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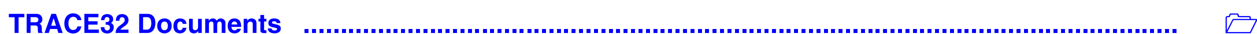
TRACE32 Documents .... 

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Usage:

(B) command only available for ICD
(E) command only available for ICE
(F) command only available for FIRE

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Version 18-Nov-2020

History

08-May-19 New command: PCI.Option.DOMAIN.

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PCI

Legacy PCI configuration

The command group **PCI** supports the access to the legacy PCI configuration space (first 256 bytes of device data).

See also

- PCI.Dump
- PCI.Option.DOMAIN
- PCI.Read
- PCI.Scan
- PCI.Write

PCI.Dump

Display PCI device data

Format:	**PCI.Dump** *<bus>* *<device>* *<function>* [**/***<option>*]
<bus>:	**0..Max_PCI_Busnumber**
<device>:	**0..Max_PCI_Devicenumber**
<function>:	**0..Max_PCI_Functionnumber**
<option>:	**Byte** | **Word** | **Long** | **Quad** **BE** | **LE**

Displays the raw PCI device data.

<bus>	PCI bus number
<device>	PCI device number
<function>	PCI function number
<option>	Data display format and endianness

See also

- PCI

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PCI.Option.DOMAIN

Format:	**PCI.Option.DOMAIN** *<domain>*
<domain>:	**0**…**65535**

Default: 0

Configures the PCI domain used as default by other **PCI** commands. A PCI domain is an isolated set of PCI bus segments. Usually multiple PCI domains are used when there are multiple independent PCI controllers on a chip.

See also

- PCI

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Format:	**PCI.Read** *<bus> <device> <function> <register>* [**/***<option>*]
<bus>:	**0..Max_PCI_Busnumber**
<device>:	**0..Max_PCI_Devicenumber**
<function>:	**0..Max_PCI_Functionnumber**
<register>:	**0..Max_PCI_Registernumber**
<option>:	**Byte** | **Word** | **Long** | **Quad** **BE** | **LE**

Reads the selected PCI register. The read access is always 32bit (long), using a byte or word format is only for convenience.

<bus>	PCI bus number
<device>	PCI device number
<function>	PCI function number
<register>	PCI register number
<option>	Data display format and endianness

See also

■ PCI

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PCI.Scan

List PCI devices

Format:	**PCI.Scan** [*<range>*]
<range>:	*<start>*--*<end>*
<start>:	**0..Max_PCI_Busnumber**
<end>:	**0..Max_PCI_Busnumber**

Scans the PCI bus and lists the found devices.

<range>	PCI bus range, default: 0.--1.
<start>	*<start>* **must be smaller than or equal to** *<end>.*
<end>	*<end>* **must be greater than or equal to** *<start>.*

See also

- PCI

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Format:	**PCI.Write** *<bus> <device> <function> <register>* [**%***<format>*] *<value>*
<bus>:	**0..Max_PCI_Busnumber**
<device>:	**0..Max_PCI_Devicenumber**
<function>:	**0..Max_PCI_Functionnumber**
<register>:	**0..Max_PCI_Registernumber**
<format>:	**Byte** | **Word** | **Long** | **Quad** **BE** | **LE**
<value>:	**Number**

Writes the selected PCI register. The write access is always 32bit (long), using a byte or word format is only for convenience (read-modify-write operation).

<bus>	PCI bus number
<device>	PCI device number
<function>	PCI function number
<register>	PCI register number
<format>	Data display format and endianness
<value>	New PCI register value

See also

- PCI

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PCPOnchip

The **PCPOnchip** command group allows to display and analyze the PCP trace information stored to the on-chip trace provided by an ED device e.g. for the TriCore architecture.

The **PCPOnchip** command is only applicable if the PCP debugging and tracing is performed with the same TRACE32 instance then the core debugging (legacy PCP).

For a description of the command usage, refer to the **<trace>** command group.

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PER Peripheral files

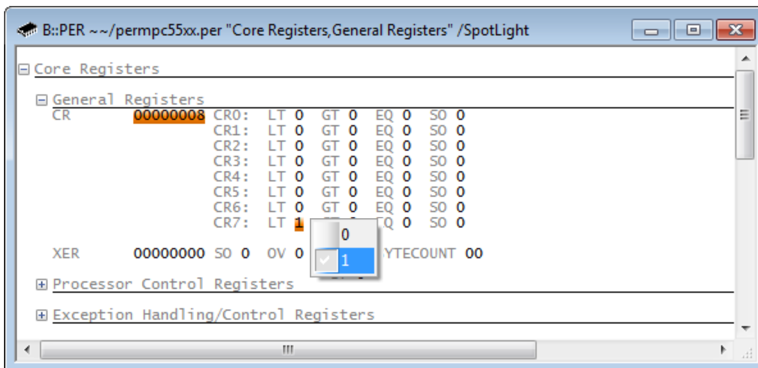
See also

- PER.In
- PER.Program
- PER.ReProgram
- PER.ReProgramDECRYPT
- PER.Set
- PER.STOre
- PER.TestProgram
- PER.view
- PER.viewDECRYPT
- SETUP.DropCoMmanD

▲ 'Release Information' in 'Release History'

Overview PER

The command **PER.view** displays a window with a view on the control registers of integrated peripherals. The so-called *peripherals files* (*.per) controlling the contents of this window can be freely configured for displaying memory structures or I/O structures.



All microcontroller emulation probes are supported by a file which describes the internal peripherals. This file may be modified (using logical names instead of pin numbers for i/o ports) or extended to display additional peripherals outside the microcontroller.

Examples for different microcontrollers reside in the directory **~~/demo/per**.

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PER.In Read port

Format: **PER.In** *<address>* [*<count>*] [**/***<options>*]

<options>: **Byte** | **Word** | **Long** | **Quad** | **TByte** | **PByte** | **HByte** | **SByte**
BE | **LE**
Repeat | **INCrement** | **CORE** *<core_number>*

This command reads data from the specified address and prints it to the message line. Please refer to the description of the **Data.In** command for more information.

■ PER ■ PER.view

See also

■ PER ■ PER.view

PER.Program Interactive programming

Format: **PER.Program** [*<file>* [*<line>*]] [**/***<option>*]

<option>: **AutoSave** | **NoSave**

Opens the **PER.Program** editor window, where you can create and edit peripheral files.

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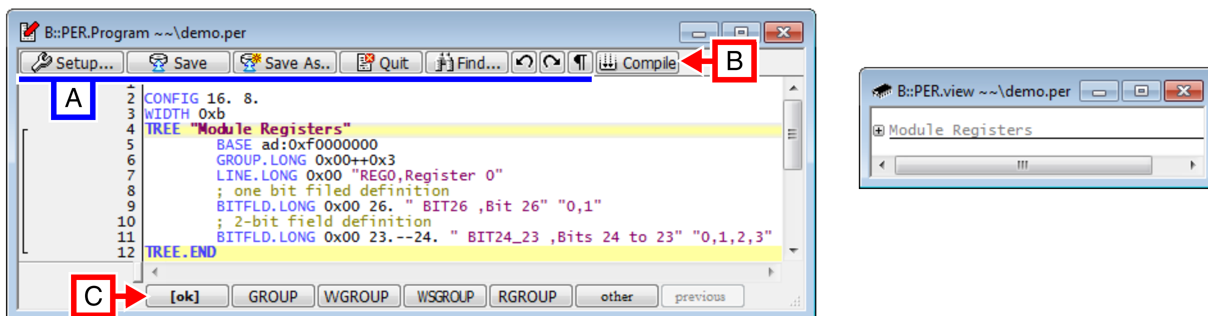
The editor provides an online syntax check. The input is guided by softkeys. For a description of the syntax for the peripheral files, refer to **“Peripheral Files Programming Commands”** (per_prog.pdf).



Buttons common to all TRACE32 editors:

A For button descriptions, see **EDIT.file**.

Buttons specific to this editor:

B **Compile** performs a syntax check and, if an error is found, displays an error message.
If the peripheral file (*.per) is error free, then the message “compiled successfully” is displayed in the **PER.Program** window.
To view the result, open the file in the **PER.view** window.

C Commands for programming peripheral files. For descriptions and examples, refer to **“Peripheral Files Programming Commands”** (per_prog.pdf).

<file>	The default extension for *<file>* is ***.per**.
<line>, *<option>*	For description of the arguments, see **EDIT.file**.

See also

- PER
- PER.ReProgram
- PER.view
- SETUP.EDITOR
- IOBASE()
- 'Text Editors' in 'PowerView User's Guide'
- 'Release Information' in 'Release History'

PER.ReProgram — Load default program

Format:	**PER.ReProgram** [*<file>*]

Without command parameter <file>, the CPU specific default peripheral file (*.per) in the system directory is used (e.g. peromap35xx.per).

With command parameter <file>, the corresponding file is compiled. The file should not have any errors when using this command. This given file will be temporary used as new default peripheral file till the next **PER.ReProgram** command or a new start of TRACE32 software.

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The peripherals can be displayed with the **PER.view** command without arguments.

See also

■ PER ■ PER.Program ■ PER.view ❏ IOBASE()
▲ 'Release Information' in 'Release History'

PER.ReProgramDECRYPT Load default program (encrypted)

Format:	**PER.ReProgramDECRYPT** [<*file*>]

Reprograms encrypted PER file. See **PER.ReProram** for more information.

See also

■ PER ■ PER.view

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The **PER.Set** command group is used to modify peripheral registers.

See also

- PER.Set.Field
- PER.Set.Index
- PER.Set.IndexField
- PER.Set.Out
- PER.Set.SaveIndex
- PER.Set.SaveIndexField
- PER.Set.SaveTIndex
- PER.Set.SaveTIndexField
- PER.Set.SEQuence
- PER.Set.SEQuenceField
- PER.Set.SHADOW
- PER.Set.simple
- PER.Set.TIndex
- PER.Set.TIndexField
- PER
- PER.view

PER.Set.Field — Modify a bit field in memory

Format:	**PER.Set.Field** *<address>* **%***<format>* *<mask>* [*<mult>* [*<summ>*]]*<value>*
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Modifies a bit field in memory. When some register content is shown in the Peripheral window by the **HEXMASK** or **BITFLD** command, it may be scaled with a multiplier and a summand. This command can be used to modify the scaled value without having to unscale it manually or taking care of the bitfield's offset.

The memory content at *<address>* is read with the access width given by *<format>*. The bits set in *<mask>* will be replaced by the corresponding bits in *<value>* and the new value is written to *<address>*. *<value>* is considered to be completely within the mask, one must not specify any offset to the mask.

```
OldData:      0x53674210   0y0101.0011.0110.0111.0100.0010.0001.0000
mask:         0x007c0000   0y0000.0000.0111.1100.0000.0000.0000.0000
                                        --- --|   <-  offset  ->   |
value:        0x5          0y           001 01
                           ----------------------------------------
NewData:      0x53174210   0y0101.0011.0001.0111.0100.0010.0001.0000
                  --                    --- --

NewData = (OldData & ~mask) | ( (value<<offset(mask)) & mask)
```

Additionally a possible multiplier *<mult>* may be specified as divisor. If the *<mult>* is omitted, the default is 1. Also a possible summand *<summ>* can be specified as subtrahend. If the *<summ>* is omitted, the default is 0. If *<summ>* and *<mult>* both specified, the division is performed before the subtraction.

```
tmpvalue = (<value> / <mult>) - <summ>;
tmpvalue = tmpvalue << (number of bits between <mask> and 0);
Memory(<address>) = (Memory(<address>) & <mask>) | tmpvalue;
```

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Example 1 - the following PER file is given:

```
GROUP D:0xBF000000++3 "Cache Configuration"
LINE.LONG 0 "CACHE"
HEXMASK.LONG 0x0 8.--9. 64. 0. "Cache Size "

; Bits [9:8] are defined:  0 =   0 K Cache Size, displayed is 0x00
;                          1 =  64 K Cache Size, displayed is 0x40
;                          2 = 128 K Cache Size, displayed is 0x80
;                          3 = 172 K Cache Size, displayed is 0xC0
```

To change the cache size to 128 KB, perform the following command:

```
PER.Set.Field D:0xBF000000 %Long 0x00000300 64. 0. 128.
```

As result, the content of bits [9:8] is 0y10 (0x2).

Example 2 - Change single bit only and leave other bits untouched:

```
PER.Set.Field D:0xF0000470 %Long 0x00002000 1.    ; set bit 13
PER.Set.Field D:0xF0000470 %Long 0x01000000 0.    ; clear bit 24
```

See also

- PER.Set

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Format:	**PER.Set.Index** *<idx_addr>* **%***<idx_fmt> <idx_rd> <idx_wr> <data_addr>* **%***<data_fmt> <data_value>*
<idx_fmt>, *<data_fmt>*:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Writes or modifies indirectly addressed registers.

<idx_addr>	Specifies the address register.
<data_addr>	Specifies the address of the data register of the indirect access.

PER.Set.Index can be translated into the following commands (IS_BITMASK and APPLY_BITMASK are pseudo-functions):

```
if IS_BITMASK(<data_value>)
(
  PER.Set <index_addr> %<idx_fmt>  <idx_rd>
  &read_value=DATA.<data_fmt>(<data_addr>)
  &new_value=APPLY_BITMASK(&read_value,<data_value>)
)
else
(
  &new_value=<data_value>
)
PER.Set <index_addr> %<idx_fmt>  <idx_wr>
PER.Set <data_addr>  %<data_fmt> &new_value
```

If the address register *<idx_addr>* is read/write, it is recommended to use **PER.Set.SaveIndex**, to restore the original setting after the access.

See also

- PER.Set

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PER.Set.IndexField

Set fields at indexed register

Format:	**PER.Set.IndexField** *<idx_addr>* **%***<idx_fmt>* *<idx_rd>* *<idx_wr>* *<data_addr>* **%***<data_fmt>* *<data_value>*
<idx_fmt>, *<data_fmt>*:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

See also

- PER.Set

PER.Set.Out

Write data stream to memory

Format:	**PER.Set.Out** *<address>* **%***<format>* *<data>* *<string>* [**/***<option>*]
<options>:	**Repeat** | **CORE** *<core>*

Writes a sequence of data elements sequentially to *<address>*.

See also

- PER.Set

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Format:	**PER.Set.SaveIndex** *<idx_addr>* **%***<idx_fmt> <idx_rd> <idx_wr> <data_addr>* **%***<data_fmt> <data_value>*
<idx_fmt>, *<data_fmt>*:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Writes or modifies indirectly addressed registers.

<idx_addr>	Specifies the address register.
<data_addr>	Specifies the address if the data register of the indirect access.

The original value of the register at *<idx_addr>* is restored after the access.

PER.Set.SaveIndex can be translated into following commands (IS_BITMASK and APPLY_BITMASK are pseudo-functions):

```
&original_idx_addr=DATA.<idx_fmt>(<index_addr>)

if IS_BITMASK(<data_value>)
(
  PER.Set <index_addr> %<idx_fmt>  <idx_rd>
  &read_value=DATA.<data_fmt>(<data_addr>)
  &new_value=APPLY_BITMASK(&read_value,<data_value>)
)
else
(
  &new_value=<data_value>
)
PER.Set <index_addr> %<idx_fmt>  <idx_wr>
PER.Set <data_addr>  %<data_fmt> &new_value

PER.Set <index_addr> %<idx_fmt>  &original_idx_addr
```

If the address register *<idx_addr>* cannot be read (write only), use **“PER.Set.Index Modify indirect (indexed) register”** (general_ref_p.pdf).

See also

■ PER.Set

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PER.Set.SaveIndexField — Set fields at indexed register

Format:	**PER.Set.SaveIndexField** *<idx_addr>* **%***<idx_fmt>* *<idx_rd>* *<idx_wr>* *<data_addr>* **%***<data_fmt>* *<data_value>*
<idx_fmt>, *<data_fmt>*:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

See also

- PER.Set

PER.Set.SaveTIndex — Set fields at indexed registers

Format:	**PER.Set.SaveTIndex** *<address>* **%***<format>* *<value>*
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Modifies fields at indexed registers.

See also

- PER.Set

PER.Set.SaveTIndexField — Set fields at indexed registers

Format:	**PER.Set.SaveTIndexField** *<address>* **%***<format>* *<value>*
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Modifies fields at indexed registers.

See also

- PER.Set

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PER.Set.SEQuence

Set SGROUP members

Format:	**PER.Set.SEQuence** *<offset>* **%***<format>* *<data>* …
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

See also

- PER.Set

PER.Set.SEQuenceField

Set SGROUP members

Format:	**PER.Set.SEQuenceField** *<offset>* **%***<format>* *<data>* …
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

See also

- PER.Set

PER.Set.SHADOW

Modify data based on shadow RAM

Format:	**PER.Set.SHADOW** *<address1>* *<address2>* **%***<format>* *<data>* *<string>* [**/***<option>*]
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**
<options>:	**Verify** | **ComPare** | **DIFF** | **PlusVM** | **CORE** *<core>*

Modifies data as **PER.Set**, but modifies data both on *<address1>* and on *<address2>* in shadow RAM.

See also

- PER.Set

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PER.Set.simple

Modify registers/peripherals

Format:	**PER.Set.simple** *<address>* **%***<format>* *<value>* [**/***<option>*]
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**
<options>:	**Verify** | **ComPare** | **DIFF** | **PlusVM** | **CORE** *<core>*

Modifies configuration registers/onchip peripherals. The command usually appears in the command line after a double click on a register in the **PER.view** window. See **Data.Set** for details on how to modify memories.

See also

■ PER.Set

▲ 'Registers' in 'Training FIRE Basics'

PER.Set.TIndex

Set fields at indexed registers

Format:	**PER.Set.TIndex** *<address>* **%***<format>* *<value>*
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Modifies fields at indexed registers.

