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**EQUIPMENT INSTALLATION MANUAL**

**for the**

**GDC62 RADIO ALTIMETER INTERFACE UNIT**

**P/N 1102-4000-01**

**RELEASED**

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Austin, TX 78729

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### RECORD OF REVISIONS

| <b>REV</b> | <b>DESCRIPTION</b>                     | <b>DATE</b> | <b>APPROVED</b> |
|------------|--|-------------|-----------------|
| IR         | INITIAL RELEASE E1438                  | 04/02/2012  | BH              |
| A          | Correct wire names in Section 15 E1452 | 04/17/2012  | BH              |
| B          | Add Functional Test Mode E1467         | 06/07/2012  | BH              |
| C          | See ECO E1641-03                       | 02/20/2013  | BH              |
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## 1. INTRODUCTION:

This manual contains installation data, specifications and continued airworthiness information for the GDC62 Radio Altimeter Interface Unit (RAIU), part number 1102-4000-01.

## 2. DESCRIPTION:

The Model GDC62 RAIU produces ARINC 429 label 164 from a direct current (dc) input voltage supplied from any one of the Radio Altimeter models listed in Table 5.2-1.

## 3. PART NUMBER:

The Model GDC62 RAIU is available under the following part number:

1102-4000-01-001( )      Radio Altimeter Interface Unit

|  
Software part number, where ( ) contains the number zero for initial release, or any letter, A – Z to denote a minor change.

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## 4. REFERENCE DOCUMENTS

|              |   |
|--------------|---|
| ETSO-2C87    | TSO, Low Range Radio Altimeters   |
| ED-30        | Minimum Performance Specification for Airborne Low Altitude Range Radio (RADAR) Altimeter Equipment |
| RTCA/DO-160E | Environmental Conditions and Test Procedures for Airborne Equipment                                 |
| RTCA/DO-178B | Software Considerations in Airborne Systems and Equipment Certification                             |
| ARINC 429    | Mark 33 Digital Information Transfer System   |

## 5. REGULATORY COMPLIANCE:

### 5.1. Software

The GDC62 software was developed in accordance with RTCA/DO-178B to criticality level C.

### 5.2. Hardware

The GDC62 is approved via PMA using the guidance of ETSO-2C87, Low Range Radio Altimeters, for equipment performance requirements. The GDC62 is only approved for installation with the radio altimeter models listed in Table 5.2-1.

| Model      | Make          |
|------------|---------------|
| KRA 10     | Bendix / King |
| KRA 405 /B | Bendix / King |
| ALT 50     | Collins       |
| ALT 55     | Collins       |
| ARINC 552  | ARINC         |
| RT 200     | Sperry        |

**Table 5.2-1**  
**Approved Interfaces**



## 6. SUPPLIED EQUIPMENT

Each unit is shipped with the following items:

| Part Number         | Description                          | Qty |
|---------------------|--------------------------------------|-----|
| 1102-4000-01-001( ) | GDC62 Radio Altimeter Interface Unit | 1   |
| 0000-4200-62        | Installation Kit                     | 1   |

Complete installation kits are available under kit part number 0000-4200-62. Individual pieces are available under the part numbers shown. Contact DAC International sales to place orders.

| Part Number  | Description                         | Qty |
|--------------|-------------------------------------|-----|
| 0000-4200-62 | Installation Kit                    |     |
| M24308/2-14F | Connector, Receptacle, 62 pin D-Sub | 1   |
| P10891       | Backshell, 62-Pin D-Sub             | 1   |

Additional sockets are available under DAC part number M39029/57-354, quantity as required (A/R).

|               |                             |     |
|---------------|-----------------------------|-----|
| M39029/57-354 | Socket, Crimp Style, female | A/R |
|---------------|-----------------------------|-----|



## 7. GDC62 SPECIFICATIONS:

### 7.1. Physical:

The GDC62 attaches to the airframe using four (4) #8 screws. See the paragraph titled Outline Drawing for additional details.

