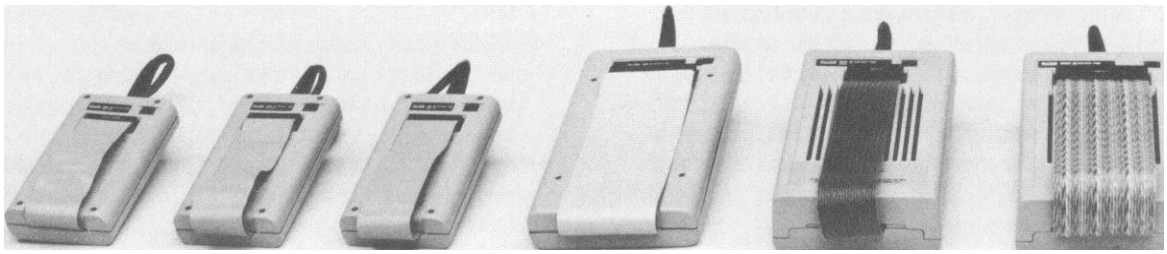
FLUKE®

Interface Pods

9000-SeriesMicro-System Troubleshooters



The Interface Pod is the heart of Fluke's Micro-System Troubleshooting System, adapting the mainframei 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 fix 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 rhe system has multiple faults, you can continue resting 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 propcr 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 Reprcscntative for further information on 9000-series microprocessor support — for today and the future.

9000-Series Interface Pod Specifications

Z80 Microprocessor (9000A-Z8O)

- 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 the 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 micropmcessor 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.
- Operates over the full range of power supply voltages (4V-12V).
- AutomaticaIIy sets probe logic-threshold levels in accordance with the microprocessor's operating voltage.
- Output lines SCO, SCl, and Q can be individually driven from the 9000-Sereis 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 frrom the 9000-Series Mainframe.
- The READY input line can he 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 YOOO-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 he driven from the 9000-Series Mainframe:
- Input lines HALT and MR can bc 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 mico-proccssor systems.
- Capable of addressing all 65,536 memory locations.
- Output lines BA and BS can bc individually driven from the 9000-Series Mainframe.
- The following input lines can be monitored and enabled or disabled from the 9000-eries Main&me:

6809	6809E
HALT	HAL?
M R	DMA
DMA	TSC

- Operates at clock speeds to 8.0 MHz.

8048 Microprocessor (9000A-8048)

- Interfaces with 8035, 8039, 8040, 8048, 8049, 8050, 8748, 8749, 8041, 8041A and 8741A microprocessor systans. Operator inserts the UUT's microprocessor into an easy-access ZIF socket. This allows any internal ROM code to he 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.

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- 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 porrs P1 and P2.
- Allows the user to read and write through 8243 cxpansion 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 spacr.

. 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 he individually driven from the YOOO-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 he individually driven from the 9000-Series Mainframe.

a Input lines HOLD and READY can be monitored and cnahled or disabled from the 9000-Series Mainframe.

. Operates at 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 memor y each).
- Capable of addressing all 65,536 I/O locations.
- Special high-speed RAM and ROM tests make testing large address spaces easy and quick.
- Operates in both the MAX and MIN modes.
- The following output lines can be individually driven from the 9000-Series Mainframe:

Max. Mode	Min. Mode
LOCK	INTA
QSO	HLDA
QS1	
GTO	
GT1	

- The following input lines can be monitored and enabled or disabled from the 9000-Series Mainframe:

Max. Mode	Min. Mode
READY	READY
RQO	HOLD
RQ1	INTR
RESET	
INTR	

- Operates at clock speeds up to 8 MHz in the max. mode and 10 MHz in the min. mode.

. 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 Microprocessor (9OOOA-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 spaces easy and quick.
- Operates in both the MAX and MIN modes.
- The following output lines can be individually driven from the 9000-Series Mainframe:

Max. Mode	Min. Mode
LOCK	INTA
QSO	HLDA
QS1	
GTO	
GT1	

- The following input lines can be monitored and enabled or disabled from the 9000-Series Mainframe:

Max. Mode	Min. Mode
READY	READY
RQ0	HOLD
RQ1	INTR
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 YOOO-Series Mainframe.
- Fully supports Bus REQUEST/GRANT operations.

