

**ZOCEIM/16  
ZOCEIM/32  
INSTRUCTION AND SERVICE MANUAL**

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## INTRODUCTION

The ZOCEIM is designed to amplify and multiplex 16 or 32 different analog signal inputs. The channels are selected by a 4 or 5 bit binary CMOS level address and can be multiplexed at speeds up to 100 kHz when used with a HyScan 2000 Data Acquisition System. The ZOCEIM is available in two versions: 16 or 32 channels.

The ZOCEIM is similar to all other cable serviced ZOC electronic pressure scanners. It utilizes the same fifteen pin connector and is addressed in the same manner. It is pin compatible with all multiplexed electronic pressure scanners.

The ZOCEIM may be interfaced to a HyScan 1000 or HyScan 2000 Data Acquisition System via the mating connector that is furnished with the unit. The ZOCEIM has a very small aspect ratio. A mounting bracket is provided that makes it easy to install virtually anywhere.

The amplifier gain may be set at 1, 10, 100, or 1000. Should needs change, the gain can be user set.

Additional features are a factory installed circuit to provide an excitation voltage for strain gauges, RTD's or pressure transducers. The circuit will provide +5 Vdc at 50 ma(optional voltages of 7 and 10 Vdc are available on special order).

## INSTRUCTIONS FOR ZOCEIM ELECTRICAL CONNECTIONS

Refer to ZOCEIM Drawing No. 15550 sheet 1.

- A) With power off, connect all wires to 15 pin mating connector as shown in Drawing No. 15550 Sheet 1.
- B) If the module will be used with a HyScan 1000 or HyScan 2000 Data Acquisition System, no further adjustments are required. Connect the module to a CSM2000 and energize the system. For more information, please refer to the applicable HyScan system manual.
- C) If the ZOCEIM will not be used with a HyScan system, adjust the power supply to  $\pm 15$  Vdc. Connect the module to the power supply, energize the system, and readjust the power supply. The ZOCEIM should draw approximately 45 ma from each voltage unless an excitation circuit is installed.

**WARNING** - Making or breaking connections with power on will damage the module.

## ZOCEIM/16 CIRCUIT DESCRIPTION

Refer to Drawing No. 15515, sheets 6 & 7

The ZOCEIM/16 circuit may be broken down into four functional blocks. These are the analog multiplexer, amplifier, address logic, and excitation circuits.

The multiplexing block consists of four, eight channel differential analog multiplexers: U1 through U4. The user connects the input signals to P18 through P33. These sixteen signals go to every odd numbered multiplexer input. The outputs of the multiplexers are bussed together. The address logic enables one of the multiplexers, based on the address input to the ZOCEIM. The channel within each multiplexer is selected by address lines ADR1 and ADR2 (ADR0 is always low).

The multiplexed signal is input into the instrument amplifier(U5). This IC has internally set gains of 1, 10, 100, and 1000. Jumpers soldered into W1 are used to select the amplifier gain.

The address logic section consists of two resistor networks: RN1 and RN3, and two IC's: U6 and U7. The digital inputs to the ZOCEIM/16 are four address lines that select an input channel, and a strobe line used to latch the address. Pulling the strobe line low causes U7 to latch the channel address at its given state. Any changes to the address inputs will be locked out until the strobe is set high.

Because the analog signals are connected to every other multiplexer input the ZOCEIM/16 input address lines are shifted up one bit before they are sent to the multiplexer (i.e. A0-> ADR1, A1-> ADR2). These address lines are sent to all four multiplexers in parallel. Input addresses A2 and A3 are decoded by U6 to enable the appropriate multiplexer chip. A multiplexer is active when the enable line goes high, otherwise its output is in a high impedance state.

The excitation circuit provides a stable 5 volt output at a nominal 50 ma. It consists of a voltage reference that feeds a low offset op-amp in a voltage follower configuration. A high reliability transistor is placed in the feedback path to increase the driving capability. This transistor has internal thermal shutdown and short circuit protection. Each analog input has a connection to the excitation supply.