See also

■ PER.Set

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PER.Set.TIndexField

Set fields at indexed registers

Format:	**PER.Set.TIndexField** *<address>* **%***<format>* *<value>*
<format>:	**Byte** | **Word** | **Long** | **Quad** | **TByte** | **HByte** | **BE** | **LE**

Modifies fields at indexed registers.

See also

- PER.Set

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Format:	**PER.STOre** [*<script_file>* [*<per_file>* ["*<subtree_path>*"]]] [**/CORE** *<core>*]

Stores all PER settings or all settings of a PER subtree to a PRACTICE file (*.cmm). The resulting file consists of **PER.Set.simple** commands [**B**]. If no *<script_file>* is specified, all settings are stored to the clipboard.

```
B::PEDIT ~~\pera940t_script.cmm
Setup... Save Save As.. Quit Find... ¶ Do Debug
 1 // ID Registers
 2  // PER.Set.simple C15:0x0 %Long 0x0
 3  // PER.Set.simple C15:0x100 %Long 0x0
 4 // System Configuration and Control
 5  PER.Set.simple C15:0x1 %Long 0x0
 6  PER.Set.simple C15:0x2 %Long 0x0
 7  PER.Set.simple C15:0x102 %Long 0x0
 8  PER.Set.simple C15:0x3 %Long 0x0
 9  PER.Set.simple C15:0x5 %Long 0x0
10  PER.Set.simple C15:0x105 %Long 0x0
11  PER.Set.simple C15:0x6 %Long 0x0
```

A Headings and read-only PER file values are commented out in PRACTICE scripts generated by **PER.STOre**.

The command **PER.STOre** may result in a “bus errror” or “debug port fail” if TRACE32 has no access to a peripheral component. Possible reasons are:

- The component is disabled.
- The component has no power or clock.
- The access to the component is restricted.

The script generated by the **PER.STOre** command contains the **PER.Set** commands in the order the configuration registers appear in the **PER.view** window. If the script is used to initialize the target hardware, it is probably not possible to use the script without modifications. The configuration registers for peripheral components typically need to be initialized in a particular order, require sometimes a fixed timing, and often assume that other initializations have already been performed (e.g. clocks settings). So it is recommended to check the script and rearrange the **PER.Set** commands as required.

The script generated by the **PER.STOre** command can be directly used in the TRACE32 Instruction Set Simulator, e.g. to analyze a crash dump.

Parameter	Description
<script_file>	File name of the PRACTICE script generated upon execution of the **PER.STOre** command.
<per_file>	Name of the PER file that is used to describe the configuration registers. You can use a comma (,), if you want to use the default PER file for the core/chip under debug. The name of the default PER file is displayed in the **VERSION.SOFTWARE** window.

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<subtree_path>	The optional parameter specifies the subtree to be saved. The individual components of a *<subtree_path>* are separated by comma.
CORE *<core>*	PER file values pertaining to the specified core (SMP debugging only).

Examples:

```
;generate script per_script.cmm for all settings
PER.STOre per_script.cmm
```

```
;generate script per_script.cmm for the settings
;of the subtree "Core Registers" and all its subtrees
;the name of the <per_file> is permpc564xbc.per
PER.STOre per_script.cmm permpc564xbc.per "Core Registers"
```

```
;generate script per_script.cmm for the settings
;of the subtree "Core Registers" and all its subtrees

;<per_file> can be represented by , if it is the default per file of the
;core/chip under debug
PER.STOre per_script.cmm , "Core Registers"
```

```
;generate script per_script.cmm for the settings
;of the specified subtree path
PER.STOre per_script.cmm , \
"Analog to Digital Converter,ADC0,Control Logic Registers"
```

```
;if no <script_file> is specified all settings are stored to the
;clipboard
PER.STOre
```

```
;only settings of the subtree "Core Registers" and all its subtrees
;are stored to the clipboard
PER.STOre ,, "Core Registers"
```

See also

■ PER ■ PER.view

▲ 'Release Information' in 'Release History'

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Format:	**PER.TestProgram** [<*file*>]

Can be used to detects errors in per file.

See also

- PER
- PER.view

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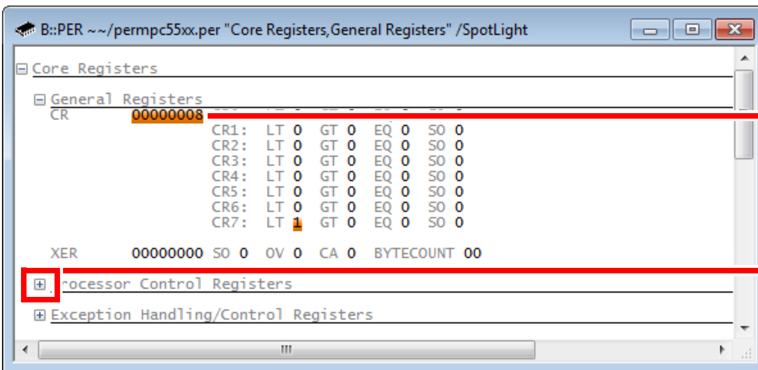
Format:	**PER.view** [*<file>* [[*<args>*] "*<subtree_path>*"] [**/***<option>*]]
<option>:	**SpotLight** | **DualPort** | **Track** | **AlternatingBackGround** **CORE** *<core_number>*

Opens the **PER.view** window, displaying a so-called *PER file,* short for *peripheral register definition file*. PER files simplify working with peripheral registers and allow to display and modify the contents of peripheral registers. The peripheral registers in a PER file are often organized in a tree hierarchy.

Note that the **PER.view** window remains empty until the commands **SYStem.CPU** *<cpu_type>* and **SYStem.Up** have been executed.



The **SpotLight** option highlights changes.

Right-click to show/hide all subtrees.
Be sure to *show* all subtrees before searching for a specific item (e.g. with **Ctrl**+**F**).

NOTE:	For searching inside a (potentially huge) PER file, proceed as follows: • Right-click on a [-] or [+] box of the tree. • Choose **show all** from the popup menu. This will open all the subtrees. • Press **Ctrl**+**F** to open a search dialog for performing a text search in the open window and enter the term to search for.

<file>	Specifies the PER file to be displayed. If *<file>* is omitted, the default PER file for the selected CPU is displayed.
<subtree_path>	The optional parameter specifies the subtree to be opened. The individual components of a *<subtree_path>* are comma-separated.
<args>	Arguments can be passed from a PRACTICE script file (*.cmm) to a PER file. For an example, see **"Passing Arguments"** (per_prog.pdf).
SpotLight	Highlights all changes on the registers. Registers changed by the last program run/single step are marked in dark red. Registers changed by the second to the last program run/single step are marked a little bit lighter. This works up to 4 levels.

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DualPort	Updates the registers while the program execution is running.
CORE *<n>*	Displays the contents of the registers for a certain core other than the currently selected core.
Track	All windows opened with the **/Track** option follow the cursor movements in the active window. For more information, see **"Window Tracking"** (ide_user.pdf).
AlternatingBack-Ground	Displays an alternating background color in the **PER.View** window. The background color display can also be toggled using the pop-up context menu entry "Toggle alternating background". This option is supported by TRACE32 release 09.2020 or newer.

Example: This script illustrates how you can use the **PER.view** command. Simply copy the script to a `test.cmm` file, and then step through the script (See "**How to...**").

```
;Displays the default PER definition file for the selected CPU, i.e.
;the peripherals for the selected CPU
PER.view

;Displays the path and the version of the PER definition file
VERSION.SOFTWARE

;The comma replaces the default PER definition file name
;and lets you use the SpotLight option.
PER.view , /SpotLight  ;This is useful to highlight changes

;Displays a specific PER definition file. The path prefix ~~ expands to
;the system directory of TRACE32
PER.view ~~/per750mm.per

;Expands all subtrees
PER.view ~~/per750mm.per "*"

;Expands just the subtree "General Registers"
PER ~~/permpc55xx.per "Core Registers,General Registers" /SpotLight
WinPAN 0. -3. ;The WinPAN command is used here for demo purposes.

;Expands all subtrees of "Core Registers"
PER.view , "Core Registers,*"
```


See also

- ■ PER
- ■ PER.In
- ■ PER.Program
- ■ PER.ReProgram
- ■ PER.ReProgramDECRYPT
- ■ PER.Set
- ■ PER.STOre
- ■ PER.TestProgram
- ■ PER.viewDECRYPT
- ■ SYStem.CPU
- ❏ PER.ARG()

▲ 'Release Information' in 'Release History'
▲ 'Registers' in 'Training FIRE Basics'

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Format:	**PER.viewDECRYPT** *<keystring>* *<file>* [*<string>* | *<address>*] [**/***<option>*]
<option>:	**SpotLight** | **DualPort** | **Track** | **AlternatingBackGround** **CORE** *<core_number>*

Encrypted PER files can be *executed* and viewed with the command **PER.viewDECRYPT** using the original *<keystring>*. Decrypting the PER file or viewing its original file contents in plain text is not possible.

<option>	For a description of the options, see **PER.view**.

See also

■ PER ■ PER.view ■ ENCRYPTPER

▲ 'Encrypt/Execute Encrypted Files' in 'PowerView User's Guide'

Programming Commands

For a description of the programming commands for peripheral files, refer to **"Peripheral Files Programming Commands"** (per_prog.pdf).

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PERF

Sample-based profiling

See also

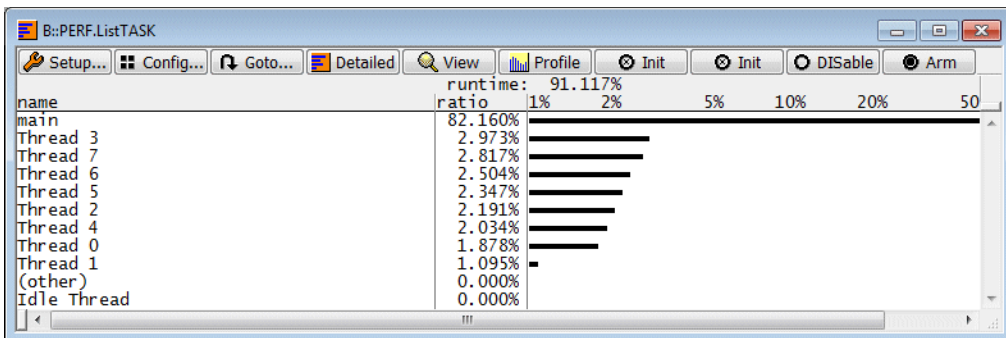
- ■ PERF.ADDRESS
- ■ PERF.ANYACCESS
- ■ PERF.Arm
- ■ PERF.AutoArm
- ■ PERF.AutoInit
- ■ PERF.ContextID
- ■ PERF.DISable
- ■ PERF.Display
- ■ PERF.Entry
- ■ PERF.EntrySize
- ■ PERF.Init
- ■ PERF.List
- ■ PERF.ListDistriB
- ■ PERF.ListFunc
- ■ PERF.ListFuncMod
- ■ PERF.ListLABEL
- ■ PERF.ListLine
- ■ PERF.ListModule
- ■ PERF.ListProgram
- ■ PERF.ListRange
- ■ PERF.ListS10
- ■ PERF.ListTASK
- ■ PERF.ListTREE
- ■ PERF.ListVarState
- ■ PERF.LOAD
- ■ PERF.METHOD
- ■ PERF.MMUSPACES
- ■ PERF.Mode
- ■ PERF.OFF
- ■ PERF.PreFetch
- ■ PERF.PROfile
- ■ PERF.Program
- ■ PERF.ReProgram
- ■ PERF.RESet
- ■ PERF.RunTime
- ■ PERF.SAVE
- ■ PERF.SCAN
- ■ PERF.SnoopAddress
- ■ PERF.SnoopMASK
- ■ PERF.SnoopSize
- ■ PERF.Sort
- ■ PERF.state
- ■ PERF.STREAM
- ■ PERF.ToProgram
- ■ PERF.View
- ❏ PERF.METHOD()
- ❏ PERF.MODE()
- ❏ PERF.RATE()
- ❏ PERF.RunTime()
- ❏ PERF.STATE()

▲ 'Release Information' in 'Release History'

Overview PERF

The TRACE32 Performance Analyzer is designed for sample-based profiling. Samples can be the actual program counter or the actual contents of a memory location. Sample-based profiling collects samples to calculate:

- The percentage of run-time used by a high-level language function.
- The percentage of run-time a variable had a certain contents.
- The percentage of run-time used by a task etc.



Samples are collected periodically. TRACE32 starts normally with 100 samples/s, but the sample acquisition methods of TRACE32 are auto-adaptive. They tune the sampling rate to its optimum.

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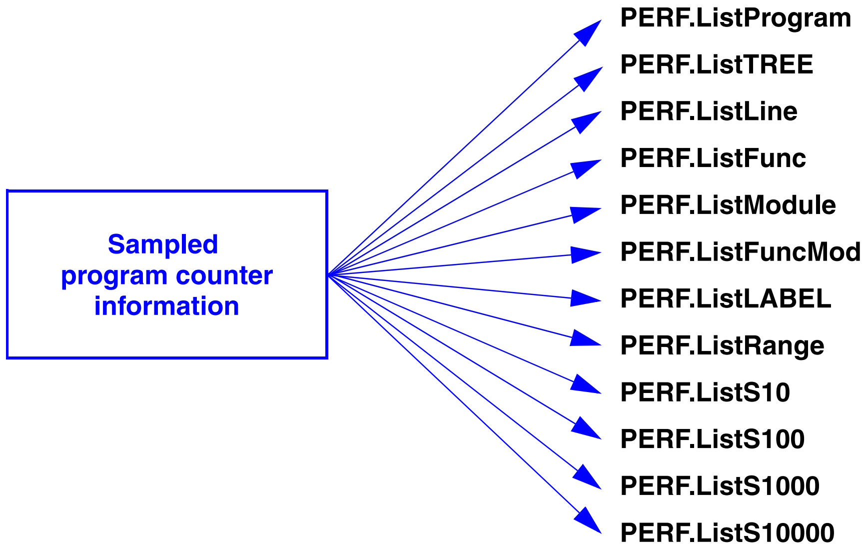
TRACE32 supports several sample acquisition methods. Some have no or nearly no effect on the target's run-time behavior but require special features from the on-chip debug logic (Snoop, Trace, DCC). The acquisition method **StopAndGo** is always supported, but has some impact on the target's run-time behavior.

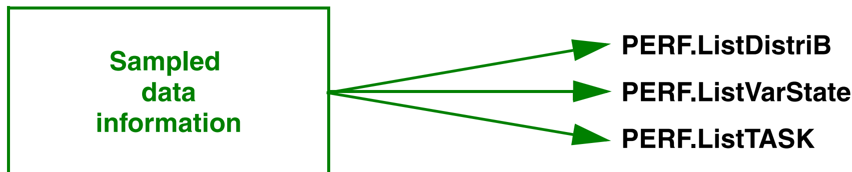
NOTE:	An unfavorable time coherence between the Performance Analyzer's sampling rate and periodic conditions on the target can distort the measurement results.

Profiling Results

The following evaluation commands can be used if the program counter is sampled:



The following evaluation commands can be used if the contents of a memory location is sampled:



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If a combi-mode is selected e.g. **PERF.Mode PCMEMory** the results can only be displayed independently.

```
PERF.state                                  ; display the Performance
                                            ; Analyzer configuration window

PERF.RESet                                  ; reset the Performance Analyzer
                                            ; configuration to its default
                                            ; setting

PERF.OFF                                    ; enable the Performance
                                            ; Analyzer

PERF.Mode PCMEMory                          ; the Performance Analyzer
                                            ; samples the program counter
                                            ; and the contents of the
                                            ; specified memory location

;PERF.METHOD StopAndGo                      ; TRACE32 set the acquisition
                                            ; method StopAndGo

PERF.SnoopAddress Var.RANGE(flags[3])       ; specify the memory location to
                                            ; to be sampled

PERF.SnoopSize Byte                         ; specify the sampling width

PERF.ListFunc                               ; open a function profiling
                                            ; window

PERF.ListVarState                           ; and a separate variable state
                                            ; profiling window

Go                                          ; start the program execution
                                            ; and the sampling
```

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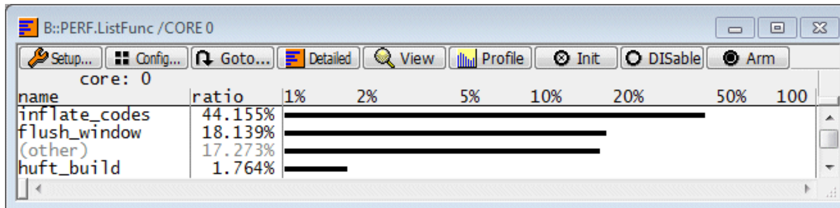
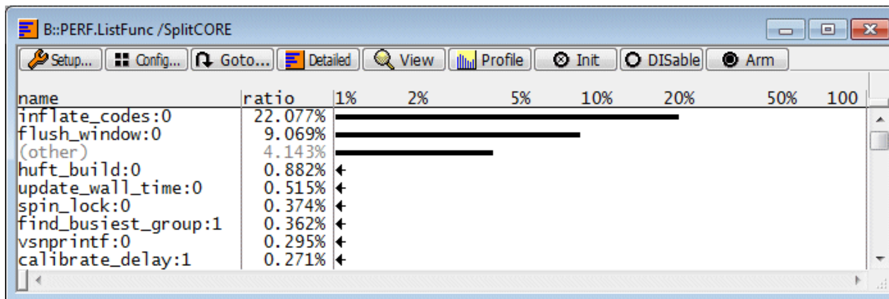
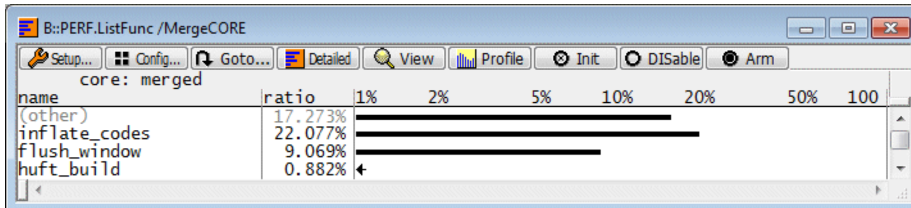
TRACE32 allows a sample-based profiling of SMP systems by supporting the **methods** **Snoop** and **StopAndGo**.

