Interface Pods

9000-Series Micro-System Troubleshooters

FLUKE
The Interface Pod is the heart of Fluke’s Micro-System Troubleshooting System, adapting the mainframe general-purpose architecture to the specific microprocessor or microprocessor family. And since the microprocessor is the central control element of the microsystem, stimulating and monitoring board activity with the Interface Pod is the most effective way to functionally test the system.

Unlike emulators and development systems which are intended for software debugging, these Interface Pods are designed specifically for troubleshooting hardware failures. They provide discrete control over all processor operations that result in pin activity. The user can drive output (control) lines and monitor input (status) lines. Even if the system has multiple faults, you can continue testing by identifying and disabling faulty lines. This allows you to easily troubleshoot one fault at a time.

Because the Pod is intended to be interfaced with defective micro-systems, special input protection circuitry is used. This provides overvoltage protection on each line to the unit under test (UUT) — even if the Pod is plugged in backwards. Other Pod circuitry monitors and checks each read/write operation as it is performed. A self-test socket is included for verifying proper Pod function.

Fluke’s present line of Interface Pods now support 32 different microprocessor types, a major segment of today’s most-widely used microprocessors. Contact your Fluke Sales Engineer or Representative for further information on 9000-series microprocessor support — for today and the future.

9000-Series Specifications

**Z80 Microprocessor (9000A-Z80)**
- Capable of addressing all 65,536 memory locations.
- Capable of addressing all 65,536 I/O locations.
- Output lines BUSAK and HALT can be individually driven from the 9000-Series Mainframe.
- Input lines BUSRQ and WAIT can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 4.0 MHz.

**1802 Microprocessor (9000A-1802)**
- Interfaces with 1802, 1804, 1805, and 1806 microprocessor systems. Operator inserts his own microprocessor type into an easy-access ZIF socket. This allows any internal ROM code to be executed in the RUN UUT mode.
- Special pod design lets the user control and analyze DMA activity.
- Capable of addressing all 65,536 memory locations.
- Capable of addressing all 7 I/O locations.

**6502 Microprocessor (9000A-6502)**
- Operates over the full range of power supply voltages (4V-12V).
- Automatically sets probe logic-threshold levels in accordance with the microprocessor’s operating voltage.
- Output lines SCO, SCI, and Q can be individually driven from the 9000-Series Mainframe.
- Input line WAIT can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 5.0 MHz.

**6502 Microprocessor (9000A-6502)**
- Capable of addressing all 65,536 memory locations.
- The SYNC output line can be driven from the 9000-Series Mainframe.
- The READY input line can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 2.0 MHz.

**6800 Microprocessor (9000A-6800)**
- Capable of addressing all 65,536 memory locations.
- The BA output line can be driven from the 9000-Series Mainframe.
- Input lines HALT, DBE and TSC can be enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 2.0 MHz.

**6802 Microprocessor (9000A-6802)**
- Interfaces with 6802, 6802NS and 6808 microprocessor systems.
- Capable of addressing all 65,536 memory locations.
- The BA output line can be driven from the 9000-Series Mainframe.
- Input lines HALT and MR can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 2.0 MHz.

**6809 Microprocessor (9000A-6809)**
- Interfaces with 6809 and 6809E microprocessor systems.
- Capable of addressing all 65,536 memory locations.
- Output lines BA and BS can be individually driven from the 9000-Series Mainframe.
- The following input lines can be monitored and enabled or disabled from the 9000-Series Mainframe:
  - BA
  - BS
  - M
  - R
  - DMA
  - TSC
- Operates at clock speeds to 8.0 MHz.

**8048 Microprocessor (9000A-8048)**
- Interfaces with 8035, 8039, 8040, 8048, 8049, 8050, 8748, 8749, 8044, 8044A, 8041A and 8741A microprocessor systems. Operator inserts the UUT's microprocessor into an easy-access ZIF socket. This allows any internal ROM code to be executed in the RUN UUT mode.
- One pod supports 12 different microprocessors. No need to buy new pods when you switch to different processors in the 8048 family.
- Capable of addressing all 8048 external and internal memory locations.
- Allows the user to read and write data to the 8048 BUS port and I/O ports P1 and P2.
- Allows the user to read and write through 8243 expansion I/O devices.
- Pod has an additional 256 bytes of internal, executable RAM, allowing the user to create his own high-speed rests. This RAM does not occupy any user memory space.
- Operates at clock rates to 11 MHz.

