



ADF DC SIN/COS TO ARINC 429 CONVERTER

PRODUCT P/N: 933752-00

INSTALLATION MANUAL

REV D

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MANUAL P/N: IM3752-00

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4037-157	Installation, ADF DC Sin/Cos to ARINC 429 Converter, P/N 933752-00	12-28-04	D
NA	Parts List, Install Kit for 15Pin D-Sub P/N IK9337	1-11-06	F

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REVISION LOG

REV.	DATE	APP'D	CHANGE
-	12-07-01	ZK	Baseline Release
A	12-28-01	ZK	Updated Supply Current to 120mA.
B	02-01-02	ZK	Changed Specifications and EQF
C	12-28-04	ZK	Changed Company name
D	02-06-06	CB	Changed company logo, IK9337, & Section 2.1

The information in this manual is subject to change without notification. To ensure complete and current updates, note the Revision Log above and call Technical Assistance for updated information.

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1. OVERVIEW

1.1 THE MANUAL

This manual is intended to determine a proper installation of the ADF DC Sin/Cos to ARINC 429 Converter. Installation instructions should be read and followed.

1.2 PRODUCT DESCRIPTION

The purpose of the ADF DC Sin/Cos to ARINC 429 Converter is to convert input values from Bendix KR-87 ADF receiver DC Sine/Cosine to ARINC 429 Label 162 operating at low speed (12.5 kbs).

The input data includes the Bearing as a DC Sine and Cosine signal referenced to their respective common signal and 2 Discrete inputs (ADF Bearing Valid and SDI Discrete defining right or left side ADF Converter). The DC Sine and Cosine is DC signal whose amplitude, relative to their respective common signal, defines the Bearing Angle.

The output data consist of an ARINC 429 Label 162 BNR and Flag 1 Discrete (ADF Valid Out = +28VDC or Open = Invalid). If any failures are detected, an LED will be illuminated (Health Monitor output).

The system diagram is given in Figure 1.

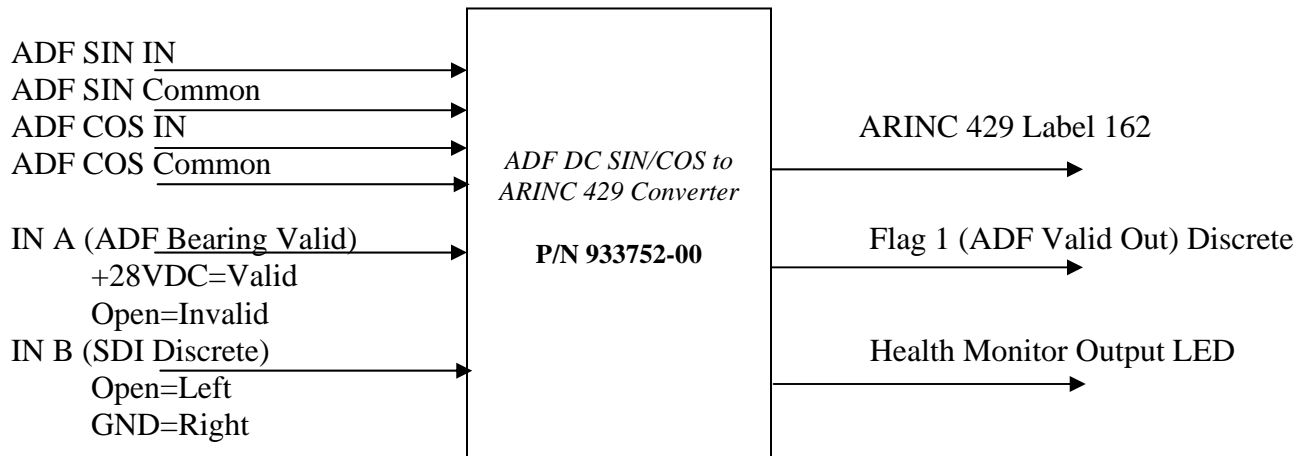


Figure 1

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ADF DC SIN/COS TO ARINC 429 CONVERTER

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1.3 SPECIFICATIONS

Physical Specifications

Dimensions: 1.15H x 4.30L x 2.40W
 Weight: 0.4lbs.