## ZOCEIM/32 CIRCUIT DESCRIPTION

Refer to Drawing No. 15515 sheets 4 & 5

The ZOCEIM/32 circuit may be broken down into four functional blocks. These are the analog multiplexer, amplifier, address logic, and excitation circuits.

The multiplexing block consists of four, eight channel differential analog multiplexers: U1 through U4. The user connects the input signals to P1 through P16. These thirty two signals go directly to the multiplexer inputs. The outputs of the multiplexers are bussed together. The address logic enables one of the multiplexers at a time, based on the address input to the ZOCEIM. The channel within each multiplexer is selected by address lines ADR0, ADR1 and ADR2.

The multiplexed signal is fed into the instrument amplifier(U5). This IC has internally set gains of 1, 10, 100, and 1000. Jumpers soldered into W1 are used to select the amplifier gain.

The address logic section consists of two resistor networks: RN1 and RN2, and two IC's: U6 and U7. The digital inputs to the ZOCEIM/32 are five address lines that select an input channel, and a strobe line used to latch the address. Pulling the strobe line low causes U7 to latch the channel address at its given state. Any changes to the address inputs will be locked out until the strobe is set high.

Input addresses A3 and A4 are decoded by U6 to enable the appropriate multiplexer chip. A multiplexer is active when the enable line goes high, otherwise its output is in a high impedance state.

The excitation circuit provides a stable 5 V output at a nominal 50 ma. It consists of a voltage reference that feeds a low offset op-amp in a voltage follower configuration. A high reliability transistor is placed in the feedback path to increase the driving capability. This transistor has internal thermal shutdown and short circuit protection. The excitation voltage output is bussed out to P17. The excitation voltage may be connected to the inputs from this connector.

## GAIN ADJUSTMENT

Refer to Drawing No. 80523 sheet 1

- 1) Turn off **ALL** power to the ZOCEIM.

**WARNING** - Making or breaking connections with the power on will damage the module.

- 2) Disconnect the ZOCEIM and remove both side panels.

- 3) Using a soldering iron, remove all jumpers from area W1 on the circuit board. Resolder them in the configuration you want according to the referenced drawing. Keep the jumpers as short as possible to prevent excessive noise or possible short circuits in the ZOCEIM.

**CAUTION** - It is important to observe good instrument practices when using a soldering iron. Avoid excessive heat on the unit which could cause damage to the circuit board. Also, good anti-electrostatic discharge practices will prevent damage to components.

