

DS-48 Microprocessor Development System



In-Circuit Emulator for Philips Telecom Derivatives

FEATURES

- **Real-Time and Transparent In-Circuit Emulator**
- **Supports Philips Telecom Derivatives**
- **Adaptable to 8051 Derivatives**
- **Emulates 1.5V to 6V Microcontrollers**
- **Maximum Frequency of 40MHz**
- **8K of Internal Memory**
- **DOS and MS-Windows Debuggers**
- **32K Trace Memory and Logic Analyzer on the Fly**
- **8K Hardware and Conditional Breakpoints**
- **Source-Level Debugger for Assembler and C**
- **On-line Assembler and Disassembler**
- **Serially Linked to IBM PC at 115 Kbaud**

DESCRIPTION

DS-48 is a real-time in-circuit emulator dedicated to the 8048 family of microcontrollers. It is serially linked to a PC or compatible system and carries out a transparent emulation on the target microcontroller. The system emulates the derivatives in the complete voltage and frequency range specified by the microcontroller manufacturer. DS-48 also supports the low-power and low-voltage microcontrollers and derivatives and can emulate the microcontrollers using either the built-in 5V power supply or any voltage applied to the target circuitry. The permitted voltage range is from 1.5V to 6V. The software includes DOS and MS-Windows Source-Level Debugger for C, Assembler Debugger, Performance Analyzer, On-line Assembler and Disassembler, Conditional Breakpoints and many other features. Files generated by the most common Assemblers and high-level language Compilers are accepted by DS-48. Standard systems are supplied with 8 KBytes of internal memory, 8K hardware breakpoints, 32K Real-Time Trace Memory and Logic Analyzer with external test points. The system may be upgraded to support 8051 microcontrollers and derivatives.

SPECIFICATIONS

EMULATOR MEMORY

DS-48 provides 8 KBytes of code memory.

HARDWARE BREAKPOINTS

Breakpoints allow real-time program execution until an opcode is executed at a specified address. Breakpoints on an AND/OR combination of two external signals are also implemented.

Conditional Breakpoints A complete set of conditional breakpoints permit halting program emulation on code addresses, source code lines, access to on-chip memory, port and register contents.

SOFTWARE ANALYZER

A 64 KByte buffer is used to record any software and hardware events of your program, such as executed code, port and internal register states, on-chip data memory contents and more.

LANGUAGES AND FILE FORMATS

DS-48 accepts files with Ceibo OMF48 object or Intel hex format. Assemblers and high-level languages from leading vendors are supported. 2500AD is supported by an external converter. The converter uses the files generated by the linker, an Intel Hex file for the code, a 2500AD symbol table file (2500AD global, 2500AD abbreviated global and 2500AD high level are acceptable) and the map file generated by the linker. The outcome of the operations is a file with default extension of ABS that can be loaded to the Ceibo Debugger program.

SOURCE-LEVEL DEBUGGER

The DS-48 Software includes a Source-Level Debugger. This function may be used to debug code written in Assembler and C. The Source-Level Debugger includes commands which allow the user to get all the information necessary for testing the programs and hardware in real-time. The commands permit setting breakpoints on high-level language lines, adding a watch window with the symbols and variables of interest, modifying variables, displaying floating point values, showing the trace buffer, executing assembly steps and many more useful functions. DS-48 Debugger comes in two versions, one for DOS and the other for MS-Windows.