Electrical and Functional

Power Supply Voltage: +28VDC
 Supply Current: 120mA at 28VDC
 Protection: Not internally fused

Inputs: *DC SIN/COS per (KR-87) ADF Receiver Output Spec*
 Signal: 1.5 - 7.5VDC
 Offset: 4.5V
 Signal Swing: ± 3 VDC
 Input Impedance: $>10K\Omega$
 Input Sampling Rate: 20Hz
 Latency: 50msec

Discrete Inputs:

IN A: ADF Bearing Valid (+28VDC = Valid, Open = Invalid)
 IN B: SDI Discrete (Open = Left, GND = Right)

Outputs: *ARINC 429 Label 162*

NAME	LABEL	FORMAT	DATA RATE
ADF BEARING	162	BNR per GAMA 429	50msec

2 Flags Output:

Flag 1: ADF Valid Out (+28VDC = Valid, Open = Invalid)
 Flag 2: Spare

TX RS-232 Output Serial Data (Test purpose only)

Environmental

RTCA/DO-160D

Categories: F2XBCB[H(C, R)]XWXXXXZBABA[VVX]LXXXXXXXX

Operating Temperature: -55° to +70°C
 Operating Altitude: Up to 55,000 ft
 Storage Temperature: -55° to +85°C
 In-Flight loss of Cooling: Equipment can run indefinitely with no cooling
 Certification: TSO - C41d, Class A

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1.4 INPUTS

This section specifies the interfaces for the Shadin ADF DC Sin/Cos to ARINC 429 Converter.

- DC Sin/Cos per (KR-87) ADF Receiver Output Spec:
 - ADF SIN IN
 - ADF SIN Common

 - ADF COS IN
 - ADF COS Common
- Discrete Inputs:
 - IN A: ADF Bearing Valid (+28VDC = Valid, Open = Invalid)
 - IN B: SDI Discrete (Open = Left, GND = Right)
- RX RS-232
- RX-422 (Reserved)

1.5 OUTPUTS

- ARINC 429 (Label 162)
- 2 Flag Output
 - Flag 1: ADF Valid Out (+28VDC = Valid, Open = Invalid)
 - Flag 2 (Spare)
- TX RS-232 Output Serial Data (Test purpose only)

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2. INSTALLATION PROCEDURE

2.1 APPROVAL FOR INSTALLATION

The conditions and test required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only if performed under 14 CFR part 43 or the applicable airworthiness requirements.

All work must conform to AC 43.13-1B.

2.2 MOUNTING

The ADF DC Sin/Cos to ARINC 429 Converter (P/N 933752-00) should be mounted in a dry location and the equipment may be installed in a non-controlled temperature and non-pressurized location.

Use installation drawing, Drawing No.: 4037-157, to connect the ADF DC Sin/Cos to ARINC 429 Converter to the system. For mounting use # 6-32 screws.

2.3 ELECTRICAL CONNECTIONS

Connection to Power Supply +28 VDC

933752-00		Description
J1:8	To	+14 to +28 VDC Power IN
J1:15	To	Power GND

Inputs

933752-00		Description
J1:1	To	TX RS-232 (Test only)
J1:2	To	RX RS-232 or RX RS-422(-) (Test only)
J1:3	To	RX RS-422(+) (Reserved)
J1:6	To	ADF SIN IN
J1:7	To	ADF COS IN
J1:9	To	ADF SIN Common
J1:10	To	ADF COS Common
J1:12	To	IN A (ADF Bearing Valid)
J1:13	To	IN B (SDI Discrete)

Outputs

933752-00		Description
J1:4	To	ARINC 429 A Output
J1:5	To	ARINC 429 B Output
J1:11	To	FLAG 1 (ADF VALID OUT)
J1:14	To	FLAG 2 (Spare)

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3.0 ENVIRONMENTAL QUALIFICATION FORM**NOMENCLATURE: ADF DC SIN/COS TO ARINC 429 CONVERTER****TYPE/MODEL/PART NO:** 933752-00 **TSO NUMBER:** C41d**MANUFACTURER'S SPECIFICATION AND/OR OTHER APPLICABLE SPECIFICATION:**

Report 4037-52, RTCA/DO-160D

MANUFACTURER: Shadin Avionics**ADDRESS:** 6831 Oxford Street, St. Louis Park, Minnesota 55426-4412

<u>CONDITIONS</u>	<u>SECTION</u>	<u>DESCRIPTION OF TESTS CONDUCTED</u>
Temperature and Altitude	4.0	Tested to Category F2.
Low Temperature		
High Temperature		
Altitude		
Decompression		
Overpressure		
Temperature Variation	5.0	Tested to Category B.
Humidity	6.0	Tested to Category C.
Operational Shock and Crash Safety	7.0	Tested to Category B.
Vibration	8.0	Tested to Category H(C,R).
Explosion	9.0	Identified as Category X. Not tested.
Waterproofness	10.0	Tested to Category W.
Fluids Susceptibility	11.0	Identified as Category X. Not tested.

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ENVIRONMENTAL QUALIFICATION FORM (Cont.)

<u>CONDITIONS</u>	<u>SECTION</u>	<u>DESCRIPTION OF TESTS CONDUCTED</u>
Sand and Dust	12.0	Identified as Category X. Not tested.
Fungus	13.0	Identified as Category X. Not tested.
Salt Spray	14.0	Identified as Category X. Not tested.
Magnetic Effect	15.0	Tested to Category Z.
Power Input	16.0	Tested to Category B.
Voltage Spike	17.0	Tested to Category A.
Audio Frequency Susceptibility	18.0	Tested to Category B.
Induced Signal Susceptibility	19.0	Tested to Category A.
Radio Frequency Susceptibility	20.0	Tested to Category VVX.
Radio Frequency Emission	21.0	Tested to Category L.
Lightning Induced Transient Susceptibility	22.0	Identified as Category XXXX. Not tested.
Lightning Direct Effects	23.0	Identified as Category X. Not tested.
Icing	24.0	Identified as Category X. Not tested.
Electrostatic Discharge	25.0	Identified as Category X. Not tested.

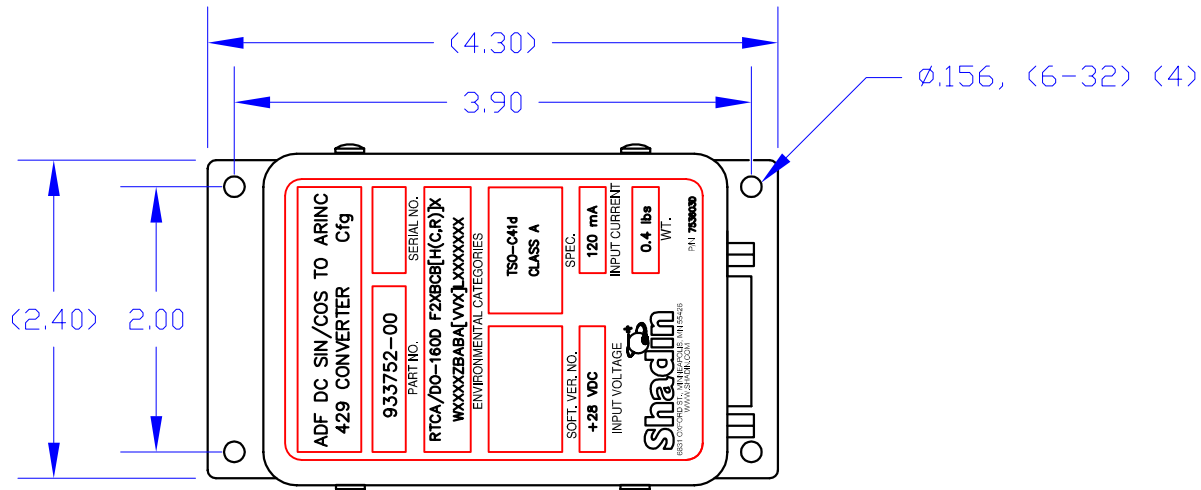
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SECTION 4.0

**INSTALLATION DRAWINGS AND
INSTALL KIT PARTS LISTS**

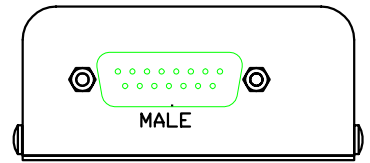
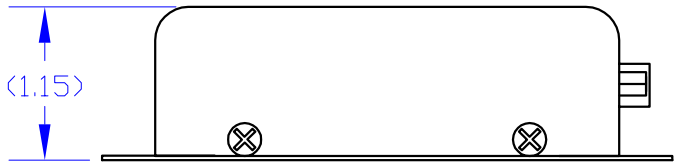
The following drawings are arranged in the sequence specified on page i of the Page Control Chart.

