

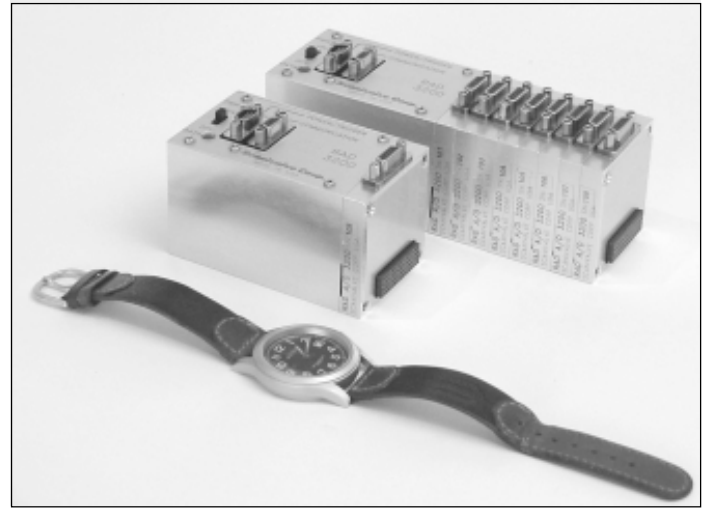
Features

- Modular 1 to 8 A/D Sections
- Compact Base 1.75 x 1.75 x 2.68 inches (44.45 x 44.45 x 68.07mm)
- Extended USB Communications up to 150 feet
- Calibration Time Savings
- Can be used with PC

General Description

The model RAD3200 Remote A/D interfaces ZOC pressure scanners to a PC. Its modular design allows up to 8 A/D (16 bit) modules to be plugged into the RADBASE. Each A/D supports one 16, 32 or 64 channel ZOC pressure scanner or one ZOC Electrical Input Module. Thus, for small models with low pressure channel requirements, the RAD can be minimal size. A feature of the system is that each A/D and each upgraded ZOC pressure scanner has an ID chip built in. When a ZOC pressure scanner is connected to the RAD, it outputs the model, pressure range, number of channels, last calibration date and serial number. Typically the RAD3200 would be located inside the wind tunnel model or other space limited locations in close proximity to the ZOC pressure scanners. The output of the RAD3200 is A/D counts transmitted via a small diameter USB cable to users PC where EU conversion is performed.

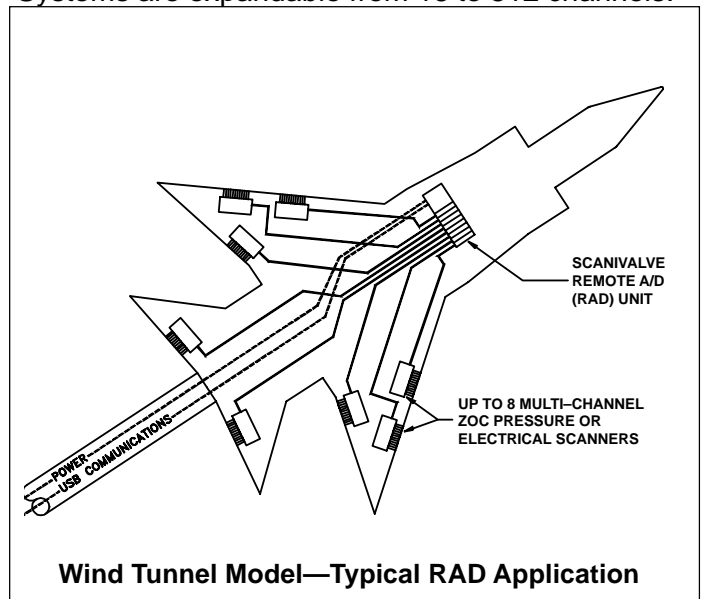
Large and expensive data acquisition systems are no longer required for fast accurate data measurement and acquisition. The cost involved to buy into this technology is now relatively low and affordable by universities and small research facilities. Now ZOC pressure scanners and RAD may be used with any PC or Laptop utilizing the worldwide accepted USB communication.



