EQUIPMENT INSTALLATION MANUAL

for the

GDC59 CONVERTER

P/N 1095-4000-01

RELEASED

DAC International
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Austin, TX 78729

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RECORD OF REVISIONS

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1. INTRODUCTION:

This manual contains installation data, specifications and continued airworthiness information for the GDC59 Converter, part number 1095-4000-01.

2. DESCRIPTION:

The Model GDC59 Converter provides on-ground-only position initialization to a Litef LCR-100 Attitude Heading Reference System (AHRS) using data supplied by an ARINC 429 capable GPS receiver. To accomplish this, the GCD59 supports two ARINC receiver ports and one ARINC 429 transmitter port. Position data is received from the GPS on labels 310 and 311, and status is received from the AHRS on label 270. If the AHRS status equals "no position initialization" and GPS position data is valid, the GDC59 converts the GPS data from labels 310 (Latitude) and 311 (Longitude) into labels 041 (Set Latitude) and 042 (Set Longitude), then sends a short burst of Set Latitude and Set Longitude to the AHRS. The AHRS uses the present position data to speed its alignment process.

3. PART NUMBERS:

The Model GDC59 Converter is available under the following part number:

1095-4000-01-001( ) Converter

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

4. REFERENCE DOCUMENTS

14130-0000-312	LCR-100 System Specification, Rev H
MIL-STD-461E	Requirements for Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
MIL-STD-810C	Environmental Test Methods
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 GDC59 software was developed in accordance with RTCA/DO-178B to criticality level D.

5.2. Hardware

The GDC59 is produced under DAC International's FAA approved quality system for installation under an active STC project. Follow-on production units will carry an FAA PMA applicable to the STC type design data.

6. SUPPLIED EQUIPMENT

Each unit is shipped with the following items:

Part Number	Description	Qty
1095-4000-01-001( )	GDC59 Converter	1
1095-4200-01	Installation Kit, Converter	1

Complete installation kits are available under kit part number 1095-4200-01. Individual pieces are available under the part numbers shown. Contact DAC International sales to place orders.

Part Number	Description	Qty
1095-4200-01	Installation Kit, Analog Rate Converter	
M24308/2-2F	Connector, Receptacle, 15 pin D-Sub	1
M39029/63-368	Socket, Crimp Style, female	15
P10053	Slide Latch Kit	1
P10067	Backshell, 15-Pin D-Sub	1
1095-2510-01	Equipment Installation Manual	1

7. GDC-59 SPECIFICATIONS:

7.1. Physical:

The GDC 59 attaches to the airframe using four (4) #8 screws. See the paragraph titled Outline Drawing for additional details.

Height.....1.25 inches

Width (LRU).....4.22” inches

Width (base).....5.22 inches

Depth.....3.54 inches

Weight.....0.4 lb.

7.2. Electrical:

Input Voltage .....28 VDC Nominal (10Vdc – 32Vdc operational)

Input Current.....0.05 Amp at 28 VDC

7.3. ARINC 429 Inputs:

Number of input ports.....2

Baud Rate.....100kbaud

GPS Labels.....310, 311 (present position)

AHRS Labels .....270 (status)

7.4. ARINC 429 Output:

Number of output ports.....1

Baud Rate.....100kbaud

Output Labels.....041 and 042 (Set Latitude and Set Longitude)

7.5. Reliability:

MTBF.....Greater than 50,000 hours.

8. OPERATION:

The GDC59 contains no operator controls. The Model GDC59 Converter provides on-ground-only position initialization to a Litef LCR-100 Attitude Heading Reference System (AHRS) using data supplied by an ARINC 429 capable GPS receiver. To accomplish this, the GCD59 supports two ARINC receiver ports and one ARINC 429 transmitter port. Position data is received from the GPS on labels 310 and 311, and status is received from the AHRS on label 270. If the AHRS status equals “no position initialization” and GPS position data is valid, the GDC59 converts the GPS data from labels 310 (Latitude) and 311 (Longitude) into labels 041 (Set Latitude) and 042 (Set Longitude), then sends a short burst of Set Latitude and Set Longitude to the AHRS. The AHRS uses the present position data to speed its alignment process.