|                                 |             |
|---------------------------------|-------------|
| Height.....                     | 1.25 inches |
| Width (including flanges) ..... | 5.00 inches |
| Depth.....                      | 4.06 inches |
| Weight.....                     | 0.5 lb..    |

### 7.2. Electrical:

|                     |  |
|---------------------|--|
| Input Voltage ..... | 28 VDC Nominal (10Vdc – 32Vdc operational) |
| Input Current.....  | 0.2 Amp nominal at 28 VDC                  |

### 7.3. DC Radio Altitude Input:

#### 7.3.1. Input Range

|                                    |   |
|------------------------------------|---|
| Number of differential inputs..... | 2   |
| RADALT_LV .....                    | Range: -0.12Vdc to +17.5Vdc (Refer to Section 15) |
| RADALT_HV.....                     | Range: -0.20Vdc to +29Vdc (Refer to Section 15)   |

#### 7.3.2. Scale Factors

|                 |                                     |   |
|-----------------|-------------------------------------|---|
| KRA 10A .....   | 20ft to 2500ft,                     | +4mV/ft   |
| KRA 405/b.....  | -20ft to 2500ft,                    | Volts = -10mV/ft, zero ft = 0Vdc  |
| ALT 50.....     | -20 to ≤500ft,<br>>500ft to 2500ft, | Volts = (0.02Vdc * ALT) + 0.4Vdc<br>Volts = 0.003 * (ALT-500) + 10.4Vdc |
| ALT 55.....     | -20 to ≤500ft,<br>>500ft to 2500ft, | Volts = (0.02Vdc * ALT) + 0.4Vdc<br>Volts = 0.003 * (ALT-500) + 10.4Vdc |
| ARINC 552 ..... | -20 to ≤480ft,<br>>480ft to 2500ft, | Volts = (0.02 * ALT) + 0.4Vdc<br>Volts = 10 * (1+ln ( (ALT + 20) / 500) |
| RT 200 .....    | -20 to 2500ft                       | Volts = -4mV/ft, zero ft = 0Vdc   |





### 7.3.3. Valid Flag

Valid.....0Vdc to 1 Vdc or 9Vdc to 32Vdc

Invalid.....1Vdc < INVALID < 9Vdc

### 7.4. Configuration Discretes

Active.....GND (X)

Inactive.....Open

| Model      | Configuration Jumpers |       |       |       |       |       |       |       |
|------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|            | J1-53                 | J1-51 | J1-50 | J1-48 | J1-47 | J1-46 | J1-45 | J1-44 |
| KRA 10     | X                     |       |       |       |       |       |       |       |
| KRA 405 /B |                       | X     |       |       |       |       |       |       |
| ALT 50     |                       |       | X     |       |       |       |       |       |
| ALT 55     |                       |       | X     |       |       |       |       |       |
| ARINC 552  |                       |       |       | X     |       |       |       |       |
| RT 200     |                       |       |       |       | X     |       |       |       |

**Table 7.4-1  
Selection Chart**

### 7.5. Functional Test Discrete:

Active.....GND

Inactive.....Open

Operation.....If the Functional Test discrete (J1-44) is active, and the radio altimeter is reporting valid, the GDC62 shall set the ARINC word Sign Status Matrix (SSM) to Functional Test (binary 1 0 in message bits 31 and 30). If the radio altimeter reports invalid, the GDC62 shall set the SSM to Fail Warning (binary 0 0).