RADBASE shown with 1 and with 8 A/D's

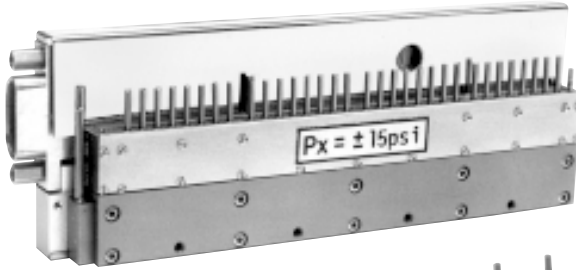
Applications

Typically the RAD3200 would be located inside a wind tunnel model or other space limited location in close proximity to ZOC pressure scanners. Systems are expandable from 16 to 512 channels.

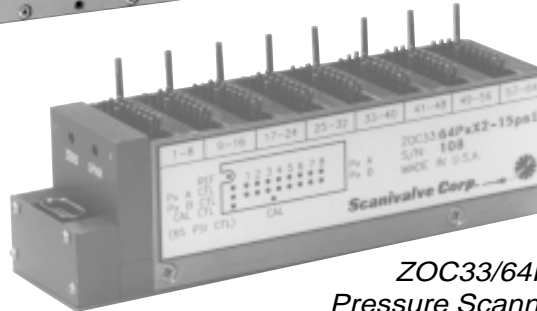


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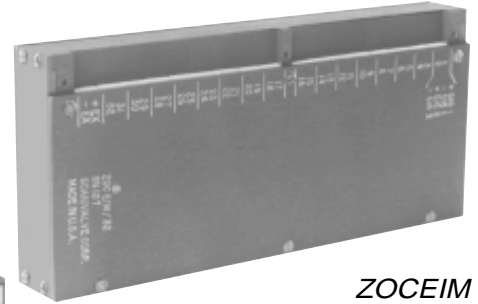
ZOC Pressure Scanners



ZOC22B/32Px
Pressure Scanner



ZOC33/64Px
Pressure Scanner



ZOCEIM
Electrical Input Module

General Description

The ZOC (Zero, Operate, and Calibrate) pressure scanners contain piezoresistive pressure sensors in arrays of 16, 32, or 64. An RTD is factory installed to sense the ZOC pressure scanner temperature. The analog pressure sensor and the RTD data are digitized in the RAD and passed to the PC for temperature corrected Engineering unit conversion.

Also incorporated into each ZOC pressure scanner is a pneumatic calibration valve that allows for sensor rezero or multipoint calibrations on demand. This calibration valve also permits purging of the pressure input lines of condensation and contaminants. Available ZOC pressure ranges are 10 inches H₂O full scale to 750 psi full scale.

Upon startup, the RAD.exe software automatically interrogates the ZOC ID chip and auto selects the appropriate ZOC calibration coefficients for each ZOC module connected on the system.

