

High-Level-Language Debugging

- Supports multiple languages
- Full support for C++
- Integrated into TRACE32 environment
- Supports most compilers and hosts
- Same user interface on different hosts
- High speed download
- Debugs optimized code
- Display of function nesting
- Display of linked lists
- Powerful expression evaluation

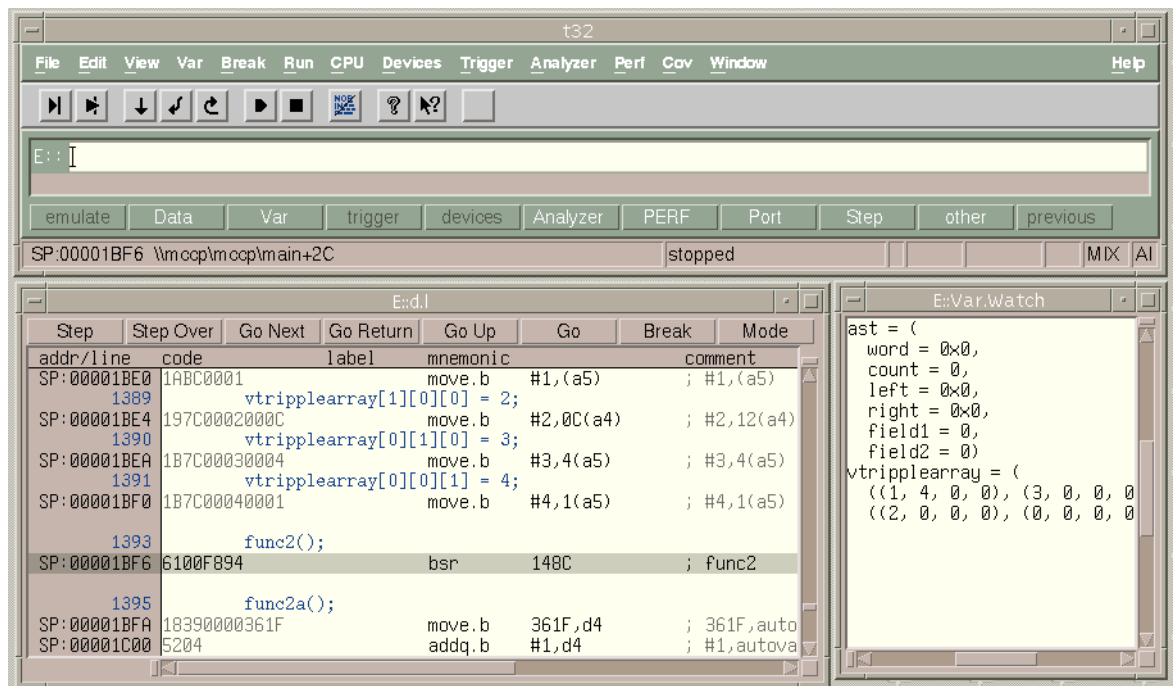
The TRACE32-HLL debuggers are integrated features of all TRACE32 emulation probes. The debugger has its own data base and interfaces to most common standard compilers systems. It uses all information supported by the compilers.

HLL Debugger

One Environment for different CPUs and Languages

- Supports C, C++, PASCAL, M2, ADA and PL/M
- Supports also compiler vendor specific formats
- Covers CPUs from 8 to 64 bits from different vendors
- See section "Supported Compilers and Assemblers" for complete list
- Same debugger for different compilers

Same User Interface on different Hosts



- Native GUI interfaces for Motif and Windows
- Same "Look & Feel" on Motif and Windows

High-Speed Download

- No converters needed
- 4-stage multiprocessor pipeline for highest speed on TRACE32-ICE
- Allows better support of compiler specific features

High Speed Operations

- Steps executed in real-time on TRACE32-ICE

- Most steps executed in real-time on TRACE32-ICD
- Very fast window refresh during stepping

Flexible Symbol Data Base

- Up to 64 MByte symbol storage for TRACE32-ICE
- Compression option
- Fast symbol access
- Fast file caching
- Operation with different compilers in one program
- On-line symbol check
- Search for symbols using wildcards
- Execute commands for symbols matching a wildcard
- Mangler and demangler for C++ signatures

HLL Display

- Module information
- Line numbers
- Source code
- Direct information or modification by clicking variable names with the mouse
- Direct scroll in source (horizontal and vertical)
- Source or target line order
- Line and Column information
- Syntax colored display

Mixed Display

The screenshot shows a window titled 'E::d.l' with a menu bar containing 'Step', 'Step Over', 'Go Next', 'Go Return', 'Go Up', 'Go', 'Break', and 'Mode'. Below the menu bar is a table with columns: 'addr/line', 'code', 'label', 'mnemonic', and 'comment'. The table displays the following content:

addr/line	code	label	mnemonic	comment
1479	{			/* sieve of erathostenes */
SP:00002614	4E560000	sieve:	link	a6,#0 ; a6,#0
SP:00002618	48E73C38		movem.l	[d2-d5,a2-a4],-(a7)
SP:0000261C	287C00003E50		movea.l	#3E50,a4 ; #flags,a4
	register int i, primz, k;			
	int anzahl;			
1483	anzahl = 0;			
SP:00002622	7A00		moveq	#0,d5 ; #0,anzahl
1485	for (i = 0 ; i <= SIZE ; flags[i++] = TRUE) ;			
SP:00002624	7400		moveq	#0,d2 ; #0,i
SP:00002626	2042		movea.l	d2,a0 ; i,a0

