

MICRO-AMP[®] System

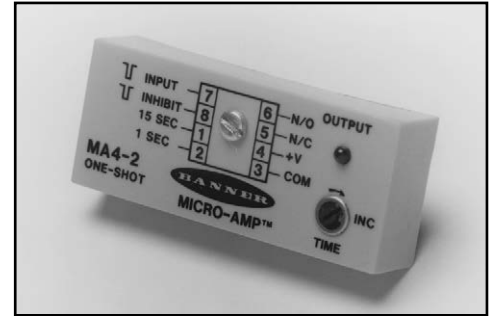
MA4-2 One-Shot Logic Module



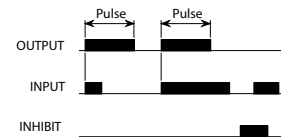
MICRO-AMP[®] module MA4-2 is a plug-in one-shot logic module with adjustable pulse length. It is designed as a way to easily add one-shot timing to a MICRO-AMP system which uses an MA3 or MA3-4 amplifier. It may also be used to add a one-shot timer to any current sinking DC device or to a system which offers a contact closure output. The MA4-2 is a perfect add-on to any Banner dc system, including dc models of OMNI-BEAM, MULTI-BEAM, MAXI-BEAM, VALU-BEAM, MINI-BEAM, ECONO-BEAM, Q08, Q19, Q25, S18, SM30, and SM512 Series self-contained sensors.

A low-going logic INPUT signal at pin #7 of the module activates a one-shot output at both pins #5 and #6, unless a low-going logic INHIBIT signal is present at pin #8 *when the input occurs*. Both NORMALLY OPEN (pin #6) and NORMALLY CLOSED (pin #5) outputs are available. Both are NPN open-collector (current sinking) transistors, each capable of switching up to 150 milliamps.

Three pulse duration time ranges are selectable. The 0.001 to 0.1 second range is standard, and 0.01 to 1 second and 1 to 15 second ranges are selected by connecting the appropriate module pin to pin #3 (dc common). The MA4-2 is a retriggerable-type one-shot, but may easily be programmed to the non-retriggerable mode by connecting pin #6 (N/O output) to pin #8 (INHIBIT input).



One-shot logic, MA4-2:



MICRO-AMP MA4-2 Specifications

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

INPUTS: INPUT and INHIBIT both respond to a logic "low" signal (less than 2V dc). A logic "high" is at least 6V dc or an open circuit. 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 and INHIBIT will respond to a low signal or high signal of 1 millisecond duration or longer.

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.

PULSE DURATION: standard range is .001 to .1 second. Programmable ranges are .01 to 1 second and 1 to 15 seconds. Select the .01 to 1 second range by connecting pin #2 to pin #3. Select the 1 to 15 second range by connecting #1 to #3.

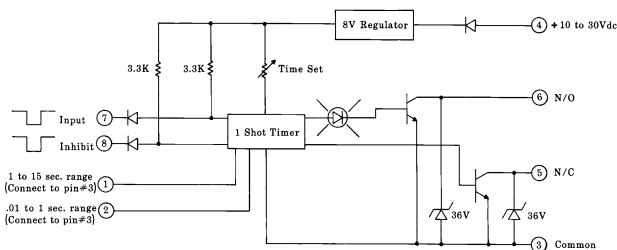
TIMING ADJUSTMENT: single-turn timing potentiometer allows adjustment of pulse duration within the selected range (use small flat-bladed screwdriver).

INDICATOR: red LED indicator on the top of the module lights whenever the N/O output is conducting (i.e. when the N/O output is closed and the N/C output is open).

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

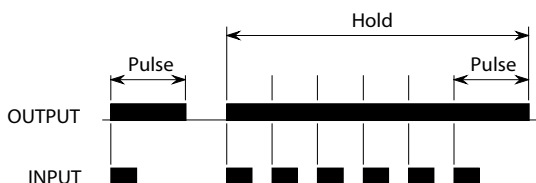
OPERATING TEMPERATURE: 0 to 70 degrees C (32 to 158 degrees F).