9. INSTALLATION:

9.1. Aircraft Interconnect Wiring

ARINC-429 inputs and output are all connected using twisted shielded pairs (M2750022SD2T23 or equivalent). Power signals should be connected using M22759/34-20-9 or equivalent.

9.2. Mounting

The GDC59 is secured with installer provided hardware. 4, 8-32 x ½" screws, 4 #8 flat washers, and 4 #8 lock washers are required for proper installation. See section 16 for the hole location dimensions. It is recommended that at least 4 inches of clearance should be provided on the connector side of the GDC59 to allow room for the mating connector and cable.

10. REMOVAL AND REPLACEMENT

10.1. Removal

1. Open the circuit breaker powering the GDC59.
2. Remove the connector.
3. Remove four (4) screws securing the unit to the airframe.

10.2. Replacement

1. Open the circuit breaker powering the GDC59.
2. Attach the unit to the airframe with four (4) screws.
3. Attach the connector. Rotate the connector outer housing until the red band on the J1 connector is fully covered.
4. Close circuit breaker.
5. Perform operational test of the GDC59 as prescribed in the aircraft maintenance manual.

11. EQUIPMENT CHECKOUT

The GDC59 provides ARINC 429 data to a Litef AHARS to aid with gyro compass alignment. There are no operator controls associated with this unit. The GPS and LRC100 AHRS must be operational in order to perform this functional test. The GPS must have a clear view of the sky in order to output valid position data.

1. Apply power to the GPS&AHRS.
2. Do not move aircraft during this test.
3. Perform the functional test of AHRS according to existing, approved maintenance data.
4. Verify correct AHRS heading output.

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 GDC59, which includes system description, removal instructions, installation instructions and functional testing, is contained in DAC International Installation Manual, 1095-2510-01 (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 appliance are as specified in the DAC International Installation Manual, 1095-2510-01 (this manual).

8. There are no Airworthiness limitations associated with the installation of this appliance.

13. ENVIRONMENTAL:

NOMENCLATURE: Model GDC59 Converter
PART NO: 1095-4000-01-XXXX
MANUFACTURER: DAC International
ADDRESS: 6702 McNeil Drive, Austin, TX 78729
RTCA/DO-160E Environmental Conditions and Test Procedures for Airborne Equipment
MIL-STD-461E Requirements for Control of Electromagnetic Interference Characteristics of Subsystems and Equipment.

Section	Category	Remarks
4.0 Temperature and Altitude	D2	50,000 Ft, (-55° to +70° C)
5.0 Temperature Variation	B	5° per minute
6.0 Humidity	A	Standard Humidity
7.0 Operational Shock and Crash Safety	D	Fixed wing
8.0 Vibration	S	Curves L, M, and C, Fixed Wing – Turbojet
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	A	Between 0.3 and 1.0 meters
16.0 Power Input	B	Alternator / Rectifiers with battery
17.0 Voltage Spike	B	E = 56 volts
18.0 AF Conducted Susceptibility – Power Inputs	A	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	XXXXX	Not Tested
23.0 Lightning Direct Effects	X	Not Tested
24.0 Icing	X	Not Tested
25.0 ESD	X	Not Tested
MIL-STD-461F	CS101	Power leads, 30Hz to 150 KHz