Function Profiling







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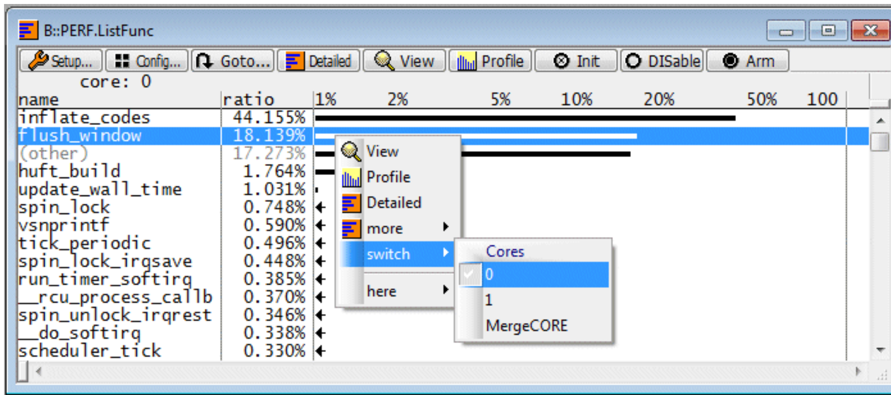
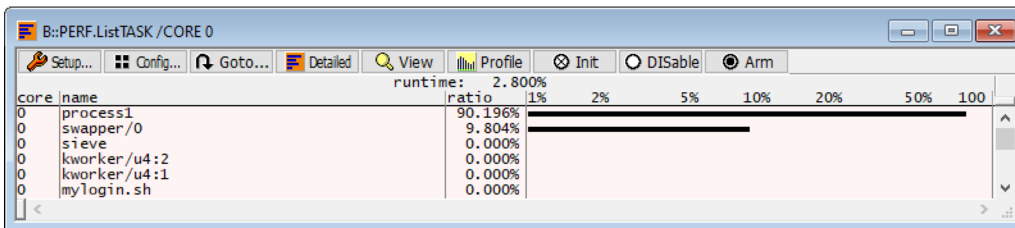
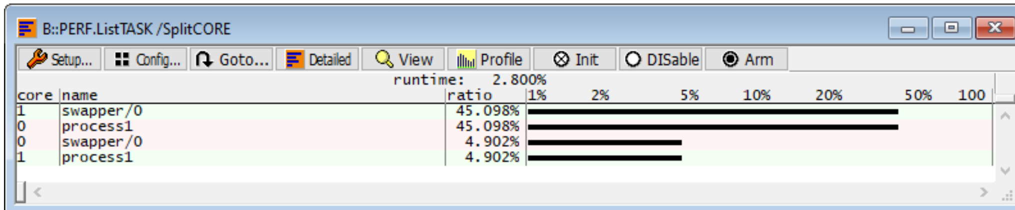
```
PERF.state                           ; display the Performance Analyzer
                                     ; configuration window

PERF.RESet                           ; reset the Performance Analyzer
                                     ; configuration window to its
                                     ; default settings

PERF.OFF                             ; enable the Performance Analyzer

PERF.Mode PC                         ; the Performance Analyzer sample
                                     ; the actual program counter

;PERF.METHOD Snoop                   ; TRACE32 set the METHOD Snoop if
                                     ; the program counter can be read
                                     ; while the program execution is
                                     ; running

PERF.ListFunc /CORE 0                ; open window for function
                                     ; profiling for core 0

…

PERF.ListFunc /SplitCORE             ; open window for function
                                     ; profiling for all cores

                                     ; display results for each
                                     ; individual core

PERF.ListFunc /MergeCORE             ; open window for function
                                     ; profiling for all cores

                                     ; results are added up for all
                                     ; cores
```

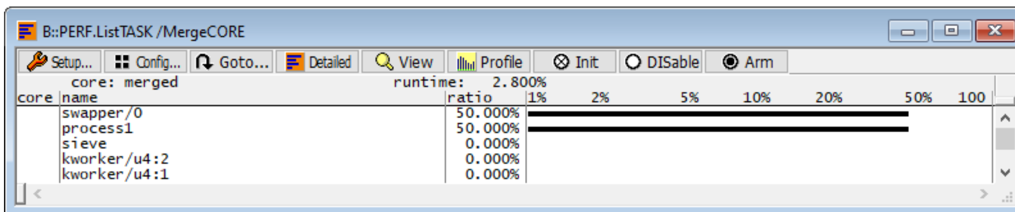
The result display can also be configured by the local pull-down menu.



Task Profiling








```
PERF.state                              ; display the Performance Analyzer
                                        ; configuration window

PERF.RESet                              ; reset the Performance Analyzer
                                        ; configuration window to its
                                        ; default settings

PERF.OFF                                ; enable the Performance Analyzer

PERF.Mode TASK                          ; the Performance Analyzer sample
                                        ; the actual program counter
```

```
;PERF.METHOD Snoop                  ; TRACE32 set the METHOD Snoop if
                                    ; the memory can be read
                                    ; while the program execution is
                                    ; running

;TASK.CONFIG ....                   Setup OS-aware debugging

PERF.ListTASK /CORE 0               ; open window for task profiling
                                    ; for core 0

…

PERF.ListTASK /SplitCORE            ; open window for TASK
                                    ; profiling for all cores

                                    ; display results for each
                                    ; individual core

PERF.ListTASK /MergeCORE            ; open window for TASK
                                    ; profiling for all cores

                                    ; results are added up for all
                                    ; cores
```

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Format:	**PERF.ADDRESS** *<address>* | *<address_range>* (program counter sampling only)

Restricts the evaluation of the program counter sampling to *<address_range>*. A given *<address>* is expanded to an address range that ends at the next label. The default *<address_range>* is the whole address space of the processor.

The following commands are equivalent:

```
PERF.ADDRESS Var.RANGE(sieve)     PERF.ListFunc /Address Var.RANGE(sieve)
PERF.ListFunc
```

Example: In this script, the sample-based profiling is restricted to the function `sieve`.

```
PERF.state                        ; display the Performance Analyzer
                                  ; configuration window

PERF.RESet                        ; reset the Performance Analyzer
                                  ; configuration to its default settings

PERF.OFF                          ; enable the Performance Analyzer

PERF.Mode PC                      ; sample the program counter
                                  ; information

PERF.METHOD Trace                 ; set the acquisition method Trace

PERF.ADDRESS Var.RANGE(sieve)     ; restrict the evaluation of the
                                  ; result to the program range of the
                                  ; function sieve

PERF.ListLine                     ; open a window for the profiling of
                                  ; high-level language lines

Go                                ; start the program execution and the
                                  ; sampling
```

See also

- PERF
- PERF.state

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PERF.ANYACCESS — Access selectivity

FIRE / ICE only

Format:	**PERF.ANYACCESS** [**ON** | **OFF**]

The range definitions of the performance analyzer are normally restricted to program fetches. Data operations will not cause the analyzer to account for the data range. This behavior can be changed when **ANYACCESS** is activated. The results are also affected by data operations and will reflect more an access histogram than a performance analysis.

See also

- PERF
- PERF.state

PERF.Arm — Activate the performance analyzer manually

Format:	**PERF.Arm**

The Performance Analyzer is coupled to the program execution if **PERF.AutoArm** is **ON** (default).

If **PERF.AutoArm** is **OFF**, the Performance Analyzer can be controlled manually. **PERF.Arm** activates the Performance Analyzer, **PERF.OFF** stops the Performance Analyzer.

See also

- PERF
- PERF.state

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PERF.AutoArm — Couple performance analyzer to program execution

Format:	**PERF.AutoArm** [**ON** | **OFF**]

The Performance Analyzer is coupled to the program execution.

ON (default)	The Performance Analyzer starts sampling when the program execution is started and stops when the program execution is stopped.
OFF	The Performance Analyzer has to be started and stopped manually by the commands **PERF.Arm** and **PERF.OFF**.

See also

- PERF
- PERF.state

PERF.AutoInit — Automatic initialization

Format:	**PERF.AutoInit** [**ON** | **OFF**]

The **PERF.Init** command will be executed automatically, when the user program is started.

See also

- PERF
- PERF.state

PERF.ContextID — Enable sampling the context ID register

Format:	**PERF.ContextID** [**ON** | **OFF**]

When this option is enabled, the ARM ContextID register will be sampled with the program counter and used in the analysis for task identification. This option is only available for some ARM cores.

See also

- PERF
- PERF.state

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PERF.DISable

Disable the performance analyzer

Format:	**PERF.DISable**

The Performance Analyzer is disabled. Enabling can be done by entering the commands **PERF.Arm** or **PERF.OFF**.

The measurement data are preserved until the Performance Analyzer is re-enabled.

See also

- PERF
- PERF.state

PERF.Display

Select the display format

FIRE / ICE only

Format:	**PERF.Display** *<item>*
<item>:	**Program** | **TREE** | **LINE** | **Function** | **Module** | **FuncMod** | **LABEL** | **S10** | **S100** | **S1000** | **S10000** | **DistriBution** | **VarState**

Select the display format for sample-based profiling for ICE and FIRE. The display format has to be selected before starting the sampling. Changing the display format will re-initialize the PERF results.

See also

- PERF
- PERF.state

PERF.Entry

Function runtime analysis

ICE only

Format:	**PERF.Entry** [**ON** | **OFF**]

As the analyzer detects accesses to address ranges and the number of passes to that ranges, it is usually not possible to get the average run time of a function. The analyzer will display the mean time spent in a function. When the **Entry** option is switched on, the analyzer tries to calculate the run time of a function with a special method. Each function range is split into two ranges, a short range at the function entry and a long range at the rest of the function. The number of passes in the function header will give the number of

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function calls and allows to calculate the average run time. To work correctly the header of a function must execute linear for some program cycles, otherwise the number of entries and the average times will be wrong. The size of this header can be adjusted with **PERF.EntrySize**.

See also

- PERF
- PERF.state

PERF.EntrySize — Function header size

ICE only

Format:	**PERF.EntrySize** *<bytes>*

This definition will be used if **PERF.Entry** is activated. It defines the size of the function header. A too small value will cause the performance analyzer to ignore entries, and result in a too small number of entries and a too large average time. This will occur if the time to fetch these bytes is **smaller than 1 µs**. A too large value will also cause errors, when header part is not executed linear, i.e. has jumps or calls inside. This calls will trigger the passed counter of the header range and cause a too large entry number and a too small average time. The best results will be gained, if the value is chosen as small as possible, but large enough that the fetches take more than 1 µs (check with the state analyzer and time stamps).

See also

- PERF
- PERF.state

PERF.Init — Reset current measurement

Format:	**PERF.Init**

Resets the current measurement. **PERF.Init** does not affect the Performance Analyzer configuration.

See also

- PERF
- PERF.state

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Format: **PERF.List** [<*column*> …] [**/**<*option*>]

<*column*>: **DEFault**
DYNamic
ALL
Name
TIme
WatchTIme
AVeRage (E)
DAVeRage (E)
Ratio
DRatio
BAR [**.log** | **.LIN**]
DBAR [**.log** | **.LIN**]
Passes (E)
Entries (E)
Hits
Address
Break (E)

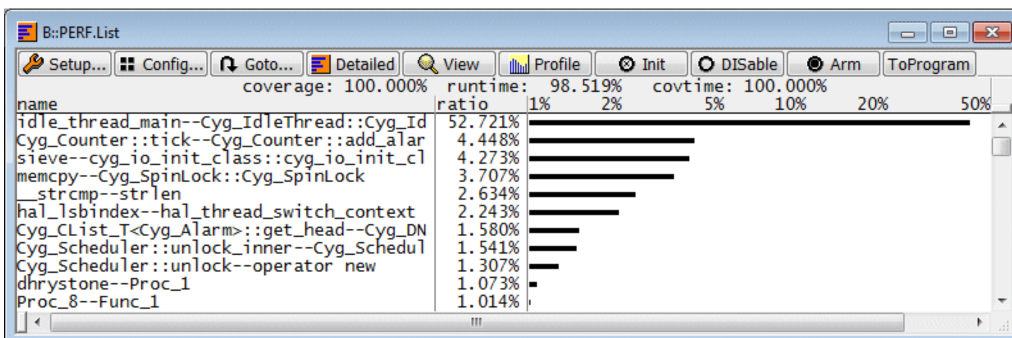
<*option*>: **Track** | **Address** <*range*> | <*address*>

CORE <*core_number*> | **MergeCORE** | **SplitCORE**

Default profiling displays:

PERF.ListLabel	for **PERF.Mode PC** | **PCTASK** | **PCMEMory**
PERF.ListTASK	for **PERF.Mode TASK**
PERF.ListDistriB	for **PERF.Mode MEMory**

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.



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Interpretation of the result:

```
coverage: 100.000%  runtime:   98.519%   covtime: 100.000%
```

coverage	(ICE only) otherwise 100%
runtime	**PERF.METHOD StopAndGo** only: Percentage of time taken by the actual program run in the last second, the rest of the time was consumed by the measurement.
covtime	(ICE only) otherwise 100%

Columns sets:

DEFault	Select the standard set (columns: Name, Ratio and BAR.log). The DEFault configuration is also used if no display items are specified.
DYNamic	Displays the results of the last second (columns: Name, DRation, DBAR.log).
ALL	Display all possible numeric fields in the **PERF.List** window (columns: Name, Time, WatchTime, Ratio, DRatio, Address, Hits).

```
PERF.List Hits DEFault            ; Open a PERF.List window starting with
                                  ; the column Hits followed by the
                                  ; default columns
```

```
PERF.List ALL
```

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B::PERF.List ALL

Setup... | Config... | Goto... | Detailed | View | Profile | Init | DISable | Arm | ToProgram

coverage: 100.000% runtime: 98.425% covtime: 100.000%

name	time	watchtime	ratio	dratio	address	hits
idle_thread_main--Cyg_IdleThread::Cyg_Id	56.270ms	104.568ms	53.811%	83.333%	P:0003A280--0003A2AB	3014.
sieve--cyg_io_init_class::cyg_io_init_cl	4.555ms	104.568ms	4.356%	0.000%	P:000315B0--0003167F	244.
Cyg_Counter::tick--Cyg_Counter::add_alar	4.537ms	104.568ms	4.338%	16.666%	P:000440A4--000442E7	243.
memcpy--Cyg_SpinLock::Cyg_SpinLock	3.547ms	104.568ms	3.392%	0.000%	P:00038A10--00038C47	190.
__strcmp--strlen	2.520ms	104.568ms	2.410%	0.000%	P:000414F4--000416EF	135.
hal_lsbindex--hal_thread_switch_context	2.446ms	104.568ms	2.338%	0.000%	P:00041D20--00041D8B	131.
Cyg_CList_T<Cyg_Alarm>::get_head--Cyg_DN	1.624ms	104.568ms	1.553%	0.000%	P:00044910--00044957	87.
Cyg_Scheduler::unlock_inner--Cyg_Schedul	1.587ms	104.568ms	1.517%	0.000%	P:0003B70C--0003B86F	85.
Cyg_Scheduler::unlock--operator new	1.288ms	104.568ms	1.231%	0.000%	P:00038F84--00038FC7	69.
hal_IRQ_handler--hal_interrupt_mask	1.045ms	104.568ms	0.999%	0.000%	P:000435B4--0004362F	56.
dhrystone--Proc_1	1.027ms	104.568ms	0.981%	0.000%	P:000304C8--00030CF7	55.

columns	
name	Name of the item (here label range)
time	Total run-time spent in item
watchtime	Observation time of item
ratio	Ratio of time spent by the item in percent
dratio	Ratio of time spent by item in the last second in percent
address	Item´s address range or contents of the memory location
hits	Number of samples taken for the item
bar	Logarithmic bar for the ratio

Column description:

Name	Display the names/contents of the listed items. Command **PERF.ListFunc**: If the sampled program counter can't be assigned to a high-level language function (e.g. assembler code, library code) it is assigned to **(other)**. Command **PERF.ListLine**: If the sampled program counter can not be assigned to the address range of an high-level language line, it is assigned to **(other)** Command **PERF.ListTASK**: If task ID 0x0 is sampled or if the sampled task ID is unknown it is assigned to **(other)**.
TIme	Total runtime spent in listed item.

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WatchTIme	Time the item is observed. This time will be the same for all ranges if the program counter is sampled. When the contents of a memory location is sampled, **WatchTime** starts when the listed value is detected the first time.
AVeRage (ICE only)	The average time spent in listed item. This is either the average run time within the function, if the **Entries** value is not displayed, or the average time executed in the function, if **Entries** is displayed.
DAVeRage (ICE only)	Similar to above, but only for the last measurement interval (dynamic).
Ratio	Ratio of time spent by the listed item in percent. This value is calculated by dividing the field **TIme** by **WatchTIme.**
DRatio	Similar to **Ratio**, but only for the last second.
BAR, DBAR	Display the profiling values in a graphical way as horizontal bars. The default display is logarithmic. The keyword **.LIN** changes to a linear display.
Passes (ICE only)	Number of entries in a range. **NOTE:** This is not the number of calls of a function. This value is also incremented, when another range is called from this range and the processor returns to that range.
Entries (ICE only)	Number of entries in a range. This value will be displayed only, if **PERF.Entry** is switched to **ON**. You should always observe the entry code of the range to ensure proper operation.
Hits	Number of samples taken for the item.
Address	Item´s address range or contents of the memory location.
Break (ICE only)	Display of breakpoints which are in use of the performance analyzer. If there are not all breakpoints in use, it will be possible to use other breakpoints for triggering. The performance analyzer will recognize them as another area for measuring.