8080 Microprocessor (9000A-8080)
- Capable of addressing all 65,536 memory locations.
- Capable of addressing all 256 I/O locations.
- Output lines HLDA, WAIT, and INTE can be individually driven from the Y000-Series Mainframe.
- Input lines HOLD and READY can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 3.0 MHz.

8085 Microprocessor (9000A-8085)
- Capable of addressing all 65,536 memory locations.
- Capable of addressing all 256 I/O locations.
- Output lines HLDA, RESET OUT, SOD, and INTA can be individually driven from the 9000-Series Mainframe.
- Input lines HOLD and READY can be monitored and enabled or disabled from the 9000-Series Mainframe, and affects clock speeds to 5.0 MHz (10 MHz crystal).

8086 Microprocessor (9000-8086)
- Capable of addressing 1 Megabyte of memory.
- Operates with systems that have memory space divided into four sections using the STACK, DATA, CODE, and EXTRA DATA registers of the microprocessor (1 megabyte of memory each).
- Operates in both the MAX and MIN modes.
- The following output lines can be individually driven from the 9000-Series Mainframe:
  - LOCK
  - INTA
  - QS0
  - QS1
  - GT0
  - GT1
- The following input lines can be monitored and enabled or disabled from the 9000-Series Mainframe:
  - READY
  - RQ0
  - RQ1
  - INTR
- Operates at clock speeds to 5.0 MHz in both the max. and min. modes.
- Special Pod circuitry allows reading of interrupt vector type and cascade address using special commands from the Y000-Series Mainframe.
- Fully supports Bus REQUEST/GRANT operations.

8088 Microprocessor (9000A-8088)
- Capable of addressing 1 Megabyte of memory.
- Operates with systems that have memory space divided into four sections using the STACK, DATA, CODE, and EXTRA DATA registers of the microprocessor (1 megabyte of memory each).
- Capable of addressing 65,536 I/O locations.
- Special high-speed RAM and ROM tests make testing large address space easy and quick.
- Operates in both the MAX and MIN modes.
- The following output lines can be individually driven from the 9000-Series Mainframe:
  - LOCK
  - INTA
  - QS0
  - QS1
  - GT0
  - GT1
- The following input lines can be monitored and enabled or disabled from the 9000-Series Mainframe:
  - READY
  - RQ0
  - RQ1
  - INTR
- Operates at clock speeds to 8 MHz in both the max. and min. modes.
- Special Pod circuitry allows reading of interrupt vector type and cascade address using special commands from the Y000-Series Mainframe.
- Fully supports Bus REQUEST/GRANT operations.

9900 Microprocessor (9000A-9900)
- Capable of addressing 65,536 memory locations.
- Through the serial bus (CRU), the Pod is capable of addressing 4096 serial-bit I/O locations, 1 to 16 hits at a time.
- Output lines HLDA and WAIT can be individually driven from the 9000-Series Mainframe.
- Input lines HOLD and READY can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds to 3.0 MHz.
68000 (9000A-68000)
- Capable of addressing 16 megabytes of memory.
- Special high-speed RAM and ROM tests make testing large address spaces easy and quick.
- Output lines HALT, VMA, BG and RESET can be individually driven from the 9000-Series Mainframe.
- Input lines HALT and BR/BGACK can be monitored and enabled or disabled from the 9000-Series Mainframe.
- Operates at clock speeds up to 10.0 MHz.
- Special Pod circuitry allows the reading of interrupt vectors using special commands from the 9000-Series Mainframe.
- Detects VPA and DTACK faults
- Supports memory management features of the 68000 (Supervisor/User and Data/Program).

General
- All Pods are powered from the Troubleshooter and do not draw any power from the UUT.
- All Pods are clocked by the UUT clock signal.
- Overvoltage protection and logic-level detection is provided on each line to the UUT.
- A power-level sensing circuit constantly monitors the power supply voltage level of the UUT. If the voltage falls outside a 10% window, it is reported to the operator.
- A self-test socket is provided on each Pod for checking Pod operation.

