

## Operator's Guide

### AeroMate™ WSC – 1x Valve



*Non-Incendive, Intrinsically Safe for  
Class I, Group C & D Hazardous Locations*

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

The 1x Valve provides a single, dual-port, pneumatic solenoid valve. The solenoid valve is rated for supply gas pressures up to 100 psi. Valve timers may be programmed as countdown timers or time-of-day and day-of-week timers.

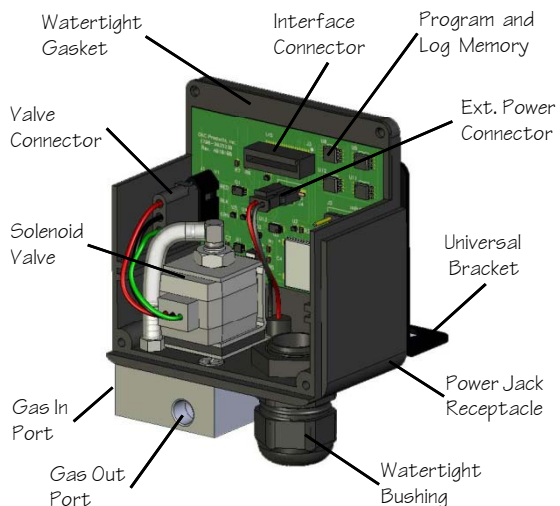
The 1x Valve may be used as an independent controller or as a functional component in conjunction with other sensors and controls within a wireless, networked control system.

vTagNet™ technology provides a virtual wire tag system to share valve events (eTag) and valve control commands (aTag) by allowing users to assign tag numbers as needed.

Data logs are generated at the user settable LUD (Log Update) time interval in seconds. Up to 3276 log records are stored before older records are deleted and replaced in a revolving data log.

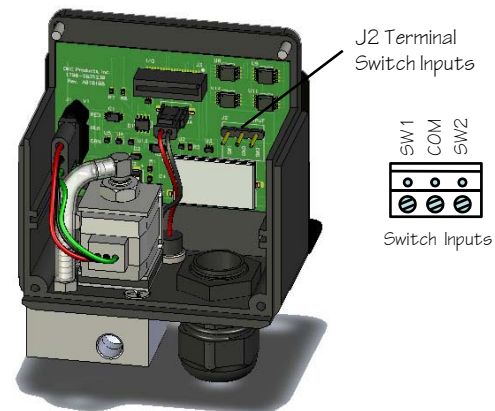
The 1x Valve application program and LCD displays may be modified, tested and simulated using the ChartWriter™ programming utility.

## 1x Valve Module



The 1x Valve module 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.

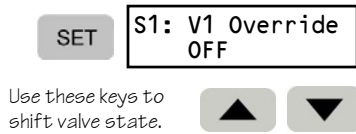
## Output Connections



Switch inputs allow hookup to dry contact switches or logic inputs with voltages up to 30 Vdc. Each input is 15 kV static protected and de-bounced to minimize multiple triggering associated with noisy switches.

## 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. This action also initiates any timing associated with these valve cycles.



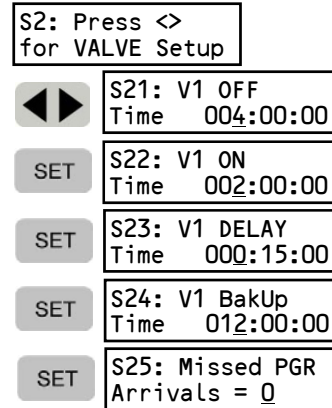
## Valve Cycle Timing

The primary control for the solenoid valve is through the use of cycle timers. Each cycle timer begins with a valve control action. Four cycle timers are provided in the standard valve configuration.

OFF	time	- primary close cycle
ON	time	- primary open cycle
DELAY	time	- plunger arrival afterflow time
BakUp	time	- missed plunger close time

## Cycle Time Setup

Each cycle timer is programmed in a HRS:MIN:SEC format. Timer setup displays are shown below. A zero time (000:00:00) setting disables timing for the cycle.

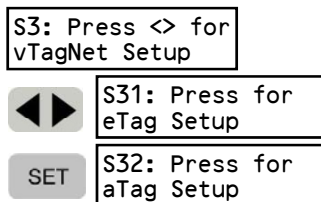


Use these keys to change selections.

The "Missed PGR Arrivals" entry determines how many missed plunger arrivals must be detected to go to the BakUp cycle instead of the OFF cycle..

## vTagNet Setup

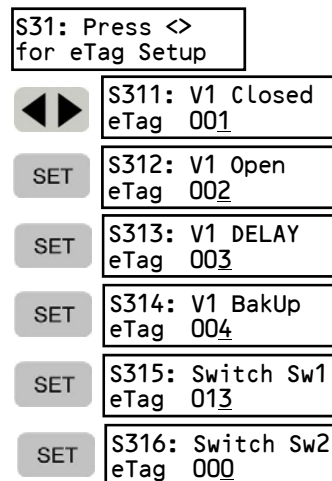
Event tags (eTag) are used to signal when valve, timing cycle or switch sensing events occur and trigger actions (aTag). For example, a plunger arrival sensed via switch input 1 (SW1) could be assigned eTag 13 and the DELAY cycle timer could be assigned aTag 13 to start the DELAY cycle on a plunger arrival event.



Action tags (aTag) tie actions to the occurrence of specific events. As shown above, a switch event is tied or connected to a valve cycle action by assigning the same tag number (13) to the event and it's associated action. When connected through a wireless network, the vTagNet system extends the functionality of individual units to include all the sensing and control functions for the networked components as a whole.

## Event Tag Setup

Assign eTags to valve and timer events. An eTag assignment of 000 indicates that no eTag is assigned to the particular event.



Use these keys to change selections.

## Action Tag Setup

Action tags (aTag) cause an action to occur whenever their corresponding event tag (eTag) is active. Assign aTags to timers as a means to initiate the timing cycle on the occurrence of an event.

S32: Press <>  
for aTag Setup

◀▶ S321: V1 OFF  
aTag 011

SET S322: V1 ON  
aTag 012

SET S323: V1 DELAY  
aTag 013

SET S324: V1 BakUp  
aTag 014

Use these keys to  
change selections.



As shown on the previous page, switch input Sw1 is assigned eTag number 013. Since the DELAY cycle aTag is also assigned the number 013, a switch closure event (plunger arrival) will start the DELAY or afterflow cycle timer.

## System Setup

Modules communicate and share vTagNet data over a closed network identified by the PAN#. The PAN# must be set the same number for all the devices on the same network to work together.

S4: Press <>  
for SYSTEM Setup

◀▶ DEV Link PAN#  
ED YES 1134

SET NUD LUD  
YES 00300s

SET DATE 05/14/08  
TIME 17:02:19

SET SET DEFAULTS  
Press UP/DOWN

Use these keys to  
change selections.



Network Update (NUD) is the time interval over which vTagNet information is updated and shared with other devices. Once tag numbers have been assigned, set the NUD to "Yes" to activate vTagNet system updates. The default NUD setting is 5 seconds.

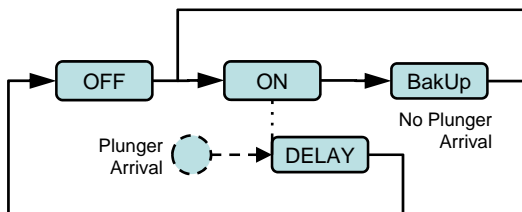
## Valve Cycle Status

The first two data displays report what timer cycle is active and the timing cycle's remaining time.

DATA D1: Active Cycle  
OFF

DATA D15: Cycle Time  
ToGo 001:37:24

The typical timing cycle sequence is as illustrated below. Normal operation with a plunger arrival is OFF, ON, DELAY and back to OFF.



If a plunger arrival is not sensed by the end of the ON cycle, the operation goes to the BakUp or missed plunger shut-in cycle and then back to ON.

## Operating Data Displays

Operating data displays provide a summary of valve and plunger operation over time. Total time displays show the total, cumulative time the unit has spent in each timing cycle. Total ON time includes time spent in the DELAY or plunger afterflow cycle.

D3: Press <> for  
OPERATING Data

◀▶ D31: Total ON  
Time 125:54:15

DATA D32: Total OFF  
Time 834:02:58

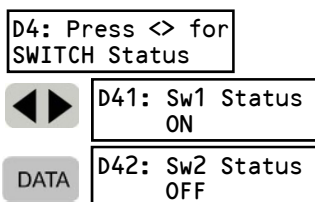
DATA D33: Total BakUp  
Time 059:16:45

DATA D34: Arrival  
Count 01327

The arrival count display tracks the number of plunger arrivals sensed on the input switch (Sw1) terminal. To reset time and count totals to zero, press Up or Down key when viewing any one of the operating displays.

## Switch Status Displays

Switch status shows the On/Off status of the switch input sensors. The active state for both switch inputs are configured for a normally open (NO) switch connection.



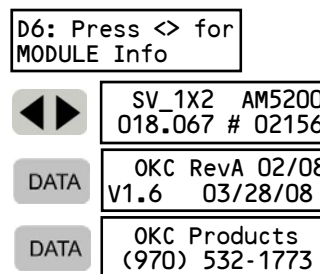
ON = Active. OFF = Not Active.

Switch inputs will tolerate an input voltage up to 30 volts without causing damage to the input circuitry. The switch inputs are “active inputs” meaning that an internal pull up resistor is used to sense switch closures, grounding the switch input pin to the circuit ground. An open or unconnected switch input terminal will normally show about 3.5 Vdc to the ground pin.

All switch inputs are protected against electrostatic discharges up to 15 kV.

## Module Information

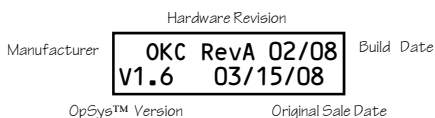
Module information displays show device identification and sales data for warranty service. Module information displays are “system displays” and can not be modified or altered using the ChartWriter™ utility. This display information is programmed into each unit by the manufacturer, at the time of shipment or sale.



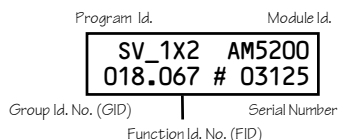
Other user guides are supplied with each unit that focus on Control Panel operation, Power Module use and features and Wireless Networking, respectively. Visit and register on the OKC eSupport site for more detailed information. <http://support.okcproducts.com/>

## 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.



Device information is also included in a single display as shown below. A “business card” sized information card is provided with each unit so that the device information may be noted for future reference.



## 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.
9203-2032150	Power Jack Assembly. 2.5mm Receptacle. Complete wired assembly.
4160-2032120	Universal Mounting Bracket. Black Zinc Plated #16 GA Steel. 2" Pipe or motor valve mount.
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. 4000 ft. (1.2km) Line of Sight range.
9200-0852251	Ext. 2 W Solar Panel w/ stand. 8.5 Vdc @ 235 mA charging. 12 ft. Power Jack cable provided.

Doc. No. 9203-2039520

[www.okcproducts.com](http://www.okcproducts.com)

05/15/08