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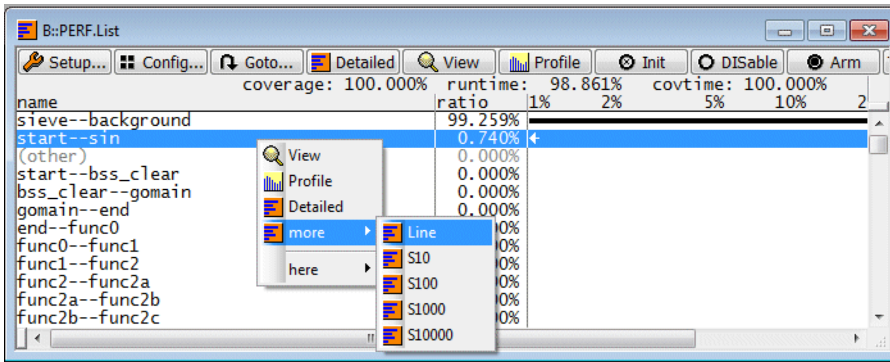
Buttons and Context Menu in the PERF.List window



Buttons	
Setup …	Opens a **PERF.state** window that allows the configuration of the Performance Analyzer.
Config …	Opens a configuration dialog that allows to rearrange the column display in the **PERF.List** window.
Goto …	Opens a **Perf Goto** dialog which allows to bring the specified item in display (command line equivalent **Data.GOTO**).
Detailed	Opens a **PERF.List** window, which lists all numerical items (command line equivalent **PERF.List<item> ALL)**. Only supported for program counter sampling.
View	Opens a window to display all performance data of a selected item (command line equivalent **PERF.View /Track**).
Profile	Opens a **PERF.PROfile** window that displays a graphical profiling for the first three listed items, (other) is ignored.
Init	Execute the command **PERF.Init**. This command resets the current measurement. The Performance Analyzer configuration is not touched.
DISable	Disable the Performance Analyzer (command line equivalent **PERF.DISable**).
Arm	Activates the Performance Analyzer manually (command line equivalent **PERF.Arm**)
ToProgram	A Performance Analyzer program is generated out of the currently shown address ranges (program counter sampling only). The command line equivalent is **PERF.ToProgram**.

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Context menu items	
View	This window displays all performance data for the selected line (command line equivalent **PERF.View** *<address>*).
Profile	Opens a **PERF.PROfile** window that displays a graphical profiling for the selected line.
Detailed	Opens a **PERF.List** window, which lists all numerical items (command line equivalent **PERF.List<item> ALL)**. Only supported for program counter sampling.
Line	Opens a **PERF.ListLine** window for the selected item (command line equivalent **PERF.ListLine /Address** *<range>*). Only supported for program counter sampling.
S10/S100/S1000/S10000	Opens a **PERF.ListSn** window for the selected item (command line equivalent **PERF.ListSn /Address** *<range>*). Only supported for program counter sampling.

Options	
Track	Tracks the window to the reference position of other windows.
Address *<range>* | *<address>*	Restricts the evaluation of the profiling results to the specified address range. If only an *<address>* is given it is expanded to an address range that ends at the next label. Only supported for program counter sampling.

See also

- ■ PERF
- ■ PERF.state
- ▲ 'Release Information' in 'Release History'

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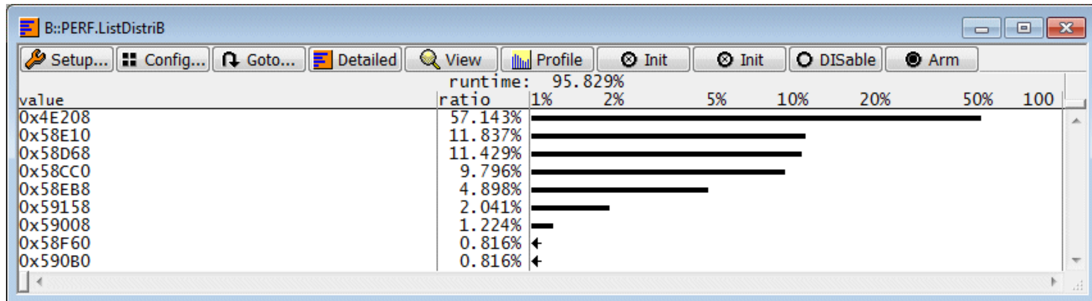
Format:	**PERF.ListDistriB** [*<column>* …] [**/Track**] (memory contents sampling)

Reports the percentage of run-time a memory location had a certain value.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

Example for ARM9:

```
PERF.state                    ; display the Performance Analyzer
                              ; configuration window

PERF.RESet                    ; reset the Performance Analyzer
                              ; configuration to its default
                              ; setting

PERF.OFF                      ; enable the Performance Analyzer

PERF.Mode MEMory              ; the Performance Analyzer samples
                              ; the contents of a memory location

;PERF.METHOD StopAndGo        ; TRACE32 sets the acquisition
                              ; method StopAndGo

PERF.SnoopAddress 0x4BD60     ; specify the memory location

PERF.SnoopSize Long           ; specifies the sampling width

PERF.ListDistriB              ; open a memory contents
                              ; profiling window

Go                            ; start the program execution and
                              ; sampling
```

See also

■ PERF ■ PERF.state

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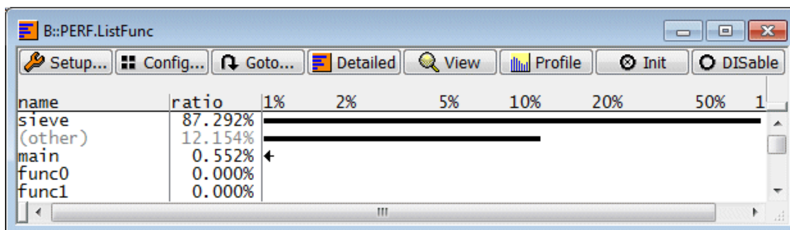
Format:	**PERF.ListFunc** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time used by high-level language functions.

If the sample program counter can not be assigned to the address range of an HLL function, it is assigned to (other). The command **PERF.ListLABEL** can be used to get more information on what is assigned to (other).



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

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Example for ARM9:

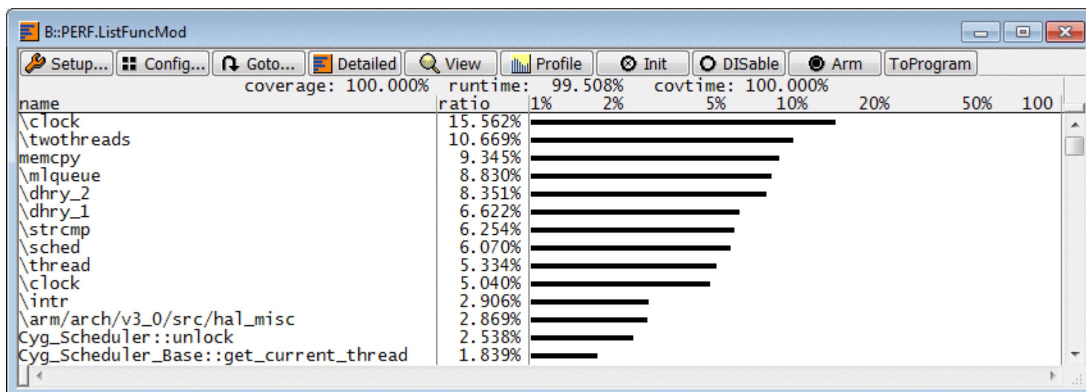
```
; example for ARM9

PERF.state                              ; display the Performance Analyzer
                                        ; configuration window

PERF.RESet                              ; reset the Performance Analyzer
                                        ; configuration to its default
                                        ; settings

PERF.OFF                                ; enable Performance Analyzer

PERF.Mode PC                            ; the Performance Analyzer samples
                                        ; the actual program counter

PERF.METHOD Trace                       ; set the acquisition method Trace

PERF.ListFunc                           ; open a window for function
                                        ; profiling

Go                                      ; start the program execution and
                                        ; sampling
```

See also

- PERF
- PERF.state

Format:	**PERF.ListFuncMod** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Report the percentage of run-time spent in high-level language functions inside the address range specified by the **PERF.ADDRESS** command. Outside the specified address range the percentage is reported on module base.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

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Example for ARM9:

```
PERF.state                              ; display the Performance Analyzer
                                        ; configuration window

PERF.RESet                              ; reset the Performance Analyzer
                                        ; configuration to its default
                                        ; settings

PERF.OFF                                ; enable Performance Analyzer

PERF.Mode PC                            ; the Performance Analyzer samples
                                        ; the actual program counter

; PERF.METHOD StopAndGo                 ; TRACE32 sets the acquisition
                                        ; method StopAndGo

PERF.Mode PC                            ; the Performance Analyzer samples
                                        ; the actual program counter

PERF.ADDRESS 0x38000--0x38fff           ; specify address range

PERF.ListFuncMod                        ; display a function profiling
                                        ; inside the specified address
                                        ; range and module profiling
                                        ; outside the specified address
                                        ; range

Go                                      ; start the program execution and
                                        ; sampling
```

See also

- PERF
- PERF.state

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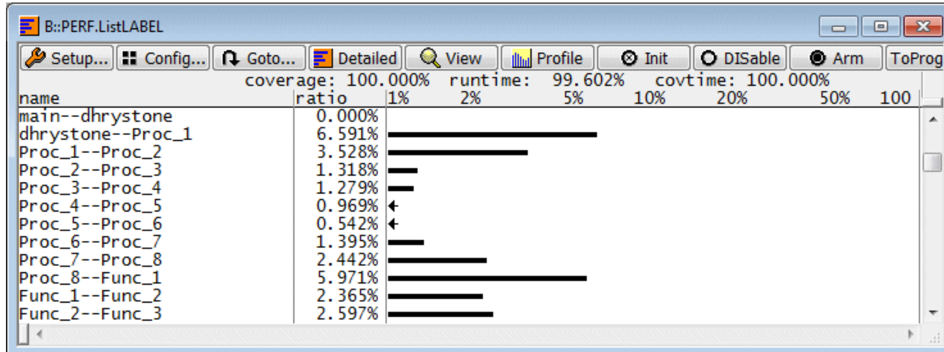
Format:	**PERF.ListLABEL** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in the address range between two labels.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **“Profiling for SMP Systems”**, page 34.

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Example for ARM9:

```
PERF.state                          ; display the Performance Analyzer
                                    ; configuration window

PERF.RESet                          ; reset the Performance Analyzer
                                    ; configuration to its default
                                    ; settings

PERF.OFF                            ; enable Performance Analyzer

PERF.Mode PC                        ; the Performance Analyzer samples
                                    ; the actual program counter

; PERF.METHOD StopAndGo             ; TRACE32 sets the acquisition
                                    ; method StopAndGo

PERF.Sort OFF                       ; the result is sorted by the
                                    ; succession of the labels in the
                                    ; symbol database

PERF.ListLABEL                      ; open a window for label-based
                                    ; profiling

Go                                  ; start the program execution and
                                    ; sampling
```

See also

- PERF
- PERF.state

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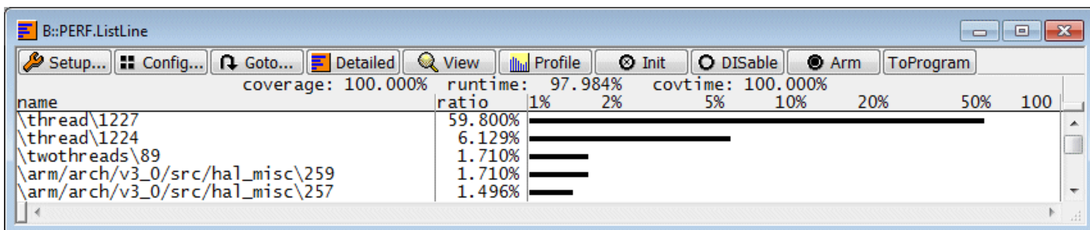
Format:	**PERF.ListLine** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in high-level language lines.

If the sampled program counter cannot be assigned to the address range of an HLL line, it is assigned to (other). If the time spent in (others) is high the command **PERF.ListLABEL** can be used to get more information.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

See also

- PERF
- PERF.state

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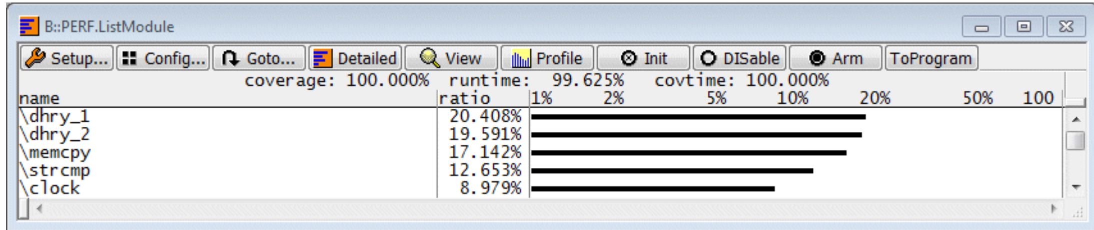
Format:	**PERF.ListModule** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in program modules.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

See also

- PERF
- PERF.state

PERF.ListProgram

Profiling based on performance analyzer program

Format:	**PERF.ListProgram** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in the address ranges specified by the Performance Analyzer program. A complete example of how to work with a Performance Analyzer program is given in the description of the **PERF.Program** command.

A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

See also

- PERF
- PERF.state

PERF.ListRange

Profiling by ranges

Format:	**PERF.ListRange** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in all ranges specified in the symbol database.

A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

See also

- PERF
- PERF.state

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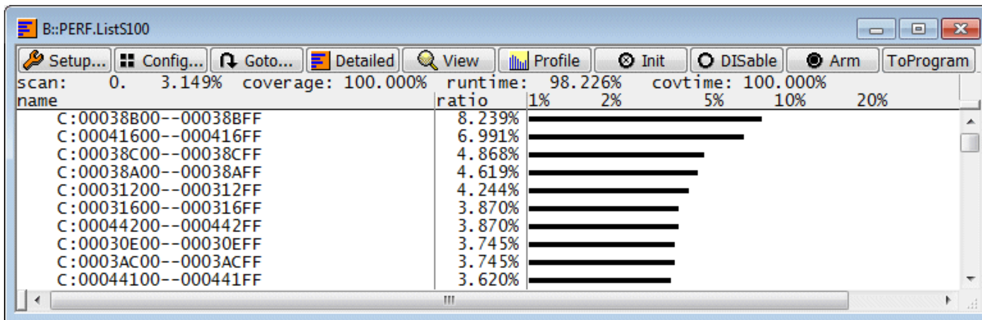
Format:	**PERF.ListS10** [*<column>* …] [**/***<option>*] **PERF.ListS100** [*<column>* …] [**/***<option>*] **PERF.ListS1000** [*<column>* …] [**/***<option>*] **PERF.ListS10000** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in 16/256/4096/65536 byte segments.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

See also

- PERF
- PERF.state

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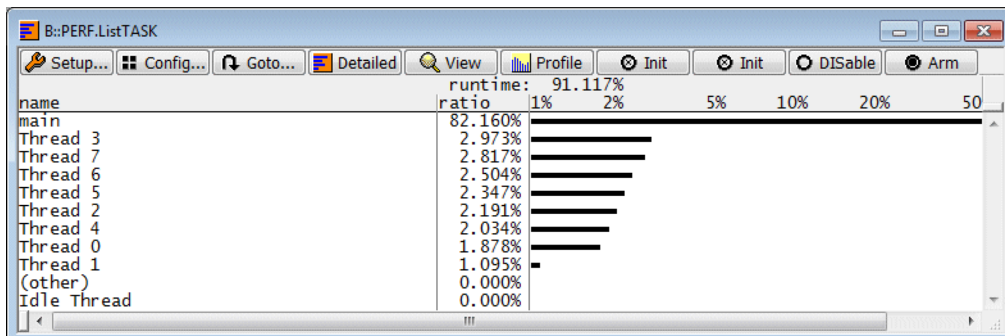
Format:	**PERF.ListTASK** [*<column>* …] **[/Track]** (memory contents sampling)

Reports the percentage of run-time spent in different tasks/threads based on the sampling of the contents of the OS-variable that contains the identifier for the current task/tread.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

Example for ARM9 and RTOS ECOS:

```
TASK.CONFIG ecos                    ; enable ECOS-aware debugging

PERF.state                          ; display the Performance Analyzer
                                    ; configuration window

PERF.RESet                          ; reset the Performance Analyzer
                                    ; configuration to its default
                                    ; settings

PERF.OFF                            ; enable Performance Analyzer

PERF.Mode TASK                      ; the Performance Analyzer samples
                                    ; the contents of the variable that
                                    ; contains the identifier for the
                                    ; current task

; PERF.METHOD StopAndGo             ; TRACE32 sets the acquisition
                                    ; method StopAndGo

PERF.Mode TASK                      ; the Performance Analyzer samples
                                    ; data information from
                                    ; TASK.CONFIG(magic)

PERF.ListTASK                       ; open a window to display a
                                    ; a task profiling

Go                                  ; start the program execution and
                                    ; the sampling
```

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Example for ARM9 and proprietary target-OS:

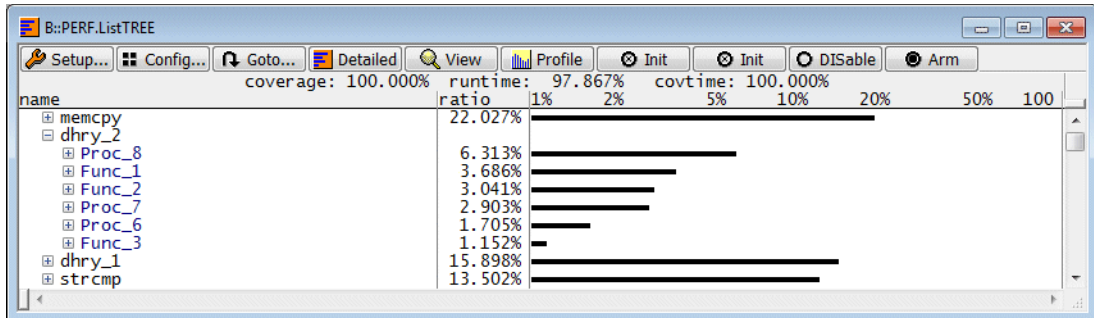
```
; inform TRACE32 which variable contains the identifier for the
; current task
; ~~ represents the TRACE32 installation directory
TASK.CONFIG ~~/demo/kernel/simple/simple.t32 current_task

; specify names for the individual tasks
Task.NAME.Set 0x4bca "Idle Task"
TASK.NAME.Set 0x58cc0 "Thread 1"

; list specified task names
TASK.NAME.view

; display the Performance Analyzer configuration window
PERF.state

; reset the Performance Analyzer configuration to its default settings
PERF.RESet

; enable Performance Analyzer
PERF.OFF

; the Performance Analyzer samples the contents of the variable that
; contains the identifier for the current task
PERF.Mode TASK

; TRACE32 sets the acquisition method StopAndGo
; PERF.METHOD StopAndGo

; open a window to display a task profiling
PERF.ListTASK

; start the program execution and the sampling
Go
```

See also

- PERF
- PERF.state

Format:	**PERF.ListTREE** [*<column>* …] [**/***<option>*] (program counter sampling)
<option>:	**Track** | **Address** *<range>* | *<address>* **CORE** *<core_number>* | **MergeCORE** | **SplitCORE**

Reports the percentage of run-time spent in modules/functions as a tree display. The tree is based on the module/function information provided by the symbol database.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

CORE, **MergeCORE**, **SplitCORE**	For details, refer to **"Profiling for SMP Systems"**, page 34.

