

**NEW UPGRADED
SYSTEM**



E-RAD3200

Ethernet Pressure
Measurement System
Data Sheet No. G 561

Features

- 590/Hz/channel/second throughput
- Modular 1 to 16 A/D sections
- Compact base 1.75 x 1.75 x 2.68 inches (44.45 x 44.45 x 68.07mm)
- Extended digital communications up to 150 feet
- Used with any PC, host or LAN
- Up to 1024 measurement channels
- Ethernet TCP/IP protocol "Network Ready"

General Description

The New E-RAD (Ethernet Remote A/D) system is a turnkey pressure measurement system that combines the field proven RAD3200 with Ethernet TCP/IP. The New E-RAD system is capable of maintaining its performance even as computer technology and operating system technology moves forward. E-RAD will work on any hardware platform that has an Ethernet port, thus minimizing the user system interface task.

The E-RAD system consists of ZOC pressure scanners, RAD remote A/D's, and the RSM3200 RAD Service module (which includes RAD2.exe software).

The model RAD3200 Remote A/D is a modular unit that allows up to 8 A/D (16 bit) modules to be plugged into one RADBASE. Each A/D supports 16, 32, or 64 channel ZOC pressure scanners or one ZOCEIM Electrical Input Module. Thus, for small models with low number of pressure channel requirements, The RAD can be minimal size to fit into the model. A feature of the system is that each A/D and each ZOC pressure scanner has a built in ID chip. When connected, the ZOC ID chip outputs model, pressure range, serial number and number of channels.

The output of the RAD3200 is counts transmitted via a small diameter digital cable to the RSM3200. The RSM has the sensor calibration data stored in memory and converts the digital data to temperature compensated Engineering Units.

Data are then output Ethernet TCP/IP 100baseT.

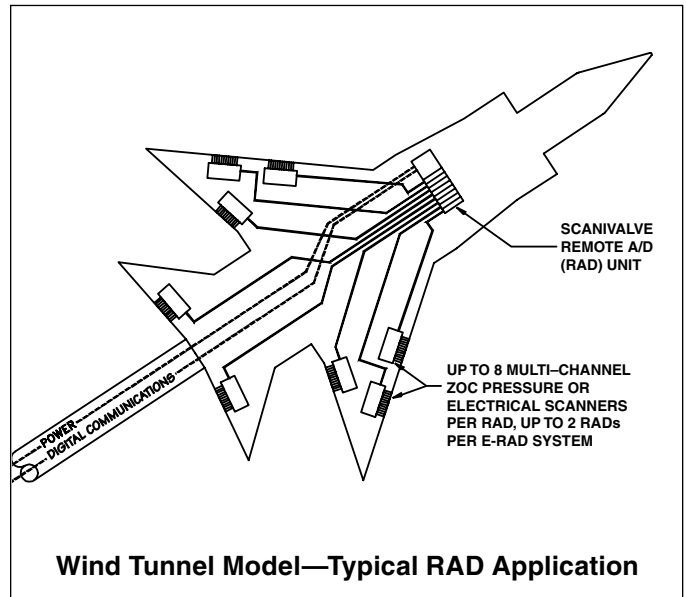
Large and expensive data acquisition systems are no longer required for fast accurate data measurement and acquisition. The cost involved to buy into this technology is now relatively low and affordable by universities and small research facilities. Now ZOC pressure scanners and RAD may be used with any PC, laptop, host or mainframe utilizing the worldwide accepted Ethernet TCP/IP 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. The RSM3200 would be located external to the wind tunnel. Systems are expandable from 16 to 1024 channels.

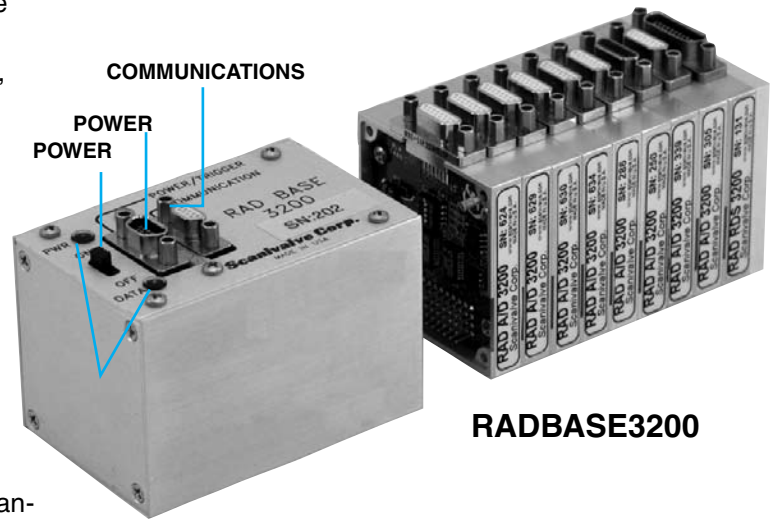


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RAD3200 Remote A/D Operation

The model RAD3200 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.

