EQUIPMENT INSTALLATION MANUAL, GEN-X ELECTRONIC FLIGHT BAG

1069-2510-X3

RELEASED

Rev B

6702 McNeil Dr.
Austin, Texas 78729
(512) 331-5323 Phone
(512) 331-4516 Fax

RECORD OF REVISIONS

REV	DESCRIPTION		DATE	APPROVED
IR	Initial Release	E1468	06/13/2012	BH
A	See ECO	E1579-02	11/08/2012	BH
B	See ECO	E1753	01/10/2014	BH

TABLE OF CONTENTS

TABLE OF FIGURES

1. INTRODUCTION

This Installation Manual contains Class III installation data, specifications and Instructions for Continued Airworthiness (ICA) for the DAC International GEN-X Electronic Flight Bag (EFB) System.

1.1. Reference Documents

The following material is for reference only and is not required to perform the procedures outlined in this document.

1069-4000-X3	Assembly, RPU, GEN-X
1069-4910-01	Assembly, Display, 10”, XGA, USB-ETH, GEN-X

1.2. Acronyms List

DU	Display Unit
EFB	Electronic Flight Bag
FMS	Flight Management System
LVDS	Low Voltage Differential Signaling
RPU	Remote Processor Unit
SVGA	800 x 600 video screen resolution
XGA	1024 x 768 video screen resolution

2. SYSTEM DESCRIPTION

The Class III GEN-X EFB is a paperless flight bag which consists of a Remote Processor Unit (RPU), Display Unit (DU), and LVDS Display Cabling. The DU is the interface for the operator. It is a touch screen display which is mounted for easy access by the operator. The DU is connected via the display cable to the remotely mounted RPU. Inputs to the RPU include FMS data and Ethernet connectivity for communication to a second EFB.

3. PURPOSE

This manual contains data and guidance for GEN-X EFB installation, including maintenance and ICA examples for use in developing individual aircraft specifications.

4. SCOPE

This manual is applicable to installations utilizing RPU part numbers 1069-4000-03 or 1069-4000-13.

5. PART NUMBERS

5.1. Required Equipment

5.1.1. Installations Employing XGA Display Units

5.1.1.1. Remote Processor Unit

1069-4000-03 EFB RPU

5.1.1.2. Remote Processor Unit Mount

1069-6001-06 EFB RPU Mount w/Fan Helicopter

5.1.1.3. Display Unit

1069-4910-01 EFB Display Unit

5.1.1.4. Display Cable

5.1.1.4.1. Installations Employing Single-End-Terminated Display Cable

P10732

5.1.1.4.2. Installations with Installer Prepared Display Cabling

Refer to the following sections for more information:

Parts: §5.2.3
Connector Pin Out: §14.1.3
Wiring Diagram: §15.2

5.1.1.5. Connector Kit for 1069-4000-03 RPU

TABLE I. **1069-4200-03 Connector Kit Parts List**

Item	Part Number	Description	Qty	UOM
1	P10440	Power Connector, P2, Straight	1	EA
2	P10512	Power Connector, P2, R/A	1	EA
3	P11031	Display Connector, P4, In-Line	1	EA
4	P10607	RPU Display Connector, P1	1	EA
5	P10601	P1 Backshell Straight	1	EA
6	P10602	P1 Backshell R/A	1	EA
7	P10878	Connector, P3	1	EA
8	P10958	P3 Backshell w/side latch	1	EA
9	P11056	P3 Strain Reliefs	2	EA

5.1.2. Installations Employing SVGA Display Units

5.1.2.1. Remote Processor Unit

1069-4000-13 EFB RPU

5.1.2.1.1. Remote Processor Unit Mount

1069-6001-06 EFB RPU Mount w/Fan Helicopter

5.1.2.2. Display Unit

1069-48XX-XX EFB Display Unit

```
          |    |
          |    \_____Tenth digit indicates the color code of the display housing
          |              01 = Gray, 02 = Black
          |
          \_________ Seventh and eighth digits indicate display size
                       08 = 8", 10 = 10"
```

5.1.2.3. Display Cable

5.1.2.3.1. 16' Configuration

1069-4700-XX 16' Display Cable

____ Ninth and tenth digits indicate connector orientation
01 = Straight
02 = Right Angle

5.1.2.3.2. 30' Configuration

5.1.2.3.1.2 27' Display Cable

P10732 27' Display Cable (for use with 1069-4710-01 in 30' configuration)
NOTE: Requires connector MS3121F14-19P

5.1.2.3.2.2 3' Stub Display Cable

1069-4710-01 3' Stub Display Cable (for use with P10732 in 30' configuration)

5.1.2.4. Connector Kit for 1069-4000-13 RPU

TABLE II. **1069-4200-13 Connector Kit Parts List**

Item	Part Number	Description	Qty	UOM
1	P10440	Power Connector, P2, Straight	1	EA
2	P10512	Power Connector, P2, R/A	1	EA
3	P10878	Connector, P3	1	EA
4	P10958	P3 Backshell w/side latch	1	EA
5	P11056	P3 Strain Reliefs	2	EA
6	MS3121F14-19P	Display Connector, J5, In-Line	1	EA

5.2. Replacement Equipment

5.2.1. GEN-X RPU 19.2V Main Battery

1069-6440-01 Battery, NiMH, 19.2V, 4500mAh, RPU, GEN-X

5.2.2. GEN-X RPU 3V Backup Battery

P10913 Battery, Li, 3V, RPU, GEN-X

5.2.3. Connectors and Connector Accessories:

TABLE III. **Connectors and Connector Accessories List and Cross-Reference**

Connector	Description	Orientation	Notes	-03	-13	DAC P/N	MFR	MFR's P/N
P1	Connector	N/A	Includes contacts	X	X	P10607	Amphenol	PT06SE14-19S
	Backshell	Straight	Includes strain relief	X	X	P10601	Glenair	380DS002B1406A3
	Backshell	Right Angle	Includes strain relief	X	X	P10602	Glenair	380DA002B1406A
P2	Connector	Straight	Includes contacts and strain relief	X	X	P10440	Amphenol	PT06SE-14-19SW(SR)
	Connector	Right Angle	Includes contacts and strain relief	X	X	P10512	Amphenol	PT08SE14-19SW
P3	Connector	N/A	Includes contacts	X	X	P10878	Positronic	ODD44F10000/AA-14
	Backshell	Straight	Includes slide latch and one (1) strain relief	X	X	P10958	Positronic	D25000GVL0
	Strain Relief	N/A	N/A	X	X	P11056	Positronic	4951-1-0-0
P4	Connector	Straight	Includes contacts and strain relief	X		P11031	Amphenol	PT01SE-16-23P-SR
J5	Connector	Straight	Includes contacts and strain relief		X	MS3121F14-19P	Various	MS3121F14-19P

5.3. Non-Supplied Equipment

The following parts are not provided for installation:

ITEM:
1. Single conductor, non-shielded wire: 22-24 GA per MIL-W-22759
2. Shielded wire/cabling: 22-24 GA per MIL-C-27500
3. Ethernet cabling: PIC Wire & Cable P/N E10424, or equivalent
4. LVDS Cable: CarlisleIT (ECS) P/N 382410A
5. All power and ground wire; single conductor, non-shielded wire 20 GA per MIL-W-22759

6. REGULATORY COMPLIANCE

6.1. Software

The software was developed in accordance with RTCA/DO-178B to criticality level E in accordance with FAA Advisory Circular AC 120-76A for Type B software.

6.2. Hardware

The GEN-X hardware was developed in compliance with FAA Advisory Circular AC 120-76A guidance.

7. SPECIFICATIONS

7.1. Physical

See Section 16, “Outline Drawings”, for additional detail.

7.1.1. RPU

Note: All RPU Dimensions include mount.

Height.....2.77”
Width.....12.81”
Depth.....8.63”
Weight.....9.0lb

7.1.2. Display Units

7.1.2.1. SVGA, 8”

Height.....9.90”
Width.....6.90”
Depth.....1.71”
Weight.....3.4lb

7.1.2.2. SVGA, 10”

Height.....11.60”
Width.....8.13”
Depth.....1.71”
Weight.....4.6lb

7.1.2.3. XGA, 10.4”

Note: Dimensions for XGA display unit do not include cable

Height.....10.55”
Width.....7.32”
Depth.....1.25”
Weight.....4.0lb MAX

7.2. Electrical

Values listed below are "nominal" unless otherwise noted:

Note: For essential input voltages between 18 and 22Vdc, the RPU will function, but battery charging may be reduced or suspended and the battery may supply power to operate the RPU.

7.2.1. Essential Buss (-03 XGA)

Input Voltage ..... 28Vdc (22Vdc – 32Vdc operational)
Input Current..... 3A at 28Vdc with internal battery fully charged, DU connected
7A (max) with PC power on and internal battery charging
DU Current (1069-4910-01) (The portion of essential input current associated with the DU)
1.1A at 22Vdc, 0.72A at 32Vdc

Note: This value may be subtracted from the RPU input current specification above for installations that do not include the 1069-4910-01 DU.

7.2.2. Essential Buss (-13 SVGA)

Input Voltage ..... 28Vdc (22Vdc – 32Vdc operational)
Input Current..... 3A at 28Vdc with internal battery fully charged, DU connected with DU heater on.
6A (max) with PC power on and internal battery charging
DU Current (1069-48XX-XX) (The portion of essential input current associated with the DU)
0.7A at 22Vdc, 0.46A at 32Vdc (heater off)
1.4A at 22Vdc, 0.92A at 32Vdc (heater on)

Note: This value may be subtracted from the RPU input current specification above for installations that do not include the 1069-48XX-XX DU.

7.2.3. Emergency Buss (Monitored Only)

Input Voltage ..... 28Vdc nominal (18Vdc – 32Vdc operational)
Input Current..... 0.005A (max) across 0Vdc – 32Vdc input range

7.3. Data Input

7.3.1. Format

Data Input Format..... ARINC 429
Baud Rate..... Auto Sensing

7.3.2. Supported Labels

Supported ARINC Data Labels ..... See User's Manual, 1069-UM-01

8. SYSTEM INSTALLATION CONSIDERATIONS

1. The GEN-X RPU may be mounted in any orientation; however, due to heat dissipation requirements it is recommended that the RPU not be mounted upside down. It is also recommended that for maintenance considerations the RPU be oriented such that the annunciator panel is visible without removing the unit.
2. Initial installation may require the "Display Unit Screen Rotation Procedure" during setup. Refer to Section 17.1 for instructions. Any time the DU's mounting configuration is changed the "Touch Screen Calibration Procedure" must be performed. Refer to Section 17.2 for instructions.
3. When performing initial installation of each system (paired RPU and DU) the "Touch Screen Calibration Procedure" must be performed. Refer to Section 17.2 for instructions.
4. The RPU should be mounted in a temperature controlled, pressurized environment.
5. As an improved reliability measure a fan is supplied with the tray assembly.

9. OPERATION

9.1. Power Logic

RPU On-Off function is controlled through the power input logic described in TABLE V and is indicated on the annunciator panel located on the RPU.

TABLE IV.**Power Logic**

Essential Buss	Emergency Buss	Behavior	Description
ON	ON	System powers up using Essential Buss and charges internal battery	This is normal turn on sequence
OFF	ON	System goes to internal Battery.	This assumes power loss emergency. Battery power 30 mins minimum at max battery life.
OFF	OFF	System performs normal shutdown down using internal battery	This is the normal shutdown sequence
ON	OFF	System remains powered on Essential Buss	This is an unexpected logic and unit remains on through essential buss power.

9.2. Display buttons and indicators:

The display has the following buttons and indicators.

1. **Brightness button(s)**: Press + to increase brightness and – to decrease brightness. Repeatedly press or hold – to decrease brightness to less than 1 Nit.

