

**GET OPTIMUM PERFORMANCE FROM YOUR VALVES
WITH
HIGH-PERFORMANCE VALVE DRIVERS
FROM
WAYNE MILLER ASSOCIATES**

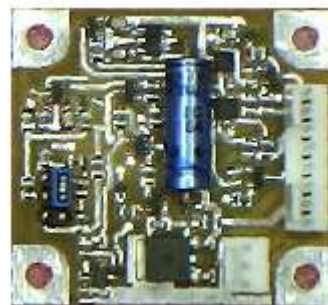
- **FASTER PULL-IN TIMES**

- **FASTER DROP-OUT TIMES**

- **LESS VALVE HEATING**

- **LOWER SYSTEM POWER REQUIREMENTS**

- **CONTROL OF EMI EMISSIONS**



WMA-018-1B Analog Driver

BACKGROUND

For the past 20 years, Wayne Miller Associates (WMA) has been involved in high performance valve driver design and manufacture for valve manufacturers in the northeast. Capitalizing on the experience of numerous designs and thousands of units shipped, we have recently developed two new high-performance drivers using the latest technologies available.

TECHNICAL APPROACH

The WMA-018 series valve drivers utilize surface mount technology to permit advanced features in a small space. Analog designs produce the highest level of performance with the best control of EMI emissions. Digital designs make use of the latest in programmable logic technology and produce the highest efficiency with the highest circuit density.

Both approaches permit over-voltage pull-in for faster pull-in times. Likewise, they both feature reduced hold-in voltages for less valve heating and lower system power requirements. The analog designs feature a controlled fly-back network that permits faster drop-out times while controlling EMI emissions. Whatever the application, a WMA-018 series driver can get the highest performance from any valve.

APPLICATIONS

The best source for high performance valve drivers is through valve manufacturers. This enables their customers to evaluate their valve products in the best possible environment without the customer having to be involved with the details of driver design. This is particularly true for laboratory use or in the early stages of product development when quick set up is required. Product support from WMA is knowledgeable, confidential, and personal. We take each customer's requirements and business needs seriously.

For production quantities, the high performance and highly manufacturable technologies embodied in the WMA-018 series products can be adapted for specialized applications at competitive prices. The components and assembly methods can be either those of traditional materials or of RoHS compliant materials, where RoHS compliance is required.

These drivers are suitable for a wide range of valves and other solenoid-actuated products, including electromechanical switches. For valve or other applications that are beyond the specified capabilities of the present designs, we are expanding our WMA-018 series to include new requirements. We have experience with pull-in voltages as high as 300 volts and reverse drop-out bursts of 75 volts. Additionally, we have produced drivers with higher dissipation capabilities for higher wattage solenoids.

PERFORMANCE SPECIFICATIONS

The accompanying Table lists the major parameters of an analog and a digital valve driver. An additional column describes briefly the impact of the various parameters and the differences between the two products.

It is evident from the parameter listing that neither design is universally better than the other in all applications. The linear circuits generate fewer EMI products that could affect sensitive applications, even though they dissipate more power while doing so. Also, the analog driver embodies a specialized network to control fly-back, permitting a faster closing response than possible with the digital driver. If these two attributes of the linear driver are not required for a particular application, the digital driver provides several clear advantages: The digital driver takes up less than one half the space of the linear driver; it dissipates less power during hold-in; and it is significantly less cost per driver.

PRICE AND AVAILABILITY

Pricing for a linear and a digital product are listed below. Existing designs can be modified to generate different models for different applications, or for specific customer requirements.

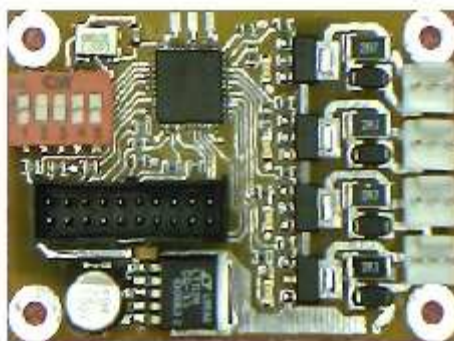
	10 Pieces Single Shipment	100 Pieces 1 Year Blanket
Model WMA-018-1B Single Analog Driver	\$80 / piece	\$60 / piece
Model WMA-018-4A Quad Digital Driver	\$110 / piece	\$80 / piece

NOTES:

- Pricing FOB Stanhope, NJ.
- Availability: Stock to 6 weeks.
- Pricing is subject to change without notice.
- These products are not certified for life-support systems.
- Contact WMA for pricing on RoHS compliant versions.

