Agilent Technologies E5900B Emulation Probes

Data Sheet

Figure 1. Agilent E5900B emulation probe

- **Support for ARM7/ARM9/ARM9TDMI, MIPS, Motorola/IBM PowerPC 4xx, 6xx, & 8xx; MPC 82xx; MPC 74xx and M•Core processors**
- **10/100T LAN connectivity to industry-standard debuggers**
- **Download speeds up to 1Mbyte/sec**
- **Standalone operation with an industry-leading debugger**
- **Operation coupled with logic analyzers and oscilloscopes in the Agilent 16700 Series logic analysis systems for complete target system analysis**
- **Support for 1.2 V to 5 V operation**
- **IEEE 1149.1 (JTAG) or BDM connection to the processor's debug port**
- **Self powered, no target power required**
- **Easy upgrade to meet changing processor needs**

The Agilent E5900B series of emulation probes provide an electrical interface to a supported microprocessor's on-chip debug port (BDM or JTAG), enabling access for either debuggers or Agilent 16700 Series logic analyzers and oscilloscopes.

Agilent E5900B emulation probes connect to industry-leading debuggers via 10/100 Base-T LAN. While operating with the debugger, the probes provide code downloading as well as run control and access to on-chip registers and memory.

The emulation probes are self-powered, making them ideally suited for working in battery-powered and other systems that have not budgeted extra power for debug tools.

Debugger Interface

Agilent engineering labs have tested the compatibility of the E5900B probes with industry-leading debuggers and development systems from Green Hills, Mentor Graphics, Metrowerks and Wind River for a wide range of processors. Please refer to the Agilent web site for the most current listing of debuggers at www.agilent.com

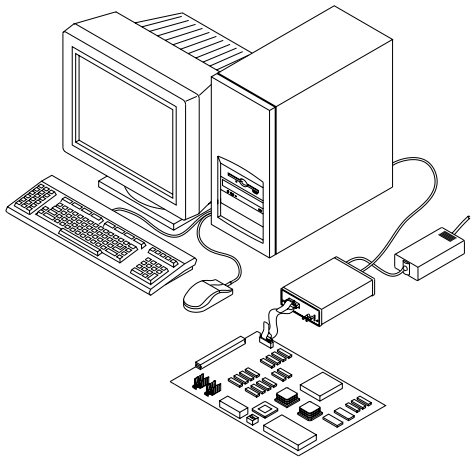

Figure 2. Agilent E5900B operating with a PC hosted debugger via LAN connection

A System Troubleshooting Tool

Coupling an oscilloscope and/or logic analyzer to an emulation probe via the probe's trigger output and break input ports lets you view system operation as related to CPU status. For example, in systems where the processor supports an external break input, an oscilloscope's trigger output can command the processor to break if a critical control line ever enters a specified state.

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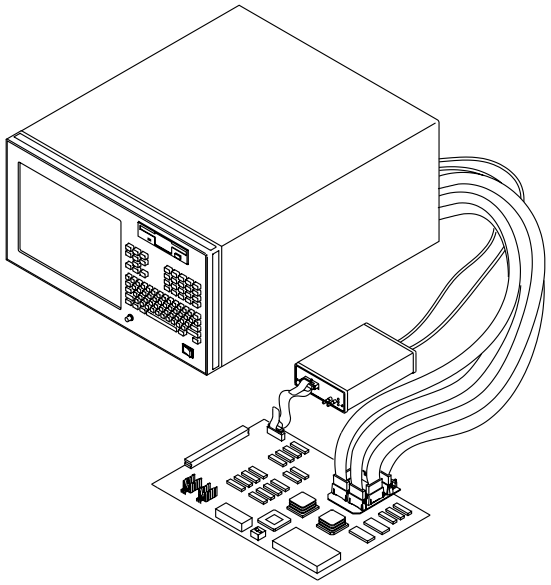

Figure 3. Agilent E5900B emulation module operating with the 16702 logic analyzer

Quickly Isolate System Integration Problems

The Agilent E5900B emulation probes can be tightly coupled to the Agilent 16700 Series logic analysis systems. These systems enable quick determination of your most difficult hardware, software and system integration problems. The E5900B operate under control of the logic analyzer via the LAN or with the addition of the E5901B emulation module. With logic analysis providing timing and state analysis of system operation, the emulation probe can monitor internal microprocessor activity. This combination of logic analysis and emulation gives you a view of your total system, encompassing everything from signals to source code.

Easy Migration Protects Your Investment

The E5900B emulation probes can continue to be useful development tools when a different processor is selected for new projects. Agilent migration kits provide an easy and economical method to convert existing emulation probes to keep up with your changing processor needs.

Selection Guide

Select the configuration of the emulation probe for your application from the following table.

