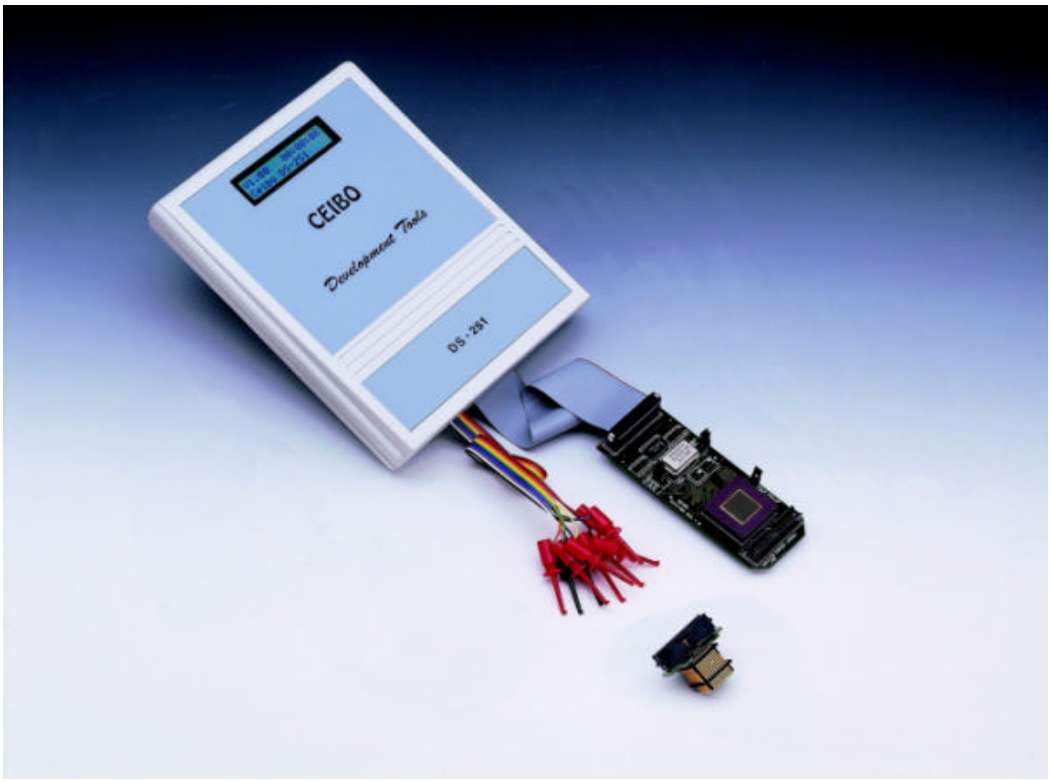
DS-251 In-Circuit Emulator



In-Circuit Emulator for 251 Microcontrollers

FEATURES

- **Real-Time and Transparent In-Circuit Emulator for 251s**
- **Standard 256K Emulation Memory**
- **Real-Time Trace up to 128K Frames Deep, 128 Bits Wide**
- **Complex Hardware Breakpoints**
- **Supports Both Binary Mode and Source Mode**
- **MS-Windows Debugger**
- **High-Level Support for Popular C-Compilers**
- **Full Support of Local and Global Variables**
- **On-Line Assembler and Disassembler**
- **Performance Analyzer**
- **Serially Linked to IBM PC at 115 KBaud**

DESCRIPTION

Ceibo DS-251 is a real-time in-circuit emulator dedicated to Intel and Atmel W&M / Temic 251 microcontrollers. It is serially linked at 115KBaud to a PC or compatible host and can emulate the microcontroller using either the built-in clock oscillator or any other clock source connected to the microcontroller, up to its maximum frequency as specified by Intel and Atmel W&M / Temic. DS-251 provides 256 KBytes of code memory with software mapping. Breakpoints allow real-time program execution until an opcode is executed at a specified address. Breakpoints on data read or write and an AND/OR combination of two external signals are also implemented. A complete set of conditional breakpoints permit halting program emulation on code addresses, source code lines, access to external and on-chip memory, port and register contents. The MS-Windows software includes source level debugger for C, assembler debugger, performance analyzer, on-line assembler and disassembler, conditional breakpoints and many other features. The DS-251 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. The system can be configured into either binary mode or source mode. When configured in binary mode, it is binary code compatible with 8051 microcontrollers and can execute existing 51 application code directly without modifying it and improving the performance of your system. Files generated by the most common 8051 and 251 assemblers and high-level language compilers are accepted by the DS-251. Systems are supplied with MS-Windows debugger, 256K Bytes of internal memory, 256K hardware breakpoints, real-time trace memory and logic analyzer with external test points.