ZOC Pressure Scanner Upgrades

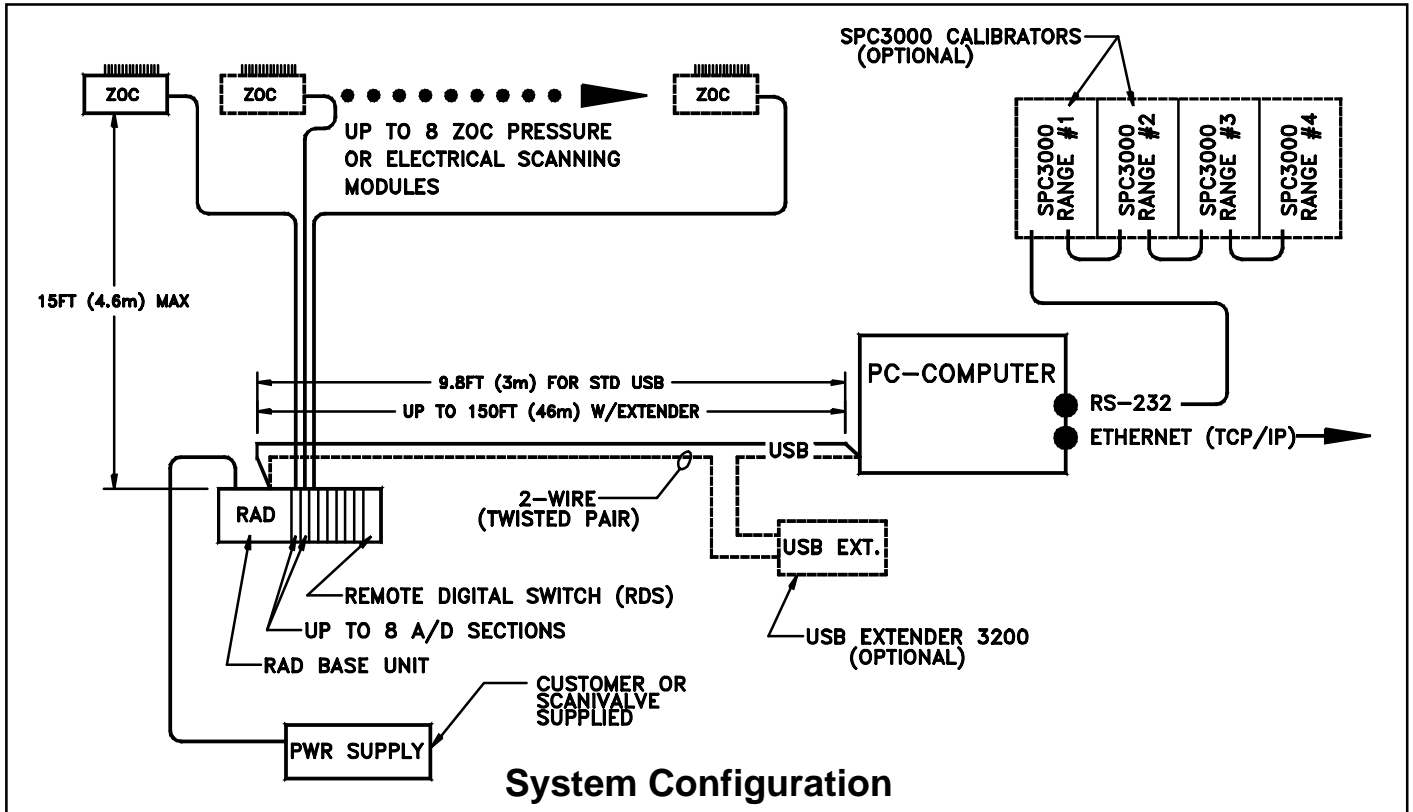
All ZOC pressure scanners (ZOC22B, ZOC33, ZOC17, ZOCEIM) will be manufactured with an ID chip installed when ordered with a RAD system. Existing ZOC pressure scanners may be upgraded with an ID chip at Scanivalve's factory. ZOC pressure scanners may also be used with the RAD system without an ID chip installed, but will lose the auto configuration capability.

ZOC Models

ZOC17/16Px	16 pressure inputs	(data sheet G447)
ZOC22B/32Px	32 pressure inputs	(data sheet G436)
ZOC22B/32PxX2 *	64 pressure inputs	(data sheet G436)
ZOC33/64Px	64 pressure inputs	(data sheet G480)
ZOC33/64PxX2 *	128 pressure inputs	(data sheet G480)
ZOCEIM	16 or 32 analog inputs	(data sheet G466)

* Models available with Duplexing function. Duplexing shares two pressure inputs (Px) with one pressure sensor.

PC Operation



PC Operation

Scanivalve's RAD.exe software performs temperature correction and engineering unit conversion. The software performs automatic on-line rezero of the ZOC pressure sensors. When Scanivalve's model SPC3000 pressure calibrator is part of the system, the software can orchestrate a recalibration of the ZOC pressure scanners. This on-line calibration capability virtually eliminates ZOC sensor thermal errors.

The software also performs temperature compensated Engineering Unit (EU) conversion from the RADBASE digital signals. Data are either stored on the hard disk of the PC or output via Ethernet 100baseT.