Functional Schematic, MA4-2 ONE-SHOT Module

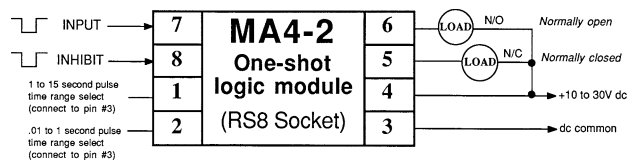


There are two types of basic "one-shots": RETRIGGERABLE and NON-RETRIGGERABLE. The output pulse timing of a retriggerable one-shot is re-started with the reoccurrence of every input. The output will remain "on" as long as the time between consecutive inputs is shorter than the one-shot pulse time (see timing diagram, below).

Retriggerable one-shot logic:

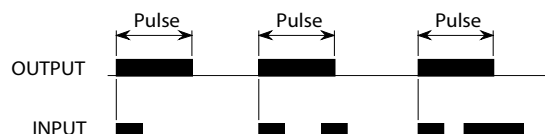


Hookup Diagram, MA4-2 ONE-SHOT Module



A non-retriggerable one-shot timer must complete a pulse before it will accept any new input signals. Non-retriggerable one-shots sometimes offer an advantage in indexing or registration control applications where multiple input signals are possible during advance of the product. The MA4-2 may be programmed for the non-retriggerable mode by connecting pin #6 to pin #8.

Non-retriggerable one-shot logic:



MICRO-AMP® Accessories

Sockets

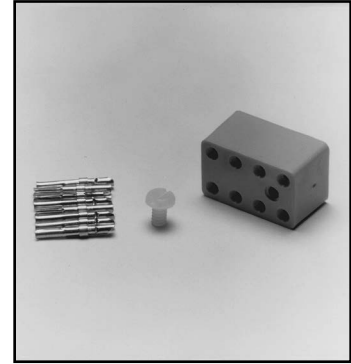
RS8

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.

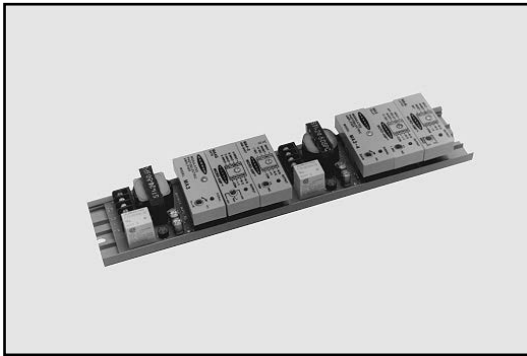


RS8K

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

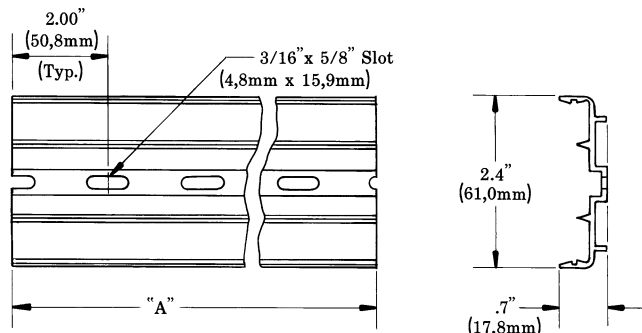


- TR100-1** 1 inch (25mm) long (supplied with RS8 socket)
- TR100-4** 4 inch (100mm) long (supplied with MPS-15 series power supply)
- TR100-6** 6 inch (150mm) long
- TR100-12** 12 inch (300mm) long

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	Min. Number of Slots
TR100-1	1" (25 mm)	1
TR100-4	4" (100 mm)	2
TR100-6	6" (150 mm)	3
TR100-12	12" (300 mm)	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.

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