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## 7.6. ARINC 429 Output:

|                             |  |
|-----------------------------|--|
| Number of output ports..... | 2  |
| OUT-1 .....                 | ARINC 429 High Speed (Refer to Section 15)   |
| OUT-2 .....                 | ARINC 429 Low Speed (Refer to Section 15)  |
| Operation.....              | The GDC62 will set the Sign Status Matrix of the ARINC messages as follows:<br>Normal when pin 62 = valid and pin 44 = open.<br>Functional Test when pin 62 = valid and pin 44 = GND.<br>Fail when pin 62 = invalid. |

## 7.7. Reliability:

|            |                            |
|------------|----------------------------|
| MTBF ..... | Greater than 40,000 hours. |
|------------|----------------------------|



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## 8. OPERATION:

The GDC62 contains no operator controls. It accepts an input voltage from one of the radio altimeter models listed in §5.2, performs an analog to digital conversion selected by the programming straps then outputs digital radio altitude via ARINC label 164 on both a high speed and a low speed output port.



## 9. INSTALLATION:

This section contains considerations and recommendations for installation of the GDC62 LRU. The interconnect wiring harness and physical mounting must be considered to satisfy all applicable regulations. The environmental conditions and tests required for TSO of these articles are minimum performance standards. If this article is installed in a location that would place it in environmental conditions outside the limitations listed in the manual, it is the responsibility of that installing agency to determine if additional compliance data is required and to present such data to the administrator of the Federal Aviation Administration or other applicable certifying agency. Refer to the Environmental Qualification Forms found later in this document.

### 9.1. Aircraft Interconnect Wiring

The typical interconnect diagram and connector pin listings are provided to assist the installation agency in preparation of the interconnect wiring cables. Wiring shown as twisted/shielded must be installed as shown in order to maintain compliance with the Environmental categories. Analog inputs and ARINC 429 outputs are all connected using twisted shielded pairs (M27500-26SB2T23 or equivalent). Power and ground return signals should be connected using M22759/32-24-9 or equivalent.

| DESCRIPTION        | PART NO.                      |
|--------------------|-------------------------------|
| 24 AWG             | M22759/32-24-9 or equivalent  |
| TPL TWSTD SHIELDED | M27500-24SB3T23 or equivalent |
| DBL TWSTD SHIELDED | M27500-24SB2T23 or equivalent |
| SHIELD TERMINATION | M83519/2-13 or equivalent     |

### 9.2. Mounting

The GDC62 is intended to mount in the aircraft electronic equipment bay but may mount in either a pressurized or non-pressurized section of the aircraft so long as consideration is given to the appropriate environmental categories. It can be mounted in any orientation. The GDC62 is secured with installer provided hardware; four each 8-32 screws (length as appropriate for aircraft installation), four each #8 flat washers, and four each #8 lock washers are required for proper installation. See section 16 for the location dimensions of the mounting holes. It is recommended that at least 4 inches of clearance be provided on the connector side of the GDC62 to allow room for the mating connector and cable.



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## 10. REMOVAL AND REPLACEMENT

### 10.1. Removal

1. Open the circuit breaker powering the GDC62.
2. Loosen the two jack screws on P1 and remove the connector.
3. Remove four (4) screws securing the unit to the airframe.

### 10.2. Replacement

1. Open the circuit breaker powering the GDC62.
2. Attach the unit to the airframe with four (4) screws.
3. Attach connector P1 to the GDC62. Thread the two jack screws on P1 in J1 then tighten.
4. Close circuit breaker.
5. Perform operational test of the GDC62 as prescribed in the aircraft maintenance manual.

## 11. EQUIPMENT CHECKOUT

The GDC62 provides ARINC 429 radio altitude data to an EFIS or other suitable display. There are no operator controls associated with the GDC62. The radio altimeter and the EFIS or other equipment utilizing the GDC62 output data must be operational in order to perform this functional test.

1. Apply power to the radio altimeter and EFIS.
2. Configure the EFIS to display radio altitude.
3. Perform the functional test of radio altimeter according to existing, approved maintenance data.
4. Verify correct EFIS radio altitude is displayed on the EFIS or other display equipment.



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## 12. CONTINUED AIRWORTHINESS:

This section provides data intended to assist the installer with establishing Instructions for Continued Airworthiness as required by FARs 23.1529, 25.1529, 27.1529 and 29.1529.

