

MICRO-AMP[®] System

MA5 Delay Logic Module



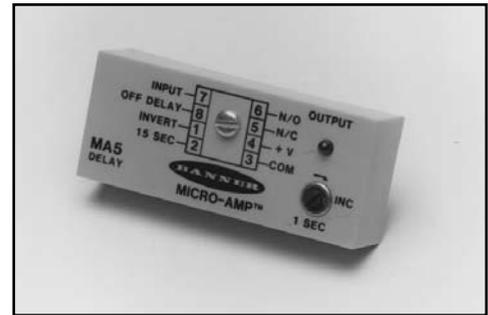
MICRO-AMP[®] model MA5 is a plug-in delay logic module with adjustable delay timing. It is designed as a way to easily add an ON DELAY or an OFF DELAY timer to a MICRO-AMP system which uses an MA3 or MA3-4 amplifier. It may also be used to add a delay timer to any current sinking dc device or to a system which offers a contact closure output. The MA5 is a perfect add-on to any Banner dc system, including OMNI-BEAM, MULTI-BEAM, MAXI-BEAM, VALU-BEAM, MINI-BEAM, ECONO-BEAM, QØ8, Q19, Q25, S18, SM3Ø, and SM512 Series self-contained sensors.

A low-going logic INPUT signal at pin #7 of the module activates an ON DELAY timer. If the signal remains longer than the set ON DELAY time, the output at both pins #5 and #6 will change state. If pin #8 is connected to pin #3, the MA5 is converted to an OFF DELAY timer. In the OFF DELAY mode, an output will occur immediately when an input signal appears at pin #7, and the output will remain "on" after the input is removed for the OFF DELAY time period.

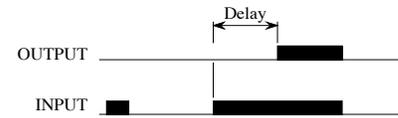
The MA5 may be programmed to respond to a high-going input signal by connecting pin #1 to pin #3. Both NORMALLY OPEN (pin #6) and NORMALLY CLOSED (pin #5) outputs are available (simultaneously). Both outputs are NPN open-collector (current sinking) transistors, each capable of switching up to 150 milliamps.

Two delay time ranges are selectable. The .01 to 1 second range is standard, and a 1 to 15 second range may be programmed by connecting pin #2 to pin #3. A potentiometer allows fine adjustment within each time range.

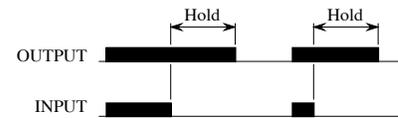
The MA5 may be mounted and wired using the optional RS8 socket, or it may be wired into a printed circuit board either directly or by using the model RS8K PC board socket.



On-delay logic, MA5:



Off-delay logic, MA5:



MICRO-AMP MA5 Specifications

SUPPLY VOLTAGE: 10 to 30V dc at less than 20 milliamps (exclusive of load); 10% maximum ripple.

INPUTS: A logic "low" must be less than 2V dc. A logic "high" is at least 6V dc or an open circuit. Connecting pin #1 to pin #3 (dc common) causes the MA5 to respond to "high-going" signals. Inputs must be capable of sinking at least 4 milliamps. Inputs may be derived from limit switches or from dc sensors with NPN (current sinking) output transistors.

RESPONSE SPEED: INPUT will respond to a low or high signal of 1 millisecond or longer duration.

OUTPUT CONFIGURATION: two open-collector NPN transistors with complementary outputs (one normally open, one normally closed). Maximum sinking current 150 milliamps, each output. Saturation voltage less than 0.5V dc at 10 milliamps. Off-state leakage current less than 1 microamp.

DELAY SELECTION: connect pin #8 to pin #3 (dc common) for OFF DELAY operation. For ON DELAY operation, leave pin #8 unconnected.

DELAY DURATION: standard range is .01 to 1 second. Select the 1 to 15 second range by connecting pin #2 to pin #3.

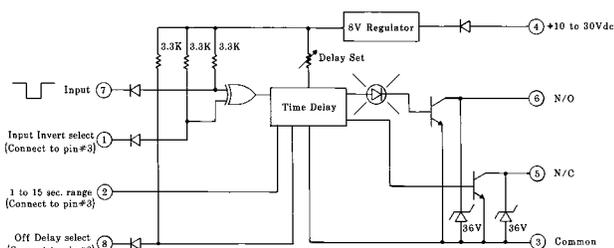
TIMING ADJUSTMENT: single-turn timing potentiometer allows adjustment of delay time within the selected range (use small flat-bladed screwdriver for adjustment).

INDICATOR: red LED indicator on the top of the module lights whenever the N/O output is conducting.