2. **On/Off button:** This button controls the power functions.

    a. **With aircraft power present:**
        i. **To turn off:** When the unit is on, press and hold the on/off button for 5 seconds and the system will begin the shutdown process. Release button. Approximately 10 seconds after powering off the button is re-armed and can be used to turn the system back on.
        ii. **To turn on:** After turning the unit off with the on/off button (as described above), press and release the on/off button and the unit will turn on.

    b. **With aircraft power not present:**
        i. **To turn off:** When the unit is on, press and hold the on/off button for 5 seconds and the system will begin the shutdown process. Release button. Approximately 10 seconds after powering off the button is re-armed and can be used to turn the system back on.
        ii. **To turn on:** When the unit is off, press and hold the on/off button for 15 seconds and the unit will turn on.

    NOTE: If the system becomes unresponsive, cycle power using the display button as described above in step 2.a.

3. **Power status LED (1069-4910-01 only)**:

    a. **Green**: indicates the essential power is applied and healthy.

    b. **Amber**: indicates the essential power has been removed and the system is running on internal battery.

    c. **Flashing Amber**: indicates the system has been powered off and is timing out the button arming sequence.

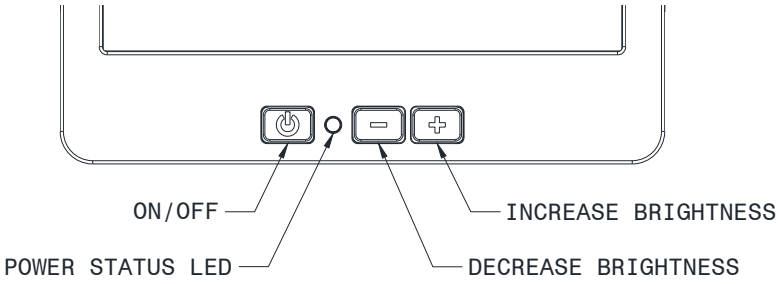


FIGURE 1. **1069-4910-01 Display Buttons and Indicators**

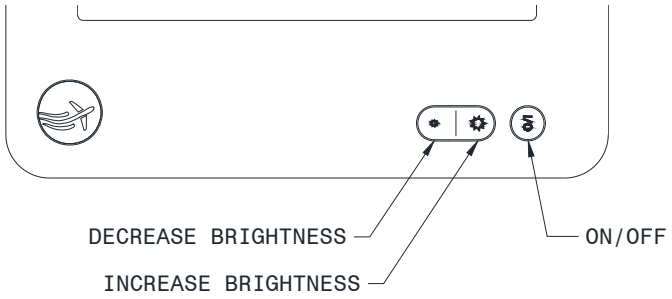


FIGURE 2. **1069-48XX-XX Display Buttons**

9.3. Ethernet Ports:

The system has two Gigabit Ethernet (GbE) ports. One is used internally for ARINC 429 interfacing and the other is an externally accessible port. Setting these ports up correctly is important for proper RPU function.

LAN1, an internal port, should be set to the proper TCP/IP setting for the ARINC 429 interface. See FIGURE 3 and TABLE V.

LAN2, an external port, should be set to the user specific settings (typically the default system settings).

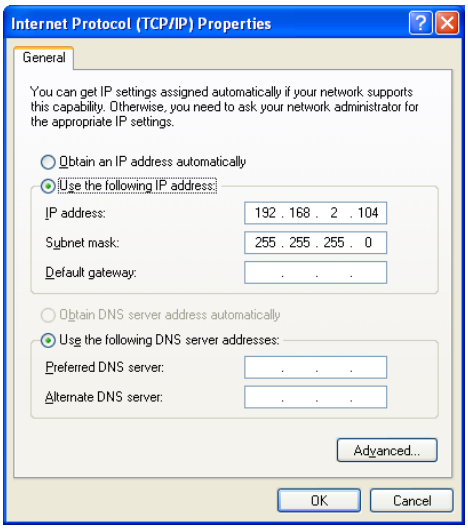


FIGURE 3. **Internet Protocol Properties**

TABLE V. **Internet Protocol Configuration**

LAN1	LAN2
IP address: .....192.168.2.104 Subnet mask: .....255.255.255.0 Default gateway: .....(blank) Preferred DNS server: ....(blank) Alternate DNS server: ....(blank)	IP address: ..... Subnet mask: ..... Default gateway:.....(user defined) Preferred DNS server: ..... Alternate DNS server: .....

10. REMOVAL AND REPLACEMENT

10.1. RPU:

To remove the RPU loosen the two screws on the mounting flange to retract them, grasp the handle and lift the RPU up and out.

To install the RPU reverse the removal process.

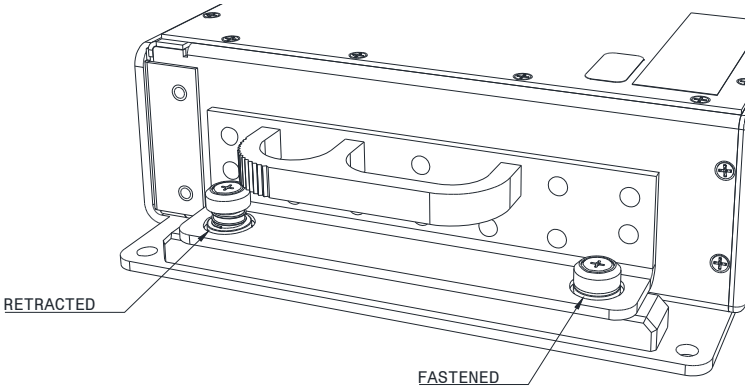


FIGURE 4. **RPU Mounting Flange**

10.2. Display:

DU mounting is aircraft specific – refer to appropriate aircraft documentation for more information.

11. EQUIPMENT CHECKOUT

The GEN-X RPU Electronic Flight Bag general system check is listed below. Refer to the pilot's guide or aircraft maintenance manual for aircraft specific tests.

1. Apply power to both the RPU emergency buss circuit breaker and the RPU essential buss breaker. System will initiate.
2. Ensure operation of dimming and screen on-off control.
3. Ensure operation of EFB touch screen.
4. Perform the functional test of the GEN-X Electronic Flight Bag as specified in pilot's guide or aircraft maintenance manual.
5. Visually inspect fan at RPU tray to insure proper operation.

12. CONTINUED AIRWORTHINESS

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

12.1. Maintenance Manual

Maintenance Manual information for the GEN-X includes a system description, removal instructions, installation instructions and functional testing, which are all contained in the DAC International Installation Manual, 1069-2510-X3 (this document).

12.2. Illustrated Parts Catalog

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).

12.3. Wiring Diagram Manual

Wiring diagram information contained in the installation data package should be placed in the aircraft operator's appropriate airplane Wiring Diagram Manual.

12.4. Scheduled Maintenance Program

Scheduled Maintenance Program tasks are as follows:

12.4.1. Recommended Periodic Scheduled Servicing

TABLE VI.**Recommended Periodic Scheduled Servicing**

Part Description	Part Number	Period	Service Description
Battery, 3V	P10913	Once every 5 years	Replace
Battery, 19.2V	1069-6440-01	Once every 6 months	Test IAW Battery Servicing Instructions below.

12.4.1.1. Battery Servicing, Required Equipment

The following items are required to perform periodic battery service:

1) DC power supply, 28V ±2V, 5A (or greater).
2) GEN-X RPU, 1069-4000-13.
3) P2 Test Cable. This is a P2 connector (DAC P/N P10440) with Essential and Emergency power and return wires connected as follows:
    a. P2-C to 28Vdc power supply positive, 22 AWG stranded wire, color: RED, length as required (not to exceed 10 feet).
    b. P2-D to 28Vdc power supply negative, 22 AWG stranded wire, color: BLACK, length as required (not to exceed 10 feet). Twist with P2-C. Label this pair "ESS".

c. P2-E to 28Vdc power supply positive, 22 AWG stranded wire, color: WHITE, length as required (not to exceed 10 feet).
d. P2-V to 28Vdc power supply negative, 22 AWG stranded wire, color: BLACK, length as required (not to exceed 10 feet). Twist with P2-E. Label this pair "EMG".

12.4.1.2. Battery Servicing, Procedure

The following procedure details the steps required to perform periodic battery service:

1) On the RPU to be used for this procedure, remove the battery cover, disconnect and remove battery (skip this step if the battery to be serviced is already installed in the RPU). Install the battery to be serviced and connect (the battery cover may remain off for the remaining steps).
2) Connect the P2 Test Cable (described above) to the RPU.
3) Connect the P2 Test Cable "EMG" wires to the 28Vdc power supply (secure the ESS wires, but do not connect them).
4) Turn on the 28Vdc power supply. Watch for the RPU LEDs to indicate that the RPU is on using internal battery power. If there is no indication after 60 seconds, proceed to step 6.
5) Allow the RPU to remain powered until the all of the LEDs go off indicating that the battery has been discharged (this could take as long as 2 hours).
6) Turn off the 28Vdc power and connect the P2 Test Cable "ESS" wires (the "EMG" wires may be left connected).
7) Turn on the 28Vdc power supply. Watch for the RPU LEDs to indicate that the RPU is on and there is no battery fault. If there is a battery fault, proceed to the Battery Fault Section.
8) Allow the RPU to remain energized for at least 6 hours.
9) When finished, verify that there are no battery faults, then turn off the 28Vdc power.
10) Remove the battery under test from the RPU and return to storage and replace the original battery (skip this step if the battery is to remain with the RPU used for this procedure).
11) Battery service complete.

12.4.2. Recommended Periodic Scheduled Preventive Maintenance Tests

12.4.2.1. Battery Condition Test

With power applied to the RPU essential and emergency buss inputs, check the three indicators on the RPU indicator panel. During normal operation the essential buss indicator and emergency buss indicator are illuminated green and the battery indicator is extinguished. If the Battery indicator is illuminated yellow the battery must be replaced.

12.4.2.2. Fan Operation

Also inspect Fan on tray for proper operation.

12.4.3. Recommended Periodic Inspections

None required.

12.4.4. Recommended Periodic Overhaul Period

None required.

12.4.5. Special Inspection Requirements

None required.

12.5. Application of Protective Treatments

None required.

12.6. Special Tools

None required.

12.7. Electrical Loads

Electrical loads for this appliance are as specified in the DAC International Installation Manual, 1069-2510-X3 (this manual).

12.8. Airworthiness Limitations

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

13. ENVIRONMENTAL

13.1. RPU and Tray

The following GEN-X components meet the environmental test categories detailed below in accordance with RTCA/DO-160F, Environmental Conditions and Test Procedures for Airborne Equipment and 14 CFR 25.869 Code of Federal Regulations: Title 14 Aeronautics and Space; Subpart D – Design and Construction; Subsection 25.869 (a)(4) – Fire Protection Systems.