- Environment:
  - Storage: -40°C to +70°C, RH<95%
- Operating: 0°C to +25°C, RH<95%
  - 25°C to +40°C, RH<75%
  - +40°C to +50°C, RH<45%

Ordering Information
Models
9005A Micro-System Troubleshooter     $3,595
9010A Micro-System Troubleshooter     $3,995
9020A-001 Micro-System Troubleshooter w/RS-232 Interface $4,295
9020A-002 Micro-System Troubleshooter w/IEEE-488 Interface $4,295
Troubleshooters require one Interface Pod, listed below.

Option
9010A-001* RS-232 Interface Pod $395
* For 9010A or 9005A

Interface Pods
9000A-Z80 Interface Pod $1,595
9000A-1802 Interface Pod $1,995
9000A-6502 Interface Pod $ 895
9000A-6800 Interface Pod $ 895
9000A-6802 Interface Pod $ 895
9000A-6809 Interface Pod $ 995
9000A-8048 Interface Pod $1,995
9000A-8080 Interface Pod $ 895
9000A-8085 Interface Pod $ 895
9000A-8086 Interface Pod $2,495
9000A-8088 Interface Pod $2,495
9000A-9000 Interface Pod $1,795
9000A-68000 Interface Pod $1,995

Accessories
9000A-900 Transit Case $ 295
Y8007 10-pack of minicassettes $ 150

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P.O. Box C9090, Everett, WA 98206
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206-356-5500 from other countries

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Phone or write for the name of your local Fluke representative.
Essential to troubleshooting microprocessor-based systems is the unique ability to gain control and observe the operation of the unit under test (UUT). Fluke microprocessor (µP) interface pods are the keys to this new testing technique. Serving as the test connection between the Fluke 9000 Series mainframe and the UUT, the interface pods adapt the general architecture of the mainframe to the specific microprocessor utilized in the UUT.

Connection to the UUT is made by inserting the pod’s ribbon cable directly into the µP socket. Once inserted, testing can begin immediately.

Using the array of powerful tests built into the Fluke 9000 mainframe, the connections to the processor can be checked for lines tied high, for shorts to ground, and for lines tied together. Then the examination can proceed to the rest of the kernel, checking RAM, ROM, I/O lines and BUS integrity.

B-Bit Probeable Socket
All S-bit and 40-pin processor pods include Fluke’s 9000A-7201 Probeable Socket. This device connects to the µP socket in the board, and includes a secondary socket that the pod connector inserts into. The probeable socket allows the individual µP pins to be exposed for easy probing with the Fluke Troubleshooter Probe for any additional testing that need be performed.

General Pod Features
- All pods are powered from the Troubleshooter and do not draw any power from the UUT.
- All pods are clocked by the UUT clock signal.
- Overvoltage protection and logic-level detection is provided on each Address, Data and Control line to the UUT.
- A power level sensing circuit constantly monitors the power supply voltage level of the UUT. If the voltage falls outside a 10% window, it is reported to the operator.
- A self-test socket is provided on each pod for checking pod operation.