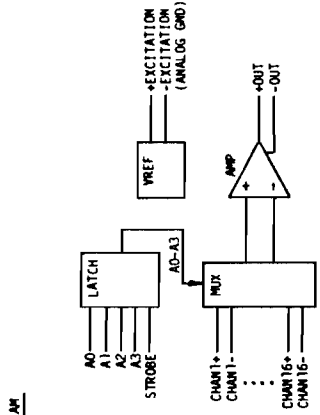
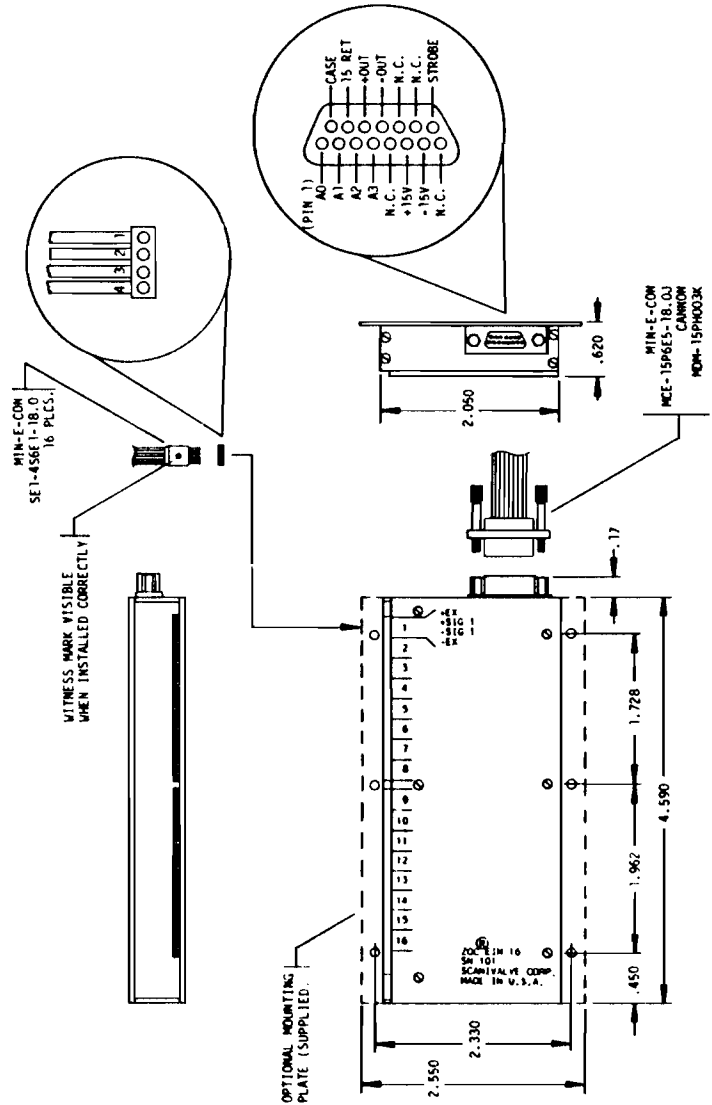
- 4) Check all connections to make sure you have it connected correctly, then reinstall both side panels.
- 5) Reconnect the interface cable to the ZOCEIM. After verifying all connections are correct, turn on the power and check for proper operation.
- 6) If a problem occurs, recheck all work. If the problem persists, contact Scanivalve Corp Product Support Department for assistance.

# SCANIVALVE® CORP.

SAN DIEGO, CA, USA

OUTLINE DIM. ZOCEIM/16	
Part No.	80409
Rev. BCF	Rev. MAR91
Rev. ECM-744	Rev. MAR91
SMT 2 of 2	

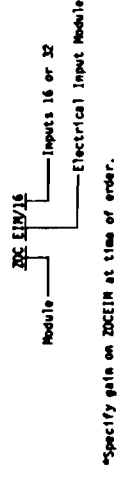
**NOTES: UNLESS OTHERWISE SPECIFIED**  
 1. ALL DIMENSIONS IN INCHES.  
 2. SEE MPD 15556-2.



## SPECIFICATIONS

- Signal Inputs: 16 (See sheet 1 for 32 channel)
- Input Signals: ±2mV up to ±10VDC differential
- DC Power: +15VDC 100mA, -15VDC 50mA
- Output Signals: Nominal: ±2.5VDC, Maximum: ±10VDC
- Excitation Circuit: STD. ±5VDC 50mA, Optional 7VDC, 10VDC available as special order
- Common Mode Rejection: ±10VDC greater than 100 dB
- Over Voltage: 30 Volts peak to peak
- Gain Settings: USER DEFINED 1 TO 1000, Specify at time of order
- Standard gain settings are:  
 1 +/- 0.03% 50ppm/OEG C  
 10 +/- 0.15% 10ppm/OEG C  
 100 +/- 0.35% 25ppm/OEG C  
 1000 +/- 1.0% 50ppm/OEG C
- Accuracy: ±0.25%FS
- Scan Rate: ZOCEIM: 20kHz
- Sensor Channel Addressing: 4 BIT Binary, CMOS level
- Digital Inputs (Addressing): V in LOW 2.5V max., V in HIGH 12.5V min.
- Internal ZTE pullups to +15V supply
- Address strobe level sensitive, transparent high, latched low.
- Max. Operating Temperature: 0 to 70°C
- Max. Storage Temperature: 0 to 85°C
- Weight: 4.5 oz. (1.26gm)