- Source lines
- Address
- Disassembled code
- HLL information on assembler lines
- Direct scroll in source code
- Symbols for register or stack variables
- Lines in source or target order

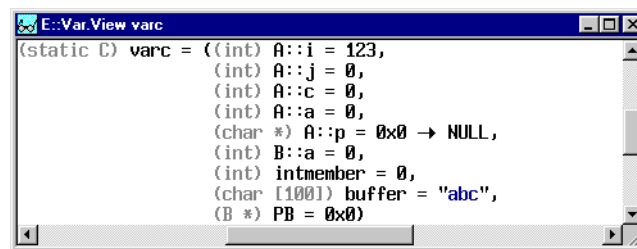
Debugging Optimized Code

- Source reordering by compiler
- Support for inlined functions
- Code shared by multiple lines
- Colored register variables
- Limited lifetimes of variables
- Virtual frame pointers and stack pointer tracking
- Direct scroll in source code
- Symbols for register or stack
- Lines in source or target order

Advanced Stepping

- Step one line or column
- Step over call
- Go to next line
- Return from function
- Go up in function nesting
- Automatic overstepping libraries
- Jump to line defined by mouse
- Most steps executed in real-time

Variable Window



```

E::Var.View varc
(static C) varc = ((int) A::i = 123,
                  (int) A::j = 0,
                  (int) A::c = 0,
                  (int) A::a = 0,
                  (char *) A::p = 0x0 -> NULL,
                  (int) B::a = 0,
                  (int) intmember = 0,
                  (char [100]) buffer = "abc",
                  (B *) PB = 0x0)
  
```

- Showing variables, arrays and structures
- Direct change of variables and elements with the mouse
- Display of type information
- Display in hex, binary, decimal, ASCII
- Showing enumerations, sets, ranges
- Flexible formatting
- Trace nested structures
- Inherited C++ members
- Hidden C++ members

Stack Frame

```

end of frame
-003 main()
  j = 11
      func13( 1, 2, 3 );
-002 func13(? , c = 2, e = 3)
  b = 6
  d = 42
  f = 7
      c += func13( b, f, e-1 );
-001 func13(? , c = 7, e = 2)
  b = 15
  d = 315
  f = 21
      c += func13( b, f, e-1 );
-000 func13(a = 15, c = 21, e = 1)
  b = 37
  
```

- | | |
|---|--|
| <input type="checkbox"/> Function nesting | <input type="checkbox"/> Scrolling through stack |
| <input type="checkbox"/> Parameters | <input type="checkbox"/> Access to stack variables |
| <input type="checkbox"/> Local variables | <input type="checkbox"/> Link to source |
| <input type="checkbox"/> Configurable display | |

Local Variables

- | | |
|---|--|
| <input type="checkbox"/> Shows always all valid local variables | <input type="checkbox"/> Nested variables in PASCAL and MODULA |
| <input type="checkbox"/> Displays variable types | <input type="checkbox"/> Show and modify return values |

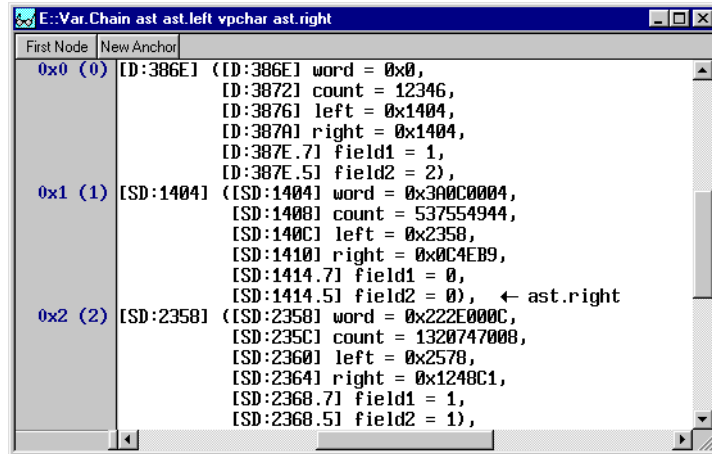
Structured Variable Display

- | | |
|--|--|
| <input type="checkbox"/> Follow links and pointers | <input type="checkbox"/> Show formatted matrixes |
| <input type="checkbox"/> Show nested structures | |

Automatic Variable Display

- | | |
|---|--|
| <input type="checkbox"/> Lists last recently used variables | <input type="checkbox"/> Local variables of function |
|---|--|

Display of Linked Lists and Arrays



- Scroll thru linked lists or arrays
- Visualize pointers to lists or arrays
- Display pointers as multi-dimensional arrays
- Display parts of multi-dimensional arrays

Graphical Variable Display

- Display any table or array graphically
- Zooming and panning
- Vector or dot display

FPU Support

- Direct display and modification of floating point variables
- FPU stack frames
- Display of FPU registers
- Change of FPU registers with the mouse
- Floating point arithmetic in command line
- Support of special floating point formats