9900 Microprocessor (9OOOA-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 he monitored and enabled or disabled from the 9000-Series Mainframe.

. Operates at clock speeds to 3.0 MHz.

68000 (9OOOA-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*
902OA-002 Micro-System Troubleshooter w/IEEE-488 Interface	*$4,295*

Troubleshooters require one Interface Pod, listed below.

Option

9010A-001* RS-232 Interface	$ 395

* For 9010A or 9005A

Interface Pods

9000A-Z80 Interface Pod	$ 895
9OOOA-1802 Interface Pod	$1,595
9000A-6502 Interface Pod	$ 895
9000A-6800 Interface Pod	$ 895
9000A-6802 Interface Pod	$ 895
9000A.6809 Interface Pod	$ 995
9OOOA-8048 Interface Pod	$1,995
9000A-8080 Interface Pod	$ 895
9000A-8085 Interface Pod	$ 895
9OOOA-8086 Interface Pod	$2,495
9000A-8088 Interface Pod	$2,495
9OOOA-9900 Interface Pod	$1,795
9000A-68000 Interface Pod	$1,995

Accessories

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

FLUKE

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Fluke Micropocessor
Interface Pods
Z80, 1802*, 6502, 6800, 6802, 6809*, 8048*, 8080, 8085, 9900

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 (uP) 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 uP 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 uP 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

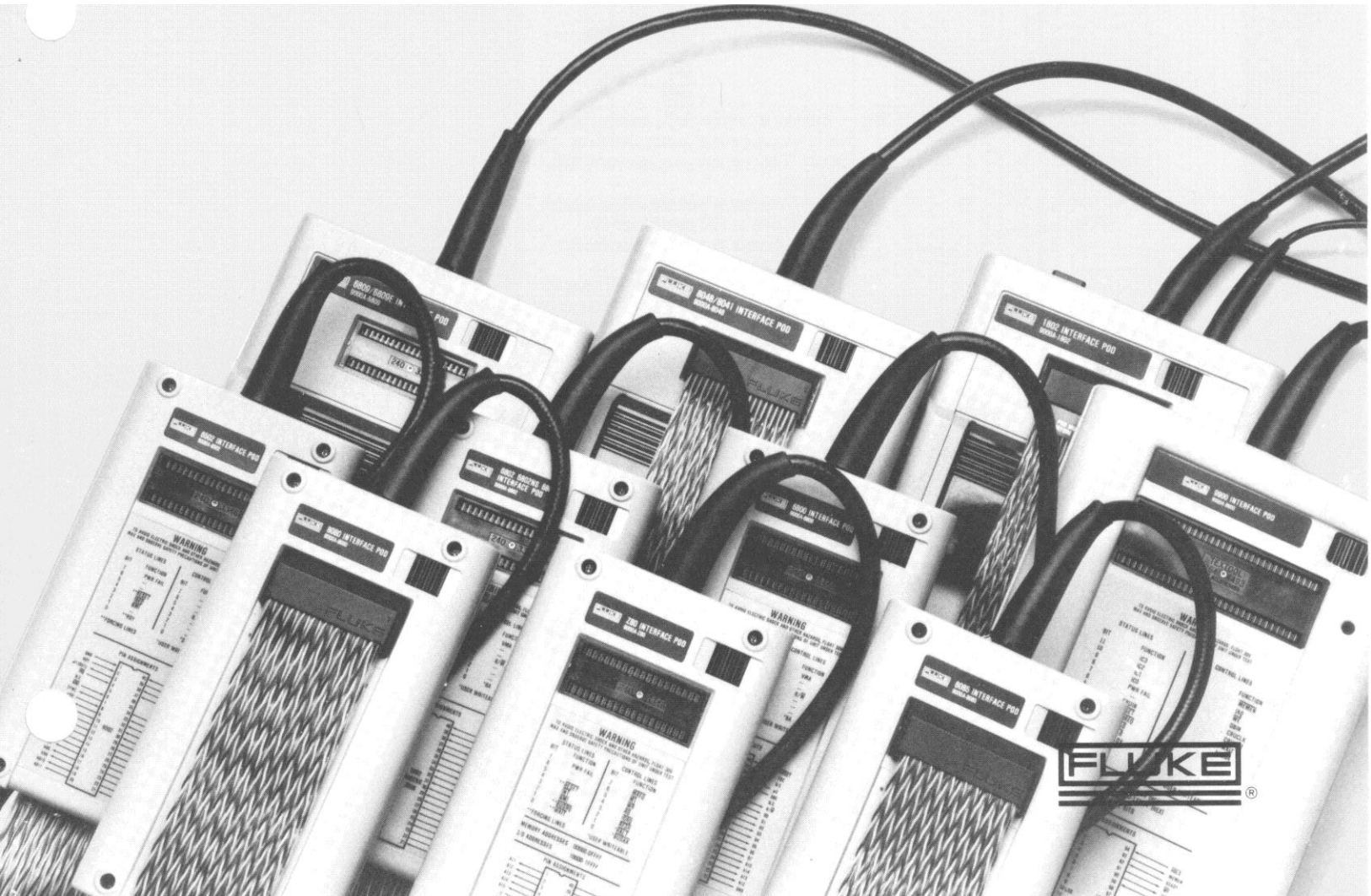
. All pods are powered from the Trouble-shooter and do not draw any power from the UUT.