## ORDERING INFORMATION







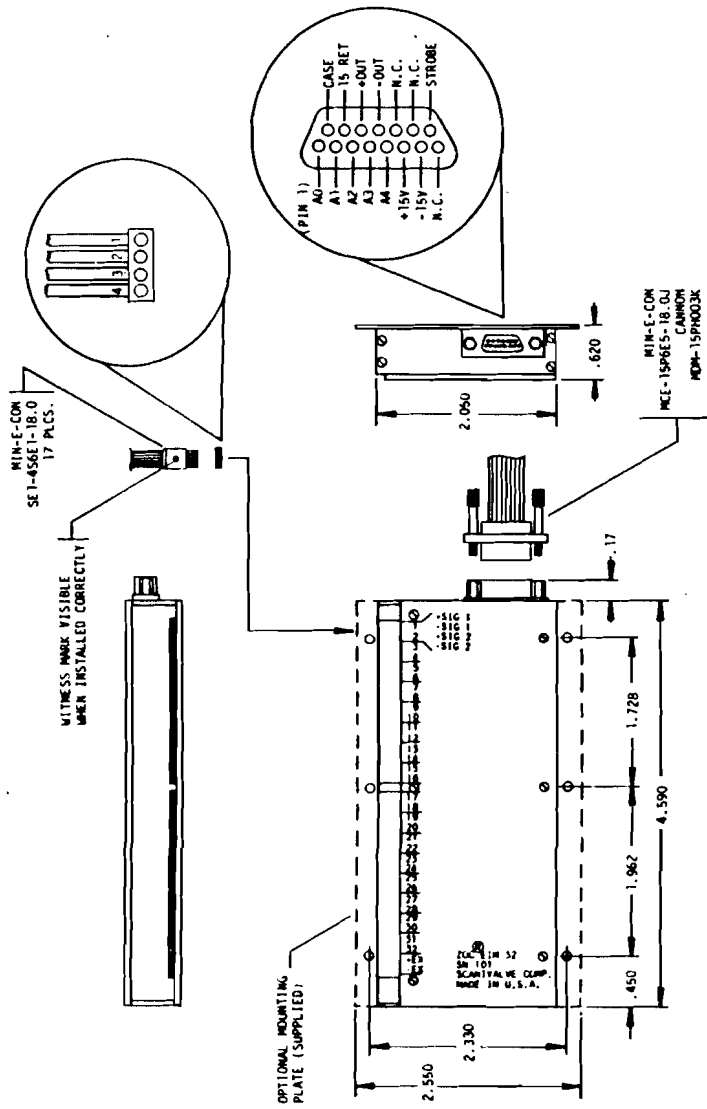
**SCANIVALVE CORP.**  
SAN DIEGO, CA, U.S.A.

OUTLINE DWG. ZOCEIM/32

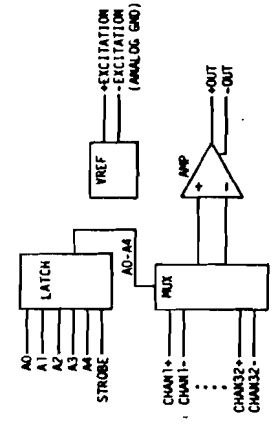
Part No.	Rev.	DATE	BY	CHKD	APP'D
10409	1	MAR 91			
B   ECRN-744 RLF MAR91					
D   10409 SHT 1 OF 2					