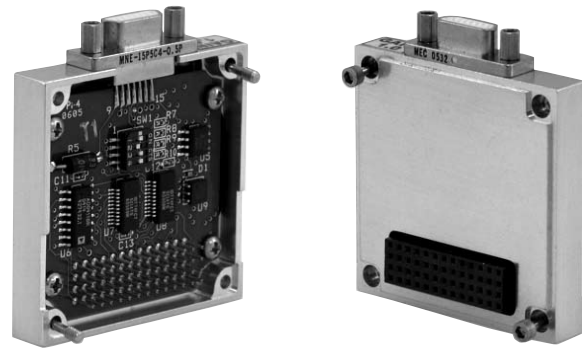
1) RADBASE 3200 is the base unit that incorporates the communication and power connectors and an on-off switch. Communication and data throughput is via a small diameter digital cable. The maximum cable distance of the RAD-BASE3200-EXT from the RSM3200 is 150 feet (46 meters). Power required is +/-15 Vdc and +5 Vdc. Up to 2 RAD bases can be connected to the RSM3200 (512Px channels per RADBASE, 1024 channels per RSM3200).



RADBASE3200

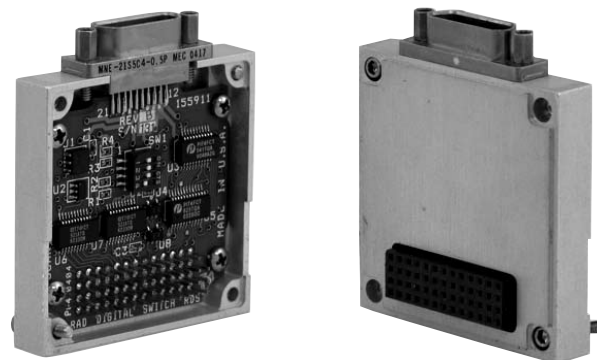
2) RAD A/D3200 is the modular A/D portion of the RAD. The RAD A/Ds are now temperature compensated. Each 16 bit A/D module supports one ZOC pressure scanner, or one Electrical Input Module (ZOCEIM). Additional A/D modules can be plugged into the system to easily expand it from 1 to 8 A/D's (512 channel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

Each A/D has an ID chip to identify itself with its serial number, date of manufacture, date of last calibration, temperature coefficients, as well as maps the calibration coefficient files. 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. Contact Scanivalve for longer cable lengths.



