

Operator's Guide

AeroMate™ WSC – Sensor Module



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

U.S. Patent Numbers 6,194,793 and 6,462,507
Copyright © 2011 OKC Products, Inc. All Rights Reserved

Introduction

Multi-Function Hardware

The AeroMate Sensor unit is a multi-function module that includes two digital switch I/O's and two analog inputs for stable, reliable sensor measurements.

Customizable Measurement and Processing

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

Configurable Analog Inputs

Analog sensors use stable, high resolution 5V, 12-Bit ADC converters. Calibration includes zero voltage, maximum voltage and units scaling to accept industry standard voltage output transducers. An on-board +10V to +12V sensor power supply completes the Sensor module's measurement tools.

Configurable Switch I/O

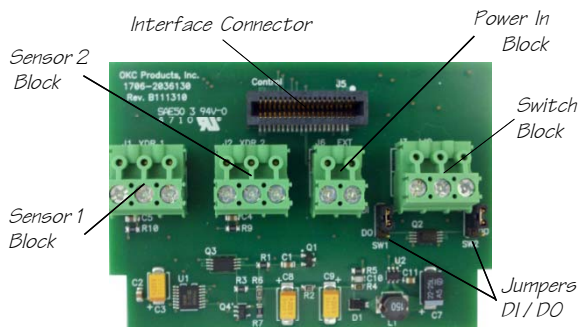
Two digital switch I/O's are jumper selectable for input or output functions. Switch configuration allows for normally open (NO) or normally closed (NC) states as well input Time Constant and Pulse Width output control.

9203-2039600

www.okcproducts.com

04/11

Sensor Module Board



Removable, screw terminal blocks allow convenient hook up with 18 to 24 AWG wire. Three terminal sensor blocks provide signal input, ground and power for any 0-5 Vdc output sensor.

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.

9203-2039600

www.okcproducts.com

04/11

Hook Up Connections



J1 XDR 1

SIG – Voltage sensor input.
GND - Common ground connection.
PWR - Sensor power (+10 Vdc*).

J2 XDR 2

SIG – Voltage sensor input.
GND - Common ground connection.
PWR - Sensor power (+10 Vdc*).

J6 EXT

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

J3 I/O

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

JP1 / JP2

DI - J3 Switch input.
DO - J3 Switch output.

* Sensor power may range from +10 Vdc to +12 Vdc.

9203-2039600

www.okcproducts.com

04/11

2x Transducer Model



The 2x Transducer version includes two, integral static, non-ratiometric sensors for pressure measurement up to 2000 psi. A 316 SS manifold provides dual ¼-NPT male ports (bottom and side) for easy hookup. Module also includes two dual purpose switch I/O's for either input switch sensing or output switch control.

Applications include dual 2x static or differential switch gage, pressure monitoring and pressure logging. A typical application is Casing pressure, Tubing pressure and plunger arrival for wellhead monitoring and control.

9203-2039600

www.okcproducts.com

04/11

2x Transducer Displays

Data displays show current sensor readings and switch output or input status depending on I/O jumper selections. Other data displays may be used to present data from networked units or for reporting purposes.

DATA	CSG	TBG	DIFF
	0843	0735	0108
DATA	OUTPUT	SW1	SW2
	Status	OFF	ON
DATA	INPUT	SW1	SW2
	Status	OFF	ON

Measured variables, such as psi and psid, may also be used for internal or networked control parameters. Sample displays below show digital gage set points that may be used for pressure and differential pressure control functions.

SET	Gage1	LOW	HIGH
	psi	Q350	0750
SET	Gage2	LOW	HIGH
	psid	Q035	0100

Use these keys to change selections.

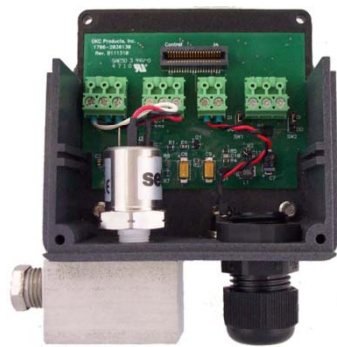


9203-2039600

www.okcproducts.com

04/11

1x Transducer Model



The 1x Transducer version includes one, static non-ratiometric sensor for pressure measurement up to 2000 psi. A 316 SS manifold provides dual ¼-NPT male ports (bottom and side) for easy hookup. Module also includes two dual purpose switch I/O's for either input switch sensing or output switch control.

Applications include static pressure switch gage, pressure monitoring and pressure logging. A typical application is digital switch gauge and remote sales line pressure measurement.

9203-2039600

www.okcproducts.com

04/11

1x Transducer Displays

Data displays show the pressure sensor's current reading, averages and switch output or input status depending on I/O jumper selections. Other data displays may be used to present data from networked units or for reporting purposes.

DATA	CSG	0893	psi
	AVG	0752H	0635D
DATA	OUTPUT	SW1	SW2
	Status	ON	OFF
DATA	INPUT	SW1	SW2
	Status	OFF	ON

Gage set points are in units of psi. Auxiliary (SIG2) sensor input may be calibrated for any 0-5 Vdc output sensor. This may be temperature, pressure, flow, etc.

SET	Gage1	LOW	HIGH
	psi	Q350	0750
SET	S2	MIN	MAX
		Q500	4500
			SCL
			2000

Use these keys to change selections.