1. Maintenance Manual information for the GDC62, which includes system description, removal instructions, installation instructions and functional testing, is contained in DAC International Installation Manual, 1102-2510-01 (this document).
2. Line Replaceable Unit (LRU) part numbers and other parts contained in the installation data package should be placed in the aircraft operator's appropriate airplane Illustrated Parts Catalog (IPC).
3. Wiring diagram information contained in the installation data package should be placed in the aircraft operator's appropriate airplane Wiring Diagram Manual.
4. Scheduled Maintenance Program tasks are as follows:
  - a. Recommended Periodic Scheduled Servicing: ..... None required
  - b. Recommended Periodic Scheduled Preventive Maintenance Tests..... None Required
  - c. Recommended Periodic Inspections: ..... None Required
  - d. Recommended Periodic Overhaul Period ..... None Required
  - e. Special Inspection Requirements ..... None Required
5. Application of Protective Treatments ..... None Required
6. Special Tools..... None Required
7. Electrical Loads for this article are as specified in the DAC International Installation Manual, 1102-2510-01 (this manual).
8. There are no Airworthiness limitations associated with the installation of this article.

### 13. ENVIRONMENTAL:

NOMENCLATURE: Model GDC62 Radio Altimeter Interface Unit  
 PART NO: 1102-4000-01-XXXX  
 MANUFACTURER: DAC International  
 ADDRESS: 6702 McNeil Drive, Austin, TX 78729  
 RTCA/DO-160E Environmental Conditions and Test Procedures for Airborne Equipment

| Section  | Category | Remarks  |
|--|----------|--|
| 4.0 Temperature and Altitude                                 | D2       | 50,000 Ft  |
| 5.0 Temperature Variation                                    | B        | Partially controlled temperature   |
| 6.0 Humidity   | A        | Standard Humidity  |
| 7.0 Operational Shock and Crash Safety                       | B        | Standard Operational Shock   |
| 8.0 Vibration  | SBM      | Curve B, A/C Type 2, Fixed Wing – Turbojet or Turbofan, Reciprocating & Turboprop Engines, Single and Multi Eng, Aircraft Zone 2. Curve M, A/C Type 5, Fixed Wing – Reciprocating & Turboprop, Multi Eng, Aircraft Zone 2. |
| 9.0 Explosion Proofness                                      | X        | Not Tested   |
| 10.0 Waterproofness  | X        | Not Tested   |
| 11.0 Fluids Susceptibility                                   | X        | Not Tested   |
| 12.0 Sand and Dust   | X        | Not Tested   |
| 13.0 Fungus Resistance                                       | X        | Not Tested   |
| 14.0 Salt Spray  | X        | Not Tested   |
| 15.0 Magnetic Effect   | Z        | Less than 0.3 meter  |
| 16.0 Power Input   | B        | Alternator / Rectifiers with battery   |
| 17.0 Voltage Spike   | A        | E = 600 volts  |
| 18.0 AF Conducted Susceptibility – Power Inputs              | B        | Alternator / Rectifiers with battery   |
| 19.0 Induced Signal Susceptibility                           | AC       | No interruption of operation   |
| 20.0 Radio Frequency Susceptibility (Radiated and Conducted) | QQ       | 50 volts/meter, 0.075 amps/meter   |
| 21.0 Emission of Radio Frequency Energy                      | M        | At or below acceptable limit per DO-160E.  |
| 22.0 Lightning Induced Transient Susceptibility              | A3XXX    | Pin input test, interference controlled to tolerable levels.   |
| 23.0 Lightning Direct Effects                                | X        | Not Tested   |
| 24.0 Icing   | X        | Not Tested   |
| 25.0 ESD   | A        | Aircraft mounted equipment   |



## 14. CONNECTOR PIN OUT:

The GDC62 contains a single 62-pin male connector, J1, DAC part number P10879. The part numbers for mating connector P1, along with crimp pins and backshell are described previously under the section “Equipment Supplied”.