- All pods are clocked by the UUT clock signal.
- Overvoltage protection and logic-level detection IIS 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.



Pod Operation Specifications

Pod Model Number	Microprocessor Types Interfaced	Memory Locations Addressable	Clock Speed Operation	Special Features
9000A-Z80 9000A-Z80AA	Z80A Z80B	64K Capable of addressing all 65,536 I/O locations.	To 4.0 MHz To 6.0 MHz	■ Output lines $\overline{\text{BUSAK}}$ and $\overline{\text{HALT}}$ can be individually driven from the 9000 Series Mainframe. ■ Input lines $\overline{\text{BUSRQ}}$ and $\overline{\text{WAIT}}$ can be monitored and enabled or disabled from the 9000 Series Mainframe.
9000A-1802	1802, 1804, 1805, 1806	64K Capable of addressing all 7 I/O locations.	To 5.0 MHz	■ 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. ■ Output lines SC0, SC1, and Q can be individually driven from the 9000 Series Mainframe. ■ Input line $\overline{\text{WAIT}}$ can be monitored and enabled or disabled from the 9000 Series Mainframe.
9000A-6502	6502	64K	To 2.0 MHz	■ The SYNCH 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-6800	6800	64K	To 2.0 MHZ	■ The BA output line can be driven from the 9000 Series Mainframe. ■ Input lines $\overline{\text{HALT}}$, DBE and TSC can be enabled or disabled from the 9000 Series Mainframe.
9000A-6802	6802, 6802NS, 6808	64K	To 2.0 MHz	■ The BA output line can be driven from the 9000 Series Mainframe. ■ Input lines $\overline{\text{HALT}}$ and MR can be monitored and enabled or disabled 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: **6809**: $\overline{\text{HALT}}$, MR, $\overline{\text{DMA}}$ **6809E**: $\overline{\text{HALT}}$, TSC
9000A-8048	8035, 8039, 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 ROM 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. ■ Pod 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 Capable of addressing all 256 I/O locations.	To 3 MHz	■ Output lines HLDA, WAIT, and INTE 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-8085	8085	64K Capable of addressing all 256 I/O locations.	To 5 MHz (10 MHz crystal)	■ Output lines HLDA, RESET OUT, SOD, and $\overline{\text{INTA}}$ 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.
9000A-9900	9900	64K	To 3.0 MHz	■ Throughout the serial bus (CRU), the Pod is capable of addressing 4096 serial-bit I/O locations, 1 to 16 bits at a time. ■ Output lines HLDA and WAIT can be individually driven from the 9000 Series Mainframe. ■ Input lines $\overline{\text{HOLD}}$ and READY can be monitored and enabled or disabled from the 9000 Series Mainframe.