See also

- PERF
- PERF.state

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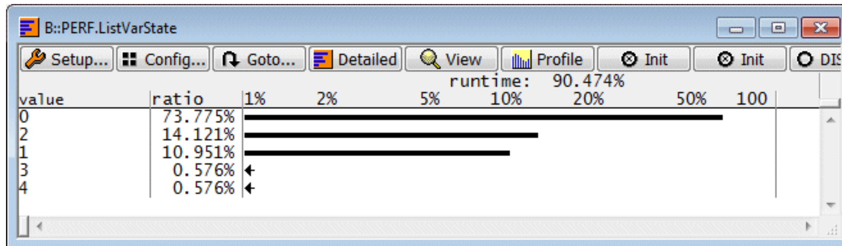
Format: **PERF.ListVarState** [<*column*> …] [**/Track**]
(memory contents sampling)

Reports the percentage of run-time a variable had a certain contents.



A detailed description of all display columns, all options, all window-specific buttons and the context pull-down is given in the description of the **PERF.List** command.

Example for ARM9:

```
PERF.state                                   ; display the Performance
                                             ; Analyzer configuration
                                             ; window

PERF.RESet                                   ; reset the Performance
                                             ; Analyzer configuration to
                                             ; its default settings

PERF.OFF                                     ; enable Performance Analyzer

PERF.Mode MEMory                             ; the Performance Analyzer
                                             ; samples the contents of
                                             ; a memory location

; PERF.METHOD StopAndGo                      ; TRACE32 set the acquisition
                                             ; method StopAndGo

PERF.SnoopAddress Var.RANGE(sched_Lock)      ; specifies the address range
                                             ; of the variable

PERF.SnoopSize Var.SIZEOF(sched_Lock)        ; specifies the sampling width

PERF.ListVarState                            ; open a window for variable
                                             ; profiling

Go                                           ; start the program execution
                                             ; and sampling
```

See also

- PERF
- PERF.state

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PERF.LOAD
Load previously stored PERF results

Format:	**PERF.LOAD** *<file>*

Loads the PERF results previously stored with the **PERF.SAVE** command for postprocessing.

See also

- PERF
- PERF.SAVE
- PERF.state

PERF.METHOD
Specify acquisition method

Format:	**PERF.METHOD** *<mode>*
<mode>:	**StopAndGo** **Trace** **Snoop** **DCC** (only if JTAG interface provides Data Communications Channel) **Hardware** (E) **BusSnoop** (E,F)

The TRACE32 software sets automatically the acquisition method **Snoop**:

- If the processor allows to read the program counter while the program execution is running and **PERF.Mode PC** is selected.
- If the processor allows to read the contents of a memory locations while the program execution is running and **PERF.Mode MEMory** or **TASK** is selected.

Otherwise the default method is set to **StopAndGo**.

Performance Analyzer Methods	
StopAndGo	The target processor is stopped periodically in order to get the actual program counter or in order to read the data information of interest (intrusive). For details refer to **"The Method StopAndGo"** in General Commands Reference Guide P, page 66 (general_ref_p.pdf).

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Snoop	The actual program counter or the data information of interest is read while the program execution is running (non-intrusive). Sampling is done as fast as possible (no snoop fails). The minimum rate is 10 samples per second. The sampling rate is set slightly varied to avoid any side effects with the timing of the application / target. For details, refer to **"The Method Snoop"** in General Commands Reference Guide P, page 67 (general_ref_p.pdf).
Trace	This method requires an off-chip trace port. In order to get the actual program counter or the data information of interest, the trace recording is stopped shorty to get a big enough section of the most recent trace information (non-intrusive). Sampling is done as fast as possible (no snoop fails). The minimum rate is 10 samples per second. The sampling rate is set slightly varied to avoid any side effects with the timing of the application / target. For details, refer to **"The Method Trace"** in General Commands Reference Guide P, page 71 (general_ref_p.pdf).
DCC	The Performance Analyzer sample the data provided via the DCC (intrusive due to code instrumentation in the target application). For details, refer to **"The Method DCC"** in General Commands Reference Guide P, page 75 (general_ref_p.pdf).

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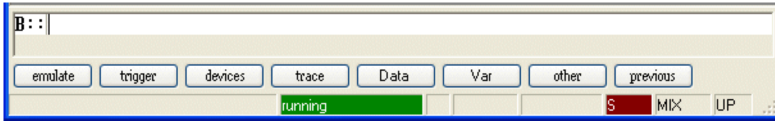
The method StopAndGo is available for all processors.

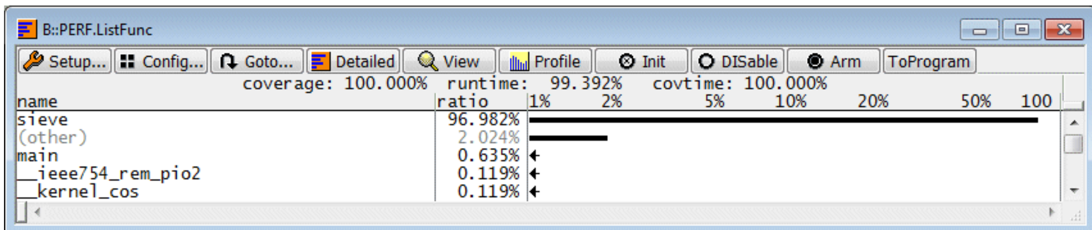
The target processor is stopped periodically in order to get the actual program counter or in order to read the data information of interest. The target processor is restarted afterwards. A stop and restart of the target processor can take more than 1 ms in a worst case scenario.



The display of a red **S** in the TRACE32 state line indicates that the program execution is periodically interrupted by the Performance Analyzer.

The field **snoops/s** in the **PERF.state** window shows how much stops have been performed in the last second.

The field **runtime** in the **PERF.List<item>** window shows the percentage of time taken by the actual program run in the last second.



TRACE32 starts the sampling with 100 stops per second, but then tunes the sampling rate so that more the 99% of the run-time is retained for the actual program run. The smallest possible sampling rate is nevertheless 10.

A fixed percentage of time can be retained for the actual program run by the command **PERF.RunTime**.

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The actual program counter or the data information of interest is read while the program execution is running (non-intrusive).

Non intrusive sample-based profiling can be done, if the target processor supports

- reading the program counter while the target program is running.
- reading memory (never cache) while the target program is running.

TRACE32 is optimizing the sampling rate. The achieved sampling rate of the last second is displayed in the field **snoops/s** in the **PERF.state** window.

Combi-modes e.g. **PERF.Mode PCMEMory** operate only if both, reading the program counter and reading memory is supported while the target program is running.

Processor architecture that allow to read the program counter while the program execution is runing	
ARC600 **ARC700**	
ARM1136 **Cortex-M0** **Cortex-M1** **Cortex-M3** **Cortex-A5** **Cortex-A9** **ARMV8**	If Program Counter Sampling Register (PCSR) is implemented
Blackfin	
CEVA-X1622 **TeakLite-III**	
DSP56300 **DSP56800E**	
GTM	
M8051EW	
MIPS32 **MIPS64**	Starting from eJTAG 3.1
R8051XC	
RH850	
RX	

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Processor architecture that allow to read the program counter while the program execution is runing	
SH	only SH4A cores
TMS320C28xx **TMS320C54xx** **TMS320C55xx** **TMS320C62xx** **TMS320C64xx** **TMS320C67xx**	
TriCore	
V850	only via quick access

Processor architectures that allow to read memory (not cache) while the program execution is running	
78K0R	
ARC600 **ARC700**	
Blackfin	Only via Background Telemetric Channel
ColdFire	
Cortex-A/R **other ARM cores**	If the DAP is connected to the AHB bus
Cortex-M	
GTM	
MPC55xx/56xx	Via NEXUS block
QORIQ	
RH850	
S12X, MCS12, 68HC12	
SH2/SH2A	

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Processor architectures that allow to read memory (not cache) while the program execution is running	
TMS320C28xx **TMS320C54xx** **TMS320C55xx** **TMS320C62xx** **TMS320C64xx** **TMS320C67xx**	
TriCore	
V850 E1 core	by QUICK access
V850 E2 core	
XC2000/C166S V2	
ZSP500	Debug Emulation Unit only

Example: Program counter sampling

```
PERF.state                              ; display the Performance
                                        ; Analyzer configuration
                                        ; window

PERF.RESet                              ; reset the Performance
                                        ; Analyzer configuration to
                                        ; its default settings

PERF.OFF                                ; enable Performance Analyzer

PERF.Mode PC                            ; the Performance Analyzer samples
                                        ; the program counter

;PERF.METHOD Snoop                      ; TRACE32 detects automatically
                                        ; that reading the program counter
                                        ; is possible while the program
                                        ; execution is running

PERF.ListFunc                           ; open a window for function
                                        ; profiling

Go                                      ; start the program execution and
                                        ; the measurement
```

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Example: Memory contents sampling

```
PERF.state                              ; display the Performance
                                        ; Analyzer configuration
                                        ; window

PERF.RESet                              ; reset the Performance
                                        ; Analyzer configuration to
                                        ; its default settings

PERF.OFF                                ; enable Performance Analyzer

PERF.Mode MEMory                        ; the Performance Analyzer samples
                                        ; the contents of a memory location

;PERF.METHOD Snoop                      ; TRACE32 detects automatically
                                        ; that reading memory is possible
                                        ; while the program execution is
                                        ; running

PERF.SnoopAddress 0xA108002F            ; specifies the memory address

PERF.SnoopSize Word                     ; specifies the sampling width

PERF.ListDistriB                        ; open a window for memory contents
                                        ; profiling

Go                                      ; start the program execution and
                                        ; the measurement
```

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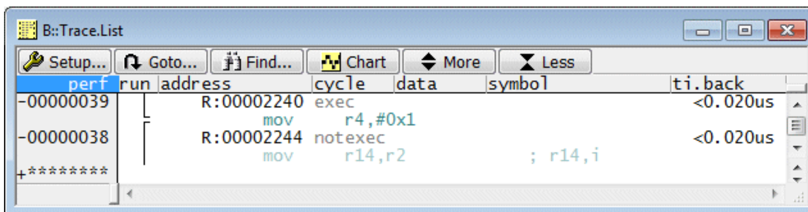
NOTE:	The sampling rate of **PERF.METHOD Trace** is much slower than the sampling rate of **PERF.METHOD Snoop**. Use **PERF.METHOD Trace** only if: • You do not want to stop the application. • The option **Snoop** (= **PERF.METHOD Snoop**) is disabled in the **PERF.state** window. • The architecture supports a trace that can be read without stopping the application.

This non-intrusive method is only available if the processor provides an off-chip trace port. Please make sure, that the trace recording is working correctly before you use the **PERF.METHOD Trace**.

In order to get the actual program counter or the data information of interest, the trace recording is stopped shortly to get a big enough section of the most recent trace information.

The field **snoop fails** in the **PERF.state** window shows how often TRACE32 failed to get the requested information out of the captured section.



The display of **perf** in blue in any Trace display window indicates that the trace recording was periodically interrupted by the Performance Analyzer. In this case the trace information is inappropriate for any trace analysis.

Sampling the actual program counter (PERF.Mode PC)

If the actual program counter is sampled the source code is required to decompress the trace information. If the target processor doesn’t allow to read memory while the program execution is running, the source code has to be loaded to the TRACE32 virtual memory.

Sampling data information (PERF.Mode MEMory/TASK)

If data information is sampled it is recommended to set a filter on the data of interest. Otherwise the number of **snoop fails** will be too high.

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Example for MPC5554: NEXUS block allows to read source code from memory while the program execution is running.

```
...

TRANSlation.Create 0x0--0xffffffff 0x0     ; specify 1:1 translation of
                                           ; effective to real addresses
                                           ; for debugger MMU

TRANSlation.ON                             ; activate translation via
                                           ; debugger MMU

...

NEXUS.DTM OFF                              ; switch data trace off in
                                           ; order to reduce load on the
                                           ; NEXUS port

PERF.state                                 ; display the Performance
                                           ; Analyzer configuration
                                           ; window

PERF.RESet                                 ; reset the Performance
                                           ; Analyzer configuration to
                                           ; its default settings

PERF.OFF                                   ; enable Performance Analyzer

PERF.METHOD Trace                          ; set acquisition method Trace

PERF.Mode PC                               ; the Performance Analyzer
                                           ; samples the program counter

PERF.ListFunc                              ; open a window for
                                           ; function profiling

Go                                         ; start the program execution
                                           ; and the sampling
```

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Example for ARM920: Load the source code to the virtual memory of TRACE32 because it is not possible to read the source code from memory while the program execution is running.

```
Data.LOAD.Elf armle.axf /VM              ; load source code to virtual
                                         ; memory of TRACE32

ETM.DataTrace off                        ; switch data trace off in order to
                                         ; reduce load on ETM trace port

PERF.state                               ; display the Performance
                                         ; Analyzer configuration
                                         ; window

PERF.RESet                               ; reset the Performance
                                         ; Analyzer configuration to
                                         ; its default settings

PERF.OFF                                 ; enable Performance Analyzer

PERF.METHOD Trace                        ; set acquisition method Trace

PERF.Mode PC                             ; the Performance Analyzer samples
                                         ; the program counter

PERF.ListLABEL                           ; open a window for label-based
                                         ; profiling

Go                                       ; start the program execution and
                                         ; the sampling
```

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Example for ARM920: A filter is set to advise the ETM to only broadcast trace information if a write access to the variable flags[3] occurs.

```
Var.Break.Set flags[3] /TraceEnable /Write     ; configure the ETM so
                                               ; that only write
                                               ; accesses to the
                                               ; variable flags[3] are
                                               ; broadcast

PERF.state                                     ; display the Performance
                                               ; Analyzer configuration
                                               ; window

PERF.RESet                                     ; reset the Performance
                                               ; Analyzer configuration
                                               ; to its default settings

PERF.OFF                                       ; enable Performance
                                               ; Analyzer

PERF.METHOD Trace                              ; set acquisition method
                                               ; Trace

PERF.Mode MEMory                               ; the Performance
                                               ; Analyzer samples
                                               ; memory contents

PERF.SnoopAddress Var.RANGE(flags[3])          ; specifies the sampling
                                               ; address

PERF.SnoopSize Byte                            ; specifies the sampling
                                               ; width

PERF.ListVarState                              ; open a variable state
                                               ; profiling window

Go                                             ; start the program
                                               ; execution and
                                               ; the sampling
```

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DCC (Debug Communications Channel) is a feature of the on-chip debugging logic currently available for all ARM/Cortex cores (not Cortex-M) and the StarCore architecture. DCC allows the target program to provide data of interest to the TRACE32 debugger. For details on DCC, refer to the manual of your target CPU.

Examples of how to use the DCC with TRACE32 are given in the TRACE32 demo folder:

```
~~/demo/arm/etc/semihosting_arm_dcc
```

The Performance Analyzer sample the data provided via the DCC. The DCC method is recommended mainly for **PERF.Mode MEMory and TASK**.

TRACE32 is optimizing the sampling rate. The achieved sampling rate of the last second is displayed in the field **snoops/s** in the **PERF.state** window.

Example for ARM920: The contents of a variable is sent via DCC to TRACE32.

```
...

PERF.state                              ; display the Performance
                                        ; Analyzer configuration
                                        ; window

PERF.RESet                              ; reset the Performance
                                        ; Analyzer configuration to
                                        ; its default settings

PERF.OFF                                ; enable Performance Analyzer

PERF.METHOD DCC                         ; set acquisition method DCC

PERF.Mode MEMory                        ; the Performance Analyzer samples
                                        ; data information

PERF.ListVarState                       ; open a variable state profiling
                                        ; window

Go                                      ; start the program execution and
                                        ; the sampling
```

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Hardware (ICE only)	A system of 64 (ECC8: 32) hardware counters is used to count the PC fetches in up to 64 (32) different ranges. 6 breakpoint types are needed to divide the 64 different ranges.
BusSnoop (ICE/FIRE only)	The PC fetch of the target CPU is read from the bus while the CPU is running. This fetch address is used to count the corresponding address range counter by software. If the fetch is outside any defined range, the "(other)" counter is incremented

See also

■ PERF ■ PERF.state ❏ PERF.METHOD()

PERF.MMUSPACES Include space IDs for addresses in the sampling

Format:	**PERF.MMUSPACES** [**ON** | **OFF**]

If a target operating system (e.g. Linux, Windows CE) is used, several processes/tasks can run at the same logical addresses. In this scenario, the logical address sampled by the Performance Analyzer is not sufficient to assign the address to a function or variable. For a clear assignment the space ID is also required.

OFF (default)	The Performance Analyzer does standard sampling.
ON	The Performance Analyzer includes the space ID in the sampling.

See also

■ PERF ■ PERF.state

▲ 'Release Information' in 'Release History'

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Format:	**PERF.Mode** *<mode>*
<mode>:	**PC** **TASK** **MEMory** **PCTASK** **PCMEMory** **LeVel** (E,F) **FLAGs** (E,F)

Selects the sampling object for the sample-based profiling.

TRACE32 samples in essence either:

- The actual program counter (PC)
- The contents of a memory location (MEMory, TASK)
- Or both simultaneously (PCMEMory, PCTASK)

The sampled program counter information and the sampled data information can only be profiled independently of each other.

PC	The actual program counter is sampled.
TASK	The contents of the variable that contains the identifier for the actual task is sampled. If **OS-aware debugging** is configured, TRACE32 knows the address of this variable (TASK.CONFIG(magic)). Context ID packets are not supported.
MEMory	The memory address specified by the command **PERF.SnoopAddress** is sampled in the size specified by the command **PERF.SnoopSize**.
PCTASK	The actual program counter and the contents of the variable that contains the identifier for the actual task are sampled. The information is sampled simultaneous, but can only be evaluated separately.
PCMEMory	The actual program counter and the memory address specified by the command **PERF.SnoopAddress** is sampled in the size specified by the command **PERF.SnoopSize.** The information is sampled simultaneous, but can only be evaluated separately.
LeVel	Trigger levels (E,F).
FLAGs	Trigger flags (E,F).

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Not all **PERF Modes** are suitable for all **PERF METHODs**. The table below provides a summary.

	Mode PC	**Mode MEMory/TASK**	**Mode PCMEMory/PCTASK**
METHOD StopAndGo	yes	yes	yes
METHOD Trace	yes	yes, but requires appropriate filter	no
METHOD Snoop	yes, if the program counter can be read during program run	yes, if memory can be read during program run	yes, if program counter and memory can be read during program run
METHOD DCC	no	yes	no

See also

- ■ PERF
- ■ PERF.state
- ❏ PERF.MODE()
- ▲ 'Release Information' in 'Release History'

PERF.OFF

Stop the performance analyzer manually

Format:	**PERF.OFF**

The Performance Analyzer is coupled to the program execution if **PERF.AutoArm** is ON (default).

If **PERF.AutoArm** is OFF, the Performance Analyzer can be controlled manually. **PERF.Arm** activates the Performance Analyzer, **PERF.OFF** stops the Performance Analyzer.

If the Performance Analyzer is disabled (state disable) it can be enable by **PERF.OFF**.

See also

- ■ PERF
- ■ PERF.state
- ❏ PERF.STATE()

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PERF.PreFetch

Prefetch handling

ICE only

Format:	**PERF.PreFetch** [**ON** | **OFF**]

Because many processors have a prefetch mechanism, they read program areas, but never execute them. This causes the performance analyzer to display times for functions, that were never executed. To prevent this behavior, the ranges programmed have to be a little bit smaller than the defined value. This ensures, that prefetches do not cause the analyzer to count functions that never executed. The disadvantage is, of course, a measurement error caused by the too small range. The **PERF.PreFetch** command allows to select between the two modes. If activated (default) the ranges are shortened by the maximum number of prefetch cycles of the target processor.

See also

- PERF
- PERF.state

PERF.PROfile

Graphic profiling display

Format:	**PERF.PROfile** *<channel>* [*<channel>* [*<channel>*]] [*<gate>* *<scale>*]
<channel>:	*<range>* | *<address>* | *<value>*
<gate>:	**0.1s** | **1.0s** | **10.0s**
<scale>:	**1.** … **32768.**

The Performance Analyzer charts the percentage of time spent in the specified item over the time axis.

By default the display is updated once per second while the minimum update period is 100 ms. Within the update period a large number of PC samples is required to calculate a statistically relevant distribution of the runtime. Therefore using slow sample methods like *StopAndGo* with short update periods will give imprecise results.

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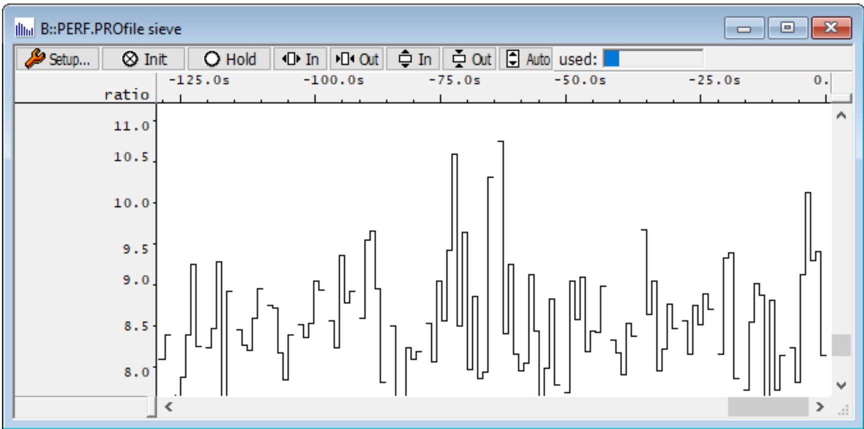
Up to three channels may be displayed in one window. Channels correspond to a code areas like functions, address ranges, addresses, tasks or memory/variable contents.

```
PERF.METHOD StopAndGo                ; take the samples for the profiling
                                     ; from the recorded trace information

PERF.Mode PC                         ; sample the program counter
                                     ; information

PERF.Arm                             ; arm the Performance Analyzer

PERF.PROfile sieve                   ; restrict the evaluation of the
                                     ; result to the program range of the
                                     ; function sieve
```

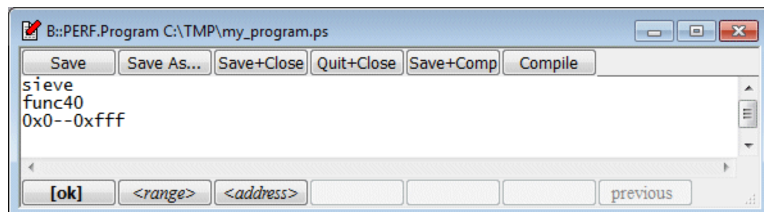


See also

- PERF
- PERF.state

Format:	**PERF.Program** [<*file*>] (program counter sampling only)

PERF.Program opens a Performance Analyzer programming window that allows to restrict the evaluation of the program counter sampling to address ranges of interest.



Buttons in the PERF.Program window	
Save	Save the Performance Analyzer program. If no name is specified the default name t32.ps is used.
Save As …	Save the Performance Analyzer program under a different name.
Save + Close	Save the Performance Analyzer program and close the Performance Analyzer programming window.
Quit + Close	Quit editing and close the Performance Analyzer programming window.
Save + Comp	Save the Performance Analyzer program and activate it as done by **Compile**.
Compile	Compiles the Performance Analyzer program. The evaluation of the profiling is restricted to the specified address ranges in all **PERF.List<item>** windows that evaluate sampled program counter information.

Example:

```
PERF.state                              ; display the Performance Analyzer
                                        ; configuration window

PERF.RESet                              ; reset the Performance Analyzer
                                        ; configuration to its default
                                        ; settings

PERF.OFF                                ; enable the Performance Analyzer

; PERF.METHOD StopAndGo                 ; the acquisition method StopAndGo
                                        ; is set by TRACE32
```

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```
PERF.ReProgram my_program.ps          ; load a existing, error-free
                                      ; Performance Analyzer program

PERF.ListProgram                      ; open a window for Performance
                                      ; Analyzer program based profiling

Go                                    ; start the program execution and
                                      ; the sampling
```

See also

- PERF
- PERF.state
- ▲ 'Release Information' in 'Release History'

PERF.ReProgram — Load an existing performance analyzer program

Format:	**PERF.ReProgram** [<*file*>] (program counter sampling only)

Loads an existing, error-free Performance Analyzer program to the Performance Analyzer.

See also

- PERF
- PERF.state
- ▲ 'Release Information' in 'Release History'

PERF.RESet — Reset analyzer

Format:	**PERF.RESet**

All settings of the performance analyzer and all marked breakpoints will be destroyed. The windows of the performance analyzer will be changed to the freeze mode and the performance analyzer will be disabled.

See also

- PERF
- PERF.state

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PERF.RunTime

Retain time for program run

Format: **PERF.RunTime** *<value>*

If **PERF.METHOD StopAndGo** is used a fraction of time is taken by the sample-based performance measurement, the rest is used by the actual program run. The command **PERF.RunTime** allows to specify the percentage of time that should be retained for the actual program run.

Examples:

```
PERF.RunTime 90.                         ; 90% of time is retained for the
                                         ; actual program run, the sample-
                                         ; based performance measurement can
                                         ; take 10% of the time

PERF.RunTime 90%                         ; alternative input format
```

The adjustment of the snoops/s is done gradually (see the **snoops/s** field in the **PERF.state** window).

See also

- PERF
- PERF.state

PERF.SAVE

Save the PERF results for postprocessing

Format: **PERF.SAVE** *<file>*

The PERF results are stored to the selected file. The file can be then loaded for postprocessing with the **PERF.LOAD** command.

See also

- PERF
- PERF.LOAD
- PERF.state

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PERF.SCAN

Scanning mode

ICE only

Format:	**PERF.SCAN** [**ON** | **OFF**]

When more ranges than available counters are covered and the **Ratio** sort mode is selected then the performance analyzer enters a scanning mode. In this mode the analyzer searches for the most time consuming areas. When these areas are found, it may be useful to disable the scanning and monitor only these ranges.

See also

■ PERF ■ PERF.state

PERF.SnoopAddress

Address for memory sample

Format:	**PERF.SnoopAddress** *<address>* | *<range>* (memory contents sampling only)

Defines the memory address for snoop modes (**DistriBution**, **VarState**). Supplying an address range defines also the size of the memory operation (**PERF.SnoopSize**).

See also

■ PERF ■ PERF.state

❏ PERF.MEMORY.SnoopAddress()

PERF.SnoopMASK

Mask for memory sample

Format:	**PERF.SnoopMASK** *<value>* (memory contents sampling only)

Defines the sample mask for snoop modes (**DistriBution**, **VarState**).

See also

■ PERF ■ PERF.state

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PERF.SnoopSize

Size for memory sample

Format:	**PERF.SnoopSize Byte** | **Word** | **Long** (memory contents sampling only)

Defines the memory access size for snoop modes (**DistriBution**, **VarState**).

See also

- ■ PERF
- ■ PERF.state
- ❏ PERF.MEMORY.SnoopSize()

PERF.Sort

Specify sorting of evaluation results

Format:	**PERF.Sort** *<mode>*
<mode>:	**OFF** **Address** **sYmbol** **Ratio**

As a default the results are sorted by ratio.

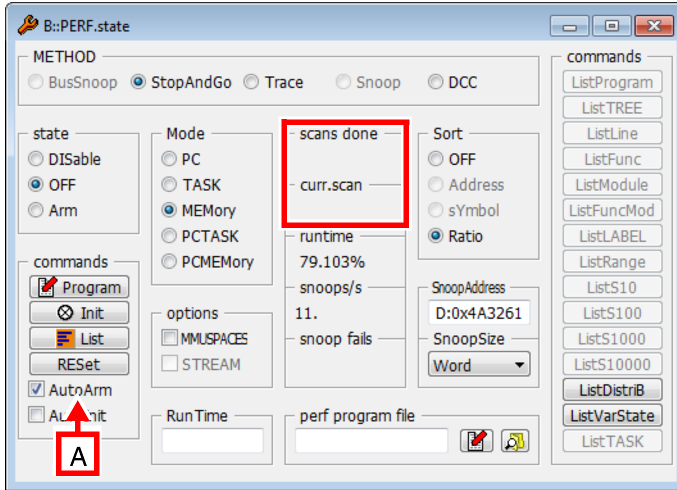
OFF	Don’t sort. Results of the program counter sampling are sorted by address, results of memory contents sampling are sorted by occurrence.
Address	Sort evaluation result by addresses (program counter sampling only).
sYmbol	Sort evaluation result by symbol names (program counter sampling only).
Ratio	Sort evaluation result by the ratio of time used by the items.

See also

- ■ PERF
- ■ PERF.state

Format:	**PERF.state**

Displays the control window for the Performance Analyzer.



A For descriptions of the commands in the **PERF.state** window, please refer to the **PERF.*** commands in this chapter.
Example: For information about the **AutoArm** check box, see **PERF.AutoArm**.

scan done	Displays the number of scans already completed. The field will be displayed only, if the scanning mode is active, i.e. **Ratio** is active and more ranges than available counters are covered.
curr.scan	The 'current scan' field displays the ratio of the scanned ranges to total the number of ranges.
covered time	The 'covered time' field gives the time covered by the current set of ranges. (not shown in the above **PERF.state** window.)

See also

- PERF
- PERF.ADDRESS
- PERF.ANYACCESS
- PERF.Arm
- PERF.AutoArm
- PERF.AutoInit
- PERF.ContextID
- PERF.DISable
- PERF.Display
- PERF.Entry
- PERF.EntrySize
- PERF.Init
- PERF.List
- PERF.ListDistriB
- PERF.ListFunc
- PERF.ListFuncMod
- PERF.ListLABEL
- PERF.ListLine
- PERF.ListModule
- PERF.ListProgram
- PERF.ListRange
- PERF.ListS10
- PERF.ListTASK
- PERF.ListTREE
- PERF.ListVarState
- PERF.LOAD
- PERF.METHOD
- PERF.MMUSPACES
- PERF.Mode
- PERF.OFF
- PERF.PreFetch
- PERF.PROfile
- PERF.Program
- PERF.ReProgram
- PERF.RESet
- PERF.RunTime
- PERF.SAVE
- PERF.SCAN
- PERF.SnoopAddress
- PERF.SnoopMASK
- PERF.SnoopSize
- PERF.Sort
- PERF.STREAM
- PERF.ToProgram
- PERF.View
- ❏ PERF.METHOD()
- ❏ PERF.MODE()
- ❏ PERF.RATE()
- ❏ PERF.RunTime()
- ❏ PERF.STATE()

▲ 'Release Information' in 'Release History'

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PERF.STREAM — PERF stream mode

Format:	**PERF.STREAM** [**ON** | **OFF**] (program counter sampling and StopAndGo method only)

Default: OFF

Enable/disable STREAM mode for program counter sampling when **PERF.METHOD** is set to StopAndGo.

When STREAM mode is enabled, the sampling is performed by the software running on the PowerDebug module instead of the PowerView host software which leads to higher sampling rates.

The STREAM mode cannot be used together with **PERF.MMUSPACES**.

See also

- PERF
- PERF.state

PERF.ToProgram — Automatic generation of performance analyzer program

Format:	**PERF.ToProgram** (program counter sampling only)

The different **PERF.List<item>** commands partition the address spaces into address ranges in order to evaluate the sampled program counter information. Examples:

PERF.ListFunc	Partitions the address space in function ranges
PERF.ListLine	Partitions the address space in high-level language line ranges
PERF.ListModule	Partitions the address space in module ranges

The command **PERF.ToProgram** converts the current segmentation into a Performance Analyzer program.

TRACE32 allows up to 1024 address ranges in a Performance Analyzer program.

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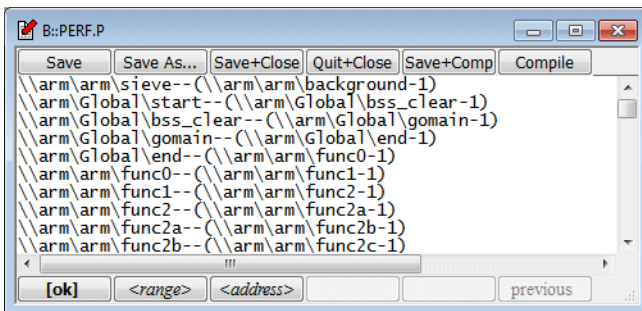
Example for ARM9:

```
PERF.state                            ; display the Performance Analyzer
                                      ; configuration window

PERF.RESet                            ; reset the Performance Analyzer
                                      ; configuration to its default
                                      ; settings

PERF.OFF                              ; enable Performance Analyzer

PERF.Mode PC                          ; the Performance Analyzer samples
                                      ; the actual program counter

; PERF.METHOD StopAndGo               ; acquisition method StopAndGo
                                      ; is set by TRACE32

PERF.ListLABEL                        ; open a window for label-based
                                      ; profiling

Go                                    ; start the program execution and
                                      ; sampling

Break                                 ; stop the program execution and
                                      ; the sampling

PERF.ToProgram                        ; convert the listed label ranges
                                      ; to a Performance Analyzer program
```



See also

■ PERF ■ PERF.state

PERF.View Detailed view

Format:	**PERF.View** *<address>* | **/Track**

Displays all numerical results of a symbol or an area.

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Examples:

```
PERF.View sieve                          ; list all numerical results for
                                         ; the function sieve
```

```
PERF.state                               ; display the Performance
                                         ; Analyzer configuration window

PERF.RESet                               ; reset the Performance Analyzer
                                         ; to its default settings

PERF.OFF                                 ; enable the Performance
                                         ; Analyzer

PERF.Mode MEMory                         ; the Performance Analyzer
                                         ; samples the contents of a
                                         ; memory location

; PERF.Mode StopAndGo                    ; the Performance Analyzer sets
                                         ; the acquisition method
                                         ; StopAndGo

PERF.SnoopAddress Var.RANGE(flags[3])    ; specify the memory address

PERF.SnoopSize Byte                      ; specify the sampling width

PERF.ListVarState                        ; open a window for variable
                                         ; state profiling