| Pin | Signal  | Function                                |
|-----|---------|---|
| 1   | A+      | 28 Vdc Primary Power                    |
| 2   |         | Reserved                                |
| 3   |         | Reserved: ARINC Transmitter 4A          |
| 4   |         | Reserved: ARINC Transmitter 4B          |
| 5   | 429TX2A | ARINC Transmitter 2A, Low Speed         |
| 6   | 429TX2B | ARINC Transmitter 2B, Low Speed         |
| 7   |         | Reserved (COM 2 RX) Production Use Only |
| 8   |         | Reserved: ARINC Receiver 3A             |
| 9   |         | Reserved: ARINC Transmitter 3A          |
| 10  |         | Reserved (COM 1 RX)                     |
| 11  | n/c     |   |
| 12  | n/c     |   |
| 13  | n/c     |   |
| 14  |         | Reserved                                |
| 15  |         | Reserved                                |
| 16  |         | Reserved                                |
| 17  | 429TX1A | ARINC Transmitter 1A, High Speed        |
| 18  | 429TX1B | ARINC Transmitter 1B, High Speed        |
| 19  | 429RX1A | ARINC Receiver A                        |
| 20  | 429RX1B | ARINC Receiver B                        |
| 21  |         | Reserved                                |
| 22  | A+      | 28 Vdc Primary Power                    |
| 23  |         | Reserved                                |
| 24  |         | Reserved: ARINC Receiver 4A             |
| 25  |         | Reserved: ARINC Receiver 4B             |
| 26  |         | Reserved: ARINC Receiver 2A             |
| 27  |         | Reserved: ARINC Receiver 2B             |
| 28  |         | Reserved (COM 2 TX) Production Use Only |
| 29  |         | Reserved: ARINC Receiver 3B             |
| 30  |         | Reserved (COM 1 TX)                     |
| 31  | n/c     |   |
| 32  |         | Reserved: ARINC Transmitter 3B          |
| 33  | n/c     |   |