HLL Information in Dump Window

address	data	value	symbol
SD:0000398A	00	varc.buffer[98] = 0	\\mccp\mccp\varc+7A
SD:0000398B	00	varc.buffer[99] = 0	\\mccp\mccp\varc+7B
SD:0000398C	00	varc.PB = 0x0	\\mccp\mccp\varc+7C
SD:0000398D	00		\\mccp\mccp\varc+7D
SD:0000398E	00		\\mccp\mccp\varc+7E
SD:0000398F	00		\\mccp\mccp\varc+7F
SD:00003990	00	varc.PB = 0x3994	\\mccp\mccp\varc+80
SD:00003991	00		\\mccp\mccp\varc+81
SD:00003992	39		\\mccp\mccp\varc+82
SD:00003993	94		\\mccp\mccp\varc+83
SD:00003994	00	varc.OB.a = 0	\\mccp\mccp\varc+84
SD:00003995	00		\\mccp\mccp\varc+85
SD:00003996	00		\\mccp\mccp\varc+86
SD:00003997	00		\\mccp\mccp\varc+87
SD:00003998	00	vtree.branch_cnt = 10	\\mccp\mccp\vtree
SD:00003999	00		\\mccp\mccp\vtree+1
SD:0000399A	00		\\mccp\mccp\vtree+2
SD:0000399B	0A		\\mccp\mccp\vtree+3
SD:0000399C	00	vtree.branch_public = 0	\\mccp\mccp\vtree+4
SD:0000399D	00		\\mccp\mccp\vtree+5
SD:0000399E	00		\\mccp\mccp\vtree+6

- Symbols and offsets
- Address
- Access information
- HLL variable values

HLL Information in the Analyzer

record	run	address	cycle	d.w	var	ti.ref
-003009	f	SD:000024B2	wr-word	BFF0		11.000us
-003008	f	SD:000024B4	wr-word	0000		11.500us
-003003	f	SD:000024B6	wr-word	0000		14.000us
-003002	f	SD:000024B8	wr-word	0000	vdouble = -1.0	14.500us
224					vdouble = 10.0;	
-002998	f	SD:000024B2	wr-word	4024		16.500us
-002997	f	SD:000024B4	wr-word	0000		17.000us
-002992	f	SD:000024B6	wr-word	0000		19.500us
-002991	f	SD:000024B8	wr-word	0000	vdouble = 10.0	20.000us
225					vdouble = 1.6;	
-002987	f	SD:000024B2	wr-word	3FF9		22.000us
-002986	f	SD:000024B4	wr-word	9999		22.500us
-002981	f	SD:000024B6	wr-word	9999		25.000us
-002980	f	SD:000024B8	wr-word	999A	vdouble = 1.6	25.500us

- Analyzer programming with object name from source code
- Display with symbolic information
- Variable values in declarations
- Multicycle variable transfer reconstruction
- Source tracking
- Variable tracking
- Trigger definition on objects

Program Coverage Analysis on HLL Level

- Realtime memory access analysis (TRACE32-ICE)

- C1 Coverage with Analyzer

Data Access Analysis

- Read and write access
- Show which variables and elements have been accessed
- Trigger on "read-before-write"

Advanced Performance Analysis

- Direct access to function names
- Analyzing in real-time without interruption
- Execution time statistics (include/exclude)
- Complex statistical analysis
- Timecharts
- RTOS timing measurements

Direct Access to Source

- Edit function
- Type function
- Tracking
- Link to external editor
- Link to Codewright
- Cut & Paste to other applications
- Drag & Drop to other applications

Assembler Source Level Debugging

- Assembler Source
- Comments
- Locals
- Macros

Powerful Expression Parser

- C, C++ and PASCAL/Modula expressions
- Target function call with parameters
- Calling C++ methods and overloaded operators
- Access to C++ static and virtual members
- Language extensions supported (e.g. far, bit)
- 64-bit integers supported
- Conditional program execution

Type and Class Hierarchy Display

- C++ class hierarchy
- C nested classes
- Methods for C++
- Physical layout of structures

Conditional Program Execution

- Go until variable accessed
- Go until variable changed
- Go until expression TRUE
- Step until expression TRUE
- Step until expression changed
- Step over function

Logging Variables

- Show changes of variable during debugging
- Update when variable was accessed by CPU (TRACE32-ICE)
- Update on execution break
- Update on time interval

Debugger Internal Variables

- Also structured types possible
- Control batchfiles by target expressions
- Store temporary results for module testing

Change Debug Scope

- walk up or down in Call hierarchy
- go up or down by line or function
- Jump to an address or function
- Select different task in RTOS environments

Fast access by "Point and Click"

- Go to selection
- Set PC to selection
- Display function under cursor
- Set breakpoints to lines or variables
- Show variables in various formats
- Add variables to Watch by Drag & Drop
- Select sub-expressions for evaluation by dragging

Supported Compilers and Assemblers

CPU	Language	Compiler	Company	Option
32000				
32000	C	ICC32000	Introl Corporation	ICOFF
32000	C	GNX-C	National Semiconductor Corporation	COFF
56000				
56000	ASM	GAS	NXP Semiconductors	MCOFF
56000	C	GCC56K	NXP Semiconductors	MCOFF
56000	C	C56	TASKING	IEEE
56100				
56100	C	GCC56100	NXP Semiconductors	MCOFF
56100	C	C561	TASKING	IEEE
56300				
56300	C	GCC56300	NXP Semiconductors	MCOFF
56300	C	C563	TASKING	IEEE
56800				
56800	C	CODEWARRIOR	NXP Semiconductors	ELF/DWARF
56800	C	CODEWARRIOR	NXP Semiconductors	ELF/DWARF
68HC05				
68HC05	C	CX68HC05	Cosmic Software	COSMIC