“These pods Interface with more than one type of microprocessor-based system. Refer to pod specification chart.”
<table>
<thead>
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<th>Pod Operation Specifications</th>
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<td>Pod Model Number</td>
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| 9000A-280       | 280A                           | 64K                         | To 4.0 MHz           | **Output lines BUSGR and HALT can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input lines BUSGR and WAIT can be monitored and enabled or disabled from the 9000 Series Mainframe.** |
|                 | 280A                           |                             | To 6.0 MHz           | **Operator inserts his own microprocessor type into an easy-access ZIF socket. This allows any internal REM code to be executed in the RUN UUT mode.**  
|                 |                                |                             |                      | **Special ped design lets the user control and analyze DMA activity.**  
|                 |                                |                             |                      | **Output lines S0D, SC1, and G can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input line WAIT can be monitored and enabled or disabled from the 9000 Series Mainframe.** |
| 9000A-280AA     |                                |                             |                       | **The SYMBOL output line can be driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **The READY input line can be monitored and enabled or disabled from the 9000 Series Mainframe.** |
| 9000A-6002      | 6002                           | 64K                         | To 2.0 MHz           | **Output lines BA and BS can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **The following input lines can be monitored and enabled or disabled from the 9000 Series Mainframe:**  
|                 |                                |                             |                      | **HOLD**  
|                 |                                |                             |                      | **HALT**  
|                 |                                |                             |                      | **MR**  
|                 |                                |                             |                      | **TSC**  
|                 |                                |                             |                      | **DD**  
| 9000A-6800      | 6800                           | 64K                         | To 2.0 MHz           | **Output lines BA output line can be driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input lines HALT, DBE and TSC can be enabled or disabled from the 9000 Series Mainframe.** |
|                 |                                |                             |                      | **The BA output line can be driven from the 9000 Series Mainframe.** |
| 9000A-6802      | 6802, 6802DD, 6806            | 64K                         | To 2.0 MHz           | **Output lines BA output line can be driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input lines HALT and MR can be monitored and enabled from the 9000 Series Mainframe.** |
|                 |                                |                             |                      | **The BA output line can be driven from the 9000 Series Mainframe.** |
| 9000A-6809      | 6809, 6809E                    | 64K                         | To 8.0 MHz           | **Output lines BA and BS can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **The following input lines can be monitored and enabled or disabled from the 9000 Series Mainframe:**  
|                 |                                |                             |                      | **HOLD**  
|                 |                                |                             |                      | **HALT**  
|                 |                                |                             |                      | **MR**  
|                 |                                |                             |                      | **TSC**  
|                 |                                |                             |                      | **DD**  
| 9000A-8048      | 8048, 8049, 8040, 8048, 8049, 8050, 8748, 8749, 8041, 8041A, 8741A | All                         | To 11 MHz           | **Operator inserts the UUT’s microprocessor into an easy-access ZIF socket. This allows any internal REM code to be executed in the RUN UUT mode.**  
|                 |                                |                             |                      | **Allows the user to read and write data to the 8048 BUS port and I/O ports P1 and P2.**  
|                 |                                |                             |                      | **Allows the user to read and write through 8243 expansion I/O devices.**  
|                 |                                |                             |                      | **Has an additional 256 bytes of internal, executable RAM, allowing the user to create his own high-speed tests. This RAM does not occupy any user memory space.** |
| 9000A-8080      | 8080                           | 64K                         | To 3 MHz             | **Output lines HOLD and READY can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input lines HOLD and READY can be monitored and enabled or disabled from the 9000 Series Mainframe.** |
| 9000A-8888      | 885                            | 64K                         | To 5 MHz             | **Output lines HOLD, RESET OUT, S0D, and INT can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input lines HOLD and READY can be monitored and enabled or disabled from the 9000 Series Mainframe.** |
| 9000A-9900      | 9900                           | 64K                         | To 3.0 MHz           | **Output lines HOLD, RESET OUT, S0D, and INT can be individually driven from the 9000 Series Mainframe.**  
|                 |                                |                             |                      | **Input lines HOLD and READY can be monitored and enabled or disabled from the 9000 Series Mainframe.** |

**Ordering Information**

9000 Series Micro-System Troubleshooters:

**900A**—Fully comprehensive test unit which includes a Learn mode and a keyboard for generating a test program. Programs can be stored and recalled on a self-contained mini-cassette tape.

**900A**—Does not have the Learn or Programming features of the 900A, but can run programs downloaded from a 904A or a mini-cassette tape.

**902A**—For use in systems with a controller or personal computer connected via either RS-232 C or EEEE-488 interface. No programming keys or mini-cassette.

**Interface Pods:**

- **9000A-280**
- **9000A-280A**
- **9000A-1802**
- **9000A-6502**
- **9000A-6800**
- **9000A-6802**
- **9000A-6809**
- **9000A-8048**
- **9000A-8080**
- **9000A-8885**
- **9000A-9900**

One Year Warranty

*U.S. list prices, effective March 1, 1985.*
The Fluke 8051 Pod brings the power of the Fluke 9000 Series Micro-System Troubleshooter to the entire family of 8051/8044* microprocessor-based systems (and their CMOS versions).

