

RaceGrade

Document Number		RG_SPEC-0006	
Title		Aero 8 CAN	
CAN Speed: 1Mbps	Base CAN ID: 0x430h	Serial Number:	Checked By:
Transmission Rate: 250Hz		Transmission Type: Pressure in kPa	
Firmware Revision	Date	Prepared By	Change History
1.3	1/21/2015	Steven Bravek	Added CAN bus output information
1.4	7/23/2015	Steven Bravek	Added manager base configuration
1.51	8/28/2015	Steven Bravek	Added pressure & voltage output and zero sensor function

Introduction

This device has 8 sensors measuring dynamic differential pressure compared to their own static reference or a signal static reference port. M AERO 8 CAN has analog voltage and CAN bus outputs. It will transmit each port via CAN in either kPa or millivolts at a rate of up to 1000Hz. This sensor comes in two different pressure ranges. M AERO 8C-60 has a range of +/- 60" H₂O. M AERO 8C-30 has a range of +/- 30" H₂O. This product features a removable manifold that commons the reference ports.

Specifications:

Part #: M AERO 8C-60
M AERO 8C-30

Output Methods: Analog Voltage & CAN

CAN Bus speeds: 1 Mbps, 500 Kbps, 250 Kbps, 125 Kbps

Transmission rate: 100,125,250,500,1000Hz

Resolution: 0.001 kPa

Update Rate: > 1000 Hz

Response Time: 0.001 sec

Supply Voltage: 6 - 20 volt DC

Temp Range: -40° to 85° C

Weight: 186 g

Calibration:

M AERO 8C-60

Δ -60" H₂O = -14.95 kPa = 0.25 vdc

Δ 0" H₂O = 0.00 kPa = 2.25 vdc

Δ 60" H₂O = 14.95 kPa = 4.25 vdc

M AERO 8C-30

Δ -30" H₂O = -7.47 kPa = 0.25 vdc

Δ 0" H₂O = 0.00 kPa = 2.25 vdc

Δ 30" H₂O = 7.47 kPa = 4.25 vdc

Connection:

Mating connector: AS610-35SA

- pin 1 – Port 1
- pin 2 – Port 2
- pin 3 – Port 3
- pin 4 – Port 4
- pin 5 – Port 5
- pin 6 – Port 6
- pin 7 – Port 7
- pin 8 – Port 8
- pin 9 – Ground
- pin 10 – Power
- pin 11 – CAN low
- pin 12 – CAN high
- pin 13 – N/C



Mounting

This sensor should be mounted with soft Velcro to help absorb vibrations.

CAN Bus definition:

The M AERO 8C sends out either three or five different CAN messages based on output mode. All data is transmitted with most significant bit first, in the following format. Ports 1 thru 8 are transmitted in kPa with a resolution of 0.001 or in millivolts. If set to output both pressure and voltage the AERO 8C will transmit pressure on messages 1 & 2. Voltage will be transmitted in millivolts on messages 4 & 5. Battery voltage is transmitted in millivolts and board temperature is transmitted in Celsius with a resolution of 0.1. The default base CAN address is 0x430, transmitting in kPa at 250Hz. The base CAN address and transmission mode can be programmed via CAN.

Base Address	Base Address+1	Base Address+2
BYTE(0) = High byte port 1	BYTE(0) = High byte port 5	BYTE(0) = High byte Battery Volts
BYTE(1) = Low byte port 1	BYTE(1) = Low byte port 5	BYTE(1) = Low byte Battery Volts
BYTE(2) = High byte port 2	BYTE(2) = High byte port 6	BYTE(2) = High byte Board Temp
BYTE(3) = Low byte port 2	BYTE(3) = Low byte port 6	BYTE(3) = Low byte Board Temp
BYTE(4) = High byte port 3	BYTE(4) = High byte port 7	BYTE(4) = High byte Version
BYTE(5) = Low byte port 3	BYTE(5) = Low byte port 7	BYTE(5) = Low byte Version
BYTE(6) = High byte port 4	BYTE(6) = High byte port 8	BYTE(6) = High byte Serial Number
BYTE(7) = Low byte port 4	BYTE(7) = Low byte port 8	BYTE(7) = Low byte Serial Number
Base Address+3	Base Address+4	
BYTE(0) = High byte volts 1	BYTE(0) = High byte volts 5	
BYTE(1) = Low byte volts 1	BYTE(1) = Low byte volts 5	
BYTE(2) = High byte volts 2	BYTE(2) = High byte volts 6	
BYTE(3) = Low byte volts 2	BYTE(3) = Low byte volts 6	
BYTE(4) = High byte volts 3	BYTE(4) = High byte volts 7	
BYTE(5) = Low byte volts 3	BYTE(5) = Low byte volts 7	
BYTE(6) = High byte volts 4	BYTE(6) = High byte volts 8	
BYTE(7) = Low byte volts 4	BYTE(7) = Low byte volts 8	

Manager:

The management software uses a PCAN-USB by [Peak Systems](#) to communicate with the Aero8 over CAN. The manager lets the user change CAN ID, CAN bus speed, transmission rate and transmission type. If you don't have a PCAN the follow programming message can be sent to change CAN ID, transmission rate and transmission type.

To program the M AERO 8C one CAN message needs to be sent on ID 0x08. Bytes 0-4 are marker bytes. Byte 5 sets transmission mode, and bytes 6-7 set CAN base ID. The first three bits of byte 5 set transmission rate. The fourth bit sets transmission type. If byte 5 is equal to two the M AERO 8C will transmit in kPa at 250Hz, if equal to ten it will transmit in millivolts at 250Hz.

The manager uses the following CAN ID's to communicate with the M AERO 8C: 0x006, 0x007, 0x008, 0x009, and 0x014.

To download the latest software go to: <http://www.racegrade.com/downloads.html>

Programing Message:

```
BYTE(0) = 0x41; // A Marker Byte
BYTE(1) = 0x45; // E Marker Byte
BYTE(2) = 0x52; // R Marker Byte
BYTE(3) = 0x4F; // O Marker Byte
BYTE(4) = 0x38; // 8 Marker Byte
BYTE(5) = 0xXX; // Transmission Mode (0x02 is standard)
BYTE(6) = 0x0X; // Top 3 Bits of Can Id 0 - 7 (0x04 is standard)
BYTE(7) = 0xXX; // Lower 8 Bits of Can id (0x30 is standard)
```

Transmission Mode:

