MICRO-AMP® System

MA4G 4-input Gate Logic Module

BANNER
the photoelectric specialist

MICRO-AMP® module MA4G is a 10 to 30V dc, plug-in, 4-input logic gate module. It offers three selectable logic modes: "AND", "NOR", and "X-NOR" (exclusive "NOR"). In the AND gate mode, the output(s) will change state when all four inputs are low simultaneously. The NOR logic mode requires that all four inputs be high at the same time for the output(s) to change state. The output(s) will change state in the X-NOR mode when all four inputs are simultaneously *either* high *or* low. The MA4G may be used as a 2, 3 or 4-input gate. Unused inputs are simply tied low (to pin #3) or left unconnected (high), depending upon the logic mode in use.
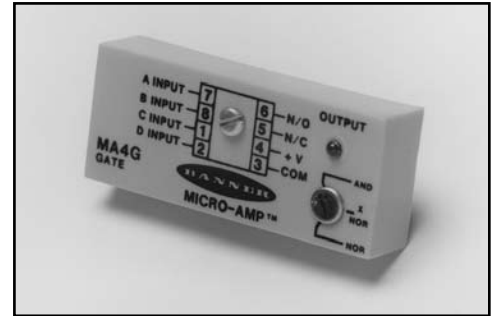
The MA4G directly accepts the outputs of other MICRO-AMP modules plus the NPN (current sinking) output of self-contained dc sensors in the following Banner families: OMNI-BEAM, MULTI-BEAM, MAXI-BEAM, VALU-BEAM, MINI-BEAM, ECONO-BEAM, QØ8, Q19, Q25, S18, SM3Ø, C3Ø, and SM512 Series.

MICRO-AMP MA4G 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: all INPUTS 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.

SELECTOR SWITCH: single-turn potentiometer selects logic mode. Fully clockwise = NOR mode; fully counterclockwise = AND mode; midpoint = X-NOR mode.

INDICATOR: red LED indicator on the top of the module lights whenever the N/O output is conducting.
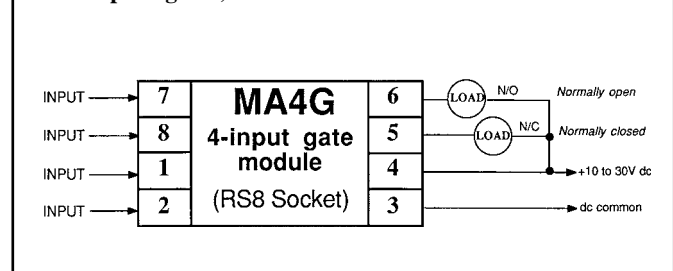
CONSTRUCTION: totally encapsulated plug-in package with molded VALOX® housing. Gold-flashed connection pins.

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

Functional Schematic, MA4G LOGIC Module
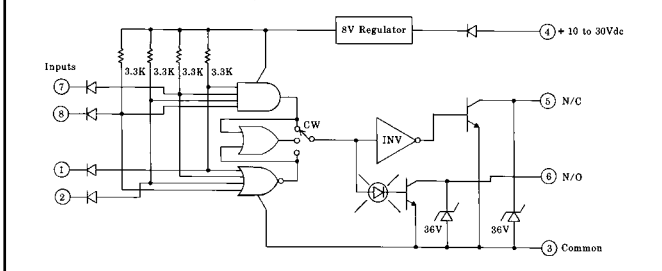
Hookup Diagram, MA4G LOGIC Module

Truth Table

This table lists the various input states and their corresponding outputs available in each logic mode. The key to reading the table is given below. Logic statements in the table read down the columns. For example, in the first column, if the selector control is at "AND" and all four inputs are logic low, the MA4G's N/O output is low, the N/C output is high, and the LED indicator is "on".

Truth Table Key
H = logic HIGH
L = logic LOW
X = either HIGH or LOW (does not matter)

"AND": all inputs low energizes N/O output.
Any input(s) high energizes N/C output.
"NOR": all inputs high energizes N/O output.
Any input(s) low energizes N/C output.
"X-NOR" ("exclusive NOR"):
All inputs the same energizes N/O output.
All inputs not the same energizes N/C output.

MA4G LOGIC TRUTH TABLE

SELECTOR	AND	AND	NOR	NOR	X-NOR	X-NOR	X-NOR
INPUT	L	H	H	L	L	H	H
INPUT	L	X	H	X	L	H	L
INPUT	L	X	H	X	L	H	X
INPUT	L	X	H	X	L	H	X
N/O OUTPUT	L	H	L	H	L	L	H
N/C OUTPUT	H	L	H	L	H	H	L
Indicator LED	ON	OFF	ON	OFF	ON	ON	OFF

# 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.
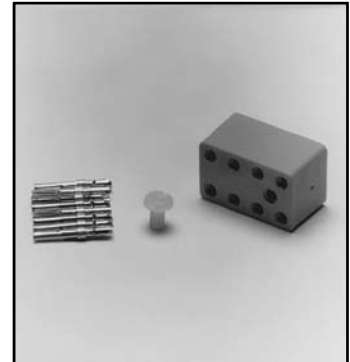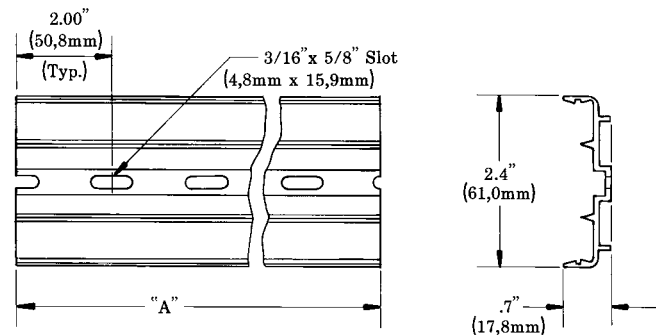

Mounting Track
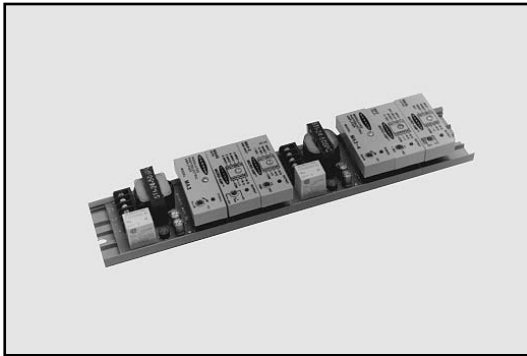
TR100-1 1 inch (25mm) long (supplied with RS8 socket)
TR100-4 4 inch (100mm) long (supplied with MPS-15 series power supply)
TR100-6 6 inch (150mm) long
TR100-12 12 inch (300mm) long

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 accomodate one MPS-15 power supply plus two additional RS8 sockets with modules.

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

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

Dimensions, TR-100 Mounting Track