NOMENCLATURE: GEN-X Electronic Flight Bag
PART NO: 1069-4000-03, 1069-4000-13, 1069-6001-06
MANUFACTURER: DAC International
ADDRESS: 6702 McNeil Drive, Austin, TX 78729

TABLE VII. **Environmental Testing Categories**

Section	Category	Remarks
4.0 Temperature and Altitude	A4	Temperature: Category A4, Operating Low temp; -15ºC and Operating High temp; +55ºC, Short time Operating Low temp; -30ºC and Short time Operating High temp; +55ºC, Ground Survival Low temp; -55ºC and Ground Survival High Temp; +85ºC. Altitude: Category A1, Altitude at 50,000 feet for 2 hours, Decompression from 8,000 feet to 50,000 feet within 15 sec., Overpressure at -15,000 feet for 10 minutes.
5.0 Temperature Variation	B	Partially controlled temperature
6.0 Humidity	X	No Tested
7.0 Operational Shock and Crash Safety	B	Saw-tooth 6g, 11msec, 3 shocks per direction. Saw-tooth 20g 11msec, 3 shocks per direction
8.0 Vibration	SMBU	Curve B, A/C Type 2, Fixed Wing – Turbojet or Turbofan, Reciprocating & Turboprop Engines, Single and Multi Eng, A/C Zone 2. Curve M, A/C Type 5, Fixed Wing – Reciprocating & Turboprop, Multi Eng, A/C Zone 2. Helicopter Vibration, Unknown Frequencies, Random, A/C Zone 1a and 2, curves G.
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	X	Not tested
17.0 Voltage Spike	X	Not tested
18.0 AF Conducted Susceptibility – Power	X	Not tested

Section	Category	Remarks
Inputs		
19.0 Induced Signal Susceptibility	X	Not tested
20.0 Radio Frequency Susceptibility (Radiated and Conducted)	X	Not tested
21.0 Emission of Radio Frequency Energy	M	Cockpit equipment
22.0 Lightning Induced Transient Susceptibility	X	Not tested
23.0 Lightning Direct Effects	X	Not tested
24.0 Icing	X	Not tested
25.0 ESD	A	Aerospace environment

13.2. Display 10.4" XGA

The following GEN-X component meets the environmental test categories detailed below in accordance with RTCA/DO-160F, Environmental Conditions and Test Procedures for Airborne Equipment and 14 CFR 25.869 Code of Federal Regulations: Title 14 Aeronautics and Space; Subpart D – Design and Construction; Subsection 25.869 (a)(4) – Fire Protection Systems.

NOMENCLATURE: GEN-X Electronic Flight Bag
PART NO: 1069-4910-01
MANUFACTURER: DAC International
ADDRESS: 6702 McNeil Drive, Austin, TX 78729

TABLE VIII. **Environmental Testing Categories**

Section	Category	Remarks
4.0 Temperature/ Rev F	A4	Operating low temp -30ºC Operating high temp +70ºC Short time operating low -30ºC Short time operating high +80ºC Ground survival low temp -30ºC Ground survival high temp +80ºC
4.0 Altitude/Rev F	A4/D1	Non-pressurized, altitude to 50,000 ft
5.0 Temperature Variation/Rev F	B	5º C per minute
6.0 Humidity	X	Not tested
7.0 Operational Shock and Crash Safety/Rev F	B	Saw-tooth 6g, 11msec, 3 shocks per direction. Saw-tooth 20g 11msec, 3 shocks per direction
8.0 Vibration/Rev E	SBMU	Curve B, A/C Type 2, Fixed Wing – Turbojet or Turbofan, Reciprocating & Turboprop Engines, Single and Multi Eng, A/C Zone 2. Curve M, A/C Type 5, Fixed Wing – Reciprocating & Turboprop, Multi Eng, A/C Zone 2. Helicopter Vibration, curve F and F1.
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

Section	Category	Remarks
13.0 Fungus Resistance	X	Not tested
14.0 Salt Spray	X	Not tested
15.0 Magnetic Effect/Rev E	Z	Less than 0.3 meter
16.0 Power Input	X	Not tested
17.0 Voltage Spike	X	Not tested
18.0 AF Conducted Susceptibility – Power Inputs	X	Not tested
19.0 Induced Signal Susceptibility	X	Not tested
20.0 Radio Frequency Susceptibility (Radiated and Conducted)	X	Not tested
21.0 Emission of Radio Frequency Energy/Rev E	M	Cockpit Equipment
22.0 Lightning Induced Transient Susceptibility	X	Not tested
23.0 Lightning Direct Effects	X	Not tested
24.0 Icing	X	Not tested
25.0 ESD	X	Not tested
26.0 Fire, Flammability	X	Not tested

13.3. Display 8", Display 10" and Display Cables

The following GEN-X components meet the environmental test categories detailed below in accordance with RTCA/DO-160E, Environmental Conditions and Test Procedures for Airborne Equipment and 14 CFR 25.869 Code of Federal Regulations: Title 14 Aeronautics and Space; Subpart D – Design and Construction; Subsection 25.869 (a)(4) – Fire Protection Systems.

NOMENCLATURE: GEN-X Electronic Flight Bag
PART NO: 1069-4808-XX, 1069-4810-XX, 1069-4700-XX, 1069-4710-01 and P10732
MANUFACTURER: DAC International
ADDRESS: 6702 McNeil Drive, Austin, TX 78729

TABLE IX.**Environmental Testing Categories**

Section	Category	Remarks
4.0 Temperature and Altitude	A4	Temperature: Category A4, Operating Low temp; -15ºC and Operating High temp; +55ºC, Short time Operating Low temp; -30ºC and Short time Operating High temp; +55ºC, Ground Survival Low temp; -55ºC and Ground Survival High Temp; +85ºC. Altitude: Category A1, Altitude at 50,000 feet for 2 hours, Decompression from 8,000 feet to 50,000 feet within 15 sec., Overpressure at -15,000 feet for 10 minutes.
5.0 Temperature Variation	B	5° C per minute
6.0 Humidity	X	Not tested

Section	Category	Remarks
7.0 Operational Shock and Crash Safety	B	Saw-tooth 6g, 11msec, 3 shocks per direction. Saw-tooth 20g 11msec, 3 shocks per direction.
8.0 Vibration	X	Not tested
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	X	Not tested
17.0 Voltage Spike	X	Not tested
18.0 AF Conducted Susceptibility – Power Inputs	X	Not tested
19.0 Induced Signal Susceptibility	X	Not tested
20.0 Radio Frequency Susceptibility (Radiated and Conducted)	X	Not tested
21.0 Emission of Radio Frequency Energy	M	Cockpit Equipment
22.0 Lightning Induced Transient Susceptibility	X	Not tested
23.0 Lightning Direct Effects	X	Not tested
24.0 Icing	X	Not tested
25.0 ESD	X	Not tested
Code of Federal Regulations		
14 CFR 25.869	N/A	Fire Protection Systems

14. CONNECTOR PIN OUT

14.1. J1 – Display Interface

14.1.1. SVGA, 16’ Installations

TABLE X. **J1-J4 Pin Out, SVGA, 16’ Installation**

J1 Pin	Signal	Function	J4 Pin
A	DC COMMON	DC Common	17
B	DC COMMON	DC Common	2
C	DA0(-)	LVDS Data 0 (-)	3
D	DA0(+)	LVDS Data 0 (+)	4
E	DA1(-)	LVDS Data 1 (-)	5
F	DA1(+)	LVDS Data 1 (+)	6
G	DA2(-)	LVDS Data 2 (-)	7
H	DA2(+)	LVDS Data 2 (+)	8
J	CLK(-)	LVDS CLK (-)	9
K	CLK(+)	LVDS CLK (+)	10
L	LED3	Emergency Power Light	1
M	USBD0(-)	USB Data 0 (-)	12
N	USBD0(+)	USB Data 0 (+)	13
P	USBD1(-)	USB Data 1 (-)	14
R	USBD1(+)	USB Data 1 (+)	15
S	PWR (+V)	Power +V	18
T	PWR (+V)	Power +V	19
U	DC COMMON	DC Common	16
V	DC COMMON	DC Common	11

14.1.2. SVGA, 30’ Installations

TABLE XI. **J1-J5/P5-J4 Pin Out, SVGA, 30’ Installation**

J1 Pin	J5/P5 Pin	J4 Pin	Signal	Function
A	A	17	DC COMMON	DC Common
B	B	2	DC COMMON	DC Common
C	C	3	DA0(-)	LVDS Data 0 (-)
D	D	4	DA0(+)	LVDS Data 0 (+)
E	E	5	DA1(-)	LVDS Data 1 (-)
F	F	6	DA1(+)	LVDS Data 1 (+)
G	G	7	DA2(-)	LVDS Data 2 (-)
H	H	8	DA2(+)	LVDS Data 2 (+)
J	J	9	CLK(-)	LVDS CLK (-)
K	K	10	CLK(+)	LVDS CLK (+)
L	L	1	LED3	Emergency Power Light
M	M	12	USBD0(-)	USB Data 0 (-)
N	N	13	USBD0(+)	USB Data 0 (+)
P	P	14	USBD1(-)	USB Data 1 (-)
R	R	15	USBD1(+)	USB Data 1 (+)
S	S	18	PWR (+V)	Power +V
T	T	19	PWR (+V)	Power +V
U	U	16	DC COMMON	DC Common
V	V	11	DC COMMON	DC Common

14.1.3. XGA Installations

TABLE XII. **J1-J4 Pin Out, XGA Installation**

J1	J4	Signal	Function
A	A	DC Common	DC Common
B	B	DC Common	DC Common
C	C	DA0(-)	LVDS Data 0 (-)
D	D	DA0 (+)	LVDS Data 0 (+)
E	E	DA1(-)	LVDS Data 1 (-)
F	F	DA1 (+)	LVDS Data 1 (+)
G	G	DA2(-)	LVDS Data 2 (-)
H	H	DA2 (+)	LVDS Data 2 (+)
J	J	CLK (-)	LVDS CLK (-)
K	K	CLK (+)	LVDS CLK (+)
L	L	LED3	Emergency Power Light
M	M	USBD0 (-)	USB Data 0 (-)
N	N	USBD0 (+)	USB Data 0 (+)
P	Z	DC Common	DC Common
R	X	PWR Button	PWR Button
S	S	PWR (+V)	Power +12 VDC
T	T	PWR (+V)	Power +12 VDC
U	U	DC Common	DC Common
V	V	DC Common	DC Common
-	P	N/C	No Connect
-	R	N/C	No Connect
-	W	N/C	No Connect
-	Y	N/C	No Connect

14.2. J2 – Standard Inputs

TABLE XIII. **J2 Pin Out**

J2	Signal	Function
A	USB2 PWR	USB 2 Power
B	ETHERNET SHIELD	Ethernet Shield
C	ESSENTIAL PWR (+V)	28 VDC Power from Essential Buss
D	DC COMMON	Power Common (Emer)
E	EMERGENCY PWR (+V)	28 VDC Emergency Buss Monitor
F	COM 2 COMMON	RS232 Bus Common
G	COM 2 RX	RS 232 RX
H	COM 2 TX	RS 232 TX
J	ET6 RX(-)	Ethernet wire 6 (Rx-)
K	ET3 RX(+)	Ethernet wire 3 (Rx+)
L	ET1 TX(+)	Ethernet wire 1 (Tx+)
M	USBD2(-)	USB Data 2(-)
N	USBD2(+)	USB Data 2(+)
P	USB2 GND	USB2 PWR Common
R	ARINC RX1 (A)	429 RX1 (A)
S	ARINC SHIELD	ARINC Shield
T	ARINC RX1 (B)	429 RX1 (B)
U	ET2 TX(-)	Ethernet wire 2 (Tx-)
V	DC COMMON	Power Common