Fluke interface pods adapt the general-purpose architecture of the 9000 Series Micro-System Troubleshooter to a specific microprocessor or to a family of processors, as is the case with the 8051 pod.

Contained in the 8051 pod is a µP of the same type that the pod replaces in the Unit Under Test (UUT). Eight configuration switches are then used to match the interface pod to the particular UUT configuration.

Connection to the UUT is made by inserting the ribbon cable connector into the microprocessor socket. This gives the 9000 Series Micro-System Troubleshooter direct access to all system components which normally communicate with the microprocessor.

Clip-on Adapter Accessory

The 8051 Pod has an optional clip-on adapter available for use with soldered-in microprocessors. With the adapter, the user can simply clip on to the microprocessor in the board, and proceed to test. The clip-on adapter disables the UUT microprocessor and gives control to the microprocessor in the pod.

Standard Pod Features

As with all other microprocessor interface pods manufactured by Fluke, the 8051 Pod performs a variety of tests, as instructed through the 9000 Series' mainframe. These include BUS, RAM SHORT, ROM, IO, RAM LONG and AUTO test.

The pod itself provides the standard driveability testing, internal protection circuits, power failure and marginal power supply detection, monitoring of the clock circuitry of the UUT and built-in self-test features for checking the pod operation.

Advanced Software

In addition, the 8051 Pod contains its own advanced software that provides microprocessor troubleshooting testing abilities never before possible. The user merely sends test parameters to the pod from the 9000 Series Troubleshooter. From here on, the desired function is independently executed by the pod.

Quick Functions

The pod can implement a variety of quick test functions which allow you to test memory at real-time speed, with interaction taking place directly between the pod and the UUT.

* Quick RAM: Allows a rapid check of RAM space, and consists of two parts:
  1. Normal RAM test of Read/Write capability and address decoding.
  2. Pattern Verification test, designed primarily for testing dynamic RAM memory to assure the memory is retaining information properly.

After a period of time (the duration of which may be selected), the verification part of the test will read the pattern left in RAM from the previous decode test to verify that the data has not changed due to deterioration of the refresh capability of the system.

* Quick ROM: Designed as a quick test of blocks of ROM using a checksum proce-
duie. The checksum can be used to detect a faulty ROM device with a high degree of confidence. The Quick ROM Test will also detect inactive data bits (bits that always read high or low regardless of the ROM address selected).

**Quick Fill:** A fast method of filling memory which allows the user to customize special operations, such as might be desirable when testing a memory-mapped video display. There are three variations of this function available:

- **FILL** will write a data byte to all of the addresses in a specified block of memory. An entire terminal memory space can be quickly filled with a particular character by executing the FILL function.
- **VERIFY** will read data from all of the addresses in the block and compare each one to the data contained in the starting address, to ensure that the data has not changed.
- **Fill & VERIFY:** These two functions can be invoked consecutively with one command.

**Quick Looping:** Provides the capability of looping on a Read or Write command at a much faster rate than normally is allowed by the looping feature of the 9000 Series' mainframe. Because of the increased repetition rate, the QUICK LOOPING functions are particularly useful for enhanced viewing of signal traces on an oscilloscope that is synchronized to the TRIGGER OUTPUT pulse.

**Special Functions:**

- The advanced software in the pod also provides addressing of several special functions:
  - Monitoring of self-test failure codes
  - Monitoring last error encountered
  - Error masking capability
  - Port driveability testing
  - Providing Refresh Enable operations
  - Overriding mode switch settings through program control
  - Individual bit addressing as well as Byte addressing

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**General Specifications**

- **Size:** 5.7 cm H x 14.5 cm W x 27.1 cm L
- **Weight:** 1.5 kg (3.3 lbs)
- **Temperature:** 0°C to +80°C non-condensing
- **Humidity:** RH 95% non-condensing

**Microprocessors Supported**

- 8039, 8050, A344, Z8001
- 8041, 8051, 8052, A344, A744, 8751
- 6802, 6803, 8042, 8085A, 8748, Z80A
- 6502, 6503, 8044, 8051, 8052, A344, Z8001
- 8044, 8051, 8052, A344, A744, 8751

**Ordering Information**

9000 Series Micro-System Troubleshooters:

- **YUUA:** A fully comprehensive test unit which includes a Learn mode and a keyboard for generating a test program. Programs can be stored and recalled on a self-contained mini-cassette.