**All Drivers are designed,
manufactured, and supported
in the USA.**

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WMA-018-4A Quad Digital Driver

COMPARISON BETWEEN TWO VALVE DRIVER PRODUCTS BY WMA
MODEL WMA-018-4A, QUAD PWM DRIVER
AND
MODEL WMA-018-1B, SINGLE LINEAR DRIVER

WLM02282011-1, REV 1

PARAMETER	4A QUAD DIGITAL	1B SINGLE ANALOG	DISCUSSION
Supply Voltage Range (absolute)	+5 volts to +30 volts.	+8 volts to +30 volts.	Because of the reduced hold in feature, valve rating can be less than supply voltage for faster opening response time.
Current load, max steady state (per channel)	1 amp.	1 amp.	With reduced hold in voltages, steady state current can be significantly less than the valve rating.
Circuit Loss of Pull in Burst	0.4 ohms, typical.	0.4 volts, typical.	No practical difference.
Duration of Pull-in Burst	20 +/- 1 milliseconds.	20 +/- 4 milliseconds.	No practical difference.
Supply Quiescent Current	25 ma, nominal.	7 ma, nominal.	No practical difference.
Power dissipation of assembly while driving one 24 volt, 48 ohm valve at 50% (12 volt) hold-in.	0.8 watts.	3.1 watts.	The pulse width modulation of the Quad driver has much less dissipation for hold-in. Dissipation may limit temperature range of analog driver.
Number of Individual Channels	4 valve drivers.	1 valve driver.	The Quad Digital driver provides four times the functionality of the Single Linear driver.
Logic Outputs (per channel)	1 (POS logic).	1 (POS logic).	No difference.
Indicator (per channel)	LED (green) on board.	LED driver. (no LED on board)	Driver on model 1B sinks 10 ma of current through external LED.
Logic Input Terminations	Pull-up resistors.	Pull-down resistor (POS input) Pull-up resistor (NEG input).	Unused POS inputs must be grounded on the Quad driver.
Hold-in Characteristics, Type:	Pulse width modulated (PWM).	Linear regulated.	Pulse width modulation lowers power dissipation, but generates EMI during hold-in. Linear regulation provides a low noise option for applications sensitive to EMI.
Hold-in Characteristics, Selection:	Five position dip switch.	Five position jumper block.	The dip switch provides more selection options with no loose parts.

PARAMETER	4A QUAD DIGITAL	1B SINGLE ANALOG	DISCUSSION
Hold-in Characteristics, Options:	PWM Duty Cycle (+/-0.5%): 12%, 25%, 37%, 50%, 67%, 75%, 82%, 100%. Frequency (+/-0.01%): 256 Hz, 1096 Hz, 4096 Hz, or spread spectrum.	Ranges (expressed as a percentage of the supply voltage, +/-5%) Linear regulation: 20%, 30%, 40%, 50%, 100%.	With 8 hold-in levels, the Quad driver can be more closely optimized to the application. The frequency selection options for the quad give the possibility to minimize EMI for a particular application.
Turn-off Characteristics:	Diode clamp to snub fly-back.	Zener/resistor network to control fly-back.	The zener/resistor fly-back control permits a faster closing response than the diode clamp used on the Quad driver.
Board dimensions:	1.75" x 2.60"	1.75" x 1.625"	The Quad driver provides four times the functionality in 1.6 times the space.
Power/Logic Connector:	Dual row, 20-pin Molex P/N 90130-1120	Single row, 8-pin Molex P/N 22-27-2081	Because of the increased functionality, the Quad driver requires more connections.
Drive Connector (per channel)	Single row, 3-pin. Molex P/N 22-23-2031	Single row, 3-pin. Molex P/N 22-23-2031	No difference.
Operating temperature range	-20 to + 85 deg C.	-20 to +85 deg C. (Upper temperature may be limited by dissipation in some applications.)	Design aids are available to determine the maximum operating temperature for linear driver applications.
RoHS Compliance:	Yes, as an ordering option	Yes, as an ordering option	Not recommended for harsh environments or long service duty.