14. CONNECTOR PIN OUT:

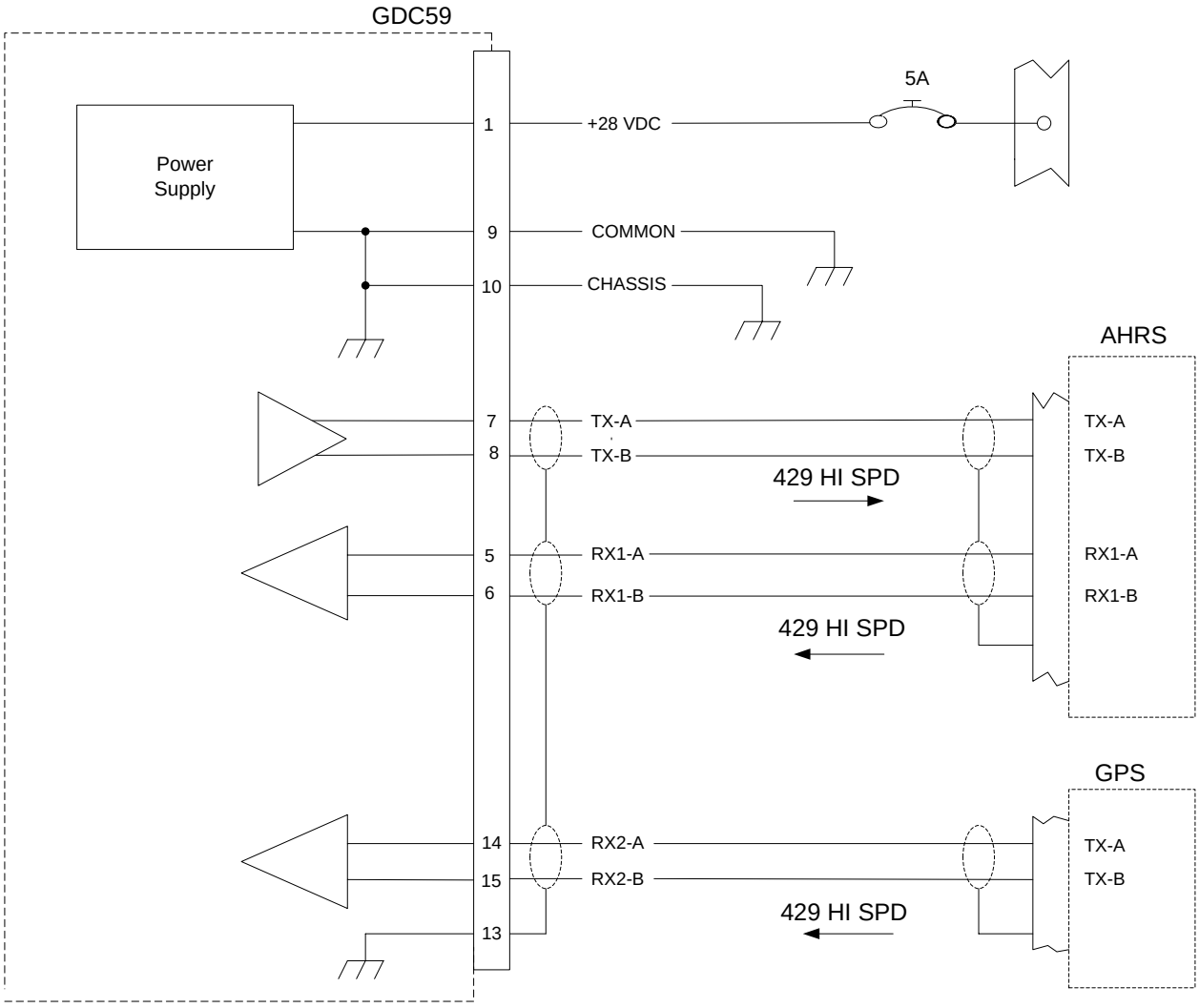
The GDC59 contains a single 15-pin male connector, J1, per MIL-C-24308, part number M24308/4-260F. The mating connector, P1, is described previously under the section “Equipment Supplied”.

