

Operator's Guide

AeroMate™ WSC – Valve Controller



Non-Incendive, Intrinsically Safe for Class I, Division 1 Hazardous Locations

U.S. Patent Numbers 6,194,793 and 6,462,507
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Introduction

Multi-Function Hardware

The AeroMate Valve Controller is a multi-function module that includes two digital switch I/O's and from one to two pneumatic solenoid valves.

Customizable Measurement and Processing

Using the Integrated Device Manager (IDM) and web based version control system, the Valve module is fully customizable to meet any simple or complex application.

Configurable Valve Control

Configurable valve controls include any number of timer cycles including time-of-day (TOD) and day-of-week (DOW) timer initiation. Dual (A/B) valve and proportional valve control to regulate flow are just a few of the features that can be programmed into the AeroMate Valve Controller.

Configurable Switch I/O

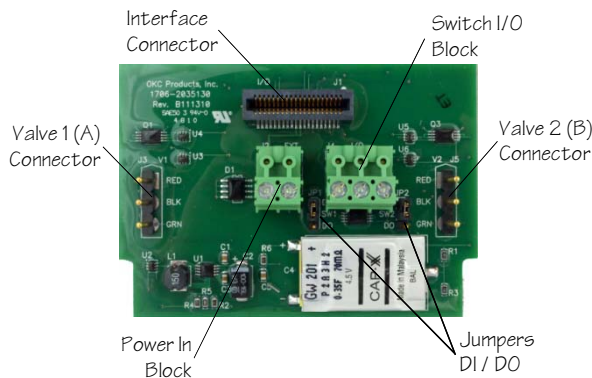
Two digital switch I/O's are jumper selectable for input or output functions. Switch configuration allows for normally open (NO) or normally closed (NC) states as well input Time Constant and Pulse Width output control.

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Valve Module Board



Removable, screw terminal blocks allow convenient hook up with 18 to 24 AWG wire. Three terminal blocks provide On/Off control for latching, pneumatic solenoid valve or electrical relay control.

Jumpers select switch input (DI) or output (DO) for Switch Block SW1 and SW2 connections.

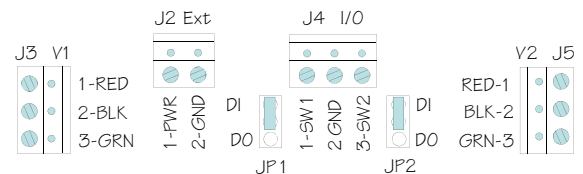
Power In Block is used to connect solar charger or other external power source for battery charging.

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Hook Up Connections



J3 V1

RED – Valve 1 Open control.
BLK – Common ground connection.
GRN – Valve 1 Close control.

J5 V2

RED – Valve 2 Open control.
BLK – Common ground connection.
GRN – Valve 2 Close control.

J2 EXT

PWR - Solar / External power
GND - Common ground connection.

J4 I/O

SW1 - Switch input/output terminal.
GND - Common ground connection.
SW2 - Switch input/output terminal.

JP1 / JP2

DI – J4 Switch input.
DO – J4 Switch output.

Note: Rev.111310 board has JP1/JP2 DO/DI positions labeled opposite of what they really are.

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Manual Override

The first SET key display is the manual valve override control. Pressing the "Next" or "Previous" key will toggle the solenoid valve between OFF and ON timer cycles. This action initiates the timing associated with these valve cycles.

SET	Manual GoTo Ready OFF
SET	Manual GoTo Toggle ON

Use these keys to shift valve state.



Valve Cycle Timing

The primary control valve is V1 which is controlled through the use of cycle timers. Each cycle timer begins with a valve control action. Five timers are provided in the standard valve configuration.