14.3. J3 – Miscellaneous Inputs/Outputs

14.3.1. SVGA Installations

TABLE XIV. **J3 Pin Out, SVGA Installations**

J3	Signal	Function
1	RED	VGA Red
2	GREEN	VGA Green
3	BLUE	VGA Blue
4	429 TX1 (A)	429 TX1 Output
5	429 TX2 (A)	429 TX Output
6	429 RX2 (A)	429 RX2 Input
7	429 RX3 (A)	429 RX Input
8	429 RX4 (A)	429 RX Input
9	COM4 CTS	RS 232
10	N/C	(reserved)
11	N/C	(reserved)
12	COM1 TX	RS 232
13	COM1 RX	RS 232
14	+12Vdc OUT	+12Vdc OUT (pair with J3-29)
15	+12Vdc OUT	FAN +12Vdc OUT (pair with J3-30)
16	R GND	VGA Red Ground
17	G GND	VGA Green Ground
18	B GND	VGA Blue Ground
19	429 TX1 (B)	429 TX1 Output
20	429 TX2 (B)	429 TX Output
21	429 RX2 (B)	429 RX2 Input
22	429 RX3 (B)	429 RX Input
23	429 RX4 (B)	429 RX Input
24	COM4 RTS	RS 232
25	COM4 RTN	RS 232 Return
26	N/C	(reserved)
27	GND	GND
28	COM1 RTN	RS 232 Return
29	+12Vdc_RTRN	+12Vdc_RTRN (pair with J3-14)
30	+12Vdc_RTRN	FAN +12Vdc_RTRN (pair with J3-15)
31	H SYNC	Horizontal Sync
32	SYNC RTN	Sync Return
33	V SYNC	Vertical Sync
34	VIDEO GND	Video Ground
35	USB4_PWR	USB port 4
36	USB4_D+	USB port 4
37	USB4_D-	USB port 4
38	USB4_GND	USB port 4
39	COM4 TX	RS 232
40	COM4 RX	RS 232
41	N/C	(reserved)
42	N/C	(reserved)
43	N/C	(reserved)
44	DUBTN	DU Power Button (closure to GND)

14.3.2. XGA Installations

TABLE XV. **J3 Pin Out, XGA Installations**

J3	Signal	Function
1	RED	VGA Red
2	GREEN	VGA Green
3	BLUE	VGA Blue
4	429 TX1 (A)	429 TX1 Output
5	429 TX2 (A)	429 TX Output
6	429 RX2 (A)	429 RX2 Input
7	429 RX3 (A)	429 RX Input
8	429 RX4 (A)	429 RX Input
9	COM4 CTS	RS 232
10	USB3_D+	USB port 3
11	USB3_D-	USB port 3
12	COM1 TX	RS 232
13	COM1 RX	RS 232
14	+12Vdc OUT	+12Vdc OUT (pair with J3-29)
15	+12Vdc OUT	FAN +12Vdc OUT (pair with J3-30)
16	R GND	VGA Red Ground
17	G GND	VGA Green Ground
18	B GND	VGA Blue Ground
19	429 TX1 (B)	429 TX1 Output
20	429 TX2 (B)	429 TX Output
21	429 RX2 (B)	429 RX2 Input
22	429 RX3 (B)	429 RX Input
23	429 RX4 (B)	429 RX Input
24	COM4 RTS	RS 232
25	COM4 RTN	RS 232 Return
26	USB3_GND	USB port 3
27	GND	GND
28	COM1 RTN	RS 232 Return
29	+12Vdc_RTRN	+12Vdc_RTRN (pair with J3-14)
30	+12Vdc_RTRN	FAN +12Vdc_RTRN (pair with J3-15)
31	H SYNC	Horizontal Sync
32	SYNC RTN	Sync Return
33	V SYNC	Vertical Sync
34	VIDEO GND	Video Ground
35	USB4_PWR	USB port 4
36	USB4_D+	USB port 4
37	USB4_D-	USB port 4
38	USB4_GND	USB port 4
39	COM4 TX	RS 232
40	COM4 RX	RS 232
41	USB3_PWR	USB port 3
42	N/C	(reserved)
43	N/C	(reserved)
44	DUBTN	DU Power Button (closure to GND)