- **9005A:** Does not have the Learn or Programming features of the 9001A, but can run programs downloaded from a 9001A or a mini-cassette tape.

- **9026A:** For use in systems with a controller or personal computer via either RS-232-C or IEEE-488. No programming keys or mini-cassette.

- **9000A-8051 Interface Pod (supports 8031, 8032, 8044, 8051, 8052, A344, A744, 8751) microprocessors.**

* $1,995.00  One-year warranty

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**Fluke**

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For more product information or where to buy Fluke products call:
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206-356-5000 from AK, HI, WA
206-356-5900 from other countries

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Phone or write for the name of your local Fluke Representative.
Quick-Function
Microprocessor Interface Pods
8086, 8088, Z8000*, 68000'

As the power of microprocessors increase, the capability to test the systems they control must also increase. Meeting this challenge, Fluke has developed a unique set of interface pods that provide an effective means to quickly test and troubleshoot microsystems utilizing the 8086, 8088, 68000, and 28000 microprocessors. The Fluke pods contain enhanced features that now allow efficient interactive testing of even large blocks of memory.

Each pod functions as the test interface between a Fluke 9000 Series Troubleshooter and the Unit Under Test (UUT). The pods are designed to assume the role of the microprocessor (MP) in the UUT, and each contain a MP of the same type that the pod replaces in the UUT.

Connection to the UUT is made by inserting the pods ribbon cable connector directly into the microprocessor socket. This gives the 9000 Series Troubleshooter and the pod direct access to all system components which normally communicate with the microprocessor.

**Standard Pod Features**

As with all other microprocessor interface pods manufactured by Fluke, the 8096, 8088, 68090, and 28000 pods allow the operator to perform a variety of tests, originating in the 9000 Series' mainframe. These include BUS, RAM SHORT, ROM, 110, RAM LONG, and AUTO test.

In addition to these tests, the pods themselves provide an automatic series of “hidden” driveability tests of all the bus lines. Driveability is verified every time the 9000 mainframe accesses the UUT through the pod. This checks that all bus lines are operating properly during any communication between the pod and the UUT.

In addition, each pod has internal protection circuits, power failure detection, and built-in self-test features for checking the pod operation. These features are all standard in Fluke's Interface Pods.

**Advanced Software**

In addition, the 8086, 8088, 68000, and 28000 pods contain advanced software that provide special microprocessor troubleshooting testing abilities. The user merely sends test parameters to the pod from the 9000 Series Troubleshooter. From here on, the desired function is independently executed by the pod.

**Quick Functions**

The pods can implement several quick test functions which allow testing of memory at real-time speed, with interaction taking place directly between the pod and the UUT.

- **Quick RAM**: Can rapidly test the READ/WRITE capability of small segments of memory or can test the entire block of RAM memory. Performs testing of address lines to ensure proper decoding of the memory addresses. Because testing is executed from the pod, large memory blocks can be tested in a very short period of time.

- **Quick ROM**: Designed as a quick test of blocks of ROM using a checksum procedure. The checksum can be used to detect a faulty ROM device with a very high degree of confidence. The Quick ROM Test will also detect inactive data bits (bits that always read high or low regardless of the ROM address selected).

- **Quick looping**: Provides the capability of looping on a Read or Write command at a much faster rate than normally is allowed by the looping feature of the 9000 Series' mainframe. Because of the increased repetition rate, the QUICK LOOPS function is particularly useful for enhanced viewing of signal traces on an oscilloscope that is synchronized to the TRIGGER OUTPUT pulse.

*Tests Z8001, Z8002, Z8003 & Z8004 microprocessor based systems.