PC Hardware

Any PC or Laptop can be used to power the Scanivalve ZOC/RAD pressure measurement system. The minimum PC requirement to operate Scanivalve's RAD.exe software is Windows 2000 Professional or Windows XP operating systems. For optimum performance, an 800MHz or faster processor and 256Mbyte of Ram is required. Scanivalve's RAD.exe software will need to be installed to operate the system.

Required Hardware

- 1) Scanivalve's USB long distance extender when USB cable lengths are longer than 9.8 feet (3 meters).
- 2) The +/- 15Vdc, +5Vdc power may be supplied from Scanivalve's RPM1000 power supply or a user's power supply.

Optional Hardware

- a) Pressure Calibrators are optional for on line pressure calibrations. Reference Scanivalve's model SPC3000, data sheet #G477.
- b) Model ENETCPM should be considered when there is no pressure calibrator present. It supplies control pressures to the ZOC pressure scanners plus provides Digital output capability.
- c) When a SPC3000 pressure calibrator is used in a 19 inch ZOCENCL2100 enclosure, Model CPM3000 should be specified for supplying the control pressures to the ZOC pressure scanners. Digital output is provided by the SPC3000 pressure calibrator.
- d) Model MSCP3200 miniature solenoid pack for supplying control pressures to ZOC pressure scanners.

RAD Networking Address

RAD DRIVERS

LabVIEW and LabWindows CVI drivers are available for the RAD based pressure measuring system. Direct communication and data acquisition to the PC can be made with ASCII commands via Telnet.

RADLINK is a Windows based software communication program that is supplied standard along with the RAD.exe executable software. It communicates externally to the PC or can operate on the PC to allow for menu driven configuration and communication. RADLINK also includes a calibration program for performing on-line calibration of the ZOC pressure scanners.

RAD SOFTWARE

The RAD software contains user commands and configuration variables. The commands permit a user to control all functions of the RAD, including control of external devices. The configuration variables permit a user to define Communications, Module setup and Identification, Scanning, EU conversion, Data output, and Digital I/O. Scanning may be initiated through software or hardware trigger. The variables for any test configuration may be saved to a file for future use.

SPECIFICATIONS

Power Requirements:

RADBASE:	+15Vdc @ 41mA -15Vdc @ 4mA +5Vdc @ 610mA
A/D (each):	+15Vdc @ 105mA -15Vdc @ 5.5mA
ZOC (each):	+15Vdc @ 120mA -15Vdc @ 16mA

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

No. of ZOC Modules Supported: 1 to 8

Type of ZOC Modules Supported: ZOC17, ZOC22B, ZOC33, ZOCEIM

A/D Module Mating Connector: Cannon 15 pin MDM15SL2P

Mating Power Connector: MDM-9PH003L-A174

Mating RADBASE USB Connector: MDM-9SH003L-A174

A/D Resolution: 16 bits

Max Sampling Rate: 250 – 500 Hz/channel based upon system configuration

Throughput Rate: 250 – 500 Hz/channel based upon system configuration

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

Humidity: up to 95% non-condensing

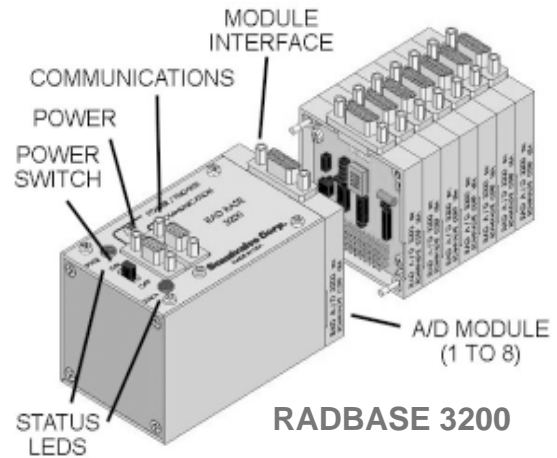
Dimensions:
RADBASE: 1.75 in. x 1.75 in. x 2.68 in.
(44.45mm x 44.45mm x 68.07mm)
RAD A/D 3200: 1.75 in. x 1.75 in. x 0.31 in.
(44.45mm x 44.45mm x 7.87mm)
RDS3200: 1.75 in. x 1.75 in. x .45 in.
(44.45mm x 44.45mm x 11.4mm)

