A. ML4100 DESCRIPTION

The Arium ML4100 Logic Analyzer provides full-featured logic analysis for the debugging and troubleshooting of digital and microprocessor-based products, including complex triggering with state, timing, and (optionally) microprocessor disassembly displays. Its basic function is to capture (record) the digital data on several signal lines, repetitively, and to do this synchronously or asynchronously with the clock of the system under test. High-speed, asynchronous operation is a powerful aid when solving hardware logic timing problems, while low-speed, synchronous operation is useful for debugging software.

The ML4100 operates at speeds of up to 100 MHz, at data widths of up to 32 channels, and at a memory depth of up to 8000 samples per channel. (At 100 MHz, the maximum number of channels is 4; when using 32 channels, the maximum speed is 12.5 MHz; and the maximum memory depth of 8000 samples per channel is available only when using up to 4 channels.)

Data and clock qualifiers can be used, as well as a trigger delay of up to 50,000 clocks. (Data qualification is available only with 32-channel operation.) The optional ROM Emulator Module (RE-016) provides in-circuit emulation and editing of code stored in 2716, 2732, 2764, and 27128 PROMs; it includes an RS-232C interface, which permits downloading or uploading of code. The expanded memory option (Setup/Data Memory, AB-032) permits both machine setups and data to be uploaded or downloaded, as well as stored while power is off.

The ML4100 contains a 5-inch, green-screen CRT which displays up to twelve channels of timing diagrams (with labelling) and has cursors for measuring time periods. The state display can be formatted and reformatted to achieve almost any conceivable digit combination in several number bases: ASCII, binary, octal, decimal, or hexadecimal.

Other options are microprocessor pods with one-clip connection to most popular microprocessors; the resulting disassembly display shows mnemonics for the various instruction and data sequences.

Four trigger words are available, and can be defined in binary, octal, decimal, or hexadecimal number base. These four words can be combined to form the trigger condition in many different ways. Nineteen trigger sequences are predefined and selectable, and the user may define his own sequence as well. All predefined sequences are available in the 32-channel mode, but these sequences are somewhat more limited in the other modes.

The ML4100 has been designed for simple setup and ease of operation. All setup and display screens contain complete prompting information which is self-explanatory for most situations. This enables the user to make productive use of this logic analyzer with a minimum of experience and, we hope, only infrequent reference to this manual.

B. OVERALL SYSTEM FUNCTIONS

1. RECORDS DIGITAL DATA AT:

   * Speeds (clock/sampling rates) of up to 100 MHZ (10 nsec between samples) (4 channels maximum at 100MHz)

   * Data (word) widths of 4 to 32 channels (bits) (12.5 MHz maximum at 32 channels)

   * Record depth (memory) of up to 8000 samples per channel (4 channels maximum at 8000 samples)

2. DISPLAYS DATA IN THREE MODES:

   * Timing (as on an oscilloscope)

   * State (a formatted word list)

   * Disassembly (microprocessor assembly code instructions)--optional

3. STANDARD ACCESSORY: 32-CHANNEL LOGIC POD (LP-320)

The ML4100 includes a 32-Channel Logic Pod (with Standard Probe Set) at no extra charge. This pod supports analyzer operation at all speeds and recording widths, with internal or external clocking; clock qualification is available with external clock. (See also Section II.A, re connection of this pod to the ML4100.)

4. OPTIONAL ACCESSORIES (available for separate purchase)

   a. 4-Channel (Glitch-Capture) Logic Pod (LP-040)

This pod operates at any speed of up to 100 MHz and a data width of 4 channels to provide advanced timing analysis with high-speed clock qualification and glitch capture. (See also Section II.A, re connection.)

   b. STD Bus Pod (8P-080)

This circuit board provides connection to an STD bus structure. It plugs into the bus as an extender card (not as a replacement card), and can thus be used in a backplane which is fully occupied. (See Section VII for

c. Microprocessor Pods

Microprocessor pods provide one-clip connection between the ML4100 and most popular microprocessors. The following such pods are available:

Catalog No.:	Microprocessors Supported:
8I-080	Intel 8085, 8031/8032, & 8035/8039/8040
8M-080	Motorola 6800/6802/6808
8M-089	Motorola 6809/6809E
8N-080	National Semiconductor NSC800
8R-065	Rockwell 6502, 6512 65C02/65C102, & 65C112
8Z-080	Zilog Z80, Z80A, Z80B, & Z80C
16M-680	Motorola 68000/68010

(See Section VI for further details.)

d. ROM Emulator Module (RE-016)

The ROM Emulator module emulates one to four Read-Only Memories per pod, up to a total of 16 Kbytes of memory, and is configurable for 2716, 2732, 2764, or 27128 PROMs. One or two pods may be used for a total of 32 Kbytes of emulation memory. The simulated ROM memory can be uploaded or downloaded, in several popular data transfer formats, to or from other equipment (such as computers and PROM programmers) via an RS-232C port on the back panel. Memory is then displayed on the ML4100 screen and can be changed directly with front-panel key entries.

(See Section VIII for further details.)

e. RS-232C Communication Control Card (RS-232)

This circuit board is contained within the ROM Emulator Module, but may also be purchased separately when the user wishes an interface between the ML4100 and other equipment. such as a computer or a printer. With this board, the user may specify operating parameters (baud rate, format, handshakes, etc.) from the ML4100 front panel.

f. Setup/Data Memory Option (AB-032)

This option provides the ML4100 with nonvolatile memory so that machine setups and capture data are permanently stored (even while the power is off) via an internally installed, electrically eraseable ROM board.

g. Setup Memory Option (SM-080)

This option provides the ML4100 with nonvolatile memory of machine setups only. (See Item f above.)

C. SYSTEM SPECIFICATIONS