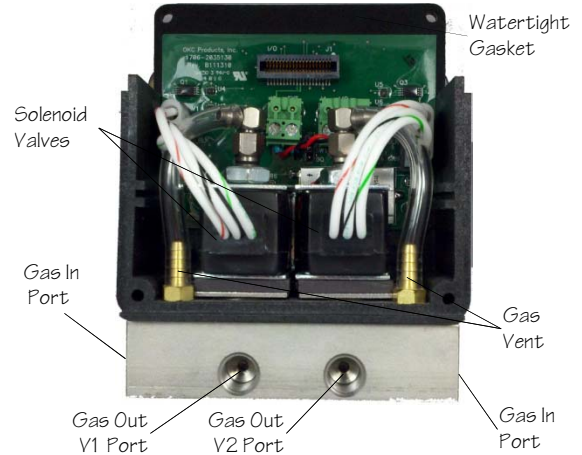
OFF	time	- primary close cycle
FALL	time	- minimum OFF time
BakUp	time	- alt. missed plunger OFF cycle
ON	time	- primary open cycle
DELAY	time	- plunger arrival afterflow time

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2x Valve Module



The 2x Valve module includes two, dual-port, latching solenoid valves, dual ¼-NPT female gas in and individual gas out ports, an external power jack receptacle, a universal 2" pipe or motor valve mount, and rear panel gasket. Manifold material is 316 SS.

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2x Cycle Time Setup

Each cycle timer is programmed in a HRS:MIN:SEC format. A zero time (000:00:00) setting disables timing for the cycle, i.e., the controller will stay in the cycle and will not timeout. This is useful when controlling valve cycles using external sensor set points only.

SET	Press <> for V1 Timer Setup
◀▶	SET OFF Time 004:00:00
SET	SET ON Time 002:00:00
SET	Press <> for V2 Timer Setup
◀▶	SET Wait Time 000:08:00
SET	SET Tank Time 000:10:00

Use these keys to change selections.

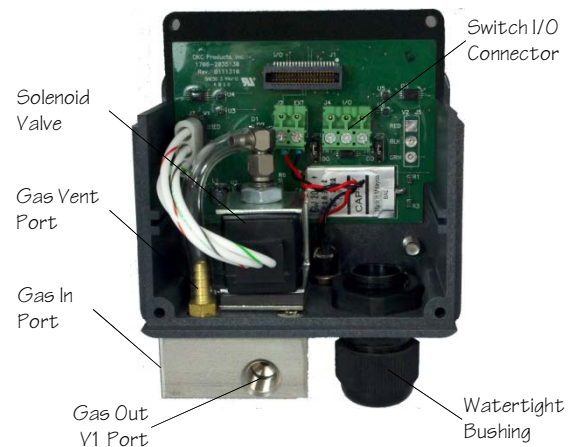


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1x Valve Module



The 1x Valve includes one, dual-port, latching solenoid valve, ¼-NPT female gas in port, ¼-NPT female gas out port, an external power jack receptacle, a universal 2" pipe or motor valve mount, a ½" watertight bushing and rear panel gasket. Manifold material is 316 SS.

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1x Cycle Time Setup

Each cycle timer is programmed in a HRS:MIN:SEC format. A zero time (000:00:00) setting disables timing for the cycle, i.e., the controller will stay in the cycle and will not timeout. This is useful when controlling valve cycles using external sensor set points only.

SET Press <> for V1 Timer Setup

SET	OFF	Time	004:00:00
SET	FALL	Time	000:10:00
SET	BakUp	Time	004:00:00
SET	ON	Time	002:00:00
SET	DELAY	Time	000:15:00

Use these keys to change selections.

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Valve Cycle Status

The first data display reports what valve V1 timer cycle is active and the timing cycle's remaining time.

Valve Indicator
I = Closed
/=Open

Plunger Sense Indicator

Sensor Actions
...
SP HOLD
FC HOLD
PopUp
Fast PGR
HP OVR
LP OVR
PNGR

DATA / DELAY ^ ...
ToGo 000:04:27

Valve V1 status display.

The second data display reports valve V2 control status, remaining V2 cycle time and associated V1 cycle status. "Ready" indicates V2 cycle is inactive. "Wait" indicates timeout to open V2. "TANK" is when V2 is active and open.

PVC/FCR Indicator

Valve 1(A) Activity

DATA * Wait /ON
| ToGo 001:37:24

Valve V2 status display.

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Cycle Totals Data

Totals data provide a summary of valve operation over time. Total time displays show the total, cumulative time the unit has spent in a timing cycle. Note that the total time data are more related to valve states than to particular timing cycles.