15. TYPICAL INTERCONNECT

15.1. XGA Installation Using P10732

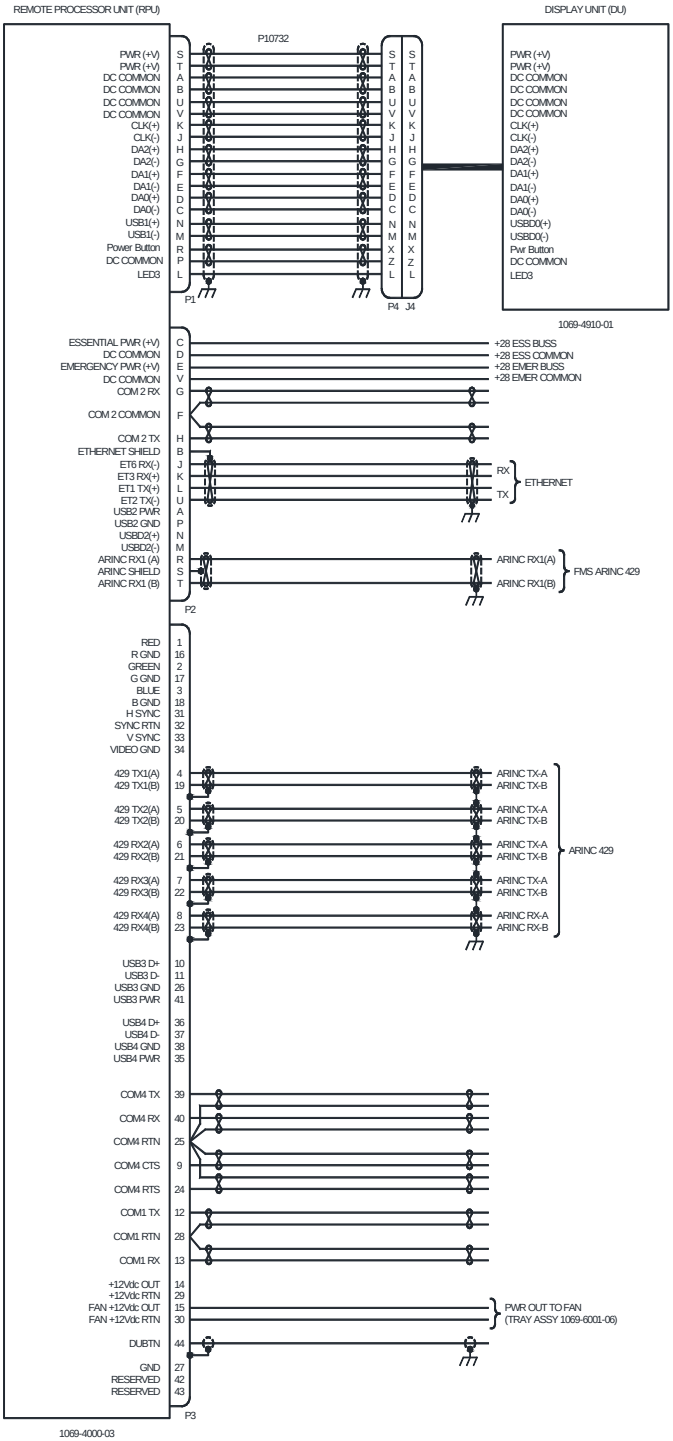


FIGURE 5. **XGA Installation Using P10732**

15.2. XGA Installation, Display Wiring Performed at Installation

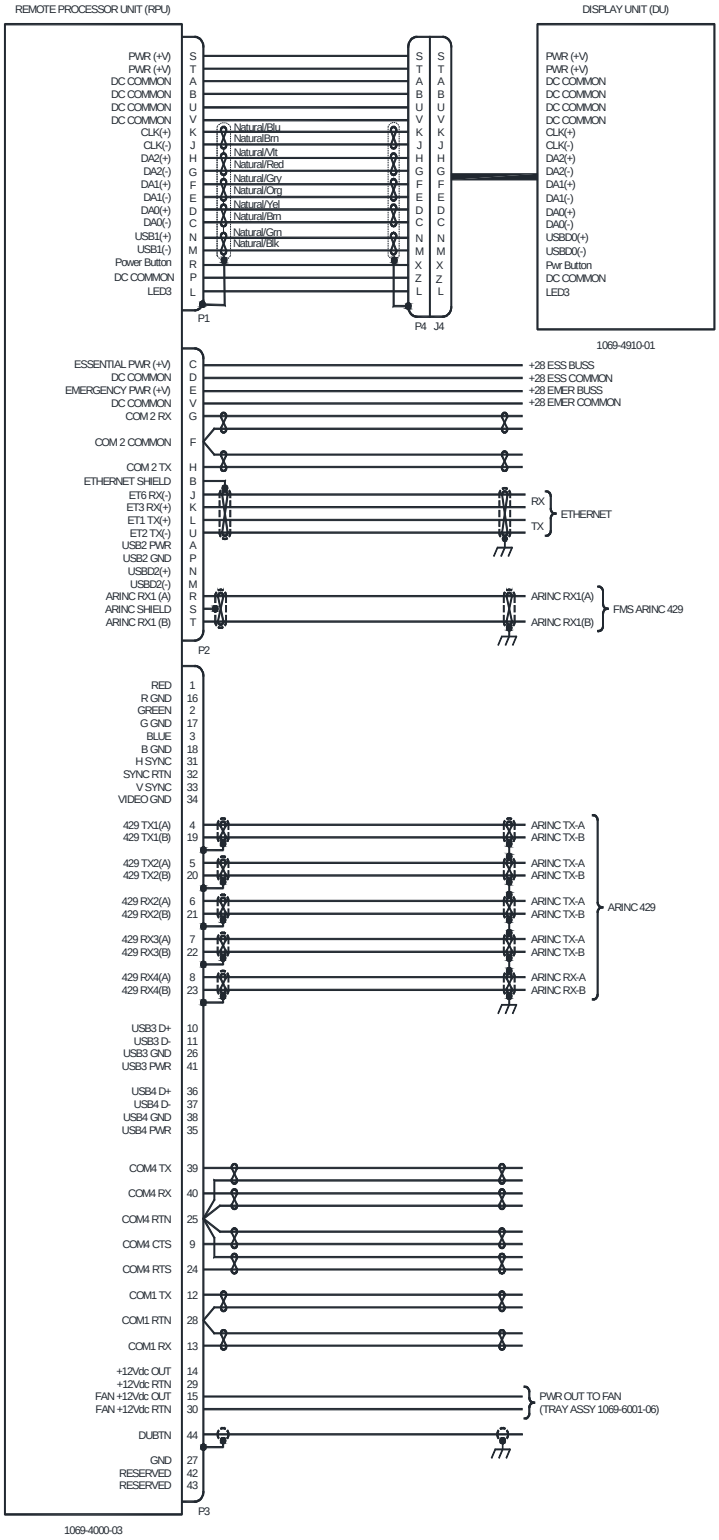


FIGURE 6. **XGA Installation, Display Wiring Performed at Installation**

15.3. SVGA 16' Installations

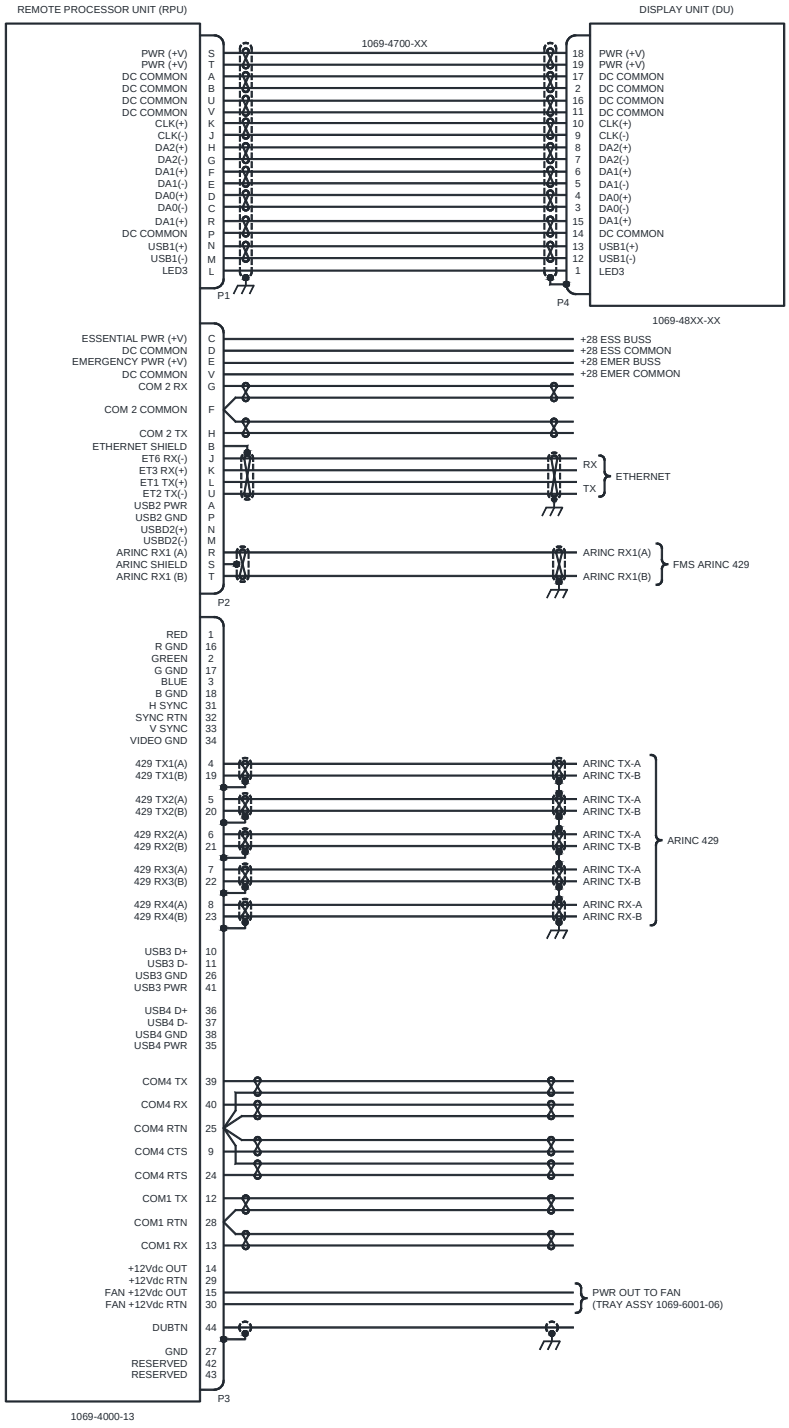


FIGURE 7. **Typical Interconnect, SVGA 16' Installation**

15.4. SVGA 30’ Installations

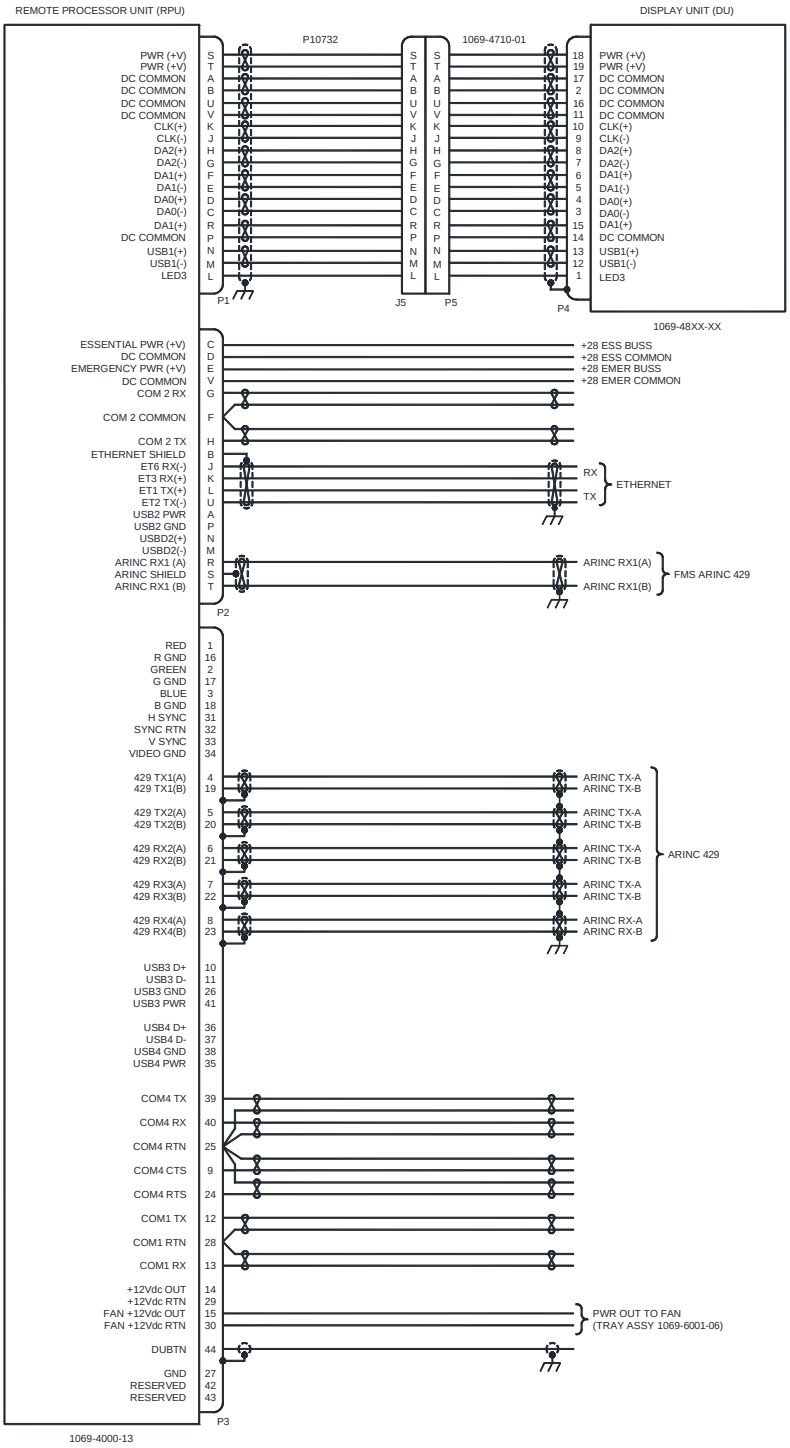


FIGURE 8. **Typical Interconnect, SVGA 30’ Installation**