*Also tests 68010 microprocessor based systems.
Specific Pod Features

8086 Interface Pod
- Capable of addressing 1 Megabyte of memory.
- Operates with systems that have memory space divided into four sections using the STACK, DATA, CODE, and EXTRA DATA registers of the microprocessor (1 megabyte of memory each).
- Capable of addressing all 65,536 I/O locations.
- Operates in both the MAX and MIN modes.
- The following output lines can be individually driven from the 9000 Series Mainframe:
  - Max Mode: LOCK, G50, G51, G50, GTI
  - Min Mode: INTA, HLDA

  The following input lines can be monitored and enabled or disabled from the 9000 Series Mainframe:
  - Max Mode: READY, RQD, RQI, INTR
  - Min Mode: READY, HOLD, INTR

  Operates at clock speeds up to 10 MHz.
  Allows both word and byte data transfers to all memory locations.
  Special Pod circuitry allows reading interrupt vector type and cascade address using special commands from the 9000 Series Mainframe.
  Fully supports Bus REQUEST/GRANT operations.

8088 Interface Pod
- Capable of addressing 1 Megabyte of memory.
- Operates with systems that have memory space divided into four sections using the STACK, DATA, CODE, and EXTRA DATA registers of the microprocessor (1 megabyte of memory each).
- Capable of addressing 65,536 I/O locations.
- Operates in both the MAX and MIN modes.
- The following output lines can be individually driven from the 9000 Series Mainframe:
  - Max Mode: LOCK, G50, GS1, GTI, GTI
  - Min Mode: INTA, HLDA

  The following input lines can be monitored and enabled or disabled from the 9000 Series Mainframe:
  - Max Mode: READY, RQD, RQI, INTR

  Operates at clock speeds up to 8 MHz in both the max and min modes.
  Special Pod circuitry allows reading of interrupt vector types and cascade address using special commands from the 9000 Series Mainframe.
  Fully supports BUS REQUEST/GRANT operations.

28000 Interface Pod
- Capable of addressing 8 Megabytes of memory.
- Operates at clock speed up to 10.0 MHz.
- Interfaces with 28001, 28002, 28003, and 28004 microprocessor systems. Operator inserts the UUT's microprocessor into an easy-access ZIF socket.
- Special Pod circuitry allows the reading of interrupt vectors using special commands from the 9000 Series Mainframe.
- Input lines BUSREQ and WAIT can be monitored and enabled or disabled from the 9000 Series Mainframe.
- Output line BUSACK can be driven from the 9000 Series Mainframe.
- Allows both word and byte data transfers to all memory locations.

Operating Features
- All pods are powered from the Troubleshooter and do not draw any power from the UUT.
- All pods are clocked by the UUT clock signal.
- Overvoltage and logic level detection is provided on each address, data, and control line to the UUT.
- A power-level sensing circuit constantly monitors the power supply voltage level of the UUT. If the voltage falls outside a 10% window, it is reported to the operator.
- A self-test socket is provided on each pod for checking pod operation.

Environment:
- Storage: 0° to +60° C, 95% non-condensing
- Operating: 0° to +40° C, 90% non-condensing

Ordering Information
9000 Series Micro-System Troubleshooters:
9001A - Fully comprehensive test unit which includes a Learn mode and a keyboard for generating a test program. Programs can be stored and recalled on a self contained mini-cassette tape.
9001AD - Does not have the Learn or Programming features of the 9001A, but can run programs downloaded from a 9001A or a mini-cassette tape.
9001BA - For use in systems with a controller or personal computer connected via either RS-232-C or IEEE-488 interface. No programming keys or mini-cassette.

Interface Pods:
- 9000A-8086 Interface Pod $2,495
- 9000A-8088 Interface Pod $1,995
- 9000A-68000 Interface Pod $1,995
- 9000A-28000 Interface Pod $1,995

ONE-YEAR WARRANTY

*U.S. list prices, effective March 1, 1985.

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The Fluke 80186 and 80188 Pods bring the power of the Fluke 9000 Series Micro-System Troubleshooter to test and troubleshoot systems with microprocessors packaged in leadless chip carriers (ICC). The 16-bit 80186 pod and the 8-bit 80188 pod use a specially designed cable and connector to allow an easy test connection to 80186 or 80188 based systems. An adapter is also available for use with pin grid arrays.

**Standard Pod Features**

As with all other microprocessor interface pods manufactured by Fluke, the 80186 and 80188 pods allow the operator to perform a variety of tests, originating from the 9000 Series’ mainframe. These include BUS, RAM SHORT, ROM, I/O RAM LONG, and AUTO tests.