MATING CONNECTOR:
 POSITRONIC # M24308/2-2
 HOOD = CINCH # DA-24658
 CAPTIVE SCREWS, (2), SHADIN P/N 512101



CONNECTOR WIRING

- 1.- TX RS-232 (TEST ONLY)
- 2.- RX RS-232/RX RS-422(-) (TEST ONLY)
- 3.- RX RS-422(+) (RESERVED)
- 4.- ARINC 429 A OUTPUT
- 5.- ARINC 429 B OUTPUT
- 6.- ADF SIN IN
- 7.- ADF COS IN
- 8.- +14 TO +28VDC POWER IN
- 9.- ADF SIN COMMON
- 10.- ADF COS COMMON
- 11.- FLAG 1 (ADF VALID OUT)
- 12.- IN A (ADF BEARING VALID)
- 13.- IN B (SDI DISCRETE)
- 14.- FLAG 2 (SPARE)
- 15.- POWER GROUND



ECD #	REV.	DATE	BY	APP'D	DESCRIPTION
0412/040	D	12/28/04	PAB	ZK	CH COMPANY NAME & NAMEPLATE
0202/003	C	2/1/02	PAB	ZK	UPDATED LABEL
0112/016	B	12/28/01	PAB	ZK	UPDATED INPUT CURRENT
0108/008	A	8/14/01	PAB	BVM	BASELINE RELEASE

UNLESS OTHERWISE NOTED DIMENSIONS ARE IN INCHES TOLERANCES: X.X = ±0.1 X.XX = ±0.01 X.XXX = ±0.005	DRAWING DATE	8/14/01
	DRAFTER	PAB
FINISH: N/A	APPROVED	BVM
	FILE NAME	933752-000.JDWG
MATERIAL: N/A	DIRECTORY	933752-00
	DO NOT SCALE	SHEET 1 OF 1

SHADIN MINNEAPOLIS, MN 55426	
INSTALLATION, ADF DC SIN/COS TO ARINC 429 CONVERTER	
DRAWING NO.	4037-157
SIZE	A
P/N	933752-00
REV	D

Report: 4037
 ECO Date: January 11, 2006
 Rev: F
 Sec.: IX
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ECO # 0601/013
 Release date: 1/11/06
 Approved: CB

PARTS LIST

Part #: **IK9337**

Drawing #: N/A

Description: **INSTALL KIT FOR 15PIN D-SUB**

<u>FN</u>	<u>P/N</u>	<u>QTY.</u>	<u>DESCRIPTION</u>	<u>MFG.</u>	<u>MFG.#</u>	<u>DESIGNATION</u>	<u>COMMENTS</u>
5	230019H-1	2	SPRING LATCH CLIP	SHA	4028-074		*
10	230050C	1	CONN, 15 Pin D-Sub F Crimp w/contacts	POS	M24308/2-2 (RD15F10000-50)		
15	230038	1	CONN HOOD, 15 Pin D-Sub	CIN	DA-24658		
20	511002	2	SCREW, 4-40 x 1/4 Phil Pan HD SS	MCM	91772A106		
25	512007	2	NUT, 4-40 3/16 x 1/16 SS	AFT	HNSP188 04C000		
27	512101	2	RETAINER CLIP, "Bow Tie" Style	KEY	2061K		*
30	541001	2	WASHER, #4 Split Lock, SS	MCM	92147A005		
32	753217	1	COMPUTER LABEL, 3.5"x 15/16"	AVR	4013		
35	PK1001	1	BAG, 2.5 x 3, 4 MIL Zip Lock				
45	PK1007	1	BAG, 6 x 8, 4 MIL				

15 items

* Use FN 5 Or FN 27, Not Both – Depending On D-Sub Connector Style Used.