Processor	Agilent E5900B Option #
Arm	
ARM7/9 TDMI	300
ARM7/9	
IBM	
PPC 4xx	060
PPC 6xx	060
PPC7xx	070
MIPS	
MIPS 32 4Kc	
MIPS 32 4Km	200
MIPS 32 4Kp	
MIPS 64 5Kc	
Motorola	
MPC 6xx	060
MPC 7xx	070
MPC 8xx	080
MPC 74xx	110
MPC 82xx	100
M•CORE	090

Performance Characteristics

Probe Input/Output Characteristics	
Target connection	JTAG as per IEEE 1149.1 specification. Pin out is specific to the processor. Details of the JTAG con nection pin out can be found on the Agilent web at **http://www.agilent.com**
JTAG Input Characteristics	
TDO, DBGACK, & RTCK	R_{in} = 4.7k Ω pull-up to V_{ref} C_{in} TDO = 75 pF, BDGACK = 95 pF, DTCK = 80 pF
TDO sampling with respect to TCK	Selectable: falling or rising TCK Minimum required setup & hold window = 7.0 ns t_{su} = 7.5 ns, t_h = -0.5 ns
V_{ref}[1]	R_{in} = 25k Ω pull down to ground
SRST[2]	R_{in} (inactive) = 4.7k Ω pull-up to V_{ref} R_{in} (active) = 12 Ω pull down to ground C_{out} = 200 pF
JTAG Output Characteristics	
TDI, TCK, TMS, TRST, & DBGRQ	V_{oh}/I_{oh} = 66 +/- 15 Ω to V_{ref} V_{0l}/I_{0l} = 66 =/-15 Ω to 0.2V
Delay	TDI & TMS delay from TCK falling edge to TDI and TMS valid Min 1 ns max 2.5 ns
Operating Voltage	
Operating range	1.2 V to 5.0 V
Communications	
LAN	RJ-45 connector IEEE 802.3 Auto sensing 10/100 BASE-T Ethernet maximum download speed 1 Mbyte/sec
Trigger out	SMB (m) 2 V into 50 ohm load
Break in	SMB (m) Input RC = 2k ohms & 20 pF Edge triggered, TTL level Maximum input = 5V above VCC
Power	
Power supply	12 V dc, maximum current = 1 A External module, 100–240 V input auto sensing 50/60 Hz, IEC 320 connector
Physical size	105 mm (4.13 inch) wide x 151 mm (5.94 inch) deep x 40 mm (1.57 inch) high
Environmental	
Temperature	Operating: 0˚C to +40˚C (+32˚F to +104˚F) Not operating: -40˚C to +60˚C (-40˚ to +140˚F)
Altitude	Operating and not operating; 4600 m (15 K feet)
Relative humidity	80% @ 40˚C for 24 hours
Regularity Compliance	
	EMC CISPR 11:1990/EN 55011:1991 Group 1, Class A IEC 801-2:1991/EN50082-1:1992 4kVCD,8kV AD IEC 801-3:1994/EN 50082:1993 3 V/m (1 kHz 80% AM,27-1 kMz) IEC 801-4:1998/EN 50082-1:1992 0.RkV Sig lines, 1 kV power lines
Safety Approval	
	IEC 1010-1:1990; AMD 1:1992; UL 1244; CSA-C22.2 No. 231

1. V_{ref} is used to determine the target power status and the reference for input threshold and output voltage swings. The Agilent emulation probes do not draw power from the target system.
2. Open collector output. Pulled up to generated voltage equivalent to the V_{ref} voltage with a 2.61 k Ω pull-up resistor.

E5900B Emulation Probe Options

Option Number	Processors Supported
060	PPC 4xx, PPC 6xx, & MPC 6xx
070	MPC 7xx
080	MPC 8xx
090	M•Core
100	MPC 82xx
110	MPC 7400, MPC 7410,MPC7440 and MPC 7450
200	MIPS 32 MIPS 64
300	ARM7, ARM 9, & ARM 9 TDMI

Note: Most current supported processor information can be obtained form the Agilent web at
www.cos.agilent.com/probe

Ordering Information

E5900B Emulation Probe
Emulation probe that provides access to the processor via BDM or JTAG interface.

Supplied with power supply, line cord, User's Guide, and processor specific interface cables.

E5901B Emulation Module
Emulation probe and interface module for Agilent 16700 Series logic analyzer.

Supplied with E5900B emulation probe, emulation interface module, power supply, line cord, logic analyzer application software, and processor specific interface cables.

E5902B Migration Kit
Personality conversion of an existing E5900B emulation probe or E5901B emulation module to support a different processor.

Supplied with software to reprogram the E5900B, User's Guide, tool kit, and processor specific interface cables.

Recommended Accessories

8120-5048 SMB (f) to BNC (m)
50 Ω trigger cable 1.22 m (48 inch)

Related Literature	Document Number
Agilent Technologies 16700 Series Logic Analysis System, Product Overview	5968-9661E
Processor and Bus Support for Agilent Technologies Logic Analyzers, Configuration Guide	5966-4365E

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ww.agilent.com/find/assist

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