Scanivalve

Model E-RAD4000
Ethernet Pressure Measurement System

FEATURES

- DSP Technology
- Compact and modular design
- Scan Rates up to 625 Hz/Channel
- Accepts up to eight analog-to-digital modules
- Max Channel Count of 512 Channels
- Ethernet 100BaseT
- Data Transfers TCP, UDP, or FTP
- Digital Input and Output capability

GENERAL DESCRIPTION

The state-of-the-art DSP technology is at the heart of our new ERAD4000 pressure measurement system. Located inside the RADBASE is a programmable device (Digital Signal Processor or DSP) capable of extremely fast math functions that operate on the data stream in real time. All measurements are converted into Engineering units.

Advantages of DSP technology:

- Boots up quickly
- Real Time Operating System
- Low Data Latency

The RADBASE DSP processor utilizes a pressure temperature look-up table which provides temperature compensation for the pressure sensors, thus reducing thermal errors. It also can control the actuation of an external calibration valve via the RDS3200 module to perform on-line zero offset corrections or purge functions. Long term accuracy is achieved for up to 6 months before recalibration is required.

This new Ethernet remote A/D system is a turnkey pressure measurement system that combines the field proven RAD3200 with Ethernet TCP/IP communications. The ERAD4000 system is capable of maintaining its performance even as computer technology and operating systems upgrade. ERAD will work on any hardware platform that has an Ethernet port, minimizing the user's future interface risks.

The ERAD system is compact and modular, allowing for the installation of up to 8 each A/D (16 bit) modules on a single RADBASE. Each A/D supports one 16, 32, or 64 channel ZOC or 64 channel MPS analog pressure scanner, or one ZOCEIM.

The output of the RADBASE is Engineering units via Ethernet connection using TCP, UDP or FTP protocol. The RADBASE stores the pressure sensor calibration data in memory and converts the digital data to temperature compensated Engineering units.
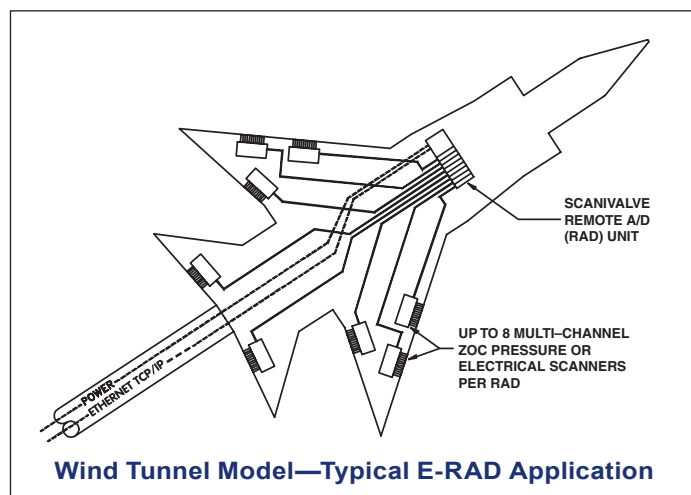

RADBASE w/ 8 ADs

RADBASE w/ 1 AD & 1 RDS
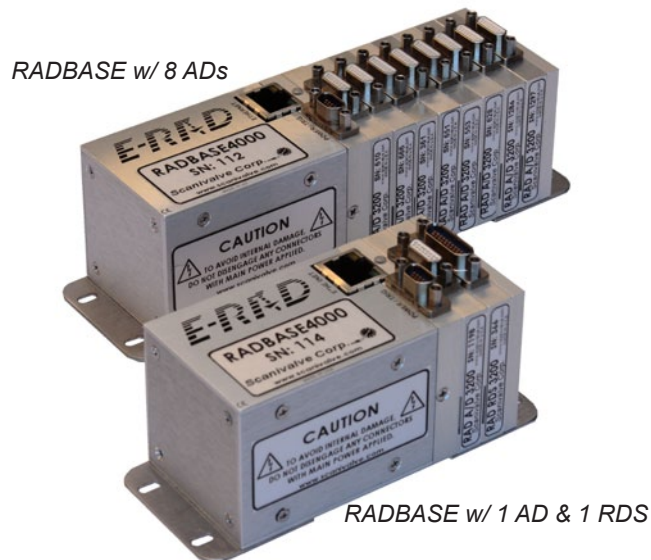
APPLICATIONS

Due to the compact nature of the ERAD4000 system, the ERAD can be located inside a wind tunnel model or other space limited location in close proximity to the ZOC or MPS analog pressure scanners.

For small models with low number of pressure channel requirements, the RADBASE can be minimal size to fit into the model. For large systems the E-RAD system can be expanded with modular A/D modules or multiple RADBASEs for up to 2048 pressure channel system.

A feature of the system is that each A/D and each connected analog pressure scanner has an ID chip installed. During power up or on demand, the RAD can read the ZOC ID chip information which includes: model, valve type, pressure range, serial number, number of channels, date of manufacture and calibration date.