Go                                       ; start the program execution
                                         ; and the sampling

PERF.View /Track                         ; list all numerical results for
                                         ; the item selected in
                                         ; PERF.List<item>
```

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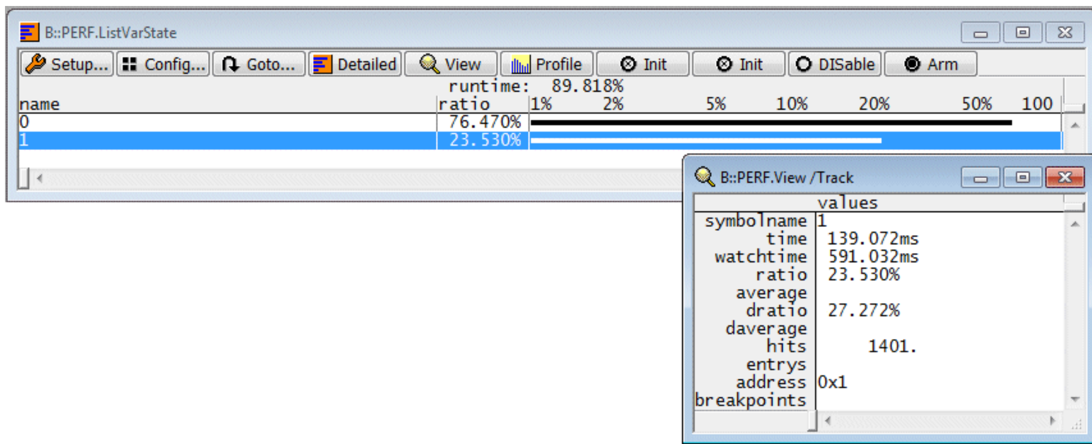

See also

- PERF
- PERF.state

PERSVD — Built-in converter for peripheral files in CMSIS-SVD format

Allows you to display peripheral files written in CMSIS-SVD format. Furthermore you can export an SVD file to Lauterbach's native peripheral file format.

PERSVD.Save — Save converted file

Format:	**PERSVD.Save** *<svd_file>* *<per_file>* [**/***<option>*]
<option>:	See **PERSVD.view**

Converts the given **svd_file** to native Lauterbach peripheral file format and saves it to a file named **per_file**.

svd_file	Source file in CMSIS-SVD format.
per_file	Destination file name. Will be overwritten if the file already exists.

PERSVD.view — Display peripherals

Format:	**PERSVD.view** *<file>* [**/***<option>*]
<option>:	**WithValue** **Description** For additional options see **PER.view**

Converts a CMSIS-SVD file to Lauterbach's native peripheral file format and displays its peripherals. See **PER.view**.

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WithValue	Precedes bitfield names or descriptions with the value followed by a colon: “<value>: <name>”.
Description	In case of bitfields, the description instead of the name will be taken from the SVD file.

In case you encounter any errors during conversion, it might be helpful to save the converted intermediate to a file (**PERSVD.Save**) first and to process the result via **PER.Program** afterwards.

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PMI

Power management interface

For a description of the **PMI** commands, see **“System Trace User’s Guide”** (trace_stm.pdf).

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POD — Configure input behavior of digital and analog probe

See also

- POD.ADC
- POD.Level
- POD.RESet
- POD.state
- POD.USB

POD.ADC — Probe configuration

[Example]

Format:	**POD.ADC** *<probe>*.*<voltage>* [**ON** | **OFF**] [*<comp>*] [*<sample>*] **POD.ADC** *<probe>*.*<current>* [**ON** | **OFF**] [*<comp>*] [*<sample>*] [*<shunt>*] **POD.ADC** *<probe>*.*<power>* [**ON** | **OFF**] [*<vref>*] **CIProbe.CONFIG.CHANNEL** <...> (deprecated)
<probe>:	**A** | **IP** | **CIP**
<voltage>: *<current>*: *<power>*:	**V0** | **V1** | **V2** | **V3** **I0** | **I1** | **I2** **P0** | **P1** | **P2**
<comp>:	**1/1** | **2/1** | **4/1** | **8/1** | **16/1** | **32/1** | **64/1** | **128/1** | **256/1**
<sample>:	**ALways** | **Track** | **BusA** | **Filter**
<shunt>:	*<float>*
<vref>:	**V0** | **V1** | **V2** | *<float>*

ADC stands for analog-digital converter. The **POD.ADC** command allows you to programmatically configure the Analog Probe together with the PowerIntegrator, PowerIntegrator II, IProbe or CIProbe. Alternatively, you can manually configure the hardware via the **POD.state A**, **POD.state IP** or the **POD.state CIP** window.

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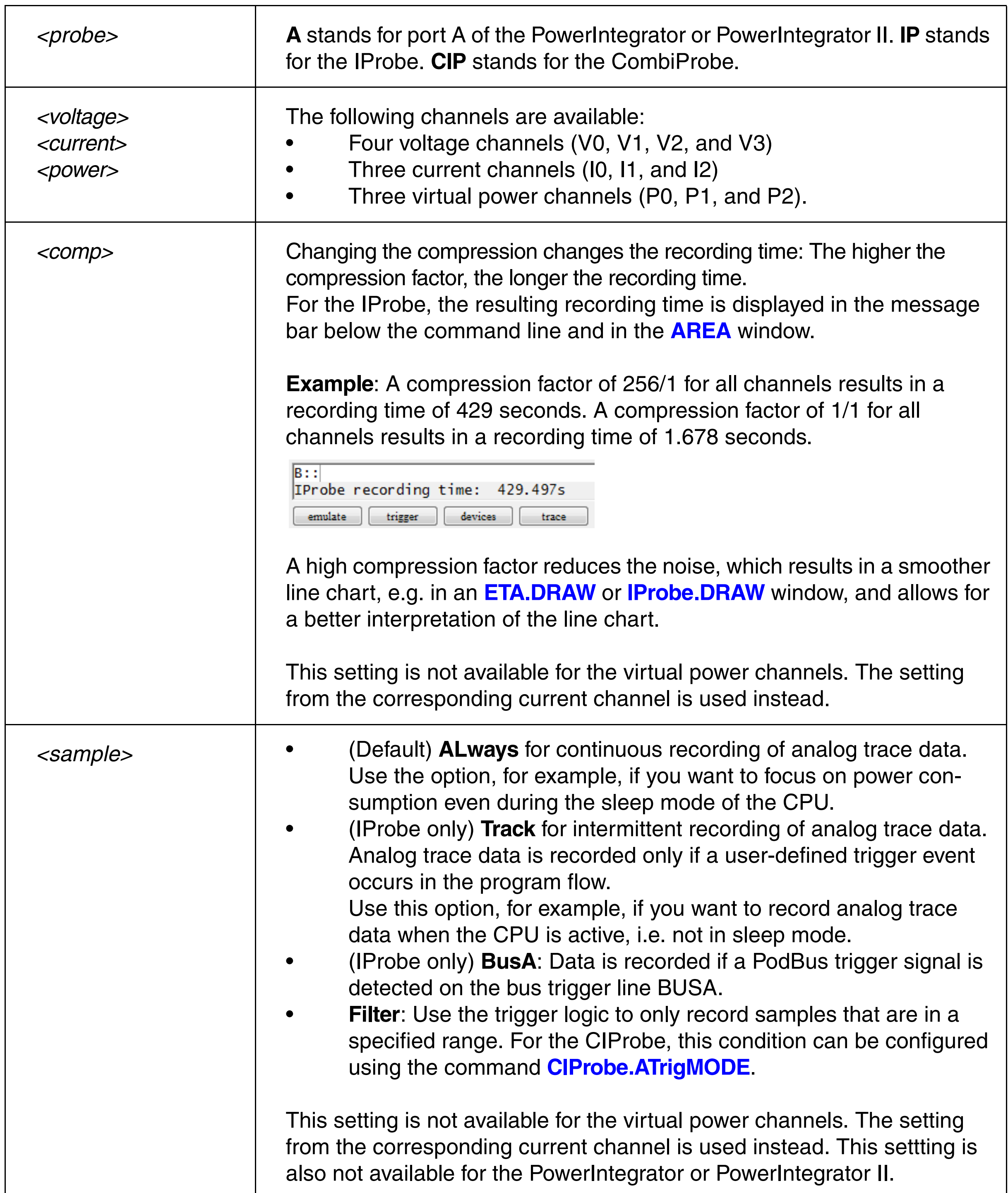
Note that all parameters after the channel are optional, but have to be specified in the correct order. If a parameter is not given, that setting remains unchanged.



<probe>	**A** stands for port A of the PowerIntegrator or PowerIntegrator II. **IP** stands for the IProbe. **CIP** stands for the CombiProbe.
<voltage> *<current>* *<power>*	The following channels are available: • Four voltage channels (V0, V1, V2, and V3) • Three current channels (I0, I1, and I2) • Three virtual power channels (P0, P1, and P2).
<comp>	Changing the compression changes the recording time: The higher the compression factor, the longer the recording time. For the IProbe, the resulting recording time is displayed in the message bar below the command line and in the **AREA** window. **Example**: A compression factor of 256/1 for all channels results in a recording time of 429 seconds. A compression factor of 1/1 for all channels results in a recording time of 1.678 seconds. B:: IProbe recording time: 429.497s emulate trigger devices trace A high compression factor reduces the noise, which results in a smoother line chart, e.g. in an **ETA.DRAW** or **IProbe.DRAW** window, and allows for a better interpretation of the line chart. This setting is not available for the virtual power channels. The setting from the corresponding current channel is used instead.
<sample>	• (Default) **ALways** for continuous recording of analog trace data. Use the option, for example, if you want to focus on power consumption even during the sleep mode of the CPU. • (IProbe only) **Track** for intermittent recording of analog trace data. Analog trace data is recorded only if a user-defined trigger event occurs in the program flow. Use this option, for example, if you want to record analog trace data when the CPU is active, i.e. not in sleep mode. • (IProbe only) **BusA**: Data is recorded if a PodBus trigger signal is detected on the bus trigger line BUSA. • **Filter**: Use the trigger logic to only record samples that are in a specified range. For the CIProbe, this condition can be configured using the command **CIProbe.ATrigMODE**. This setting is not available for the virtual power channels. The setting from the corresponding current channel is used instead. This settting is also not available for the PowerIntegrator or PowerIntegrator II.

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<shunt>	To measure current, you have to use an appropriate shunt resistor and configure TRACE32 with the shunt resistance in Ohms. **Shunt formula**: R_s = 0.125V / I_{max} • To achieve a maximum resolution of the analog-digital converter, the voltage drop permissible at the shunt must *not* exceed 0.125V. • I_{max} is the maximum current that you expect: The more accurate your estimate, the better the measurement accuracy. **Example**: R_s = 0.125V / 4A = 0.031Ω If a voltage drop of 0.125V is not acceptable in your case, then you may lower the voltage value from 0.125V to e.g. 0.05V. Note that this reduces the resolution of the analog-digital converter. **Example**: R_s = 0.05V / 4A = 0.012Ω
<vref>	If you specify a voltage value (e.g. 3.3V), the system multiplies the voltage value with the value of the current channel (e.g. I1 = 0.019561A). **Example**: 3.3V x 0.019561A = 0.064553W Alternatively, you can select the corresponding voltage channel (e.g. V1 for P1). In this case, the IProbe or CIProbe automatically uses the voltage value from that voltage channel.

Example:

```
; Configure Analog Probe and IProbe
POD.ADC CIP V0 ON 8/1 ALways
POD.ADC CIP V1 ON 8/1 ALways
POD.ADC CIP V2 ON 8/1 ALways
POD.ADC CIP V3 ON 8/1 ALways
POD.ADC CIP I0 ON 8/1 ALways 1.000
POD.ADC CIP I1 ON 8/1 ALways 1.000
POD.ADC CIP I2 ON 8/1 ALways 1.000
POD.ADC CIP P0 ON 3.300
POD.ADC CIP P1 ON 3.300
POD.ADC CIP P2 ON 3.300