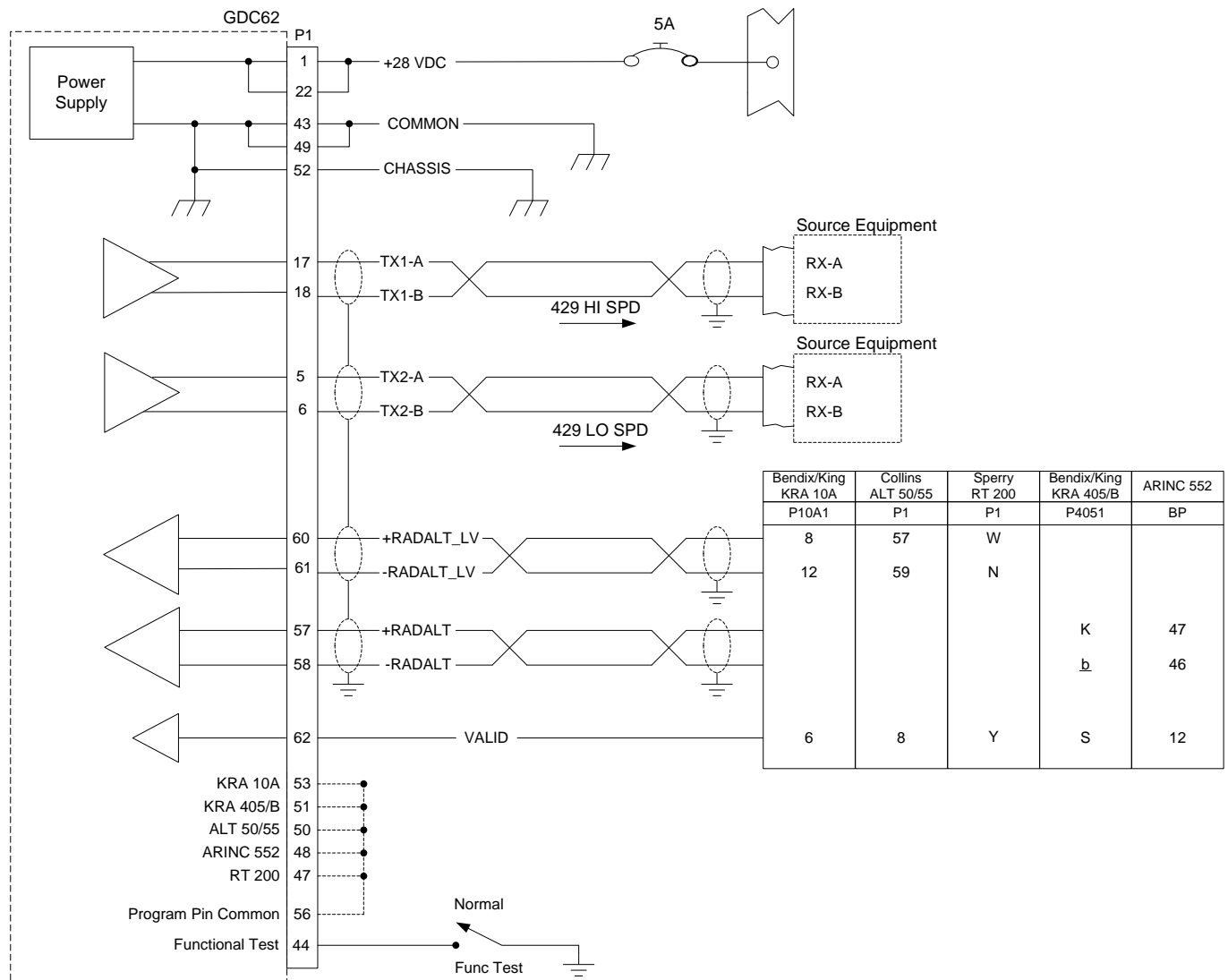


| <b>Pin</b> | <b>Signal</b>  | <b>Function</b>                                    |
|------------|----------------|--|
| 34         | n/c            |  |
| 35         |                | Reserved   |
| 36         |                | Reserved   |
| 37         |                | Reserved   |
| 38         |                | Reserved   |
| 39         |                | Reserved   |
| 40         |                | Reserved   |
| 41         |                | Reserved   |
| 42         |                | Reserved   |
| 43         | Power Com      |  |
| 44         | Function Test  | Gnd for functional test, Open for normal operation |
| 45         | SEL6           | Radio Altimeter Type Select                        |
| 46         | SEL5           | Radio Altimeter Type Select                        |
| 47         | SEL4           | Radio Altimeter Type Select                        |
| 48         | SEL3           | Radio Altimeter Type Select                        |
| 49         | Power Com      |  |
| 50         | SEL2           | Radio Altimeter Type Select                        |
| 51         | SEL1           | Radio Altimeter Type Select                        |
| 52         | Chassis Gnd    |  |
| 53         | SEL0           | Radio Altimeter Type Select                        |
| 54         | COM2 Common    | Reserved (COM2 Common) Production Use Only         |
| 55         | COM1 Common    | Reserved (COM1 Common)                             |
| 56         | Program Common |  |
| 57         | +RADALT        | High Voltage Radio Altitude + input                |
| 58         | -RADALT        | High Voltage Radio Altitude - input                |
| 59         |                | Reserved   |
| 60         | +RADALT LV     | Low Voltage Radio Altitude + input                 |
| 61         | -RADALT LV     | Low Voltage Radio Altitude - input                 |
| 62         | VALID          | 0V to 1V or 9V to 32V = Valid,<br>1 to 9 = Invalid |