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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 9010A or a mini-cassette tape.

9020A—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-Z80	$ 995
9000A-Z80AA	$1295
9000A-1802	$1595
9000A-6502	$ 995
9000A-6800	$ 995
9000A-6802	$ 995
9000A-6809	$1295
9000A-8048	$1995
9000A-8080	$ 995
9000A-8085	$ 995
9000A-9900	$1995

One Year Warranty

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

FLUKE®

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206-356-5400 from AK, HI, WA
206-356-5500 from other countries.

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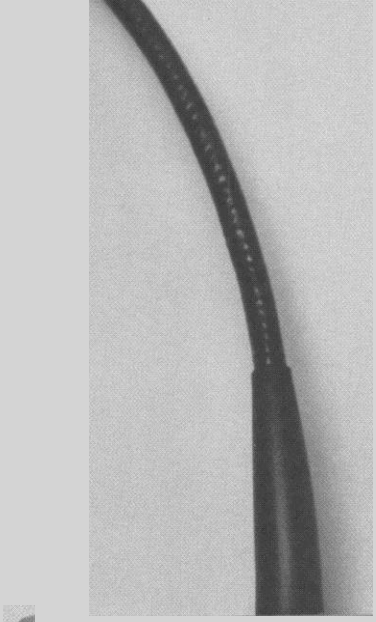
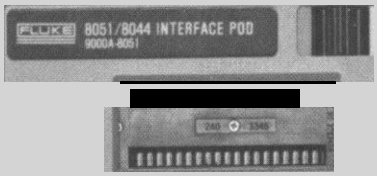
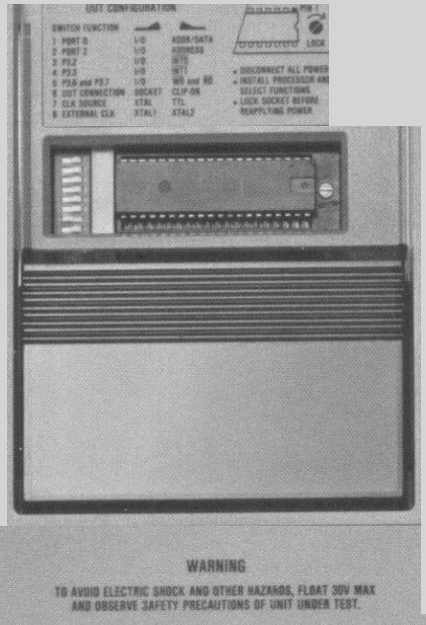
A0213A-13N8503/SE EN

8051

An Intelligent μP Interface Pod







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-SvstemTroubleshooter to a specific microprocessor or to a family of processors, as is the case with the 8051 pod.

'I

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 adapler 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, I/O, 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 sell-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-lime 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 lo 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 lest to verify that the data has not changed due lo deterioration of the refresh capability of the system.

. **Quick ROM:** Designed as a quick test of blocks of ROM using a checksum proce-

*For 8031, 8032, 8044, 8051, 8052, 8344, 8744 and 8751 microprocessors

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 inactlve data bits (bits that always read high or low regardless of the ROM address selected)

* **Quick Fill:** A fasl method of filling memory which allows the user to customlze special operations. such as might be desireable 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

  FiII & 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' malnframe Because of the Increased repetition rate. the QUICK LOOPING functions are particularly useful for enhanced vlewing 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-lest failure codes
- Monitoring last error encounlered
- Error masking capability
- Port driveablity testing
- Providing Refresh Enable operalions
- Overriding mode switch settings through program conlrol
- Individual Bit addressing as well as Byte addressing

General Specifications

Size . . . . . 5.7 cm H × 14.5 cm W × 27.1 cm L (2.2 in H × 5.7 in W × 10.7 in L)

Weight . . . . . 1.5 kg (3.3 lbs)

Environment:

Storage . . . . . −40°C to +80°C

operating RH 95% non-condensing 0°C to +40°C

RH 95% non-condensing; +40°C to +50°C RH, 75% non condensing

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

9005A — Does not have the Learn or Programming features of the 9010A, but can run programs downloaded from a 9010A or a mini-cassette tape.