CPU	Language	Compiler	Company	Option
68HC05	C	HT-6805	Microchip Technology Inc.	HITECH
68HC05	C	HICROSS	NXP Semiconductors	HICROSS
68HC08				
68HC08	C	CX68HC08	Cosmic Software	COSMIC
68HC08	C	HICROSS-68HC08	NXP Semiconductors	HICROSS
68HC11				
68HC11	ASM	A6801	IAR Systems AB	UBROF
68HC11	C	CX68HC11	Cosmic Software	COSMIC
68HC11	C	GCC11	GNU Compiler Collection	DBX
68HC11	C	ICC6811	IAR Systems AB	UBROF
68HC11	C	C11	Introl Corporation	ICOFF
68HC11	C	HICROSS-C	NXP Semiconductors	HICROSS
68HC11	C	CC11	NXP Semiconductors	COFF
68HC12				
68HC12	C	CX68HC12	Cosmic Software	COSMIC
68HC12	C	ICC6812	IAR Systems AB	UBROF
68HC12	C	HICROSS-HC12	NXP Semiconductors	HICROSS
68HC12	C	HICROSS	NXP Semiconductors	ELF/DWARF2
68HC16				

CPU	Language	Compiler	Company	Option
68HC16	C	CX68HC16	Cosmic Software	COSMIC
68HC16	C	ICC6816	IAR Systems AB	UBROF
68HC16	C	ICC68HC16	Introl Corporation	ICOFF
68HC16	C	HICROSS-68HC16	NXP Semiconductors	HICROSS
68K				
68K	ADA	ALSYS-ADA		IEEE
68K	ADA	TELESOFT-ADA	Telesoft	IEEE
68K	ASM	RTOS	IEP GmbH	SYM/LOC
68K	ASM	ASM68K	Mentor Graphics Corporation	IEEE
68K	ASM	VERSADOS-ASM	NXP Semiconductors	VERSADOS
68K	ASM	OS-9-ASSEMBLER	Radisys Inc.	ROF
68K	ASM	AS68	TASKING	IEEE
68K	C	HP-64000-C		HP
68K	C	ORGANON	CAD-UL Electronic Services GmbH	BOUND
68K	C	C68K	Cosmic Software	COSMIC
68K	C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF
68K	C	GNU-C	Free Software Foundation, Inc.	COFF
68K	C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF

CPU	Language	Compiler	Company	Option
68K	C	GREEN-HILLS-C	Greenhills Software Inc.	COFF
68K	C	ICC68K	Introl Corporation	ICOFF
68K	C	MCC	Mentor Graphics Corporation	IEEE
68K	C	HT-68K	Microchip Technology Inc.	HITECH
68K	C	HICROSS-68K	NXP Semiconductors	HICROSS
68K	C	CC68K	NXP Semiconductors	COFF
68K	C	ULTRA-C	Radisys Inc.	ROF
68K	C	OS/9-C	Radisys Inc.	ROF
68K	C	CROSSCODE-C	SDSI	SDS
68K	C	SCC68K	Sierra	COFF
68K	C	SUN3-CC	Oracle Corporation	DBX
68K	C	ICC68K	TASKING	COFF
68K	C	ICC68K	TASKING	IEEE
68K	C	TT-68K	TASKING	IEEE
68K	C	TCC68K	TASKING	AOUT
68K	C	TEKTRONIX-C	Tektronix	COMFOR
68K	C	D-CC	Wind River Systems	IEEE
68K	C	D-CC	Wind River Systems	ELF/DWARF

CPU	Language	Compiler	Company	Option
68K	C++	ORGANON-C++	CAD-UL Electronic Services GmbH	BOUND
68K	C++	GNU-C++	Free Software Foundation, Inc.	DBX
68K	C++	GNU-C++	Free Software Foundation, Inc.	ELF/DWARF
68K	C++	CCC68K	Mentor Graphics Corporation	IEEE
68K	C++	HICROSS-68K	NXP Semiconductors	HICROSS
68K	C++	CODEWARRIOR	NXP Semiconductors	ELF/DWARF
68K	C++	CROSSCODE-C++	SDSI	SDS
68K	C++	D-C++	Wind River Systems	ELF/DWARF
68K	MODULA	MOD68K	Introl Corporation	ICOFF
68K	MODULA	MCS2	Multichannelsystems GmbH	COFF
68K	MODULA	MCDS	NXP Semiconductors	MCDS
68K	PASCAL	MPC	Mentor Graphics Corporation	IEEE
68K	PEARL	RTOS	IEP GmbH	SYM/LOC
78K0R				
78K0R	C	CC78K0R	Renesas Technology, Corp.	XCOFF
78K0R	C/C++	ICC78K0R	IAR Systems AB	UBROF