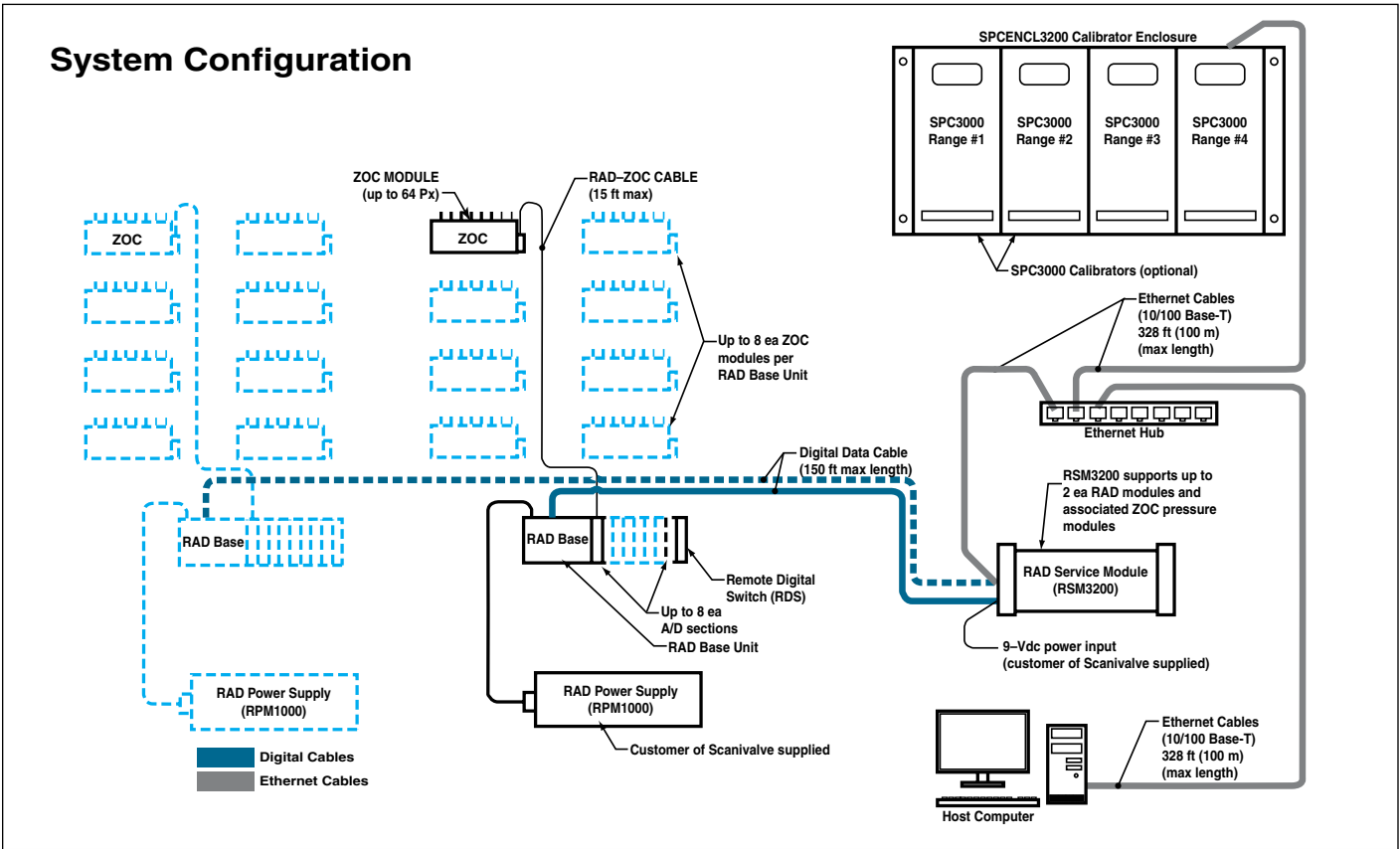
A/D MODULE

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 control 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. Up to 8 RDS modules can be used on one RADBASE.



RDS3200 MODULE

E-RAD System



E-RAD System

The E-RAD Ethernet pressure measuring system consists of:

- 1 each RSM3200 with RAD2 software installed
- 1 or 2 each RAD3200 bases (16 to 1024Px)
- 1 to 16 each ZOC pressure scanners
- Cables, power supplies, & accessories
- Optional SPC3000 pressure calibrators

The E-RAD system utilizes the field proven RAD3200 Remote A/D. The E-RAD system allows the ZOC pressure scanners and RAD A/D to be mounted inside a wind tunnel model. A small diameter digital communication cable comes out of the model and connects to the RSM3200 where data are converted to EU and output via Ethernet to the user's host computer or network.

The E-RAD 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 systems, or any user host or network.

E-RAD Software

RAD2.exe software is installed in the RSM3200 RAD Service module. It supports up to two RAD Systems.

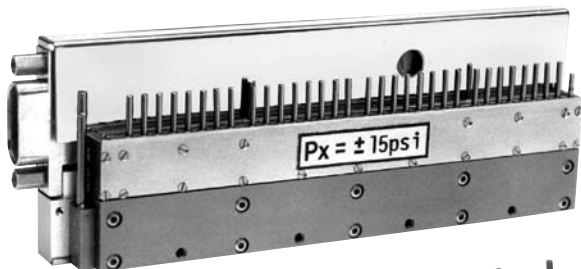
The RAD2.exe software contains user commands and configuration variables. The commands permit a user to control all functions of the RAD, including control of external devices. The configuration variables permit a user to define communications, RAD module setup, identification, scanning, EU conversion and Data output. Because the calibration files for the ZOC pressure scanners are stored in memory in the RSM3200, all Engineering Unit conversion occurs in the RSM3200. The variables for any test configuration may be saved to a file for future use.

Scanning may be initiated through a software or hardware trigger for synchronization with other data systems.

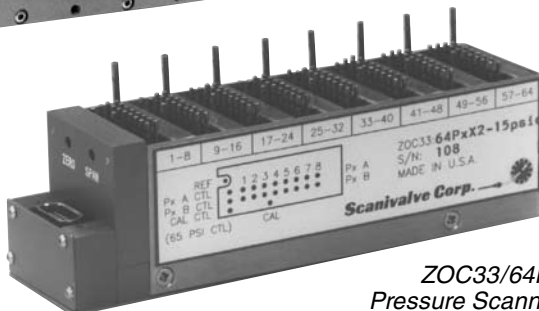
Included with the E-RAD system software is a Windows based software communication program, RADLINK. It is a menu driven configuration and communication program. Direct communication and data acquisition to the E-RAD can also be made with ASCII commands via Telnet or Hyperterminal. Also included is a field calibration program (PRESSCAL) for performing on-line calibration of the ZOC pressure scanners.