15.5. Typical Ethernet Interconnections

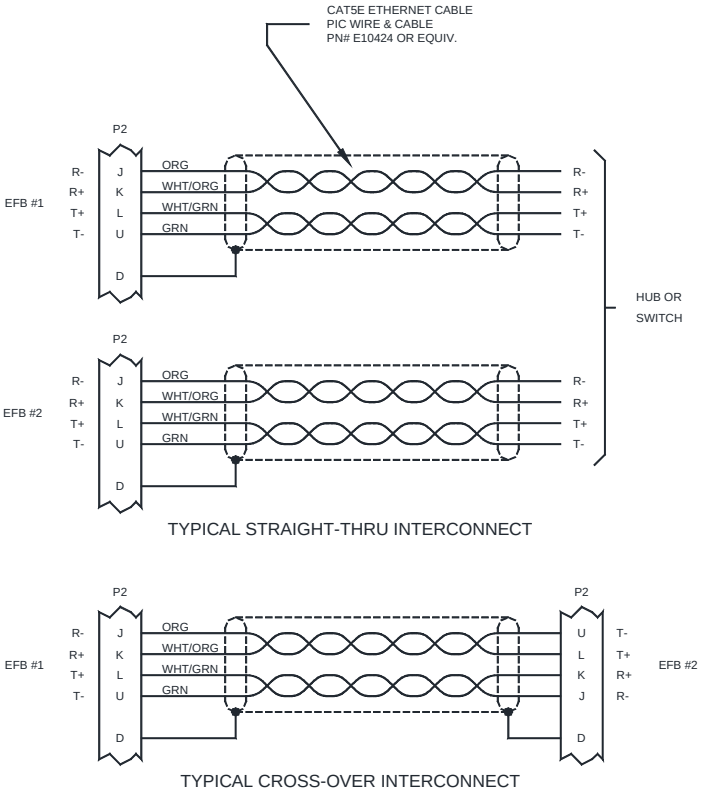


FIGURE 9. **Typical Ethernet Interconnects**

16. OUTLINE DRAWINGS

Note: All dimensions are in inches

16.1. Display Units

16.1.1. XGA, 10.4 Inch Display Unit

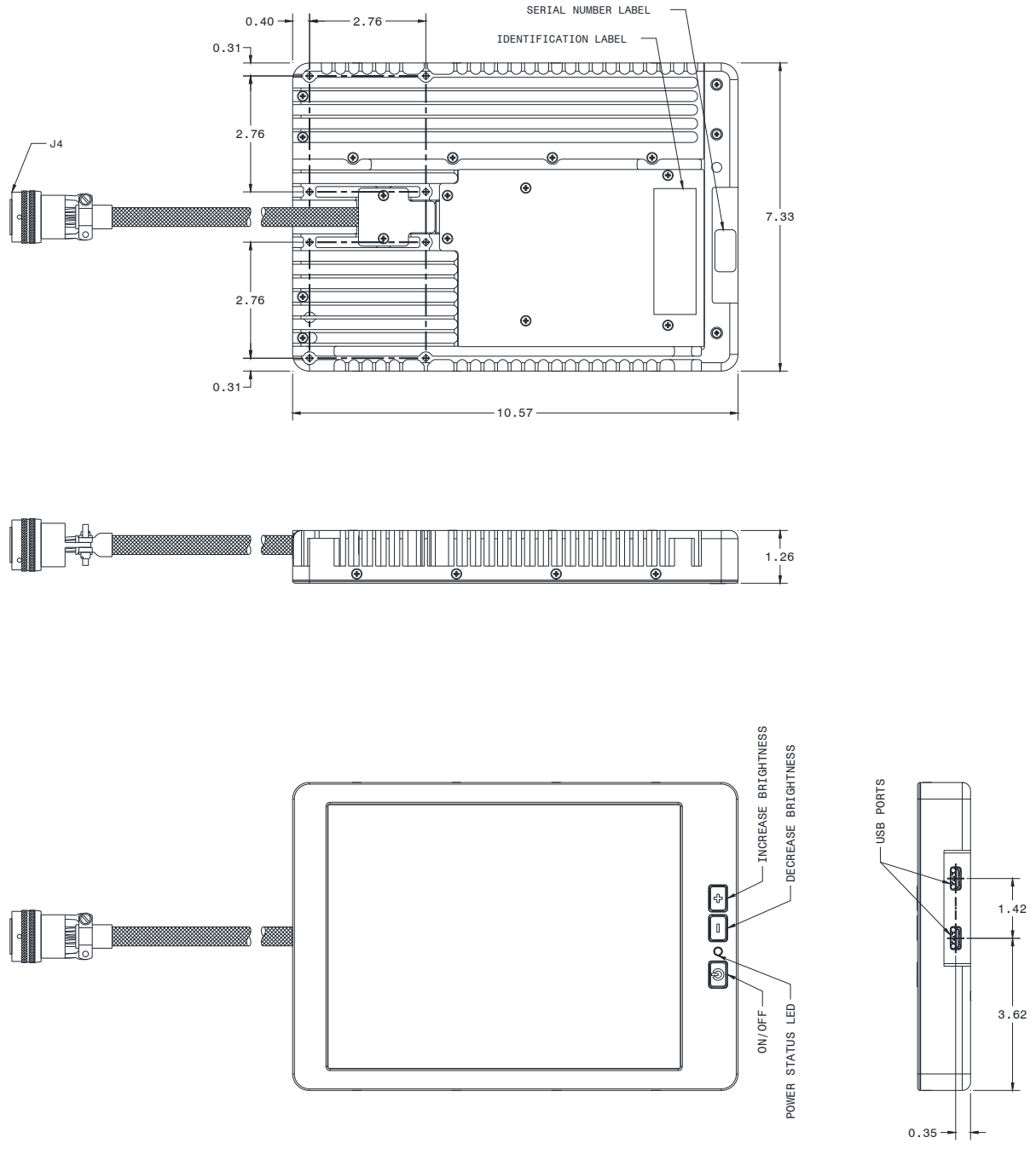


FIGURE 10. **1069-4910-01, 10.4 Inch Display Unit**

16.1.2. SVGA, 8 Inch Display Unit

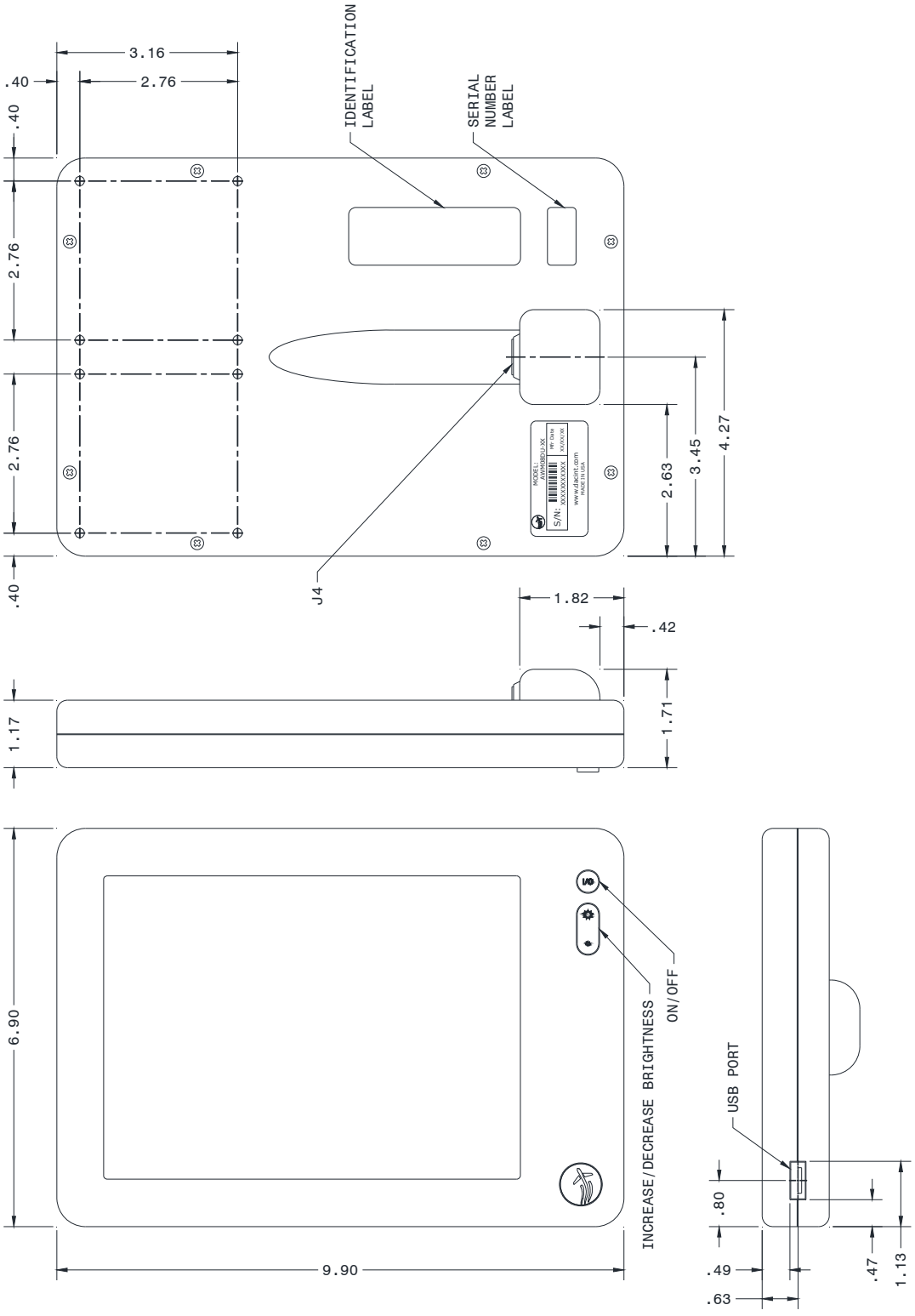


FIGURE 11. **1069-4808-XX, 8 Inch Display Unit**

16.1.3. SVGA, 10 Inch Display Unit

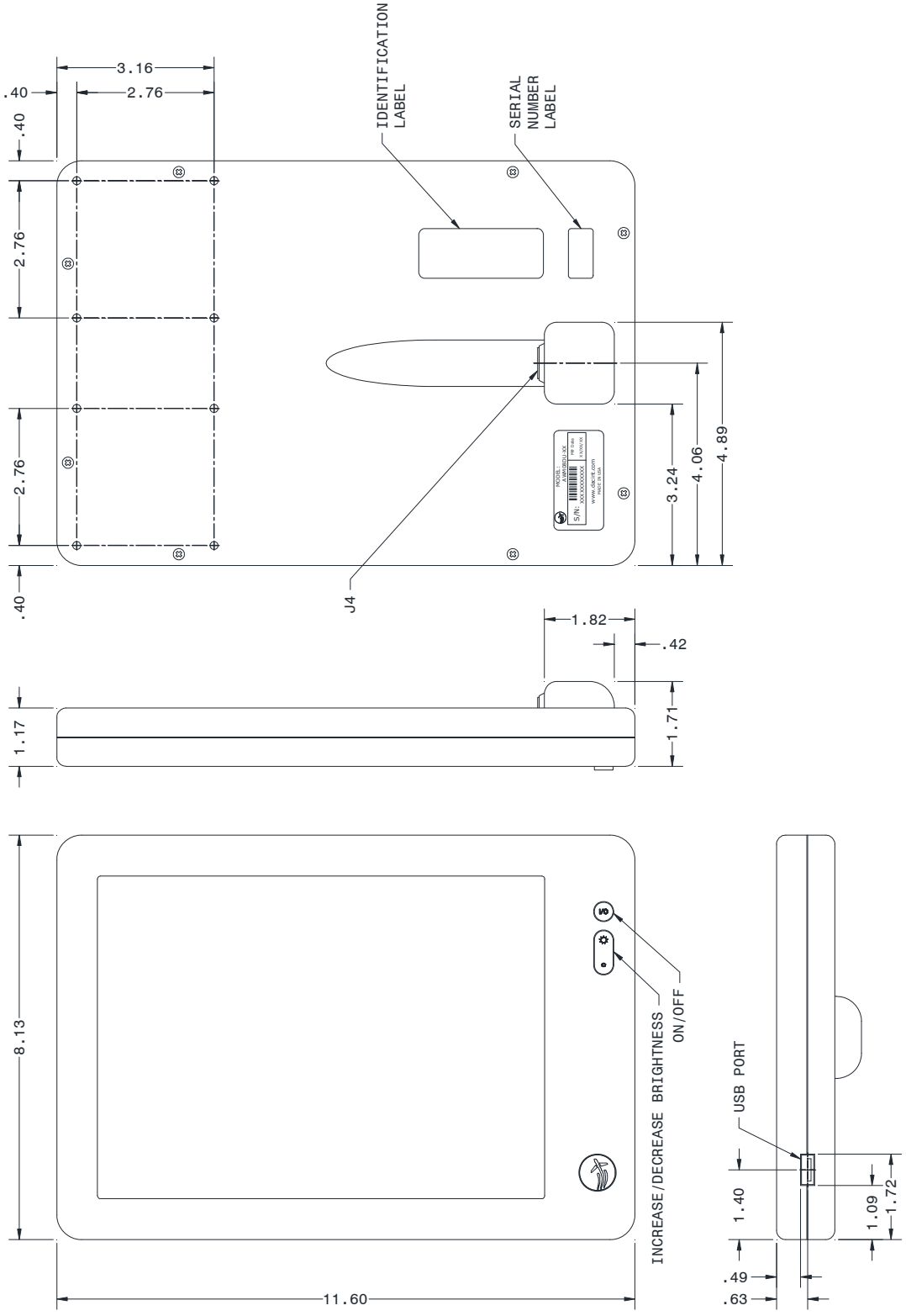
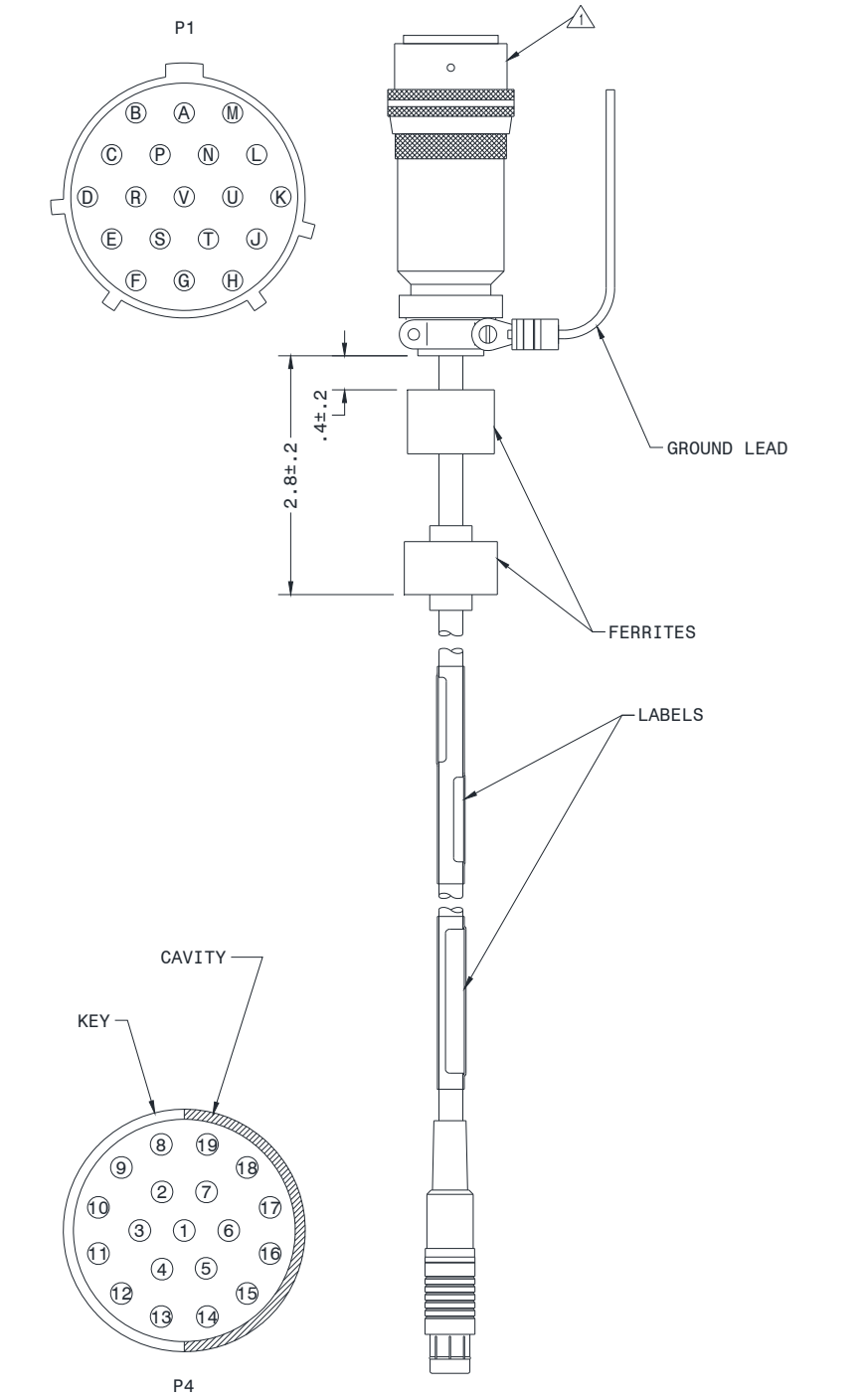