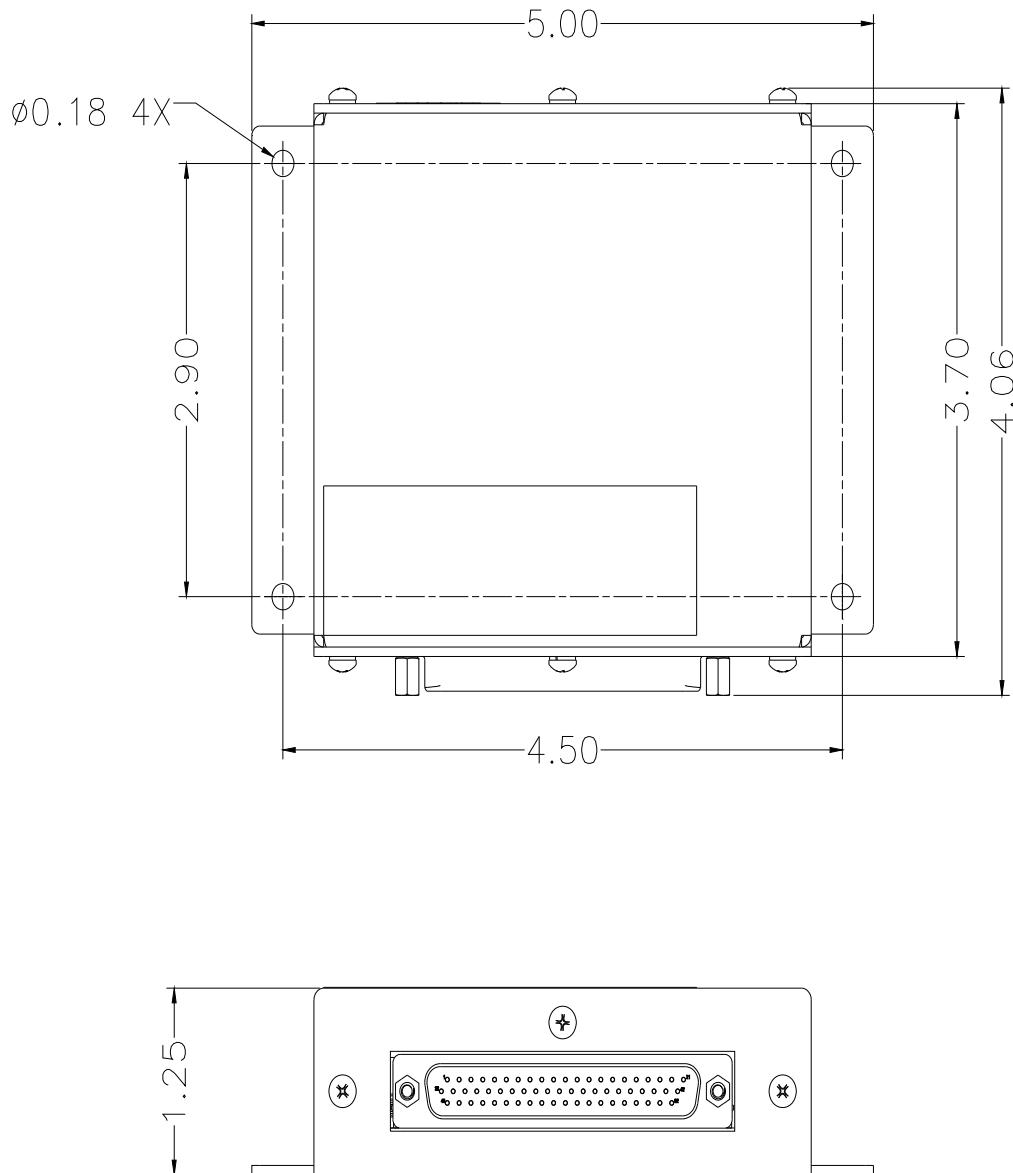
### J1 Pin Description

NOTE: Do not use pins labeled Reserved.

## 15. TYPICAL INTERCONNECT



## 16. OUTLINE DRAWING



Note: Dimensions are in inches.