CPU	Language	Compiler	Company	Option
80196				
80196	C	ICC196	IAR Systems AB	UBROF
80196	C	IC96	Intel Corporation	OMF-96
80196	C	C196	TASKING	OMF-96
80196	PLM	PL/M96	Intel Corporation	OMF-96
8051				
8051	ASM	A8051	Ashling Microsystems Ltd.	SYM
8051	ASM	A8051	IAR Systems AB	UBROF
8051	C	SDCC	Free Software Foundation, Inc.	CDB
8051	C	ICC8051	IAR Systems AB	UBROF
8051	C	C51	ARM Germany GmbH	EOMF-51
8051	C	CC	Small Device C Compiler	COFF
8051	PASCAL	SYSTEM51-PASCAL	KSC Software Systems	OMF-51
8051	PLM	PL/M-51	Intel Corporation	OMF-51
8051	PLM	PLM51	TASKING	IEEE
ANDES				
ANDES	C/C++	GNU/GCC	Andes Technology Corp.	ELF/DWARF2
APEX				
APEX	C	IP P. FOR APU2	NXP Semiconductors	ELF/DWARF2

CPU	Language	Compiler	Company	Option
APS				
APS	C++	APS3C++	Cortus S.A.	ELF/DWARF
ARC				
ARC	C/C++	GNU-GCC	Free Software Foundation, Inc.	ELF/DWARF
ARC	C/C++	METAWARE-C/C++	Synopsys, Inc	ELF/DWARF
ARM				
ARM	C	ARMCC	ARM Ltd.	AIF
ARM	C	ARMCC	ARM Ltd.	ELF/DWARF
ARM	C	REALVIEW-MDK	ARM Ltd.	ELF/DWARF2
ARM	C	GCCARM	Free Software Foundation, Inc.	COFF/STABS
ARM	C	GCCARM	Free Software Foundation, Inc.	ELF/DWARF2
ARM	C	GREENHILLS-C	Greenhills Software Inc.	ELF/DWARF2
ARM	C	ICCARM	IAR Systems AB	ELF/DWARF2
ARM	C	ICCV7-ARM	Imagecraft Creations Inc.	ELF/DWARF
ARM	C	CARM	ARM Germany GmbH	ELF/DWARF
ARM	C	HIGH-C	Synopsys, Inc	ELF/DWARF
ARM	C	TI-C	Texas Instruments	COFF
ARM	C	GNU-C	Wind River Systems	COFF
ARM	C	D-CC	Wind River Systems	ELF

CPU	Language	Compiler	Company	Option
ARM	C++	ARM-SDT-2.50	ARM Ltd.	ELF/DWARF2
ARM	C++	REALVIEW-MDK	ARM Ltd.	ELF/DWARF2
ARM	C++	GCCARM	Free Software Foundation, Inc.	COFF/STABS
ARM	C++	GNU	Free Software Foundation, Inc.	EXE/STABS
ARM	C++	GCCARM	Free Software Foundation, Inc.	ELF/DWARF2
ARM	C++	GREENHILLS-C++	Greenhills Software Inc.	ELF/DWARF2
ARM	C++	MSVC	Microsoft Corporation	EXE/CV5
ARM	C++	HIGH-C++	Synopsys, Inc	ELF/DWARF
ARM	C/C++	XCODE	Apple Inc.	Mach-O
ARM	C/C++	GCC	HighTec EDV-Systeme GmbH	ELF/DWARF
ARM	C/C++	VX-ARM	TASKING	ELF/DWARF2
ARM-64BIT				
ARM-64BIT	C	ARMCC	ARM Ltd.	ELF/DWARF
ARM-64BIT	C	ARMCC	ARM Ltd.	ELF/DWARF2
ARP32				
ARP32	C	CCS	Texas Instruments	ELF
AVR32				
AVR32	C/C++	GNU	Free Software Foundation, Inc.	AIF

CPU	Language	Compiler	Company	Option
AVR32	C/C++	ICCAVR32	IAR Systems AB	ELF/DWARF2
AVR8				
AVR8	C/C++	GNU	Free Software Foundation, Inc.	EXE/STABS
AVR8	C/C++	IAR AVR	IAR Systems AB	ELF
AVR8	C/C++	ICCV7	Imagecraft Creations Inc.	COFF
BEYOND				
BEYOND	C/C++	GNU-GCC	Beyond Semiconductor d.o.o.	ELF/DWARF
BLACKFIN				
BLACKFIN	ASM	VISUALDSP++	Analog Devices Inc.	ELF/DWARF2
BLACKFIN	C	VISUALDSP++	Analog Devices Inc.	ELF/DWARF2
BLACKFIN	C	GCC	Free Software Foundation, Inc.	ELF/DWARF2
BLACKFIN	C++	VISUALDSP++	Analog Devices Inc.	ELF/DWARF2
C166				
C166	C	XC16X/ST10	Cosmic Software	ELF/DWARF
C166	C	GNU-GCC166	HighTec EDV-Systeme GmbH	DBX
C166	C	C166	ARM Germany GmbH	EOMF-166
C166	C	C166	TASKING	IEEE

CPU	Language	Compiler	Company	Option
C166	C++	GNU-CPP166	HighTec EDV-Systeme GmbH	DBX
C166	C++	CP166	TASKING	IEEE
C2000				
C2000	C	CCS	Texas Instruments	COFF
C5500				
C5500	C	CCS	Texas Instruments	COFF
C6000				
C6000	C	CCS	Texas Instruments	COFF
C6000	C++	CCS	Texas Instruments	COFF
CEVA-X				
CEVA-X	C	GCC	Ceva, Inc.	ELF/DWARF
COLDFIRE				
COLDFIRE	C	GREENHILLS-C	Greenhills Software Inc.	COFF
COLDFIRE	C++	GNU-C	Free Software Foundation, Inc.	ELF/DWARF
COLDFIRE	C++	MCC	Mentor Graphics Corporation	IEEE
COLDFIRE	C++	CODEWARRIOR	NXP Semiconductors	ELF/DWARF
COLDFIRE	C++	DCC	Wind River Systems	ELF/DWARF
COLDFIRE	C/C++	ICC68K	TASKING	IEEE
ETPU				

CPU	Language	Compiler	Company	Option
ETPU	C	ETEC	ASH WARE Inc.	ELF/DWARF
ETPU	C/ASM	ETPUC	ByteCraft Limited	ELF/DWARF
ETPU	C/ASM	CODEWAR RIOR	NXP Semicon ductors	ELF/DWARF
GTM				
GTM	ASM	GCC	HighTec EDV- Systeme GmbH	ELF/DWARF2
GTM	ASM	VX-TC	TASKIN G	ELF/DWARF2
H8/300				
H8/300	C	GNU-C	Free Software Foundati on, Inc.	COFF
H8/300	C	ICCH8300	IAR Systems AB	UBROF
H8/300	C	MCCH83	Mentor Graphics Corporati on	IEEE
H8/300	C	CH38	Renesas Technolo gy, Corp.	SYSROF
H8/300	C++	GNU-C++	Free Software Foundati on, Inc.	COFF
H8/300H				
H8/300H	C	GNU-C	Free Software Foundati on, Inc.	COFF
H8/300H	C	IARH8	IAR Systems AB	UBROF
H8/300H	C	CH38	Renesas Technolo gy, Corp.	SYSROF
H8/300H	C++	GNU-C++	Free Software Foundati on, Inc.	COFF

CPU	Language	Compiler	Company	Option
H8/500				
H8/500	C	ICCH8500	IAR Systems AB	UBROF
H8/500	C	MCCH85	Mentor Graphics Corporation	IEEE
H8/500	C	HICROSS-H8/500	NXP Semiconductors	HICROSS
H8S				
H8S	C	ICCH8	IAR Systems AB	UBROF
H8S	C	CH38	Renesas Technology, Corp.	SYSROF
H8S	C++	GNU	Free Software Foundation, Inc.	COFF
H8S	C++	CH38	Renesas Technology, Corp.	SYSROF
M-CORE				
M-CORE	C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF
M-CORE	C	HICROSS-MCORE	NXP Semiconductors	ELF/DWARF
M-CORE	C	D-CC	Wind River Systems	ELF/DWARF
M32R				
M32R	C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF2
M32R	C	CC32R	Renesas Technology, Corp.	ELF/DWARF
M32R	C	D-CC	Wind River Systems	ELF/DWARF
M8051EW				

CPU	Language	Compiler	Company	Option
M8051EW	ASM	A8051	Ashling Microsystems Ltd.	SYM
M8051EW	ASM	A8051	IAR Systems AB	UBROF
M8051EW	C	ICC8051	IAR Systems AB	UBROF
M8051EW	C	C51	ARM Germany GmbH	EOMF-51
M8051EW	C	CC	Small Device C Compiler	COFF
M8051EW	C	CC51	TASKING	IEEE
MELPS7700				
MELPS7700	ASM	A7700	IAR Systems AB	UBROF
MELPS7700	C	ICC7700	IAR Systems AB	UBROF
MELPS7700	C	MCC7700	Mentor Graphics Corporation	IEEE
MICROBLAZE				
MICROBLAZE	C++	GCC	XILINX	ELF
MIPS				
MIPS	C	TCC	TASKING	IEEE
MIPS	C++	GCC	Free Software Foundation, Inc.	ELF/DWARF
MIPS	C++	GREEN-HILLS-C++	Greenhills Software Inc.	ELF/DWARF
MIPS	C++	SDE	Imagination Technologies	ELF/STABS
MMDSP				

CPU	Language	Compiler	Company	Option
MMDSP	C	MMDSP+	ST Microelectronics N.V.	ELF/DWARF
MSP430				
MSP430	C	MSPGCC	GNU Compiler Collection	ELF
MSP430	C	CCS	Texas Instruments	COFF
MSP430	C/C++	ICC430	IAR Systems AB	D43/uBROF
NIOS-II				
NIOS-II	C	GCC	Altera Corporation	ELF/DWARF2
NIOS-II	C	VX-NIOS	TASKING	ELF/DWARF2
NIOS-II	C++	GCC	Altera Corporation	ELF/DWARF2
OAK				
OAK	C	GCC	Ceva, Inc.	COFF
OAK	C++	GCC	Ceva, Inc.	COFF
PCP				
PCP	C	VX-PCP	TASKING	ELF/DWARF2
POWERPC				
POWERPC	ADA	GNAT	Free Software Foundation, Inc.	ELF/DWARF
POWERPC	C	CXPPC	Cosmic Software	ELF/DWARF
POWERPC	C	XCC-V	GAIO Technology Co., Ltd.	SAUF
POWERPC	C	GREEN-HILLS-C	Greenhills Software Inc.	ELF/DWARF