SPECIFICATIONS

EMULATOR MEMORY

DS-251 provides 256 KBytes of code memory with software mapping. Memory mapping has a resolution of 1 Byte and can be set to the target user or belonging to the emulator.

HARDWARE BREAKPOINTS

Breakpoints allow real-time program execution until an opcode is executed at a specified address. Breakpoints on data read or write and an AND/OR combination of two external signals are also implemented. A selection of breakpoints according to rising/falling edge or high/low level of external events is available.

CONDITIONAL BREAKPOINTS

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

LANGUAGES AND FILE FORMATS

DS-251 accepts files generated by compilers from many vendors according to Intel standard OMF-251 format (Keil, IAR, Tasking, etc.). Also 8051 compilers in many different formats can be used with this emulator. Assemblers and high-level languages such as C and PLM are fully supported.

SOURCE-LEVEL DEBUGGER

DS-251 software comes with an MS-Windows debugger. The 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.

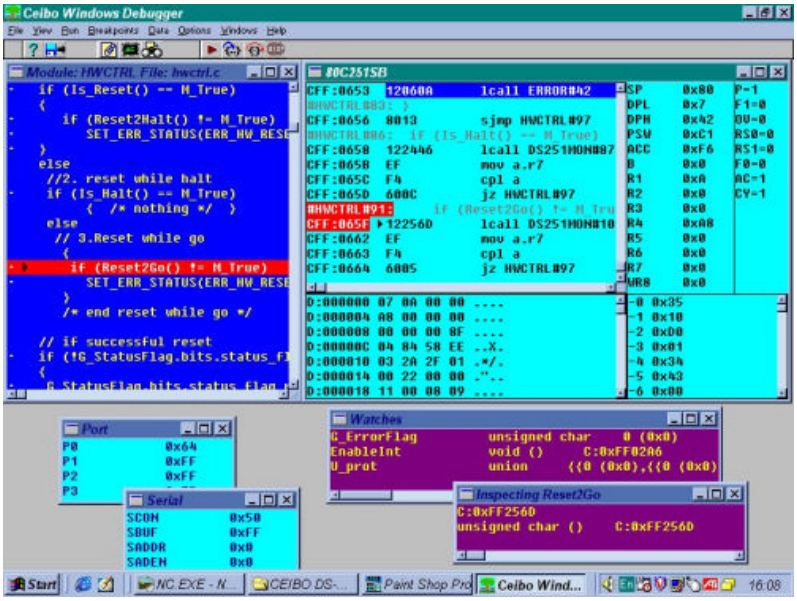


Figure 1: DS-251 Windows Debugger

TRACE AND LOGIC ANALYZER

The 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. The maximum trace memory is 128K frames of 128-bit each including bus activity, program counter, trace clips and 32-bit time stamps with a maximum resolution of 40ns.

PERFORMANCE ANALYZER

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

PERSONALITY PROBES

DS-251 uses Intel and Atmel W&M / Temic bond-out microcontrollers for hardware and software emulation. The selection of a different microcontroller is made by replacing the probe or just by software as some bond-outs emulate a family of devices.

Probe	Supported Deviced	
B-C251Gx	Atmel:	TSC80C251G2D, TSC83C251G1D, TSC83C251G2D, TSC87C251G1A, TSC87C251G2D-16K, TSC87C251G2D-32K
B-C251Tx	Intel:	80C251SB, 80C251SQ, 80C251TB, 80C251TQ, 83C251SA, 83C251SB, 83C251SP, 83C251SQ, 83C251TA, 83C251TB, 83C251TP, 83C251TQ, 87C251SA, 87C251SB, 87C251SP, 87C251SQ, 87C251TA, 87C251TB, 87C251TP, 87C251TQ

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

FREQUENCY

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, while the emulator is prepared to accept future derivatives running up to 30MHz.

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 256 KByte breakpoints, 256 KByte internal code memory. User software including Source Level Debugger, On-line Assembler and Disassembler. User’s Manual and Operating Instructions. RS-232 cable. Power supply.

OPTIONS
Adapters for the different packages. 128K trace expansion.

WARRANTY
Two years limited warranty, parts and labor.

DS-251 - ORDERING INFORMATION

Item	***Description***
DS-251	In-Circuit Emulator, Software, 32K Trace Memory, Power Supply, Cables
P-C251TX	Personality Probe, 44-pin PLCC Emulation Header
P-C251GX	Personality Probe, 44-pin PLCC Emulation Header
TR-251-128K	128K Trace Memory