9020A — 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

Microprocessors Supported

The Fluke 9000A-8051 Pod is just one of an entire family of interface pods manufactured by Fluke to support the microprocessors listed below.

1802	6802	8039	8050	a344	Z8001
1804	6802NS	8040	8051	8741A	Z8002
1805	6808	8041	8052	6742	Z8003
1806	6809	8041A	8080	8744	Z8004
6502	6809E	8042	8085A	8748	Z80A
6800	8031	8044	8085A-2	8749	Z80B
68000	8032	8048	8086	8751	
68010	8035	8049	8088	9900	

. All pods are powered from the Troubleshooter and do not draw any power from the UUT

. All pods are clocked by the UUT cluck signal

- Overvoltage 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.

FLUKE®

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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 micro processors. 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 (μP) in the UUT, and each contain a μp 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 8086, 8088, 68090, and Z8000 pods allow the operator to perform a variety of tests, originating in the 9900 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 everytime 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 Sofhvare

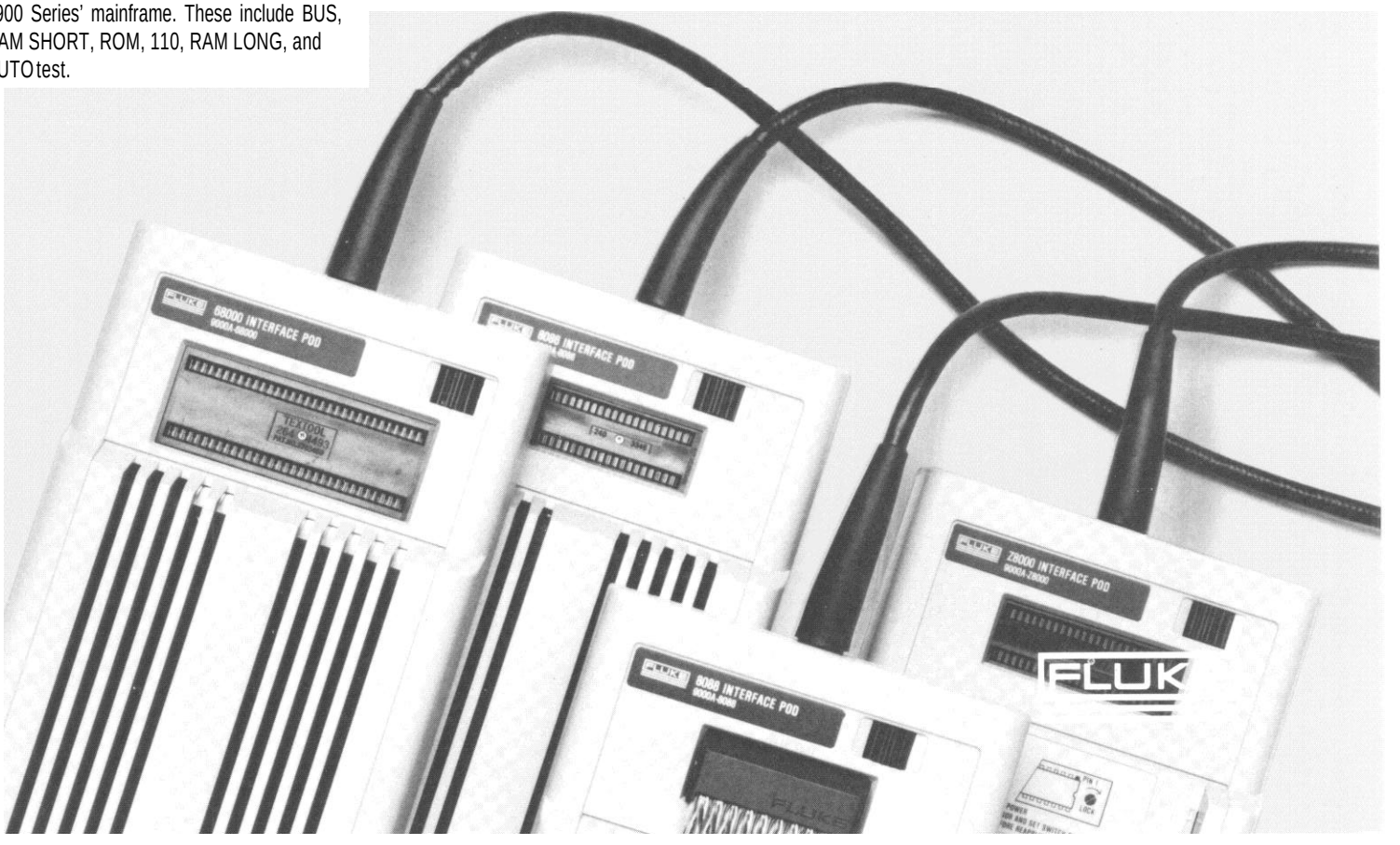
In addition, the 8086, 8088 68000. and 28000 pods contain advanced software that provide special microprocessor troubleshooting testing abilities. The user merely sends test parameters to the pod from the 9000 Series Troubleshooter. From here on, the desired function is independently executed by the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