CPU	Language	Compiler	Company	Option
POWERPC	C	MCCPPC	Mentor Graphics Corporation	ELF/DWARF
POWERPC	C	CC	NXP Semiconductors	XCOFF
POWERPC	C	ULTRA-C	Radisys Inc.	ROF
POWERPC	C	HIGH-C	Synopsys, Inc	ELF/DWARF
POWERPC	C	DCPPC	TASKING	ELF/DWARF
POWERPC	C	D-CC	Wind River Systems	IEEE
POWERPC	C	D-CC	Wind River Systems	COFF
POWERPC	C	D-CC	Wind River Systems	ELF/DWARF
POWERPC	C++	GCC	Free Software Foundation, Inc.	ELF/DWARF
POWERPC	C++	GREEN-HILLS-C++	Greenhills Software Inc.	ELF/DWARF
POWERPC	C++	CCCPPC	Mentor Graphics Corporation	ELF/DWARF
POWERPC	C++	MSVC	Microsoft Corporation	EXE/CV5
POWERPC	C++	HIGH-C++	Synopsys, Inc	ELF/DWARF
POWERPC	C++	D-C++	Wind River Systems	ELF/DWARF
POWERPC	C++	GCCPPC	Wind River Systems	ELF/STABS
POWERPC	C/C++	GCC	HighTec EDV-Systeme GmbH	ELF/DWARF

CPU	Language	Compiler	Company	Option
POWERPC	C/C++	CODEWARRIOR	NXP Semiconductors	ELF/DWARF
POWERPC	GCC	GCC	Free Software Foundation, Inc.	ELF/DWARF
POWERPC	JAVA	FASTJ	Wind River Systems	ELF/DWARF
RH850				
RH850	C	CARH850	Renesas Technology, Corp.	ELF/NEC
RH850	C	VX-RH850	TASKING	ELF/DWARF
RH850	C/C++	GREENHILLS-C	Greenhills Software Inc.	ELF/DWARF
RH850	C/C++	ICCRH850	IAR Systems AB	UBROF
RH850	C/C++	CUBESUITE+	Renesas Technology, Corp.	ELF
RX				
RX	C/C++	ICCRX	IAR Systems AB	ELF/DWARF
RX	C/C++	GNU	KPIT Infosystems Ltd.	ELF/DWARF
RX	C/C++	RXC++	Renesas Technology, Corp.	ELF/DWARF
STARCORE				
STARCORE	C	C	TASKING	ELF/DWARF
STARCORE	C/C++	GREENHILLS-C	Greenhills Software Inc.	ELF/DWARF
STARCORE	C/C++	CODEWARRIOR	NXP Semiconductors	ELF/DWARF
STARCORE	C/C++	C/CPP	StarCore, Inc.	
SUPERH				

CPU	Language	Compiler	Company	Option
SUPERH	C	GCCSH	Free Software Foundation, Inc.	COFF
SUPERH	C	GREEN-HILLS-C	Greenhills Software Inc.	COFF
SUPERH	C	ICCSH	IAR Systems AB	UBROF
SUPERH	C	SHC	Renesas Technology, Corp.	SYSROF
SUPERH	C++	SHC++	Renesas Technology, Corp.	ELF/DWARF2
SUPERH	C++	D-CC	Wind River Systems	ELF/DWARF
TEAK				
TEAK	C	GCC	Ceva, Inc.	COFF
TEAK	C++	GCC	Ceva, Inc.	COFF
TEAKLITE				
TEAKLITE	C	GCC	Ceva, Inc.	COFF
TEAKLITE	C++	GCC	Ceva, Inc.	COFF
TRICORE				
TRICORE	C/C++	GREENHILLS	Greenhills Software Inc.	ELF/DWARF2
TRICORE	C/C++	GCC	HighTec EDV-Systeme GmbH	ELF/DWARF2
TRICORE	C/C++	VX-TC	TASKING	ELF/DWARF2
TRICORE	C/C++	VX-TC	TASKING	IEEE
TRICORE	C/C++	DIAB	Wind River Systems	ELF
V850				

CPU	Language	Compiler	Company	Option
V850	C	GCCV850	Free Software Foundation, Inc.	ELF/STABS
V850	C	GREENHILLS-C	Greenhills Software Inc.	ELF/DWARF
V850	C	ICCV850	IAR Systems AB	UBROF
V850	C	CA850	Renesas Technology, Corp.	ELF/NEC
VR				
VR	C	TCC	TASKING	IEEE
VR	C++	GCC	Free Software Foundation, Inc.	ELF/DWARF
VR	C++	GREENHILLS-C++	Greenhills Software Inc.	ELF/DWARF
VR	C++	SDE	Imagination Technologies	ELF/STABS
X86				
X86	C	SCO-UNIX-CC		COFF
X86	C	GNU-C	Free Software Foundation, Inc.	DBX
X86	C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF2
X86	C	GCC386	Greenhills Software Inc.	COFF
X86	C	IC386	Intel Corporation	OMF-386
X86	C	IC286	Intel Corporation	OMF-286

CPU	Language	Compiler	Company	Option
X86	C	MCC386	Mentor Graphics Corporation	EOMF-386
X86	C	MSVC-1.5	Microsoft Corporation	EOMF-386
X86	C	MSVC	Microsoft Corporation	EXE/CV
X86	C	MSVC	Microsoft Corporation	OMF-386/CV
X86	C	MSVC/CSI	Microsoft Corporation	EOMF-386
X86	C	HC386	Synopsys, Inc	OMF386/SPF
X86	C	HIGHC	Synopsys, Inc	ELF/DWARF
X86	C++	BORLAND-C	Borland Software Corporation	EXE/BC5
X86	C++	ORGANON	CAD-UL Electronic Services GmbH	OMF386++
X86	C++	GNU-C++	Free Software Foundation, Inc.	DBX
X86	C++	MSVC	Microsoft Corporation	EXE/CV4
X86	C++	HC386	Synopsys, Inc	OMF/SPF
X86	C++	HIGH-C++	Synopsys, Inc	ELF/DWARF
X86 REAL				
X86 REAL	ASM	AXLS		HP
X86 REAL	C	BORLANDC	Borland Software Corporation	EOMF-86
X86 REAL	C	ORGANON	CAD-UL Electronic Services GmbH	EOMF-86

CPU	Language	Compiler	Company	Option
X86 REAL	C	IC86	Intel Corporation	OMF-86
X86 REAL	C	MCC86	Mentor Graphics Corporation	EOMF-86
X86 REAL	C	MSC/MSVC-16BIT	Microsoft Corporation	EOMF-86
X86 REAL	C	MSC/MSVC	Microsoft Corporation	EXE/TD
X86 REAL	C	ICC86	TASKING	OMF-86
X86 REAL	C	ICC86	TASKING	IEEE
X86 REAL	C++	BORLANDC	Borland Software Corporation	EXE/TD
X86 REAL	C++	MSVC-16BIT	Microsoft Corporation	EXE/CV
X86 REAL	MODULA	LOGITECH-M2	Terra Datentechnik	MAP/REF
X86 REAL	PASCAL	TEK-PASCAL	Tektronix	TEK
X86 REAL	PLM	PL/M86	Intel Corporation	OMF-86
XA				
XA	C	HTC-XA	Microchip Technology Inc.	HITECH
XA	C	HICROSS-XA	NXP Semiconductors	HICROSS
XA	C	CXA	TASKING	IEEE
XC800				
XC800	C	SDCC	Free Software Foundation, Inc.	CDB
XC800	C	UVISION3	ARM Germany GmbH	OMF

CPU	Language	Compiler	Company	Option
XC800	C	8051	TASKING	IEEE
XSCALE				
XSCALE	C	ARMCC	ARM Ltd.	AIF
XSCALE	C	ARMCC	ARM Ltd.	ELF/DWARF
XSCALE	C	GCCARM	Free Software Foundation, Inc.	COFF/STABS
XSCALE	C	GCCARM	Free Software Foundation, Inc.	ELF/DWARF2
XSCALE	C	GREENHILLS-C	Greenhills Software Inc.	ELF/DWARF2
XSCALE	C	ICCARM	IAR Systems AB	ELF/DWARF2
XSCALE	C	HIGH-C	Synopsys, Inc	ELF/DWARF
XSCALE	C	TI-C	Texas Instruments	COFF
XSCALE	C	GNU-C	Wind River Systems	COFF
XSCALE	C++	ARM-SDT-2.50	ARM Ltd.	ELF/DWARF2
XSCALE	C++	GCCARM	Free Software Foundation, Inc.	COFF/STABS
XSCALE	C++	GNU	Free Software Foundation, Inc.	EXE/STABS
XSCALE	C++	GCCARM	Free Software Foundation, Inc.	ELF/DWARF2
XSCALE	C++	GREENHILLS-C++	Greenhills Software Inc.	ELF/DWARF2
XSCALE	C++	MSVC	Microsoft Corporation	EXE/CV5

CPU	Language	Compiler	Company	Option
XSCALE	C++	HIGH-C++	Synopsys, Inc	ELF/DWARF
XSCALE	C/C++	VX-ARM	TASKING	ELF/DWARF2
XTENSA				
XTENSA	C++	GNU	Free Software Foundation, Inc.	ELF/DWARF
Z80				
Z80	ASM	HP-64000-ASM		HP
Z80	ASM	MI-C		SYM
Z80	ASM	AS	SDSI	SDS
Z80	C	MI-C		SYM/LOC
Z80	C	ICCZ80	IAR Systems AB	UBROF
Z80	C	MCCZ80	Mentor Graphics Corporation	IEEE
Z80	C	HT-Z80	Microchip Technology Inc.	HITECH
Z80	C	UNIWARE-C	SDSI	SDS
Z80	C	CC	Softools Inc.	UBROF
Z80	PLM	ISIS-PL/M	Intel Corporation	SYM/LOC
ZSP 400				
ZSP 400	C	GREENHILLS-C	Greenhills Software Inc.	ELF/DWARF
ZSP 400	C	GCC	ZSP Inc.	ELF/DWARF
ZSP 500				
ZSP 500	C	GCC	ZSP Inc.	ELF/DWARF

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The information presented is intended to give overview information only. Changes and technical enhancements or modifications can be made without notice.