Pin	Signal	Function
1	A+	28 Vdc Primary Power
2	n/c	Reserved (RS232 Output)
3	n/c	Reserved (RS232 Input)
4	n/c	
5	RX-1A	429 Port 1, Rx A
6	RX-1B	429 Port 1, Rx B
7	TX-A	429 Transmit A
8	TX-B	429 Transmit B
9	Power Common	28 Vdc Return
10	Aircraft Common	Chassis ground
11	RS-232 Shield	RS232 shield/return
12	n/c	Reserved (/PGM Enable)
13	ARINC Shield	RX/TX Shield
14	RX-2A	429 Port 2 Rx A
15	RX-2B	429 Port 2 Rx B

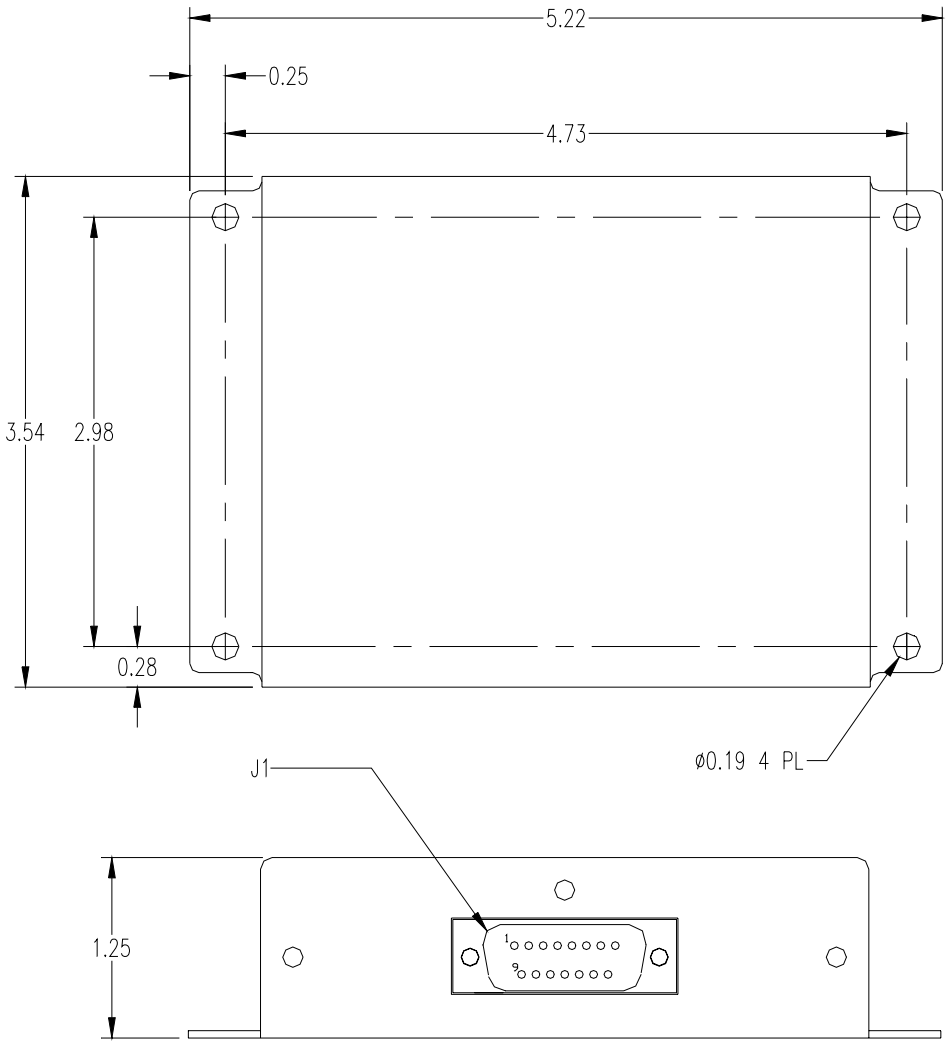
J1 Pin Description

NOTE: Do not use pins labeled Reserved. These are for factory test and In-Circuit-Programming.

15. TYPICAL INTERCONNECT



16. OUTLINE DRAWING



Note: Dimensions are in inches.

17. SLIDE LATCH ASSEMBLY

Assemble the slide latch mechanism, part number P10053, onto the mating connector as pictured using the hardware supplied with the slide latch.