An Optional LabVIEW driver is available for communication to the E-RAD pressure measuring system.

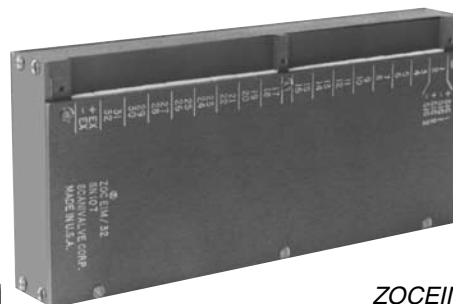
ZOC Pressure Scanners



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 RSM3200 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 RAD2.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) are manufactured with an ID chip installed. Legacy 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)

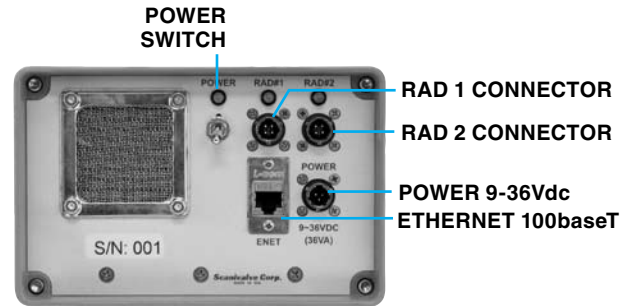
* Models available with Duplexing function. Duplexing shares two pressure inputs (Px) with one pressure sensor.

RSM3200

RSM3200

The RSM3200 (RAD Service Module) is specifically designed for use with the E-RAD pressure measurement system. It incorporates an embedded PC running the RAD2.exe software. It also contains provisions to communicate with 2 each RAD-BASE3200-EXT modules (up to 1024 Px).

The main function of the RSM3200 is to convert the RAD digital data stream into temperature compensated Engineering Units. Data are transmitted via Ethernet TCP/IP or UDP 10/100baseT in Engineering Units using ASCII or binary format. Data are transmitted at 590 Hz/channel/second maximum. This unloads the user's host from making these calculations. This architecture design enhancement allows for universal operation on all hardware platforms and operating systems that have an Ethernet port.



E-RAD Specifications

Power Requirements:

RADBASE:	+15Vdc @ 41mA
	- 15Vdc @ 4mA
	+ 5Vdc @ 610mA
A/D (each):	+15Vdc @ 105mA
	- 15Vdc @ 5.5mA
ZOC (each):	+15Vdc @ 120mA
	- 15Vdc @ 16mA
RSM3200:	24Vdc nominal @ 1.5A (9-36 Vdc)

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

No. of ZOC Modules Supported by one RAD base: 1 to 8

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

No. of RAD Bases Supported on one RSM3200: 2

Accuracy:

10 inch	H ₂ O	±0.15%F.S.
20 inch	H ₂ O	±0.12%F.S.
1 to 2.5	psid	±0.10%F.S.
5 to 50	psid	±0.08%F.S.
51 to 500	psid	±0.05%F.S. (ZOC17)
501 to 750	psid	±0.08%F.S. (ZOC17)

A/D Module

Mating Connector: Cannon 15 pin MDM15SL2P

RADBASE Mating Communication Connector:

MDM-9SH003L-A174

A/D Resolution: 16 bits

Sample Throughput Rates*:

512Px 590/Hz/channel binary UDP
1024Px 310/Hz/channel binary UDP

RSM3200 Mating Connectors:

Ethernet Connector: RJ-45
Power Connector: PT06A-8-3S-SR

RSM & 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 11.43mm)

RSM3200: 6.73 in. x 4.34 in. x 11.41 in.
(170.94mm x 110.24mm x 289.81mm)

Weight:

RADBASE: 0.31 lbs. (141gms)
RAD A/D3200: 0.05 lbs. (23gms)
RSM 3200: 7.1 lbs. (3.22Kgms)

*Actual rates may vary depending on host computer memory and speed. Contact factory for ASCII data throughput via TCP/IP.