**NOTES: UNLESS OTHERWISE SPECIFIED**

1. ALL DIMENSIONS IN INCHES.
2. SEE MAP 15550-1.



**BLOCK DIAGRAM**



**SPECIFICATIONS**

**Signal Inputs:** 32 (See sheet 2 for 16 channel)

**Input Signals:** ±20mV up to ±10VDC differential

**DC Power:** +15VDC 100mA  
-15VDC 50mA

**Output Signals:** Nominal: ±2.5VDC  
Maximum: ±10VDC

**Excitation Circuit:** STD. ±6VDC Schem  
Optional 7VDC, 10VDC available as special order

**Common Mode Rejection:** ±10VDC greater than 100 DB

**Over Voltage:** 30 Volts peak to peak

**Gain Settings:** USER DEFINED 1 TO 1000  
Specify at time of order  
Standard gain settings are:  
1 +/- 0.03% Span/DEG C  
10 +/- 0.15% Span/DEG C  
100 +/- 0.35% Span/DEG C  
1000 +/- 1.0% Span/DEG C

**Accuracy:** ±0.25%FS

**Scan Rate:** ZOCEIM: 200Hz

**Sensor Channel Addressing:** 5 BIT Binary, CMOS level

**Digital Inputs (Addressing):** V in LOW 2.5V max.  
V in HIGH 12.5V min.

Internal 22K pullups to +15V supply

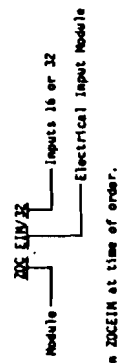
Address strobe level sensitive, transparent high, latched low.

**Max. Operating Temperature:** 0 to 70°C

**Max. Storage Temperature:** 0 to 85°C

**Weight:** 4.5 oz. (1.28kg)

**ORDERING INFORMATION**



\*Specify gain on ZOCEIM at time of order.



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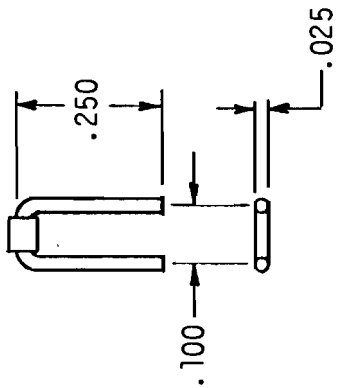
ZOCEIM GAIN SETTINGS

DATE 2/91 BY CJH 80523 SHT 1 of 1

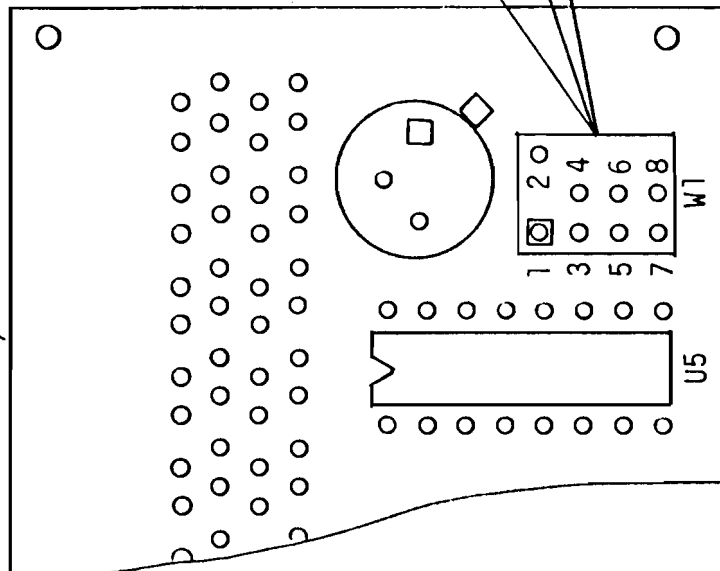
NOTES: UNLESS OTHERWISE SPECIFIED

- 1. Solder jumpers in place.  
Avoid long leads.

SQUIRES ELECTRONICS JUMPER  
J0 .100 X 0.125T 22 WHT



PCB 15515-1 & -2



GAIN	JUMPER
1	NONE
10	3-4
100	5-6
1000	7-8