9203-2039600

www.okcproducts.com

04/11

1x Flow Model



The 1x Flow version includes one, internal Differential Pressure (DP) Transmitter for gas flow measurement. A 316 stainless manifold provides dual High/Low ports (each side) for easy hookup. Module also includes a second analog input for an external sales line static pressure sensor and two dual-purpose switch I/O's for either input switch sensing or output switch control.

Applications include gas allocation metering, pipeline check meter and production flow control.

9203-2039600

www.okcproducts.com

04/11

1x Flow Displays

A typical application for the 1x Flow sensor is for gas flow measurement. This configuration uses the integral DP transmitter (inW) and an externally connected static pressure transducer (psi) to compute gas flow rate (MCF/HR). Using this data, other information may be computed such as total accumulated MCF gas volume.

DATA	027.84 MCF/HR
	003869.413 MCF
DATA	FLOW 0045 InW
	SALES 0285 psi

Measured variables, such as InW and psi, may also be used for internal or networked control parameters and alarms. Sample displays below show digital gage set points that may be used for flow rate and high sales line shut-in and hold control functions.

SET	FLO	LOW	HIGH
	InW	0050	0100
SET	SLS	LOW	HIGH
	Psi	0140	0350

Use these keys to change selections.



9203-2039600

www.okcproducts.com

04/11

2x Analog Input Model



The 2x Analog Input version includes two, general purpose 0-5 Vdc analog measurement inputs and two dual-purpose switch I/O's. Each analog input may be calibrated for zero offset voltage (MIN), full scale voltage (MAX) and units for full scale range (SCL).

Applications include flow, pressure, temperature and level sensor measurement, to name just a few. Sensor measurements may be displayed in either English or Metric units.

9203-2039600

www.okcproducts.com

04/11

2x Analog Input Displays

Analog input data displays can scale sensor readings or sensor output voltage – or the result of any desired computation for hourly, daily, weekly averages or cumulative totals.

DATA	TEMP 015C (060F)
	SENSOR 1.87 Vdc
DATA	FLOW 0247 bbL/dy
	DY AVG 0489

Input scaling displays allow entering Zero Offset (MIN), Full Scale (MAX) sensor voltage and the sensor's full scale Range (SCL) of the voltage converted units of the sensor such as, for example, psi or InW. Zero Offset and Full Scale sensor voltage are entered in units of milli-Volts (mV), i.e., 5000 mV = 5.000 V.

SET	1	MIN	MAX	SCL
		0500	4500	1000
SET	2	MIN	MAX	SCL
		0250	5000	0150

Use these keys to change selections.



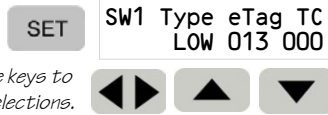
9203-2039600

www.okcproducts.com

04/11

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 J3 I/O switch inputs.



Use these keys to change selections.

Type: Input switch active state.

LOW – Switch is normally open (NC).
HI – Switch is normally closed (NO).

Time Constant: Time input must hold for sensing.

TC can range from 000 up to 999 seconds. A 000 setting responds to the switch action within a 1 second period.



ON = Active. OFF = Not Active.

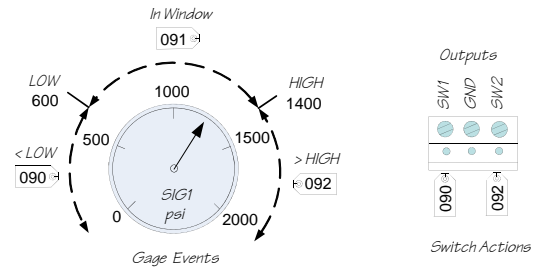
9203-2039600

www.okcproducts.com

04/11

Digital Switch Gage

AeroMate programs associate sensor measurement set points with output switch actions by assigning an aTag to the output. This emulates a MurphyGAGE™ switch gage where “LOW” and “HIGH” set points define “< LOW”, “In Window” and “> HIGH” regions for output switch control.



As shown above, selecting transducer SIG1 as the measurement source reference (Ref1) and assigning output switch action tags (aTag) to match switch gage event tags (eTag), provides a versatile digital switch gage setup. Using a second measurement source reference (Ref2), also allows switch gage setup for differential pressure measurements.

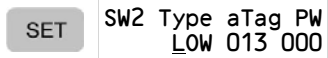
9203-2039600

www.okcproducts.com

04/11

Switch Output Displays

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.



Use these keys to change selections.

TYPE: Output switch active state.

LOW – Switch is normally open (NC).
HI – Switch is normally closed (NO).

Pulse Width: Time the output will stay active.

PW can be from 000 up to 999 seconds. A 000 setting maintains the active state only as long as switch stays active.



ON = Active. OFF = Not Active.

9203-2039600

www.okcproducts.com

04/11

Accessories

Part Number	Accessory Description
9203-2002110	Pipe Mounting Kit 2-1/4 U-Bolt with extra 5/16" nuts . Uses universal mounting plate.
6016-PJ22206	Power Jack Cable – 6 foot 2 Conductor, #22 AWG Wire Molded 2.5mm Plug.
5520-5500138	DP Transmitter 0-5psid (138 InW) 1000 psi Static Pressure Rated. 316 SS 1/4-NPT Female Ports.
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.

9203-2039600

www.okcproducts.com

04/11