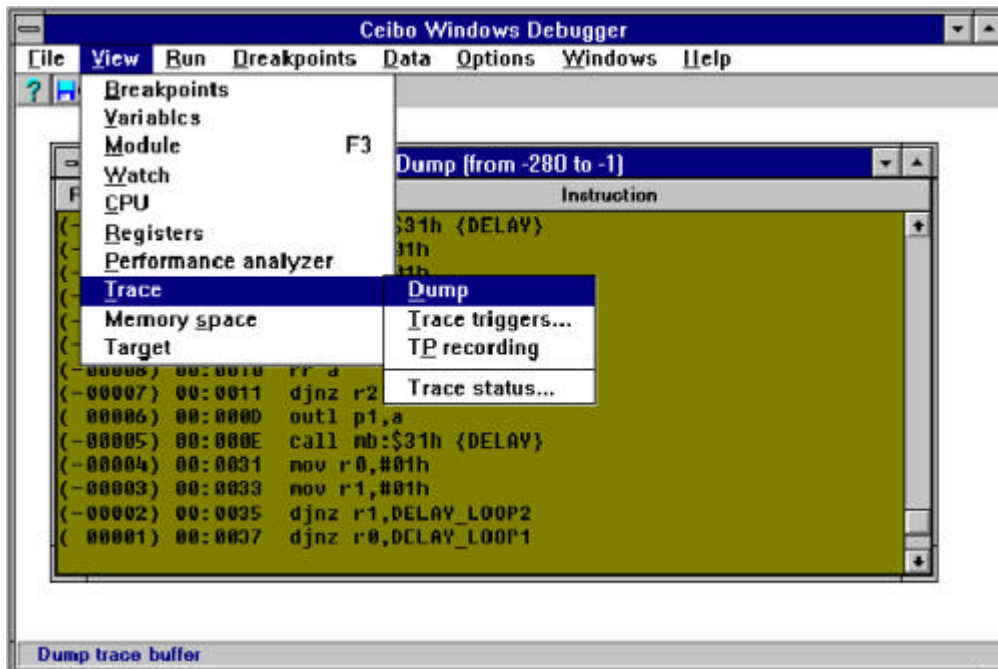


Figure 1: Windows Debugger

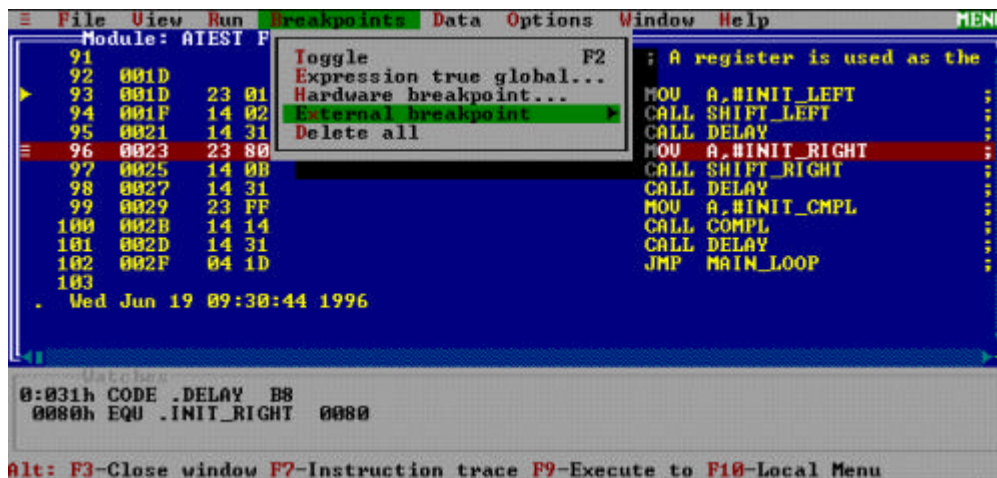


Figure 2: DOS Debugger

PERSONALITY PROBES

DS-48 uses bond-out microcontrollers for hardware and software emulation. The selection of a different microcontroller is made by software control or changing the probe. The Personality Probes run at the frequency of the crystal on them or from the clock source supplied by the user hardware. Therefore, the same probe may be adapted to the frequency requirements. The minimum and maximum frequencies are determined by the emulated chip characteristics.

<i>Probe</i>	<i>Header</i>	<i>Supported Devices</i>
C84	HD84xxD-28DIL	PCF84C00, PCF84C21A, PCF84C41A, PCF84C81A, PCD3315A, PCD3343A, PCD3348A
C3349	HD33xxD-28DIL	PCD3344A, PCD3349A
C3350	HD33xxD-28DIL	PCD3351A, PCD3352A, PCD3353A, PCD3755A, PCD3756A
C3350	HD3350Q-44QFP	PCD3350A
C3354	HD33xxD-28DIL	PCD3351A, PCD3352A, PCD3353A, PCD3755A, PCD3756A
C3354	HD3350Q-44QFP	PCD3354A
C3745	HD3745D-28DIL	PCD3745A

As the list of supported devices and available probes is continuously evolving, call Ceibo for the latest update.

TRACE AND LOGIC ANALYZER

The 32 KByte Trace Memory is used to record the microprocessor activities. Eight lines are user selectable test points. Trigger inputs and conditions are available for starting and stopping the trace recording. The trace buffer can be viewed in disassembled instructions or high-level language lines embedded with the related instructions.

PERFORMANCE ANALYZER

This useful function checks the trace buffer and provides time statistics on modules and procedures as a percentage of the total execution time.

HOST CHARACTERISTICS

IBM PC or compatible systems with 8 MByte of RAM and one RS-232 port.

INPUT POWER

5VDC/1.5A.

MECHANICAL DIMENSIONS

26mm x 151mm x 195mm (1" x 6" x 7").

ITEMS SUPPLIED AS STANDARD

In-circuit emulator with 8 KByte breakpoints, 8 KByte internal code memory. User software including Source-Level Debugger, On-line Assembler and Disassembler. User's manual and operating instructions, RS-232 cable and power supply.

OPTIONS

Personality Probes and adapters for different microcontrollers and packages. Upgrade to 8051 microcontrollers.

UPGRADE KIT

DS-48 may be upgraded to support any 80C51 derivative. The upgrade kit consist of software and hardware replacements and a personality probe to emulate the desired microcontroller. The upgraded system includes 64 KBytes hardware breakpoints and 128 KBytes of internal memory. Personality probes are available for all the derivatives and packages.

WARRANTY

Two years limited warranty, parts and labor.

DS-48 - ORDERING INFORMATION

<i>Item</i>	<i>Description</i>
DS-48	In-Circuit Emulator, Trace, Software, Power Supply, Cables
P-C84	Personality Probe, 28-pin DIL Emulation Header
P-C3349	Personality Probe, 28-pin DIL Emulation Header
P-C3350	Personality Probe, 28-pin DIL and 44-pin QFP Emulation Headers
P-C3354	Personality Probe, 28-pin DIL and 44-pin QFP Emulation Headers
P-C3745	Personality Probe, 28-pin DIL Emulation Header
PCU-48	Port Configuration Unit for DS-48