SCANIVALVE REMOTE A/D (RAD) UNIT

UP TO 8 MULTI–CHANNEL ZOC PRESSURE OR ELECTRICAL SCANNERS PER RAD

POWER
ETHERNET TCP/IP

Wind Tunnel Model—Typical E-RAD Application

Instrumentation Devices

EXAMPLE ERAD4000 SYSTEM ARCHITECTURE
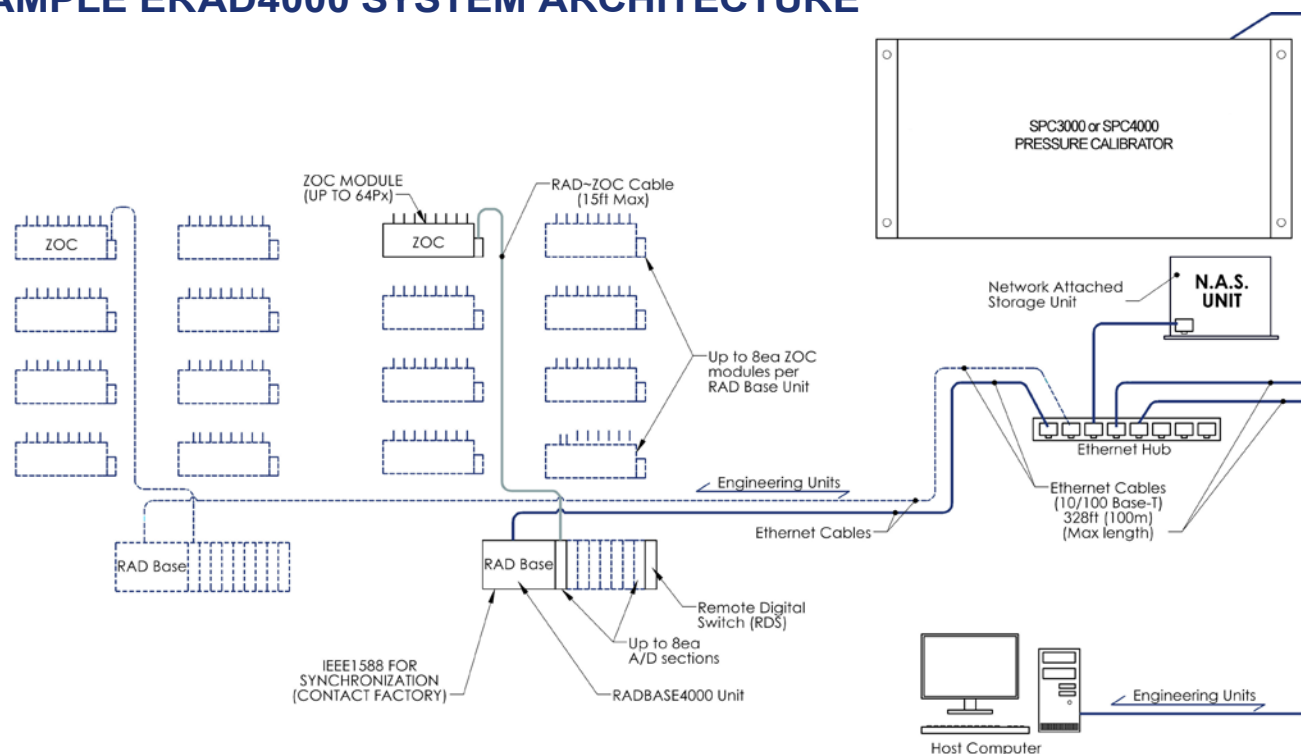
ERAD4000 CONFIGURATION

The ERAD4000 Ethernet pressure measuring system consists of:

- 1 RADBASE4000 (for each 512Px)

- 1 to 8 each RAD A/D 3200 per RADBASE

- 1 Analog pressure scanner per A/D (MPS or ZOC)

- Cables, power supplies, & accessories

- Ethernet Switch (user supplied)

- Optional SPC pressure calibrator(s)

- Optional NAS network data storage (user supplied)

The ERAD robust turnkey pressure measurement system will operate with any hardware platform that can communicate Ethernet TCP/IP. This would include PC's, MAC's, VXI or NI systems, or any user host or network.

ERAD4000 COMMUNICATIONS

The ERAD4000 firmware acts as a Telnet server. Communications and data are transmitted via Ethernet TCP/IP. Data can be returned via the same Ethernet connection using TCP, UDP or FTP data transfer. This integrated Ethernet architecture off-loads the host computers needs for calculations and processing.

The RADBASE4000 firmware allows for several variables to be configured and saved, providing quick setup and turn-over. Several additional commands permit a user to control all functions of the RAD, including control of external devices when the RDS3200 digital

switch is connected. The configuration variables permit a user to define communications, RAD module setup, identification, scanning EU conversion, and data output. Because the pressure calibration files for the ZOC pressure scanners are stored in memory, all Engineering Unit conversion and temperature compensation occurs in the RADBASE4000.

A LabVIEW® Configuration utility (includes 2009 run-time engine) and a Scanivalve Software Development Kit for LabVIEW® can be downloaded from the Scanivalve website for users who want to write their own detailed data acquisition program in LabVIEW®.

