

DIGITAL CORE DESIGN

THE POWER OF INTELLECTUAL

PROPERTY

Automatic adjustment of debug data transfer speed rate between JTAG and SWD
Communication interface
JTAG interface - v4.00 and above
DTAG three wire communication - v3.00
Fully static synchronous design with no internal tri-state

USB communication interface to target host at FULL speed
Synchronous communication interface to Debug IP Core
JTAG interface - Debug IP v4.00 and above
DTAG three wire interface - Debug IP v3.00
Support three I/O voltage standards
5.0 Volt system
3.3 Volt system
2.5 Volt system
Single power supply directly from USB
Small physical dimensions

Two working modes
hardware debug
software simulation
Source Level Debugging
C level hardware/software breakpoints

C code execution
line by line
over function
out of function
skip line
ASM code execution
instruction by instruction
over instruction
out of function
skip instruction
ASM, C source view of code
symbolic tree view of all symbols
module
function
block
variable add/del



DoCD

DoCD - DCD on Chip Debugger

OVERVIEW

ON-CHIP DEBUGGING

DoCD™ – DCD on-chip Debugging System is a useful tool, dedicated to DCD's DP8051/ DP80390, DXPIC16XXX and DF68XX / D68HCXX IP Microcontroller IP Core. System consists of three major parts:

DoCD Debug Software

Windows debugging application



Hardware Assisted Debugger – HAD2

A small hardware adapter

Hardware Debug IP Core

Integrated on-chip with processor core in silicon

DoCD OVERVIEW

DP8051/ DP80390

- **Real-time debugging**
- **Non intrusive**
- **Supports all DCD's DP8051 and DP80390 IP Cores families**
- **Two mode of operation:**
 - *hardware debugger*
 - *software simulator*
- **Supports all major high level C/ ASM tools:**
 - *Extended OMF-51 produced by Keil compiler*
 - *OMF-51 produced by Tasking compiler*
 - *OMF-51 produced by Franklin compiler*
 - *Standard OMF-51 produced by some 8051 compilers*
 - *Extended OMF-251 produced by Keil compiler*
 - *NOI format file produced by SDCC-51 compiler*
 - *Intel HEX-51 format produced by each 8051 compiler*
 - *Intel HEX-386 format produced by each 80390 compiler*
 - *BIN format produced by each 8051 & 80390 compiler*



DoCD OVERVIEW

DXPIC16XXX

- Real-time debugging
- Non intrusive
- Supports all DCD's DXPIC16XXX IP Cores families
- Two mode of operation:
 - *hardware debugger*
 - *software simulator*
- Supports all major high level C/ ASM tools:
 - *INHx8M HEX files format*
 - *INHx8S HEX files format*
 - *COD produced by CC5X C Compiler*
 - *COD produced by Hi-Tech PICC compiler*
 - *OMF-51 produced by Hi-Tech PICC compiler*



DoCD OVERVIEW

DF68XX / D68HCXX

- Real-time debugging
 - Non intrusive
 - Supports all DCD's HC11, HC0X 680X Microcontroller IP
 - Two mode of operation:
 - *hardware debugger*
 - *software simulator*
 - Source level debugging
 - *ASM source code view*
 - *ASM source code execution*
 - Real-time hardware breakpoints
 - 1024 steps deep Software Trace
 - Unlimited number of soft. breakpoints
 - Supports all major 68HC11 ASM tools:
 - *Motorola S19 HEX format*
 - *Intel HEX Format*
 - *ELF / DWAFRF 2.0.0*
 - *IAR - UBFOR*
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- Auto refresh of all windows
 - Dedicated windows for peripherals
 - Configurable auto refresh time period
 - Status bar containing real processor speed
 - The system runs on a Windows®

