

# Ultra-51

## Real-time In-circuit emulator for 80C51 and Derivatives

### Overview



Ashling's emulators for the 80C51 family provide In-Circuit Emulation, real-time Trace, source debugging, performance analysis and software quality assurance tools for rapid and reliable development of 80C51 applications. All NXP Semiconductors 80C51 devices and package-types are fully supported.

### SYSTEM SPECIFICATION

#### Source-Level Debugging

PathFinder source debugger for C and Assembly. Automatic synchronization of Source Code, Traced Executed Source Code, Disassembled Code Memory, Port Activity, Code Browser and Code Coverage windows; on-chip RAM, Banked External Data memory, Special-function Registers, Status, Stack, and Variables windows.

#### Software Quality Assurance

Options for high-speed, non-intrusive real-time Performance Analysis, Code Coverage and report generation. Symbolic function trace, time-stamping, timing analysis and automatic software-verification reports, using a dedicated real-time measurement subsystem.

#### Banked Program Support

Built-in support for banked program development, including banked code memory, banked code breakpoints, banked triggers and banked code execution trace. Auto configuration for banked programs up to 1MB.

#### Source Debugger

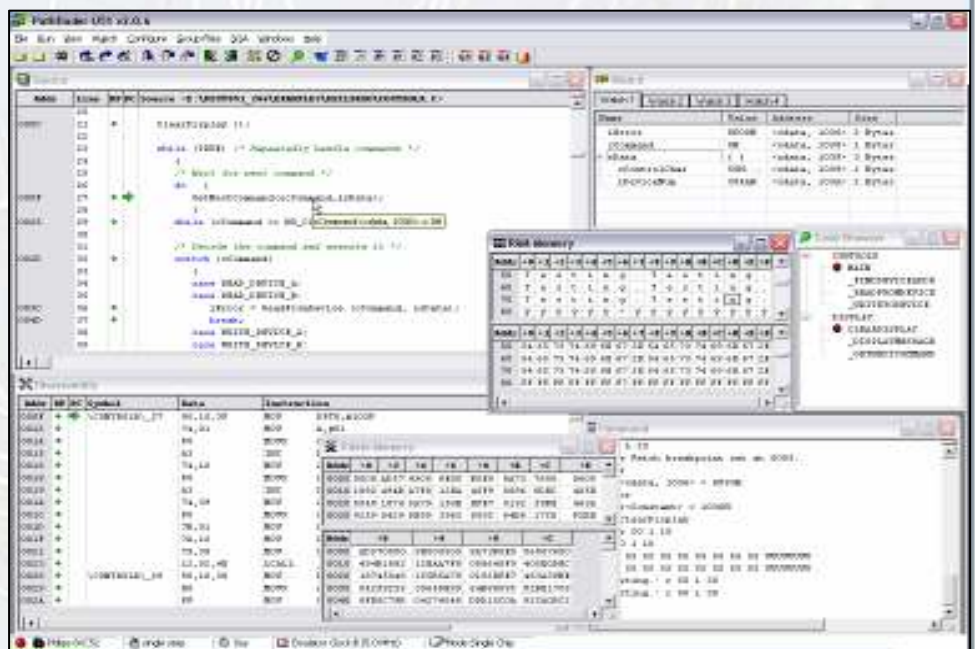
Ashling's PathFinder-51 Source Debugger provides the user-interface for the Ultra-51 Emulator. PathFinder utilizes the Windows 9x/2000/Me/NT/XP look-and-feel, to reduce the debugger learning curve and increase user friendliness, while maintaining a consistent style between the debugger and other Windows™ applications. In-Circuit Emulation, Source-level Debug, Performance Analysis and Code Coverage are all controlled by PathFinder, thus providing a true integrated view of the embedded development domain.

#### Code Coverage Measurement

Ashling's "CodeScan" Code Coverage Measurement option for the Ultra-51 System identifies all tested, untested and unreachable code in your program. This allows you to implement a repeatable, step-by-step program test procedure, to ensure that every byte of code has been tested, and to keep a formal record of test completeness.

#### STARS Performance Analyzer

Ashling's STARS Performance Analyzer option for the Ultra-51 measures the maximum, minimum and total execution time of every function in the program code, in real-time. You can measure and optimize the execution time of your program, identify untested program paths, and verify conformance to an execution-time specification.



The PathFinder Source Debugger provides real-time in-circuit emulation and source-level debugging for the NXP 80C51 microcontroller family with mouse, command-line, accelerator-key and button-bar controls.

## EMULATOR SPECIFICATION

<b>Emulator Memory</b>	1MB Emulator Code Overlay Memory and 1MB Emulator Xdata Overlay Memory.
<b>On-the-Fly Debugging</b>	Full On-the-Fly, non-intrusive debugging: You can set breakpoints, define a trigger, view trace contents and monitor variables while your program is executing.
<b>Trace Display</b>	32K Frames by 96 bits trace buffer, with variable trace length. Time-stamp on every traced frame. Optional trace expansion to 512K Frames. Display signals in cycle-by-cycle, hex, or source code. Full real-time tracing of address, data, ports, control and external buses. Save/load trace display. Compare trace against reference traces.
<b>Triggering</b>	Six multiple trigger Event recognizers; symbolic, binary, or hex values. Trigger on Boolean combinations of the Event recognizers. Trigger on address and/or data values or range(s). Pre/center/post trace triggers. Save/load trigger definition files. Modify trigger On-the-Fly.
<b>Breakpoints</b>	1MB code breakpoints. 1MB Xdata read and 1MB Xdata write breakpoints. Break on frames after stop trigger. Break on Trace buffer full. Execution timer breakpoint. External signal breakpoint. All breakpoints are halt-before-instruction, non-intrusive, real-time.
<b>Variables</b>	Full expression handling for assembler for C and assembly. Variable monitoring, including complex arrays and structures. On-the-fly variable monitoring.
<b>Languages Supported</b>	Keil C, IAR C, Altium-Tasking C, Ashling ASM51, Intel ASM51, Keil RTX51 RTOS.
<b>Host</b>	PC with Windows™9x/2000/Me/NT/XP, standard RS232 serial port.
<b>Flash microcontroller emulation</b>	Full-speed code overlay memory emulates On-Chip Flash microcontrollers.
<b>Power Supply</b>	Stand-alone in-circuit emulator with standard 115Kbits/s serial connection to PC. Supplied with 100V-230V 50/60Hz Universal power unit.

## ULTRA-51 DEVICE SUPPORT RANGE - PLEASE SPECIFY DEVICE WHEN ORDERING

80C51	80/87/89C54	83/87/89C51RD+
80C52	80/87/89C58	80/83/89C51RA2
80C31	80/83/87C524, C528	80/83/89C51RB2
80C32	80/83/87C652, C654	80/83/89C51RC2
8xC51X2, 52X2, 54X2, 58X2	80/83/87C51FA	80/83/89C51RD2
80C31X2, 32X2	80/83/87C51FB	89C660
89xC51RA2xx, RB2xx, RC2xx, RD2xx	80/83/87C51FC	89C662
89xC60X2, C61X2	80/83/87C51RA+	89C664
80/87/89C51	83/87C51RB+	89C668
80/87/89C52	83/87/89C51RC+	

## UPGRADE PATH

All Ultra-51 systems can be easily field-upgraded to a different processor type. Ashling's continuing technical co-operation with NXP Semiconductors ensures that development support is provided for each new 80C51, 80C51Mx2, XA and Smart Card derivative introduced by NXP semiconductors.

DS179 V17

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