; Initialize the CIProbe.
CIProbe.Init

; Open the POD CIP window. The following screenshot displays the result.
POD.state CIP
```

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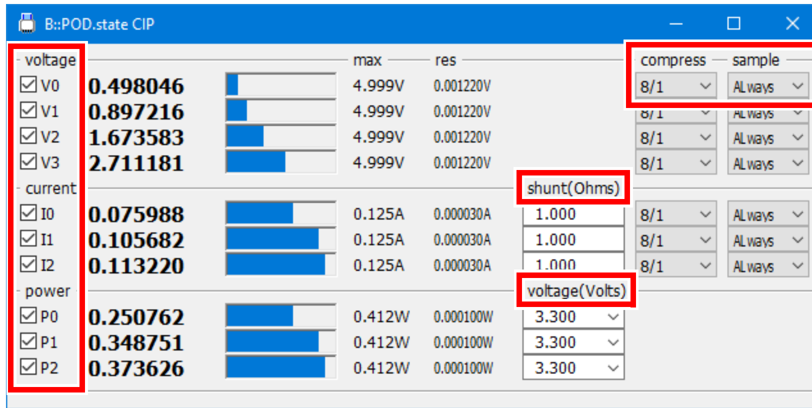
The **POD.state CIP** window displays the result of the above script:



See also

- POD
- POD.state

POD.Level

Input state

Format:	**POD.Level** *<group> <level>*	
<group>:	**00-15** | **16-31** | **32-47** | **48-63** | **SOC** **IP** | **A** | **B** | **C** | **D** | **E** | **F**	(PowerProbe) (PowerIntegrator)
<level>:	**1.0** | **1.4** (PowerProbe) **0.0** … **5.0** (PowerIntegrator)	

Defines the variable threshold levels for the PowerProbe and the input probes of the PowerIntegrator.

Default is 1.4 V for all CMOS and TLL targets down to 2.5 V supply voltage.

00-15, …, **SOC**	Input channels of the PowerProbe
IP, **A**, **B**, **C**, **D**, **E**, **F**	**A** to **F**: Input channels of the PowerIntegrator **IP**: Input channel of the IProbe
1.0 and **1.4**	Threshold level settings of the PowerProbe
0.0 to **5.0**	Threshold level range of the PowerIntegrator

See also

- POD
- POD.state

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POD.RESet

Input level reset

Format:	**POD.RESet**

All input threshold levels are set to 1.4 V.

All **POD.ADC** settings are reset.

See also

- POD
- POD.state

POD.state

Input state

Format:	**POD.state** **POD.state** *<probe>* **CIProbe.CONFIG.CHANNEL.state** (deprecated)
<probe>:	**A** | **IP** | **CIP**

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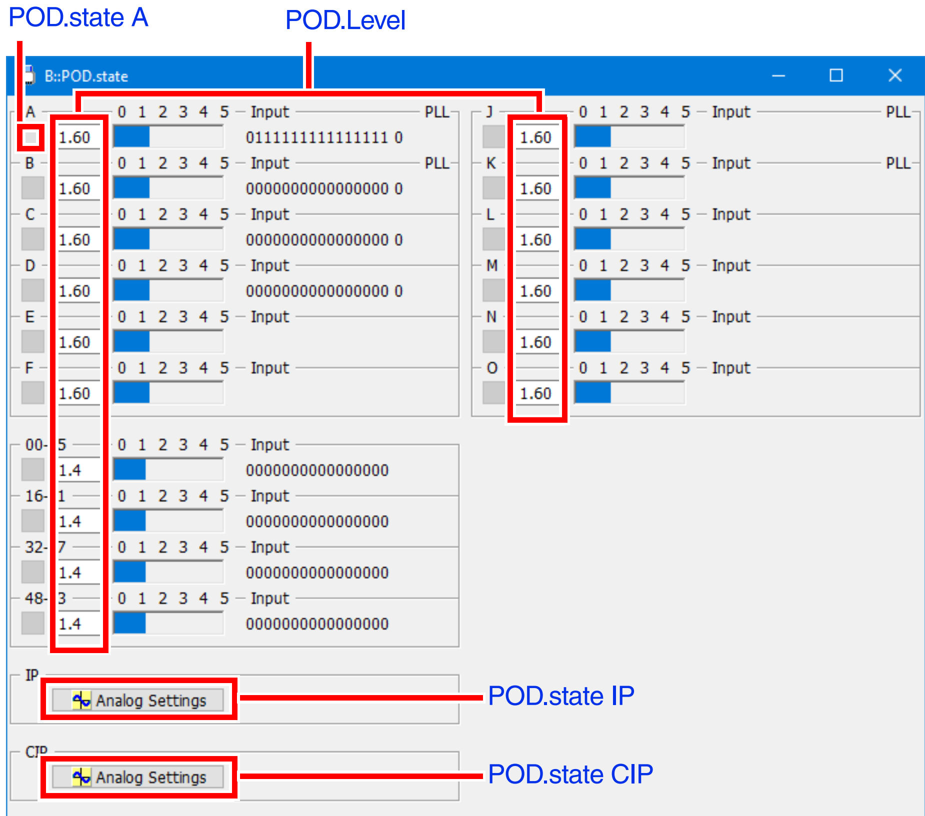
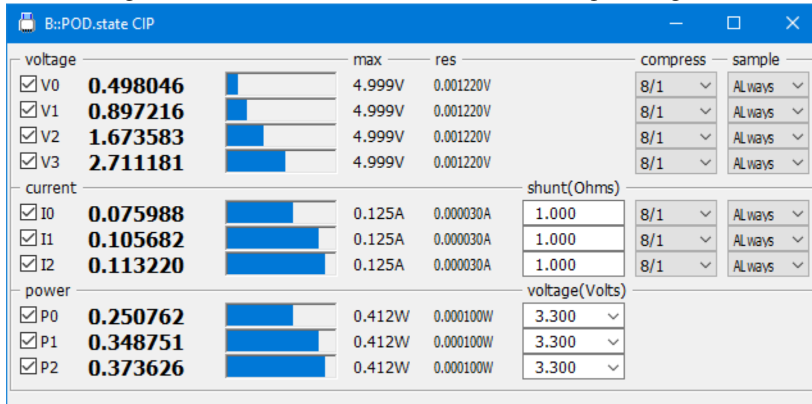
Without arguments, shows the digital probe configuration for PowerProbe, PowerIntegrator, PowerIntegrator II, IProbe, and CIProbe. The screenshot below shows the dialog with a PowerProbe, PowerIntegrator, IProbe and CIProbe,



With an argument, it can be used to show the analog settings of a connected Analog Probe:



See also

- POD
- POD.ADC
- POD.Level
- POD.RESet
- POD.USB

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POD.USB

Format:	**POD.USB USB1 | USB2** **POD.USB ENABLE | DISABLE** *<packet>*
<packet>:	**RESVD | OUT | ACK | DATA0 | PING | SOF | NYET | DATA2 | SPLIT | IN | NAK | DATA1 | ERR | SETUP | STALL | MDATA**

Sets up the hardware of the USB probe.

USB1 | USB2	Selects USB mode.
<packet>	Enables/disables recording of specific USB packets (PID).

See also

- POD
- POD.state

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PORT

NOTE:	If not otherwise mentioned, the described commands refer the timing analyzer mode!

PORT.Arm — Arm the trace

See command **<trace>.Arm** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 125).

PORT.AutoArm — Arm automatically

See command **<trace>.AutoArm** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 126).

PORT.AutoInit — Automatic initialization

See command **<trace>.AutoInit** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 131).

PORT.BookMark — Set a bookmark in trace listing

See command **<trace>.BookMark** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 132).

PORT.Chart — Display trace contents graphically

See command **<trace>.Chart** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 135).

PORT.DRAW — Plot trace data against time

See command **<trace>.DRAW** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 191).

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PORT.FindAll Find all specified entries in trace

See command <trace>.FindAll in 'General Commands Reference Guide T' (general_ref_t.pdf, page 223).

PORT.GOTO Move cursor to specified trace record

See command <trace>.GOTO in 'General Commands Reference Guide T' (general_ref_t.pdf, page 228).

PORT.Init Initialize trace

See command <trace>.Init in 'General Commands Reference Guide T' (general_ref_t.pdf, page 230).

PORT.OFF Switch off

See command <trace>.OFF in 'General Commands Reference Guide T' (general_ref_t.pdf, page 256).

PORT.PROfileChart Profile charts

See command <trace>.PROfileChart in 'General Commands Reference Guide T' (general_ref_t.pdf, page 262).

PORT.PROTOcol Protocol analysis

See command <trace>.PROTOcol in 'General Commands Reference Guide T' (general_ref_t.pdf, page 316).

PORT.REF Set reference point for time measurement

See command <trace>.REF in 'General Commands Reference Guide T' (general_ref_t.pdf, page 334).

PORT.REF Set reference point for time measurement

See command <trace>.REF in 'General Commands Reference Guide T' (general_ref_t.pdf, page 334).

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PORT.SAVE — Save trace for postprocessing in TRACE32

See command **<trace>.SAVE** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 335).

PORT.SelfArm — Automatic restart of trace recording

See command **<trace>.SelfArm** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 339).

PORT.SnapShot — Restart trace capturing once

See command **<trace>.SnapShot** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 349).

PORT.STATistic — Statistic analysis

See command **<trace>.STATistic** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 353).

PORT.Timing — Waveform of trace buffer

See command **<trace>.Timing** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 471).

PORT.TRACK — Set tracking record

See command **<trace>.TRACK** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 474).

PORT.XTrack — Cross system tracking

See command **<trace>.XTrack** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 477).

PORT.ZERO — Align timestamps of trace and timing analyzers

See command **<trace>.ZERO** in 'General Commands Reference Guide T' (general_ref_t.pdf, page 477).

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Probe

Probe logic analyzer

The trace method **Probe** is available if a PowerProbe module is connected.

For selecting and configuring the trace method Probe, use the TRACE32 command line or a PRACTICE script (*.cmm) or the **Probe.state** window [**A**].

Alternatively, execute the command **Trace.METHOD Probe** in order to select the trace method **Probe** and use the more general command group **Trace**.

Refer for more information to **"PowerProbe User's Guide"** (powerprobe_user.pdf) and **"PowerProbe/Port Analyzer Reference Guide"** (powerprobe_ref.pdf).

See also

■ Trace.METHOD

▲ 'Generic Probe Trace Commands' in 'PowerProbe/Port Analyzer Reference Guide'

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PULSE

Pulse generator

ICE only

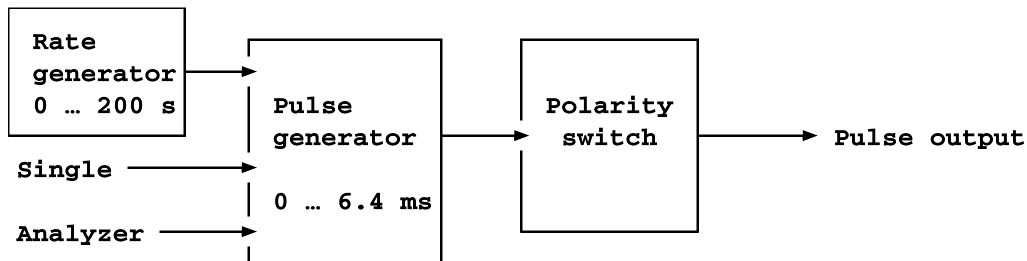
See also

- PULSE.PERiod
- PULSE.Pulse
- PULSE.RESet
- PULSE.Single
- PULSE.state
- PULSE.Width
- PULSE2

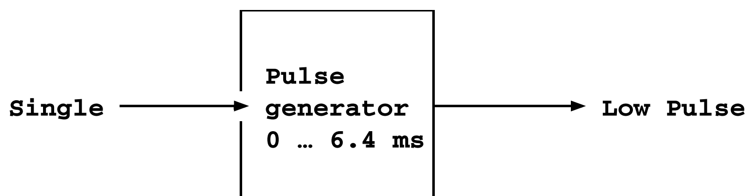
▲ 'Release Information' in 'Release History'

Overview PULSE

The pulse generator is an independent system for generating short pulses or static signals, like used for stimulation in the target system or to reset the target hardware. The output pin of the generator is placed on the output probe of the ECU module. The triggering may occur periodically, manually by the keyboard, or by the trigger unit of the analyzer. If no pulse generation is needed, the output line will be set to high or low by selecting the polarity of the pulse.



Pulse Generator on ECU32



Pulse Generator on ECC8

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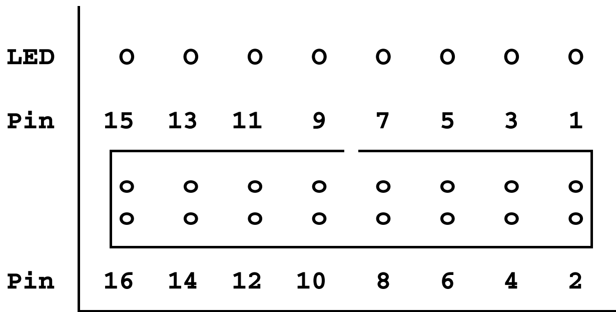
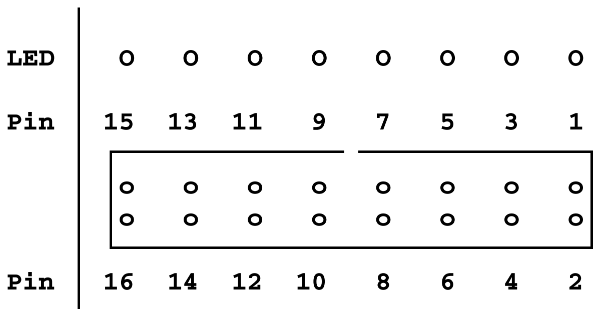
Pin assignment of the STROBE probe (ECU32)



Pin 1	Line 0	EVENT
Pin 3	Line 1	TriggerAddress
Pin 5	Line 2	RUN-(Foreground)
Pin 7	Line 3	TRIGGER
Pin 9	Line 4	SIGnal
Pin 11	Line 5	RUNCYCLE-
Pin 13	Line 6	PULSE2
Pin 15	Line 7	PULSE
Pin 2,4,6,8,10,12,14,16	Ground	

Pin assignment of the STROBE probe (ECC8)



Pin 1	Line 0	OUT.C
Pin 3	Line 1	OUT.D
Pin 5	Line 2	RUN-(Foreground)
Pin 7	Line 3	TRIGGER
Pin 9	Line 4	CharlyBreak
Pin 11	Line 5	RUNCYCLE-
Pin 13	Line 6	PULSE2
Pin 15	Line 7	PULSE
Pin 2,4,6,8,10,12,14,16	Ground	

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PULSE.PERiod

Format:	**PULSE.PERiod** *<width>* | **ON** | **OFF**
<width>:	**0.4us … 200.s**

On ECC8 the period is limited to 6.5 ms. The pulse width is automatically set to half of the period time or 100ns on ECC8.

Examples:

```
PULSE.PERiod OFF              ; set pulse generator to single pulse mode

PULSE.PERiod ON               ; set pulse generator to periodic pulse
                              ; mode

PULSE.PERiod 1.ms             ; activate periodic mode, cycle duration
                              ; is 1 ms (1 kHz)
```

See also

■ PULSE.Pulse ■ PULSE ■ PULSE.state ■ PULSE.Width

▲ 'Emulator Functions' in 'FIRE User's Guide'
▲ 'Pulse Generator' in 'ICE User's Guide'

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Format:	**PULSE.Pulse** [*<width>*] [*<period>*] [*<polarity>*]
<width>:	**0.1us … 6.4ms**
<period>:	**0.4us … 200.s** | **ON** | **OFF**
<polarity>:	**+** | **-**

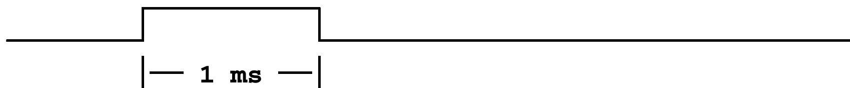
On ECC8 the period is limited to 6.5 ms. The pulse width is automatically set to half of the period time or 100ns on ECC8.

Example:

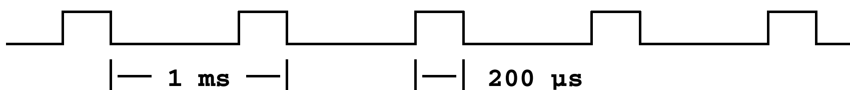
```
PULSE.Pulse 100.us 1.ms -       ; Pulse active low, 100 µs, 1 kHz

PULSE.Pulse 100.us +            ; Single pulse 100 µs, active high

PULSE -                         ; active low pulse

PULSE OFF                       ; switch off
PULSE -                         ; set output to high level
…
PULSE +                         ; set output to low level
```

Pulse 1.ms-

Pulse 1.ms+



Pulse 200.us1.ms +



See also

■ PULSE.PERiod ■ PULSE ■ PULSE.Single ■ PULSE.state
■ PULSE.Width

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▲ 'Emulator Functions' in 'FIRE User's Guide'
▲ 'Pulse Generator' in 'ICE User's Guide'

PULSE.RESet

Reset command

Format:	**PULSE.RESet**

See also

■ PULSE ■ PULSE.state

▲ 'Emulator Functions' in 'FIRE User's Guide'
▲ 'Pulse Generator' in 'ICE User's Guide'

PULSE.Single

Release single pulse

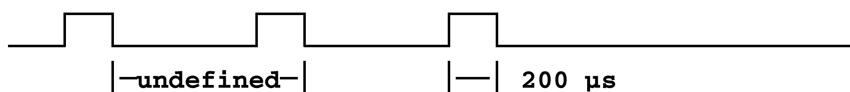
Format:	**PULSE.Single** [*<count>*]
<count>:	**1** …

Releasing more than one single pulse occurs under software control, i.e. the time between two pulses is not constant.

Examples:

```
PULSE.Single                    ; Release single pulse
PULSE.Single 3.                 ; Release threefold pulse
```

Pulse.Width 200.us
Pulse.Single 3.



See also

■ PULSE ■ PULSE.Pulse ■ PULSE.state

▲ 'Emulator Functions' in 'FIRE User's Guide'
▲ 'Pulse Generator' in 'ICE User's Guide'

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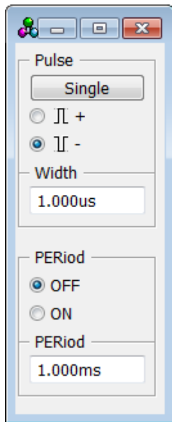
Format: **PULSE.state**

Displays the state of the pulse generator.



See also

- PULSE
- PULSE.PERiod
- PULSE.Pulse
- PULSE.RESet
- PULSE.Single
- PULSE.Width

▲ 'Emulator Functions' in 'FIRE User's Guide'

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PULSE.Width

Format: **PULSE.Width** *<width>*

<width>: **0.4us … 25.0ms**

The pulse width is limited to 6.5 ms on the ECC8. Periodical pulses can only be 100 ns or 50% ratio on the ECC8.

Examples:

```
PULSE.Width 20.u                ; Set pulse width to 20 µs

PULSE.Width 5.ms                ; Set pulse width to 5 ms
```

See also

- ■ PULSE
- ■ PULSE.PERiod
- ■ PULSE.Pulse
- ■ PULSE.state
- ▲ 'Emulator Functions' in 'FIRE User's Guide'
- ▲ 'Pulse Generator' in 'ICE User's Guide'
- ▲ 'Pulse Generator' in 'ICE User's Guide'

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PULSE2 — Pulse generator 2

ICE only

See also

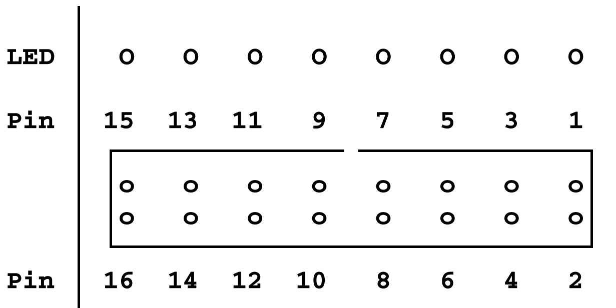
- PULSE2.Pulse
- PULSE2.RESet
- PULSE2.Single
- PULSE2.state
- PULSE2.Width
- PULSE

▲ 'Release Information' in 'Release History'

Overview PULSE2

The pulse generator 2 is an independent system for generating short pulses. The output pin of the generator is placed on the output probe of the ECU module. This pulse generator is software controlled, the pulse periods may not match exactly. Mainly this output may be used as an reset signal for the target system. If no pulse is needed, but a signal which may be programmed to fixed levels, this may be done by setting the polarity (+ = LOW, - = HIGH).

Pin assignment of the STROBE probe (ECU32)



Pin 1	Line 0	OUT.C
Pin 3	Line 1	OUT.D
Pin 5	Line 2	RUN-(Foreground)
Pin 7	Line 3	TRIGGER
Pin 9	Line 4	CharlyBreak
Pin 11	Line 5	RUNCYCLE-
Pin 13	**Line 6**	**PULSe2**
Pin 15	Line 7	PULSe
Pin 2,4,6,8,10,12,14,16	Ground	

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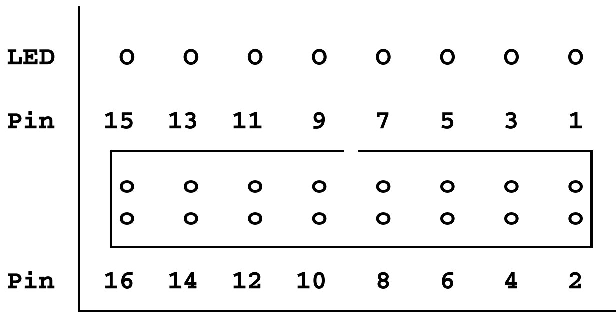
Pin assignment of the STROBE probe (ECC8)



Pin 1	Line 0	OUT.C
Pin 3	Line 1	OUT.C
Pin 5	Line 2	RUN-(Foreground)
Pin 7	Line 3	TRIGGER
Pin 9	Line 4	SIGnal
Pin 11	Line 5	RUNCYCLE-
Pin 13	**Line 6**	**PULSe2**
Pin 15	Line 7	PULSe
Pin 2,4,6,8,10,12,14,16	Ground	

PULSE2.Pulse

Programming

ICE only

Format:	**PULSE2.Pulse** [*<width>*] [*<polarity>*]
<width>:	**10.0us … 25.0ms**
<polarity>:	**+ | -**

Examples:

```
PULSE2.Pulse 100.us -          ; Pulse active low, 100 µs
PULSE2 -                       ; active low pulse
```

See also

- PULSE2
- PULSE2.state

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PULSE2.RESet — Reset command

Format:	**PULSE2.RESet**

See also

- PULSE2
- PULSE2.state

PULSE2.Single — Release single pulse

ICE only

Format:	**PULSE.Single2** [*<count>*]
<count>:	**1** …

The releasing of more than one single pulse occurs under software control, therefore the time between two pulses is not constant.

Examples:

```
PULSE2.Single2                    ; Release single pulse

PULSE2.Single2 3.                 ; Release threefold pulse
```

See also

- PULSE2
- PULSE2.state

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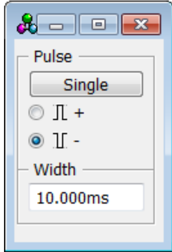
PULSE2.state

Status display

Format: **PULSE2.state**

Displays the state of the second pulse generator.



See also

- PULSE2
- PULSE2.Pulse
- PULSE2.RESet
- PULSE2.Single
- PULSE2.Width

PULSE2.Width

Pulse width

Format:	**PULSE2.Width** *<width>*
<width>:	**10.0us** … **25.0ms**

Examples:

```
PULSE2.Width 20.us              ; Set pulse width to 20 µs

PULSE2.Width 10.ms              ; Set pulse width to 10 ms
```

See also

- PULSE2
- PULSE2.state

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