In addition to these tests, the pods themselves provide an automatic series of “hidden” driveability tests of all bus lines. Driveability is verified every time the pod accesses the unit under test (UUT). This checks that all bus lines are operating properly during communications between the pod and the UUT.

Each pod also has internal protection circuits, power failure detection, and built-in self-test features for checking the pod operation. These features are standard in all of Fluke’s Interface Pods.

**Advanced Software**

The 80186 and 80188 pods contain advanced software that improves micro-system troubleshooting and testing abilities. The user merely sends test parameters to the pod from the 9000 Series Troubleshooter. The desired function is then independently executed by the pod.

**Interrupt Features**

The 80186 and 80188 pods offer features to test and troubleshoot UUT circuitry which generate interrupts to the UUT microprocessor. These pods have interrupt testing capabilities both in the Normal mode and the iRMX mode. Advanced software in the Fluke pods provides special functions for reading the type and address information that results from received interrupts. The user can control the configuration of the pod’s interrupt lines; the user can also enable or disable the interrupts, or force interrupt-acknowledge cycles.

**Quick Functions**

The pods can also perform a variety of quick test functions which allow the user to test large blocks of memory very rapidly, with interaction taking place primarily between the pod and the UUT.

**Quick RAM**

Allows a rapid check of RAM space, and consists of two parts:

1. A rapid test of the READ/WRITEMemory capability of small segments of memory or the entire block of RAM memory. Performs testing of address lines to assure proper decoding of memory addresses.

2. Pattern Verification test, designed primarily for testing dynamic RAM memory to assure the memory is retaining information property. After a period of time (the duration of which may be selected), the verification part of the test will read the pattern left in RAM from the previous decode test to verify that the data has not changed due to refresh problems in the UUT system.

**Quick ROM**

Designed as a quick test of blocks of ROM using a checksum procedure. The checksum can be used to detect a faulty ROM device with a very high degree of confidence. The Quick ROM Test will also detect inactive data bits (bits that always read high or low regardless of the ROM address selected).
QuickFill: A last method of filling memory which allows the user to customize special operations, such as might be desirable when testing a memory-mapped video display. There are three variations of this function available:

1. FILL will write a data byte to all of the addresses in a specified block of memory. An entire terminal memory space can be quickly filled with a particular character by executing the Fill function.

2. VERIFY will read data from all of the addresses in the block and compare each one to the data contained in the starting address, to ensure that the data has not changed.

3. FILL&VERIFY These two functions can be invoked consecutively with one command.

QuickLooping: Provides the capability of looping on a Read or Write command at a much faster rate than that allowed by the looping feature of the 9000 Series mainframe. The operator can synchronize an oscilloscope to the address or data timing cycles from the 9000 Series mainframe and observe the timing cycles of the UUT. The QUICKLOOPING functions are particularly useful for enhancing the viewing of signal traces on an oscilloscope because of the increased number of sync pulses coming from the mainframe.

QuickRAMP (80186 only): QuickRAMP sends to a particular address a series of data words that start at zero and increment up to FFFF hex. This function executes 65,535 write commands through the pod software, in a very short period of time. The RAMP function has found widespread application as a stimulus for signature analysis in the Micro-System Troubleshooter.

Special Functions:

- Monitoring self-test failure codes
- Monitoring the last error encountered
- Error masking capability
- Providing Refresh Enable options
- Selecting and testing Programmable Chip Select lines
- Enhanced Pod Self-test—inclu des continuity test of cables

Ordering Information

9000 Series Micro-System Troubleshooters:

9010A—Fully comprehensive test unit which includes a Learn mode and a keyboard for generating a test program. Programs can be stored and recalled on a self-contained mini-cassette tape.

9005A—Does not have the Learn or Programming features of the 9010A but can run programs downloaded from a 500A or stored on a mini cassette tape

9020A—For use n ystem with a computer connected via the RS232 C  or IEEE 488 interface No programmability or no cassette

Interface Pods:
900A 80186 Interface Pod $2.695
9000A 80188 Interface Pod $2.605

ONE YEAR WARRANTY
(UUT Interface Cable 90 DAY WARRANTY)

*U.S. list prices effective March 1, 1985.