FIGURE 12. **1069-4810-XX, 10 Inch Display Unit**

16.1.4. Display Cables

16.1.5. 16’ Display Cable



1 FOR P1 IN RIGHT ANGLE ORIENTATION, REFERENCE CABLE PART NUMBER 1069-4700-02

FIGURE 13. **1069-4700-01, Display Cable, Straight Plug**

16.1.6. 27’ Display Cable

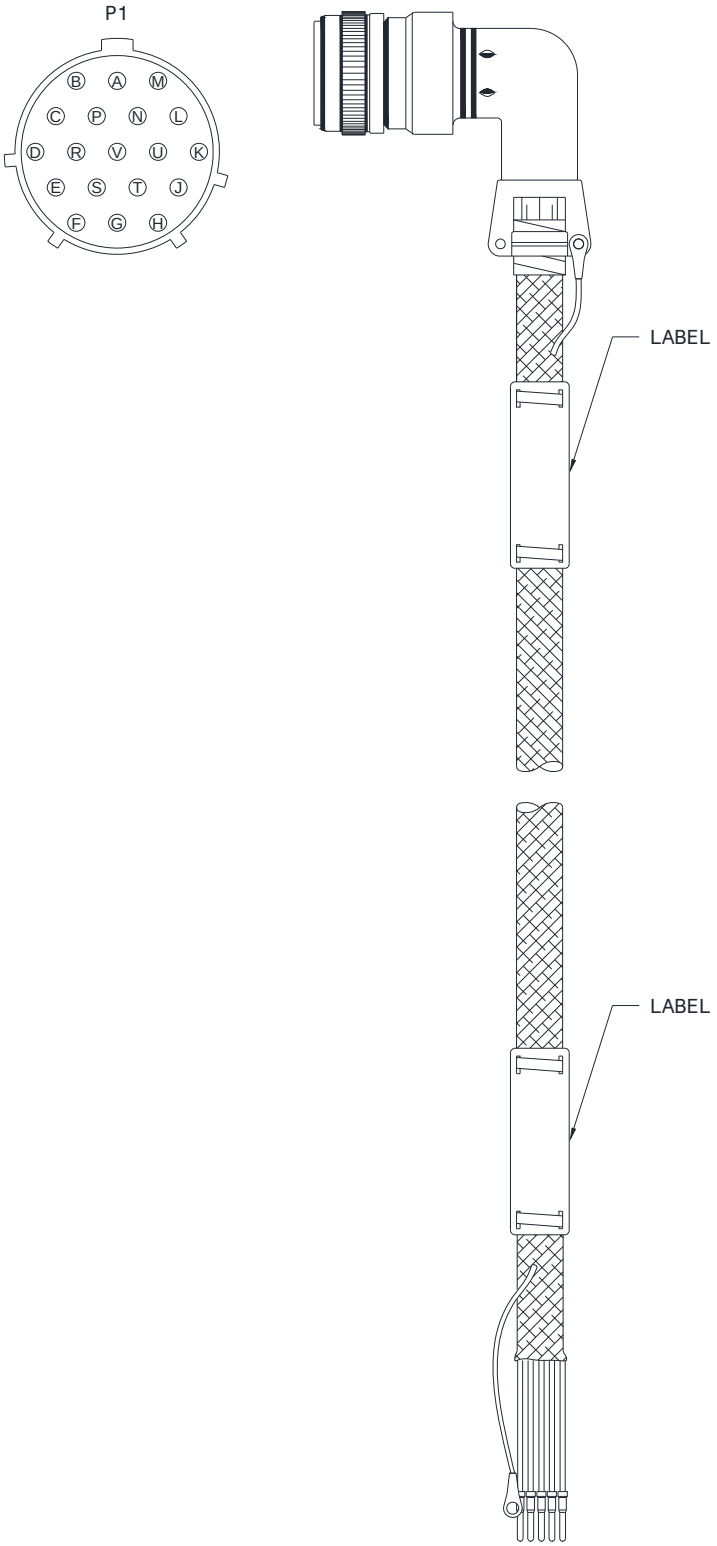


FIGURE 14. **P10732, Display Cable, 27’**

16.1.7. 3’ Stub Cable

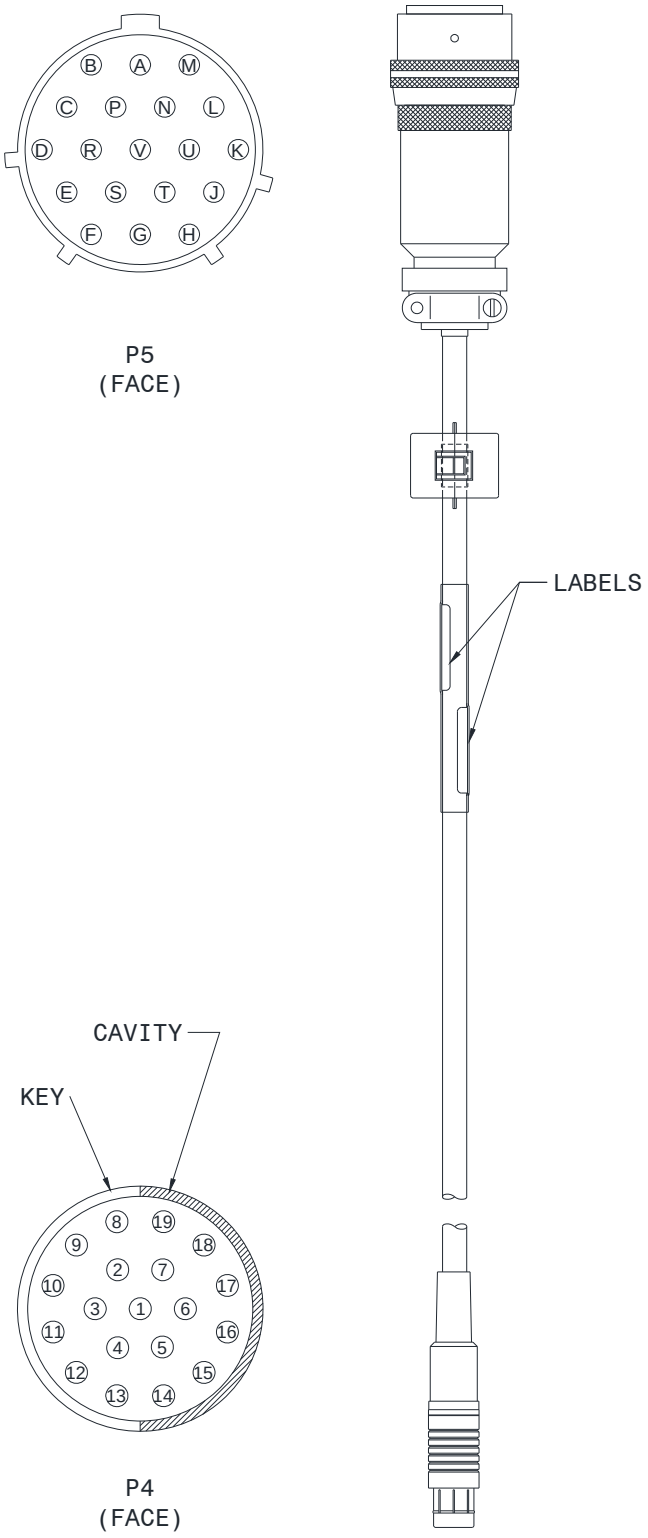


FIGURE 15. **1069-4710-01, Display Cable, 3’ Stub**

16.2. Remote Processor Unit

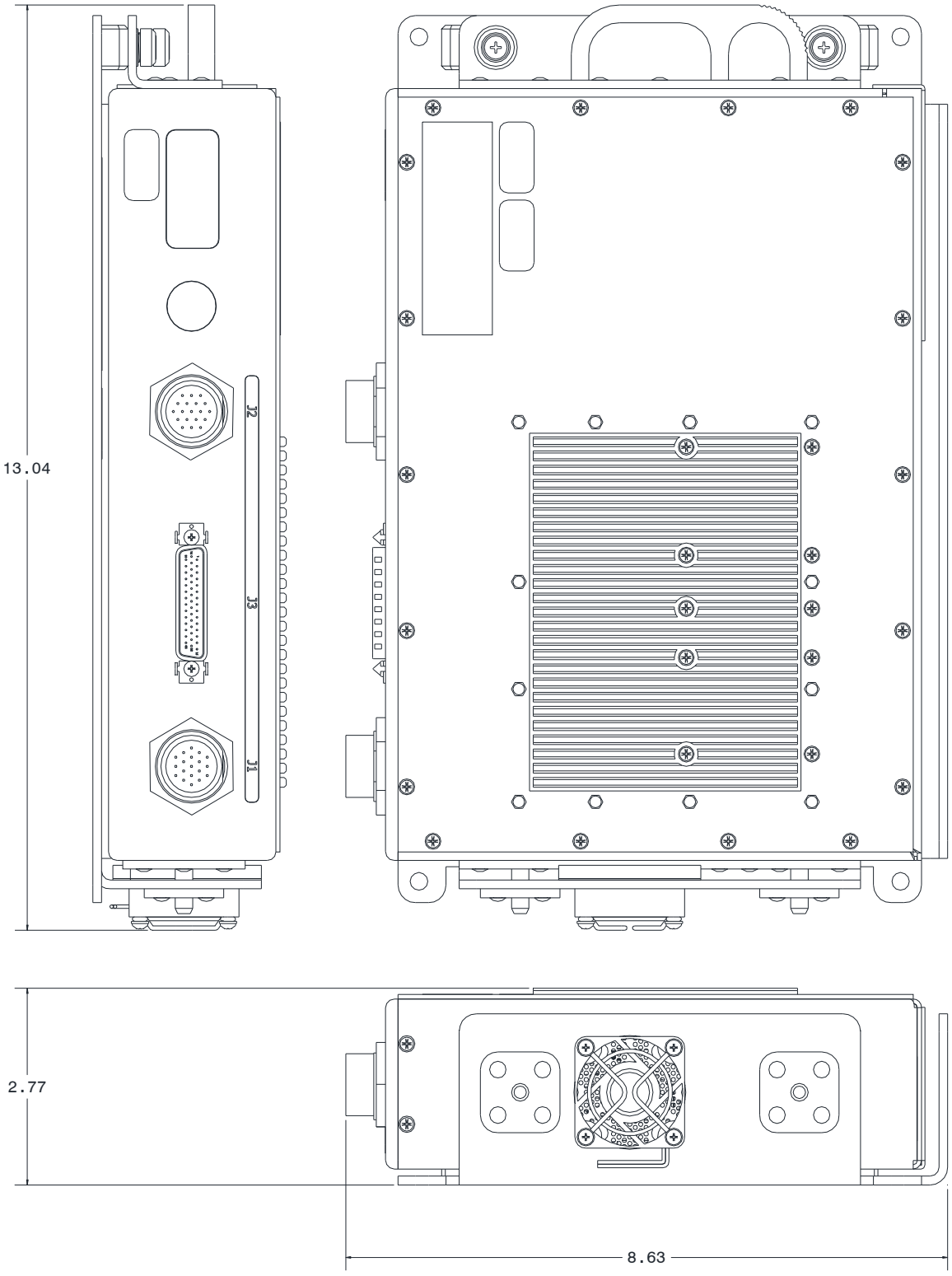


FIGURE 16. **1069-4000-03/-13, Remote Processor Unit (In Mount, 1069-6001-06)**

16.3. RPU Mount

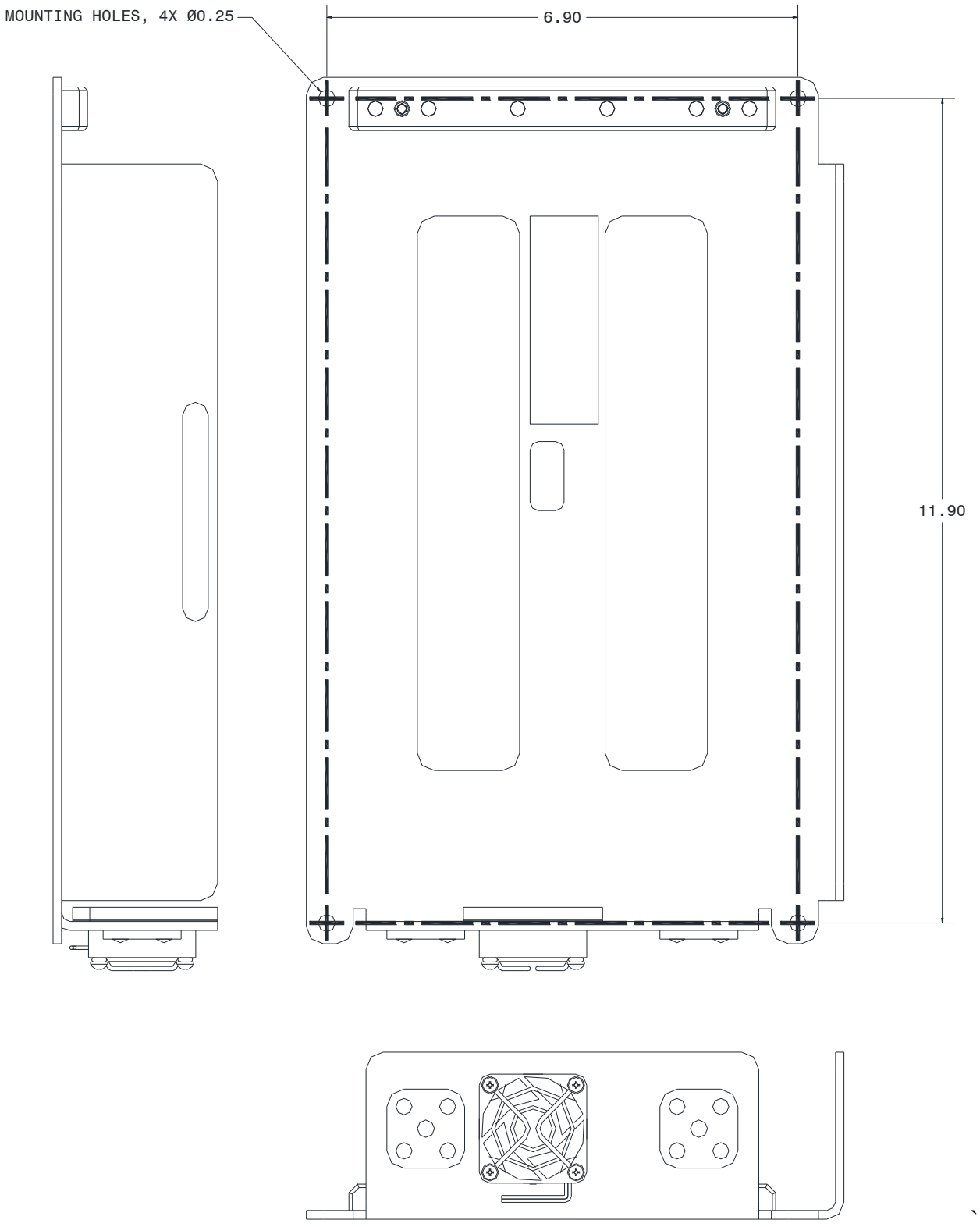


FIGURE 17. **1069-6001-06, RPU Mount**

17. ADDITIONAL PROCEDURES

17.1. Display Unit Screen Rotation Procedure

The GEN-X SVGA DU may be installed in four different mechanical orientations (2 portrait and 2 landscape). To select the correct screen orientation, utilize a USB mouse and perform the following steps:

1. Connect a USB mouse to the USB port at the bottom of the DU. Use the mouse to perform the following steps.
2. From the Desktop, right click and select “Graphics Properties…”
3. In the left panel of the dialog box that appears ensure “Display > General Settings” is selected.
4. In the General Settings window use the “Rotation” drop-down menu to select the desired screen rotation.
5. Click “OK” as necessary to confirm the change.
6. Close all windows. Rotation procedure complete.
7. Proceed to Touch Screen Calibration Procedures.

17.2. Touch Screen Calibration Procedure