Weight:
RADBASE: .31 lbs. (141gms)
RAD A/D3200: .05 lbs. (23gms)

Remote A/D Operation

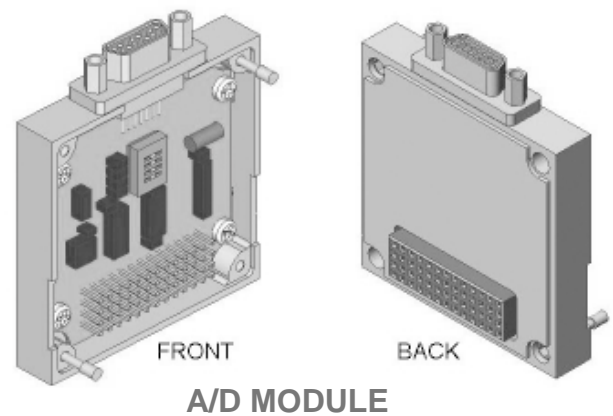
The Remote A/D consists of a base unit and 1 to 8 A/D's. They are designed to be installed inside or in close proximity to a wind tunnel model. By digitizing the transducer analog signals in the model, potential noise errors due to long cable lengths are eliminated.

1) **RADBASE 3200** is the base unit that incorporates the USB and power connectors, an optional USB extender, and an on-off switch. Communication and data throughput is via a small diameter USB cable. The maximum cable distance of the RADBASE3200 from the user's PC is 150 feet (46 meters) with the USB extender added. Power required is +/- 15 Vdc and + 5 Vdc. The model number then becomes RADBASE3200-EXT when the long distance USB extender is included.

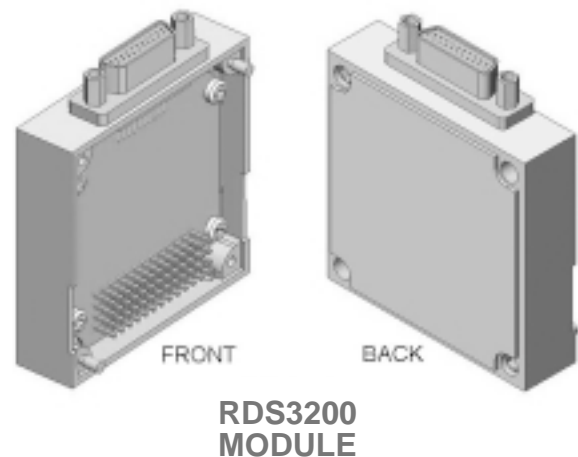


2) **RAD A/D3200** is the modular A/D portion of the RAD. Each 16 bit A/D module supports one ZOC pressure scanner, or one Electrical Input Module (ZOCEIM). Additional A/D modules can be plugged into the system to easily expand it from 1 to 8 A/D's (512 channel system).

Each A/D has an ID chip to identify itself with its serial number, date of manufacture, etc. The analog cable between the RAD A/D and a ZOC pressure scanner may be up to 15 feet (4.61m) maximum in order to maintain maximum scanning speed.



