

# Wind Engineering/ Bluff Bodies Pressure Measuring Solutions

Application

Note 8

## General Description

Typically before tall buildings, stadiums, fabric structures, long span roofs and long span bridges are built, wind tunnel simulations are performed on small scale models. These boundary layer wind tunnels operate at low speeds using a 360 degree turntable to simulate multi-directional wind forces. Ground effect boundary layers are also simulated in these tests. Of recent interest is the interaction of the wind from tornados and hurricanes on structures. The purpose of wind engineering is to determine the interaction of wind with buildings, structures, & terrain to enhance design, efficiency, and increase reliability.

## Pressure Measurements

Wind Tunnel testing determines wind load distribution on walls, roof systems, wind suction, or pressures at doorways, impact on pedestrians, as well as fluctuating forces & torques on the structure system. Scanivalve's high sample rate pressure measuring instruments are ideal for measuring unsteady state wind tunnel wall and model pressures. Our compact high density ZOC pressure scanners are available in 32, & 64 pressure input designs. These pressure scanners and RAD Base can be placed inside the model to minimize tubing lengths and measure several hundred pressures (up to 512 channels) on a scale model. Measurements from inches of water can be measured. Valveless options are also available thereby reducing the installation complexity and cost/channel.

## Pressure Measurement Data Systems

The front end analog ZOC pressure scanners noted above can be used with 3 different data systems:

1. The ZOC33 analog scanners can be integrated with the user's data acquisition System. There are also commercially available interface cards designed to work with ZOC modules (refer to our website: <http://www.scanivalve.com/about-us/partners/>). Maximum Sampling Speed is 625 Hz/channel.
2. The ZOC33 analog scanners can be used with Scanivalve's RAD4000 Remote A/D with its Ethernet TCP/IP or UDP connection. All data is output in Engineering Units. Maximum Sampling Speed is 625 Hz/channel. This digital approach of mounting the RAD4000 inside the model with the ZOC pressure scanners using a small diameter Ethernet cable eliminates many analog wires and signal conditioners as well as possible noise problems.
3. The ZOC33 analog scanners can be used with Scanivalve's DSM4000 Digital Service Module that incorporates a digital signal processor (DSP) and communicates Ethernet TCP/IP. All data is output in Engineering Units. Maximum Sampling Speed is 625 Hz/channel.

## Communication

Communication to both the RAD4000 and DSM4000 systems can be made directly with ASCII commands via TELNET, HyperTerminal, ScanTel and optional LabVIEW drivers.

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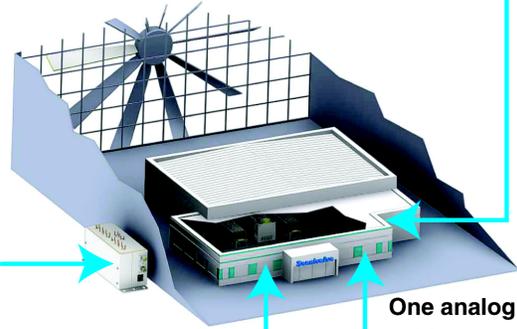
## 1. ZOC33 Analog Scanner

HOST  
A/D

One small diameter analog cable per 64 channel pressure scanner mounted inside the model

Tunnel Wall Pressure Measurement with Model DSA3217

Ethernet 10 baseT  
TCP/IP



## 2. RAD4000/ZOC33 Complete System (up to 512 Px)



Ethernet 100Base T cable  
to RAD4000 & ZOC33 pressure scanners  
mounted inside the model

One analog cable per 64 channel pressure scanner mounted inside the model

## 3. DSM4000/ZOC33 Complete System (up to 512 Px)



Ethernet 100baseT TCP/IP  
to Network, PC, or Host



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