Quick Functions

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

- QuickRAM: 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 Insure 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 LOOPING 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	Min.Mode
$\overline{\text{LOCK}}$	$\overline{\text{INTA}}$
QS0	HLDA
QS1	
$\overline{\text{GT0}}$	
$\overline{\text{GT1}}$	

- The following input lines can be monitored and enabled or disabled from the 9000-Series Mainframe:

Max.Mode	Min.Mode
READY	READY
$\overline{\text{RQ0}}$	HOLD
$\overline{\text{RQ1}}$	INTR
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	Min.Mode
$\overline{\text{LOCK}}$	$\overline{\text{INTA}}$
QS0	HLDA
QS1	
$\overline{\text{GT0}}$	
$\overline{\text{GT1}}$	

- The following input lines can be monitored and enabled or disabled from the 9000 Series Mainframe:

Max.Mode	Min.Mode
READY	READY
$\overline{\text{RQ0}}$	HOLD
$\overline{\text{RQ1}}$	INTR
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 9000 Series Mainframe.
- Fully supports Bus REQUEST/GRANT operations.

68000 Interface Pod

- Can service 68010-based systems by replacing the 68000 μP in the Pod with a 68010 μP.
- Capable of addressing 16 megabytes of memory.

- Output lines $\overline{\text{HALT}}$, $\overline{\text{VMA}}$, $\overline{\text{BG}}$ and $\overline{\text{RESET}}$ can be individually driven from the 9000 Series Mainframe.
- Input lines HALT and $\overline{\text{BR/BGACK}}$ 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 $\overline{\text{VPA}}$ and $\overline{\text{DTACK}}$ faults.
- Supports memory management features of the 68000 (Supervisor/User and Data/Program).

Z8000 Interface Pod

- Capable of addressing 8 Megabytes of memory.
- Operates at clock speed up to 10.0 MHz.
- Interfaces with Z8001, Z8002, Z8003, Z8004 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 $\overline{\text{BUSREQ}}$ and $\overline{\text{WAIT}}$ can be monitored and enabled or disabled from the 9000 Series Mainframe.
- Output line $\overline{\text{BUSACK}}$ 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	−40° to +80°C
	RH < 95% non-condensing
Operating	0°C to +40°C
	RH < 95% non-condensing
	+40°C to +50°C
	RH < 75% non-condensing

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 9010A or a mini-cassette tape.

9020A—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 (also supports 68010 μP)	$1,995
9000A-Z8000 Interface Pod (supports Z8001, Z8002, Z8003 and Z8004 μPs)	$1,995

ONE-YEAR WARRANTY

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

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80186/80188

Intelligent Microprocessor Interface Pods

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 everytime 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

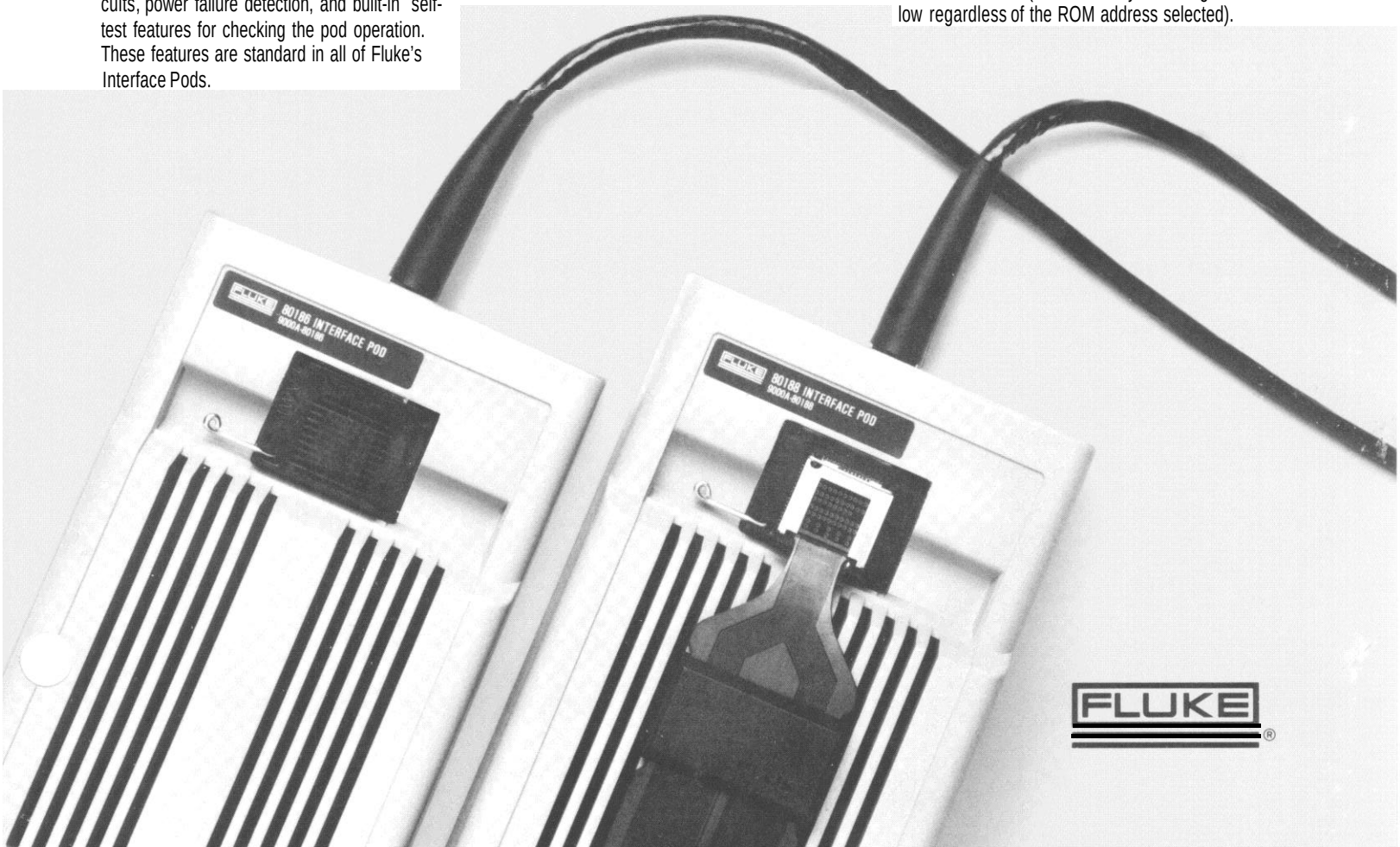
The pods can also peform a variety of quick test functions which allow the user to test large blocks of memory very rapidly, with interaction taking place primarily between the pod and the UUT.

