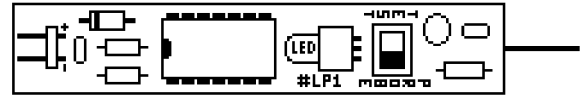


USING THE LP1 LOGIC/TEST PROBE

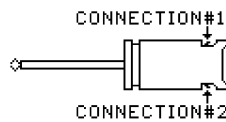
The LP1 LOGIC/TEST probe is a dual function instrument specifically designed to address common problems encountered when working with eeproms and microcontrollers in-circuit. In-circuit reading and programming requires that proper signal levels be applied to specific pins on the part.



These signals, when applied, must meet the correct voltage levels (also called logic levels) in order for the part to respond. If existing circuitry on the module to which the pins are already connected introduces a significant load, then the proper logic levels cannot be generated by the programming unit. The AR-32A programming unit is designed to provide sufficient signal drive to overcome most module circuit loads without damage to the module. If a pin or pins on the part cannot be driven to valid logic levels then the programming unit will "limit" the drive signal to protect the module and communication with the part will not be successful. The purpose of the LP1 TEST mode is to allow you to locate any pin(s) which cannot be driven to valid logic levels. This can be done before all connections have been made to the part or if communication is not successful, the LP1 can be used to identify which pin(s) are causing the problem. The second function (PROBE mode) is used to indicate the logic level (HIGH or LOW) of a pin. Certain parts, especially microcontrollers, must have specific pins preset to predetermined logic levels before communication is possible. In some cases the proper logic level is already present on the pin and it will not be necessary to force the level using an external connection. In PROBE mode you may predetermine the pin logic level and if correct, avoid an external connection. (See OPERATING THE LP1 IN PROBE MODE.)

CONNECTING POWER TO THE LP1

The LP1 itself receives power from the same connections used to power the eeprom or microcontroller. The LP1 connects to a power source using the white (+) and black (-) leads attached to the two pin connector on the probe body. To attach power to the LP1 locate the power pins on the part (eeprom or microcontroller). The positive supply will normally be labelled with Vdd, Vcc or +5. The negative supply or ground will normally be labelled with Vss or GND. The example illustration (right) shows a 68HC11E9/E20 microcontroller. Note that pin 26 is Vdd and pin 1 is Vss. Note the probe colors from the ACOM adapter using the surface mount probe set are GRAY (+5) and RED (GND). Each surface mount probe has two connections on the probe body (see illustration). Using the connection point on the opposite side of the probe body attach the BLACK lead to the RED probe pin and the WHITE lead to the GRAY probe pin. The RED and GRAY probes are then attached to the microcontroller power pins (#1 and #26).



OPERATING THE LP1 IN TEST MODE

Start the EPROM+ system and select the part. Attach the probes to the power pins on the part you wish to test. Set the switch on the LP1 to **TEST**. To apply power to the LP1 press 5 (buffer editor) then I (INSPECT DEVICE CONTENTS). The socket power light (YELLOW) on the programming unit will light and the LED on the LP1 will begin to alternately blink RED and GREEN. With the LP1 switch set to TEST a logic drive signal is applied to the probe tip. To test any pin simply touch the probe tip to the pin. For the 68HC11E9 this will be pins 2, 3, 7, 17, 20 and 21. If at any time the LED stops blinking (stays RED or GREEN) then that pin cannot be driven in-circuit and must be lifted or the connecting track cut. If the LED continues to blink when each pin is touched by the LP1 tip, then the part can be accessed in-circuit. The LP1 TEST mode may also be used for eeproms. **NOTE:** If you touch the power pins the LED will remain RED for the positive supply or GREEN for ground. Press Esc to turn power off.

OPERATING THE LP1 IN PROBE MODE

Start the EPROM+ system and select the part. Attach the probes to the power pins on the part you wish to PROBE. Set the switch on the LP1 to **PROBE**. To apply power to the LP1 press 5 (buffer editor) then I (INSPECT DEVICE CONTENTS). The socket power light (YELLOW) on the programming unit will light and the LED on the LP1 will glow YELLOW as both the RED and GREEN segments light simultaneously. To determine the logic level of a pin, touch the desired point with the LP1 tip. If the LED changes to RED the logic level is positive or high (Logic 1). If the LED changes to GREEN the logic level is ground or low (Logic 0). If the LED does not change to RED or GREEN then the pin is not connected or open. Press Esc to turn power off.

LP1 EXTERNAL POWER CONNECTION

The LP1 package includes two additional probes (black and white) which can be attached to the LP1 power leads. Use these probes if you wish to attach to an alternate power connection point on the module. The white probe connects to the positive source while the black probe connects to ground. **NOTE:** The LP1 can be powered from any DC source (3 to 5 volts). **NOTE:** The LP1 is protected if the power leads are reversed however it will cause the programming unit power supply to current limit (GREEN led off).