DATA Press <> for TOTALS Data

OFF	084%	0023
Total	125:54:15	
ON	014%	0022
Total	059:16:45	
Valve V1 totals displays.		
V2 ON	002%	0008
Total	002:23:32	
Valve V2 totals display.		

The count tracks the number of times the controller has initiated the referenced timer cycle. The "%" is the percentage of the total operating time the controller was in the specific valve cycle.

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Plunger Arrival Data

The plunger arrival status display shows the current plunger timing and number of successful (YES) and the number of missed (NO) arrivals. Plunger arrivals may be sensed during OFF or ON production cycles.

DATA Press <> for PLUNGER Data

PLUNGER	YES	NO
000:03:48	35	01
PLUNGER	0	
Time	000:07:38	
-		
-		
PLUNGER	9	
Time	000:06:17	

Plunger history displays show the arrival times for the last ten plunger arrival attempts. A "No" or missed plunger arrival will show as a 000:00:00 arrival time. The plunger arrival history is updated at the end of each production cycle.

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Switch Input Display

Switch inputs (DI) will sense up to 30 Vdc logic signals or dry contact switch actions. Switch input terminals share a common ground. Switch input (DI) status display shows the OFF/ON status of both J4 I/O switch inputs.

DATA	INPUT	SW1	SW2
	Status	OFF	OFF

ON = Active. OFF = Not Active.

Switch Output Display

Switch outputs (DO) are robust power switches capable of switching loads up to 20 Vdc at 2 Amperes and act as standard MurphyGAGE™ outputs. Switch outputs have a common ground and should be used to “ground” the load connected to the switch terminal.

DATA	OUTPUT	SW1	SW2
	Status	OFF	OFF

ON = Active. OFF = Not Active.

Note that the switch I/O functions are only accessible in the AeroMate 1x Valve Controller.

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System Status

System status displays show power, current Date/Time, and panel temperature. The power display shows battery voltage, wireless power (if used) and Enhanced Valve System (EVS) voltage.

Temperature display shows current panel temperature and the historical high and low temperatures since the last time the unit was power cycled.

Press <> for SYSTEM Info		
◀▶	BAT	V33 EVS
	2.63	3.34 4.46
DATA	TMP	MAX MIN
	73	108 -5
DATA	DATE:	04/13/11
	TIME:	13:24:35

The Date/Time display shows the current date and time as read from the system's Real-Time-Clock or the RTC. The RTC is settable using the product's power up BIOS menu – see Control Panel User Guide for instructions to set system parameters.

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Important Device Information

Each application module has important device related information saved in its non-volatile memory that can be accessed through the LCD display interface. Manufacturing and sales information is included in a single display as shown below.

Hardware Revision		Build Date
Manufacturer	OKC RevB 05/11	
	V1.0	06/03/11
OpSys Version	Original Sale Date	

Device information is also included in a single display as shown below. This includes the unit's program name or identification, unit designation, hardware type code and serial number.

Program Id.	Module Id.
SR_2X4	AM7100
018.097	# 02185
Group Id. No. (GID)	Serial Number
	Function Id. No. (FID)

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Accessories

Part Number	Accessory Description
9203-2002110	Pipe Mounting Kit 2-1/4 U-Bolt with extra 5/16" nuts . Uses universal mounting plate.
2503-1370315	Watertight Bushing. 1/8 NPT, Black Nylon. Direct thread into enclosure.
4510-4190310	Pneumatic Solenoid Valve Dual-Port Latching w/ SS Armature. 100 psi maximum supply gas.
1980-2032400	Wireless XBee Kit. Maxstream 2.4 GHz Module. 300 ft. (100m) Line of Sight range.
1980-2032401	Wireless XBee-Pro Kit. Maxstream 2.4 GHz Module. 3000 ft. (1km) Line of Sight range.
9200-0490560	Ext. 2 W Solar Panel w/ stand. 4.1 Vdc @ 520 mA charging. 6 ft. Power Jack cable provided.
9200-0501200	Ext. 6 W Solar Panel w/ stand. 5 Vdc @ 1200 mA charging. 6 ft. Power Jack cable provided

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