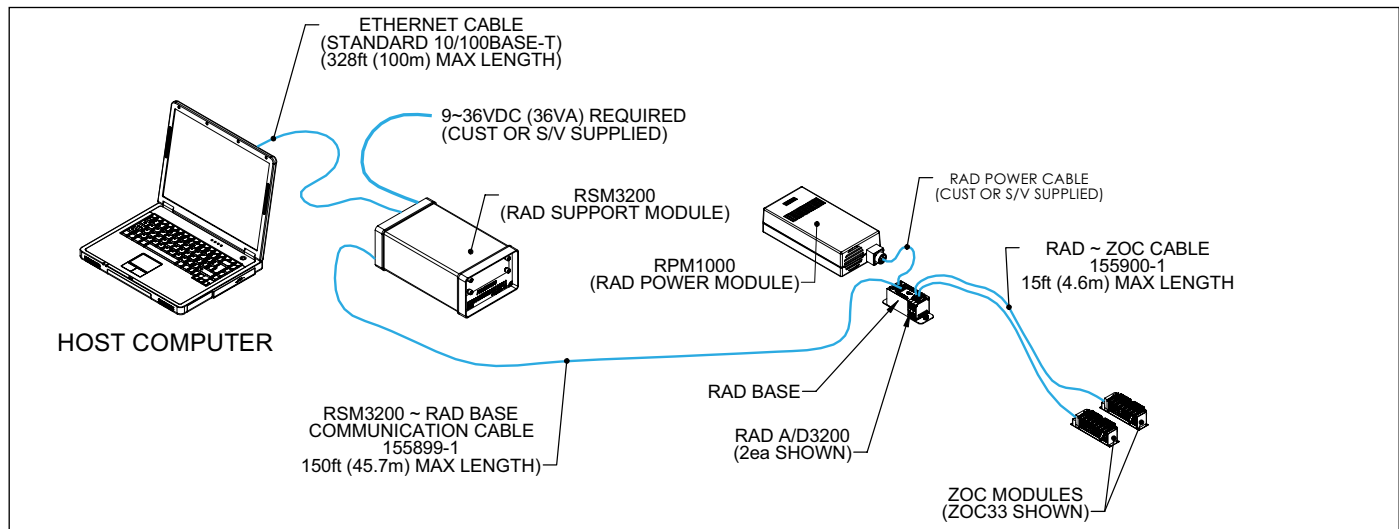
E-RAD Ordering Information

Ordering information for E-RAD system with 2 ZOC pressure scanners shown below:

- 1 each RADBASE3200-EXT
- 2 each RAD A/D3200 plug-in modules
- 1 each RPM1000 RAD power module with mating RADBASE connector or user supplied power & cable
- 2 each ZOC pressure scanners (specify ZOC model, pressure range and standard or duplex feature)
- 2 each Temperature Calibration Data
- 2 each 155900-1 RAD A/D to ZOC cabling (max 15 feet/4.61m)
- 1 each RSM3200 RAD Service Module with RAD2.exe software installed
- 1 each 155899-1 Digital communication cable with mating connectors (specify length up to 150 feet)

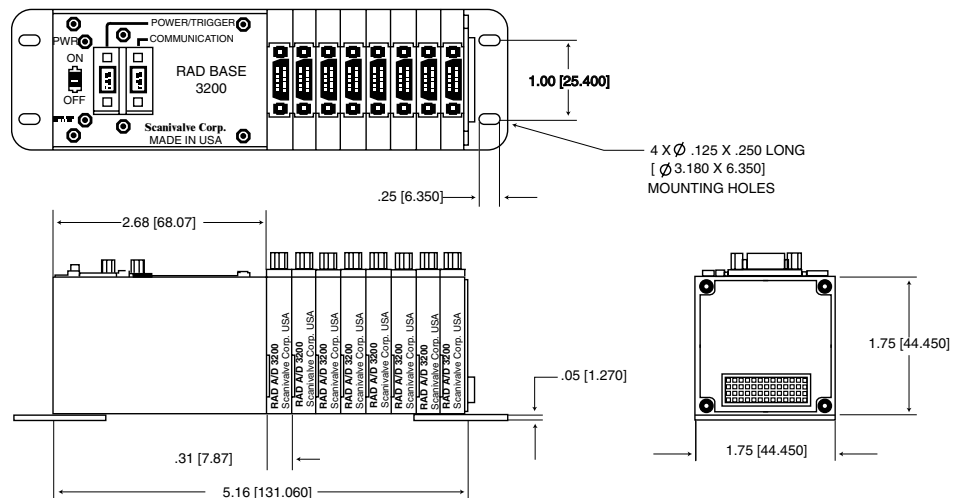
Optional:

- Online pressure calibration systems are available, model SPC3000 pressure calibrator
- 1 each RDS3200 Remote Digital Switch
- 1 each MSCP3200 miniature solenoid control pack for switching control pressures
- 1 each 155284-1 Labview driver



Dimensions Inches (mm)

RAD3200



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

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