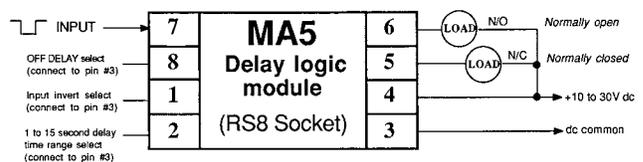
CONSTRUCTION: totally encapsulated plug-in package with molded VALOX[®] housing. Gold-flashed connection pins.

OPERATING TEMPERATURE: 0 to 70 degrees C (32 to 158 degrees F).

Functional Schematic, MA5 DELAY Module



Hookup Diagram, MA5 DELAY Module



MICRO-AMP® Accessories

Sockets

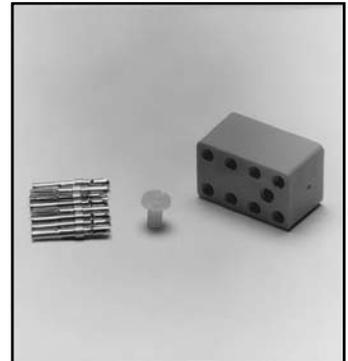
RS8

The RS8 socket is the most frequently used means of mounting and wiring a MICRO-AMP module. It consists of a socket with two four-terminal connection strips, all wired together onto a PC board. The PC board assembly slides into a 1 inch (25mm) long PVC track which is used to mount the entire assembly. A hold-down screw keys the correct polarity of the module.

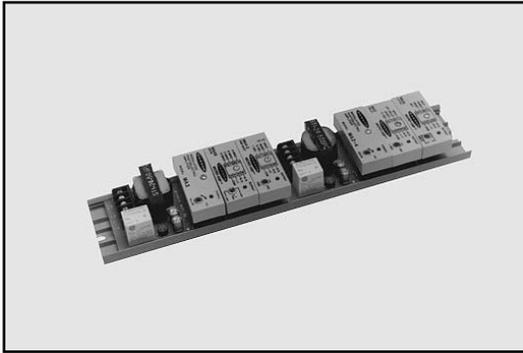


RS8K

The RS8K is a kit of parts which comprise the socket portion of the RS8 assembly. It is used to provide a socket for MICRO-AMP modules that are installed onto printed circuit boards. The RS8K consists of a molded socket block and 8 individual socket pins. A nylon screw is included to affix the socket block to the PC board. The drill size for the pins is #50 (.070"; 1,8mm). Drill pattern dimensions are included with the RS8K.



Mounting Track

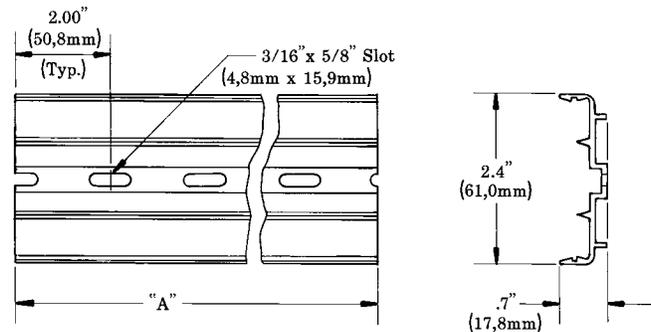


- TR100-1** 1 inch (25mm) long (supplied with RS8 socket)
- TR100-4** 4 inch (100mm) long (supplied with MPS-15 series power supply)
- TR100-6** 6 inch (150mm) long
- TR100-12** 12 inch (300mm) long

PVC mounting track for MICRO-AMP components is available in 6 and 12 inch lengths for systems which use multiple components. For example, a 6-inch length will accommodate one MPS-15 power supply plus two additional RS8 sockets with modules.

Longer lengths of mounting track may be supplied on a quote basis.

Dimensions, TR-100 Mounting Track



Track Model	"A" Dimension	Minimum number of slots
TR100-1	1" (25mm)	1
TR100-4	4" (100mm)	2
TR100-6	6" (150mm)	3
TR100-12	12" (300mm)	8



WARNING MICRO-AMP® Systems do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor or module failure or malfunction can result in *either* an energized or a de-energized sensor output condition.

Never use this product as a sensing device for personnel protection. Its use as a safety device may create an unsafe condition which could lead to serious injury or death.

Only MACHINE-GUARD and PERIMETER-GUARD Systems, and other systems so designated, are designed to meet OSHA and ANSI machine safety standards for point-of-operation guarding devices. No other Banner sensors or controls are designed to meet these standards, and they must NOT be used as sensing devices for personnel protection.

WARRANTY: Banner Engineering Corporation warrants its products to be free from defects for one year. Banner Engineering Corporation will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.