Several additional software programs are provided, such as ScanTel for communications and PressCal for performing on-line calibration of analog pressure scanners. These programs can be downloaded from the Scanivalve website.

ERAD4000 ORDER INFORMATION

Part Numbers:

- RADBASE4000 (21355)

- RAD A/D 3200 (21140)

- RDS3200 (21145)

Each RADBASE4000 is shipped with a mating power connector with flying leads, mounting plates, a RADBASE serial adaptor, and a 10ft null modem (DB9) cable.

Cables, power supplies, and accessories for the ERAD400 system can be found in the Scanivalve Module Accessory Catalog.

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E-RAD 4000

SPECIFICATIONS

Dimensions:

RADBASE4000:	1.75 in. x 1.75 in. x 2.68 in. (44.45mm x 44.45mm x 68.07mm)
RAD A/D 3200:	1.75 in. x 1.75 in. x 0.31 in. (44.45mm x 44.45mm x 7.87mm)
RDS3200:	1.75 in. x 1.75 in. x .45 in. (44.45mm x 44.45mm x 11.43mm)

Weight:

RADBASE4000:	0.31 lbs. (141gms)
RAD A/D3200:	0.05 lbs. (23gms)
RDS3200	0.05 lbs. (23gms)

Power Requirements:

ERAD4000:	+15Vdc @ 41mA
	- 15Vdc @ 4mA
	+ 5Vdc @ 610mA
A/D (each):	+15Vdc @ 105mA
	- 15Vdc @ 5.5mA

ERAD4000 Operating Temperature Range: 5°C to 60°C

Humidity: Up to 95% non-condensing

No. of RAD A/D Modules Supported on one RADBASE: 1 to 8

No. of ZOC or MPS Modules Supported by one RABASE: 1 to 8

Type of Analog Modules Supported: MPS4164, ZOC17 ZOC22B, ZOC33, ZOCEIM

Power Mating Connector: Cannon 9 pin MDM-9PH003L

A/D Module Mating Connector: Cannon 15 pin MDM-15SL2P
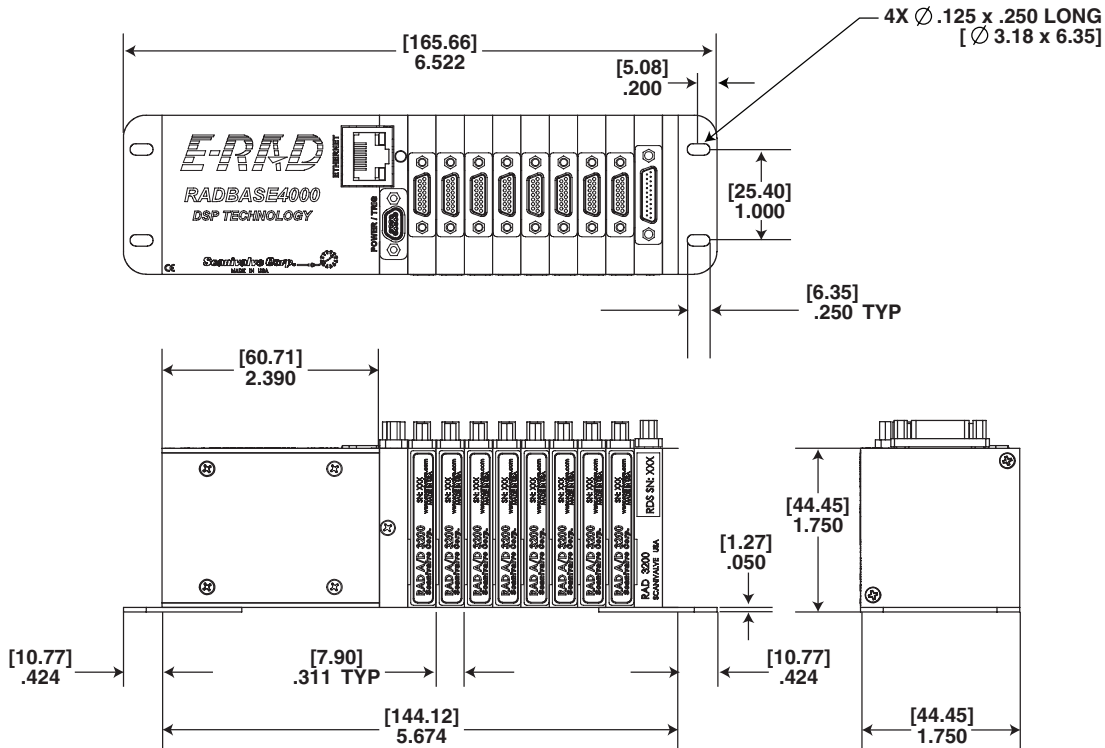
RDS Module Mating Connector: Cannon 21 pin MDM-21PH003L

Ethernet Connector: RJ-45

A/D Resolution: 16 bits

Max Scan Rates*: 50Hz - ASCII
625Hz - Binary

* Data rates may be limited due to network restrictions

DIMENSIONS - inches [mm]

* Total length is determined by number of A/D modules (8 A/D's shown)

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