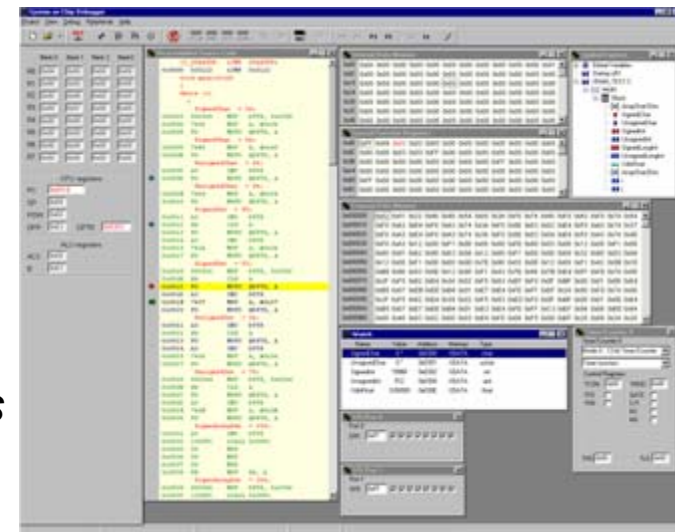
DoCD IP CORE

- **Processor execution control**
 - *Run, Halt*
 - *Reset*
 - *Step into instruction*
 - *Skip Instruction*
 - *Step out, Step over*
- **Read-write all processor contents**
- **Unlimited number of software breakpoints**
- **Hardware execution breakpoints**
 - *Program Memory*
 - *Data Memory*
 - *Special Function Registers (SFRs)*
- **Hardware breakpoints activated at a**
 - *certain program address (PC)*
 - *certain address by any write into memory*
 - *certain address by any read from memory*
 - *certain address by write a required data*
 - *certain address by read a required data*
- **Automatic adjustment of debug data transfer**
- **Communication interface**
 - *TAG two wire interface – v4.7*
 - *JTAG interface – v4.00 and above*
 - *DTAG three wire communication – v3.xx*
- **Fully static synchronous design**
- **No internal tri-states**

DoCD SOFTWARE

- **Two working modes**
- **Source Level Debugging:**
 - *C level hardware/software breakpoints*
 - *C code execution*
 - *ASM code execution*
 - *ASM, C source view of code*
- **Symbol Explorer provides hierarchical tree view of all symbols**
- **Contents sensitive Watch window**
- **Symbolic debug**
- **Unlimited number of software breakpoints**
- **Real-time hardware breakpoints**
- **1024 steps deep Software Trace**
- **Load Program Memory content from:**

<ul style="list-style-type: none"> ■ <i>DXPIC16XXX</i> ■ <i>OMF-51</i> ■ <i>COD files</i> ■ <i>Intel INHX8M HEX file</i> ■ <i>Intel INHX8S HEX file</i> 	<ul style="list-style-type: none"> ■ <i>DP8051/ DP80390</i> ■ <i>OMF 51, extended OMF-51 files</i> ■ <i>OMF – 251 file</i> ■ <i>Intel HEX-51, HEX-386 files</i> ■ <i>BIN file</i>
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- **Auto refresh of all windows**
- **Dedicated windows for peripherals**
- **Configurable auto refresh time period**
- **Status bar containing real processor speed**
- **The system runs on a Windows®**
- **Supports software tools from:**
Hi-Tech, Knudsen many others C/ASM tools



DoCD HAD

Hardware Assisted Debugger

- **USB communication interface to target host at FULL speed**
- **Synchronous communication interface to Debug IP Core**
 - *TAG interface – Debug IP v4.70 and above*
 - *JTAG interface – Debug IP v4.00 and above*
 - *DTAG interface – Debug IP v3.xx*
- **Supports four I/O voltage standards**
 - *3.3 Volt systems*
 - *2.5 Volt systems*
 - *1.8 Volt systems*
 - *1.5 Volt systems*
- **Single power supply directly from USB**
- **Small physical dimensions – pendrive style package**





THE POWER
OF INTELLECTUAL
PROPERTY

DoCD

DoCD - DCD on Chip Debugger

HEADQUARTERS:

Wroclawska 94

41-902 Bytom, Poland

E-mail: info@dcd.pl

Tel. ++48 32 282 82 66

Fax ++48 32 282 74 37

<http://www.dcd.pl>