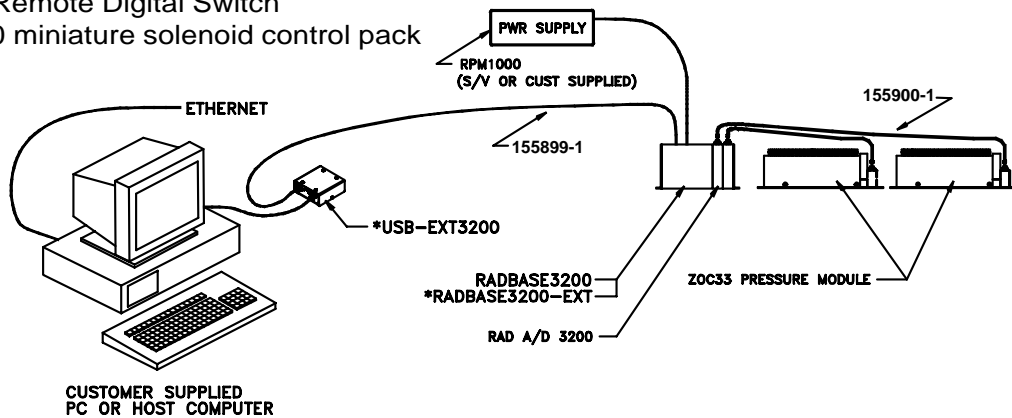
3) **RDS3200** (Remote Digital Switch) is a plug in module that incorporates 8 software controlled switches. These switches can open or close relays that operate solenoid valves or other devices. Scanivalve's Model MSCP3200 miniature solenoid pack contains 3 solenoid valves. It can be operated by the RDS3200 and is small enough to fit inside a wind tunnel model. User supplied power is required for this feature. Only one RDS module can be used with one RADBASE.



Ordering Information

Ordering information for RAD system with two ZOC pressure scanners shown below:

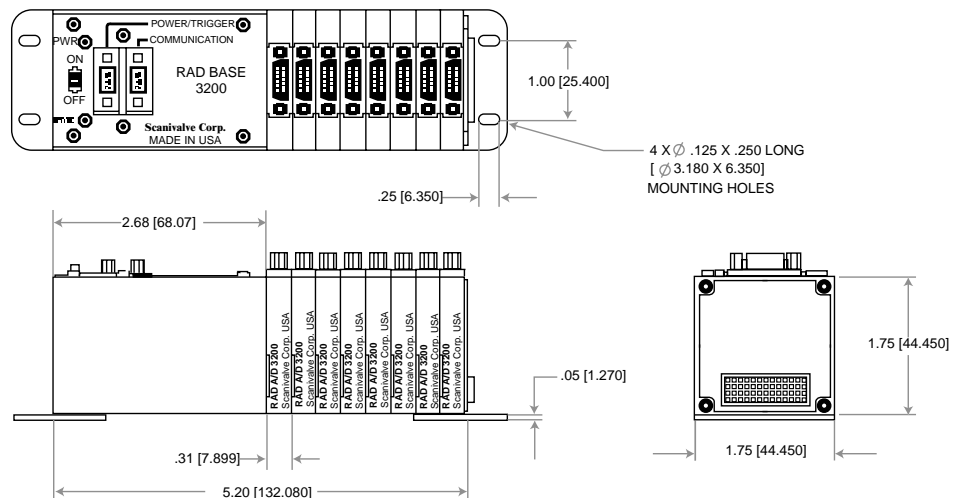
- 1 each required RADBASE 3200(USB distances less than 9.8 feet) or RADBASE3200-EXT(USB distances over 9.8 feet)
- 2 each RAD A/D 3200 plug-in modules
- 1 each user Laptop or PC(customer supplied) running Windows 2000 Professional or XP with minimum 800MHz processor
- 1 each RAD.exe software (includes RADLINK communication software)
- 2 each 155900-1 RAD A/D to ZOC cabling (max 15 feet/4.61m)
- 2 each ZOC pressure scanners (specify ZOC model, pressure range and times 1 or 2 feature)
- 1 each 155899-1 USB Communication cable with mating connectors (specify length up to 150 feet)
- 1 each USB-EXT3200 long distance extender required when USB cable length is longer than 9.8 feet (3 meters)
- 1 each RPM1000 RAD power module with mating RADBASE connector or user supplied power & cable *optional*:
- Online pressure calibration systems available, model SPC3000-consult factory
- 1 each RDS3200 Remote Digital Switch
- 1 each MSCP3200 miniature solenoid control pack



* RAD-EXT3200 (SHOWN) MUST BE ORDERED WITH RADBASE3200-EXT.
USED WHEN APPLICATION REQUIRES CABLE LENGTH OF MORE THAN 3m (9.8FT)

Dimensions Inches (mm)

RAD3200



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

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