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

1. A rapid test of the READ/WRITE capability of small segments of memory or the entire block of RAM memory. Performs testing of address lines to insure 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 al 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.

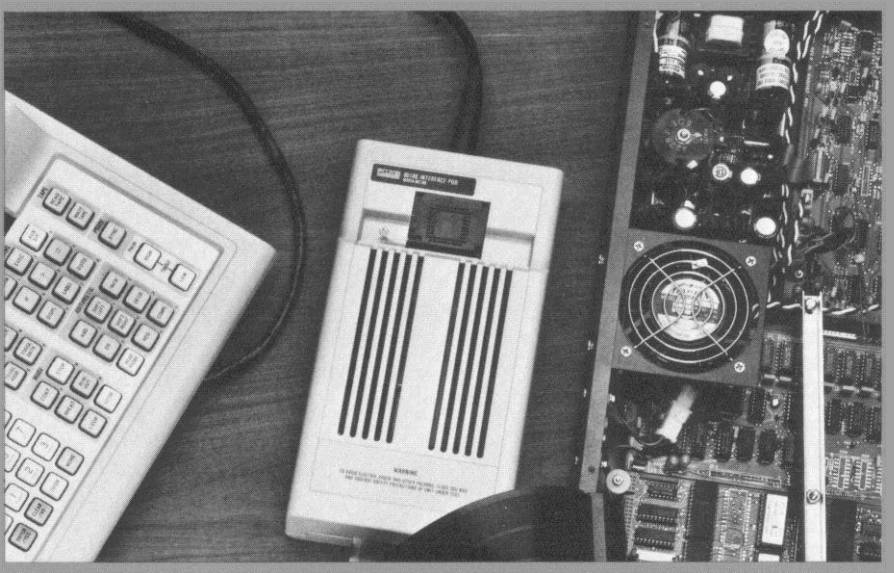
QuickLooping: Provides the capability of looping on a Read or Write command at a much faster rate than that allowed by the looping feature of the 9000 Series mainframe. The operator can synchronize an oscilloscope to the address or data timing cycles from the 9000 Series mainframe and observe the timing 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.

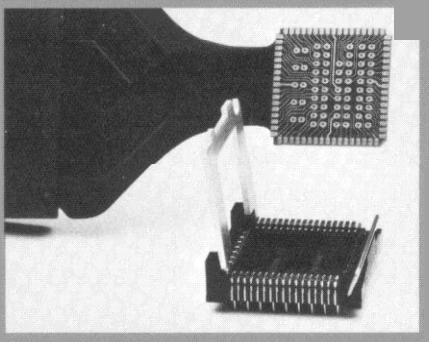
QuickRAMP (80186 only): QuickRAMP sends to a particular address a series of data words that start at zero and increment up to FFFF hex. This function executes 65,535 write commands through the pod software, in a very shod period of time. The RAMP function has found widespread application as a stimulus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

Special Functions:

The advanced software in the pod also provides several 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-includes continuity lest of cables





A close-up of the pod cable's specially designed LCC connector, shown together with the adapter used for pin grid arrays.

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.
- Pods operate at external clock frequencies from 4MHz to 16MHz. (Internal clock frequency from 2MHz to 8 MHz.)
- Overvoltage protection. 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, the failure is reported to the operator.
- A self-test socket is provided on each pod for checking pod operation.

General Specifications

Size	5.7 cm H x 14.5 cm W x 27.1 cm L
Weight	1.5 kg (3.3 lbs)
Environment:	
Storage	−40°C to +80°C
	RH < 95% non-condensing
Operating	0°C to +40°C
	RH < 95% non-condensing
	+40°C to +50°C
	RH < 95% non-condensing

Ordering Information

9000 Series Micro-System Troubleshooters:

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

9020A-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 80186 Interface Pod	$2,695
9000a 80188 Interface Pad	$2,605

ONE YEAR WARRANTY
(uut Interface Cable 90 DAY WARRANTY)

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

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