If any changes are made to the Display Unit configuration the Touch Screen Calibration Procedure must be performed in order to ensure correct operation of the GEN-X EFB.

17.2.1. XGA Display Units

1. If a USB mouse is not connected to the USB port at the bottom of the DU, connect one at this time.
2. Click: Start > All Programs > PenMount Windows Universal Driver > Utility > PenMount Control Panel.
3. Select the “PenMount 6000 USB” device, and click “Configure”. See FIGURE 18.
4. Click the “Standard Calibration” button. See FIGURE 19.
5. Follow the instructions presented on the DU screen.
6. Following the calibration procedure you will be returned to the device configuration screen. Close all windows. Calibration complete.

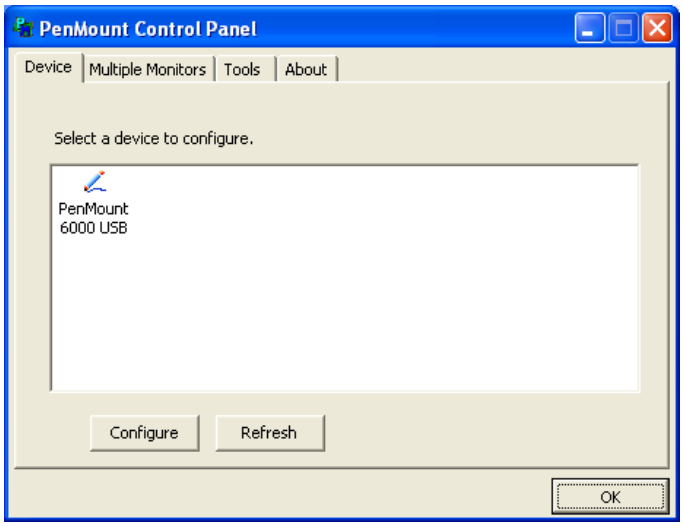


FIGURE 18. **PenMount Control Panel**

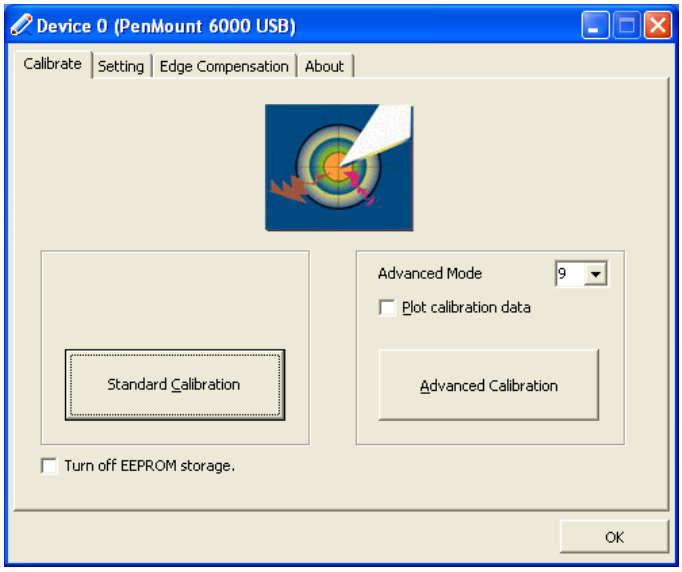


FIGURE 19. **Device Configuration Screen**

17.2.2. SVGA Display Units

1. If a USB mouse is not connected to the USB port at the bottom of the DU, connect one at this time.
2. Click: Start > All Programs > Hampshire TSHARC Control Panel.
3. Select the “Calibration” tab. See FIGURE 20.
4. Click the “Configure” button and choose “7 Point Calibration”, set “Offset” to 20%; and Click “OK”. See FIGURE 21 and FIGURE 22.
5. At the “Calibration” tab, click the large target icon/button.
6. Follow the on-screen instructions and press “Accept” when finished. See FIGURE 23.
7. Close all windows. Calibration complete.

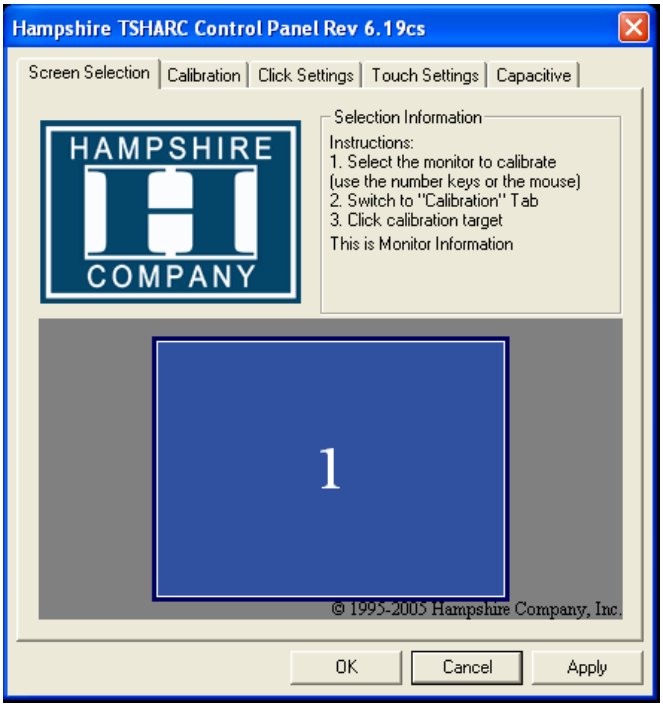


FIGURE 20. **TSHARC Control Panel**

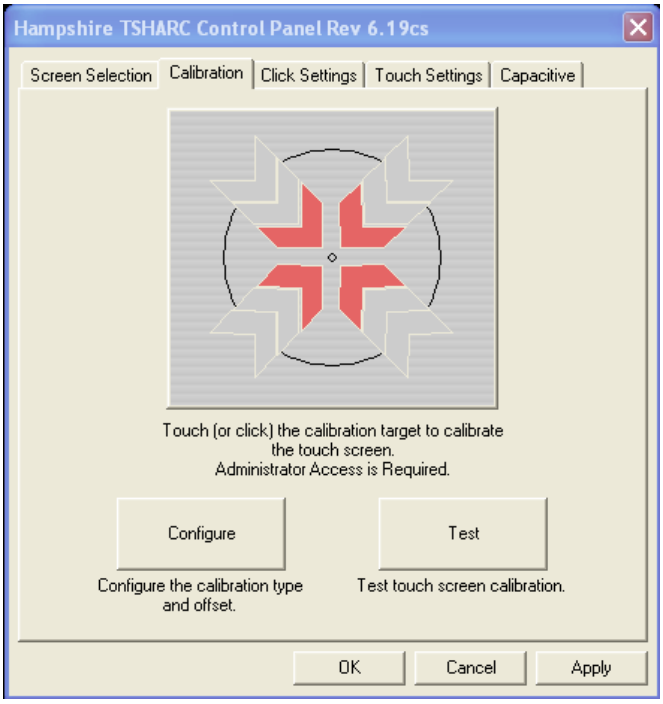


FIGURE 21. **TSHARC Calibration Tab**

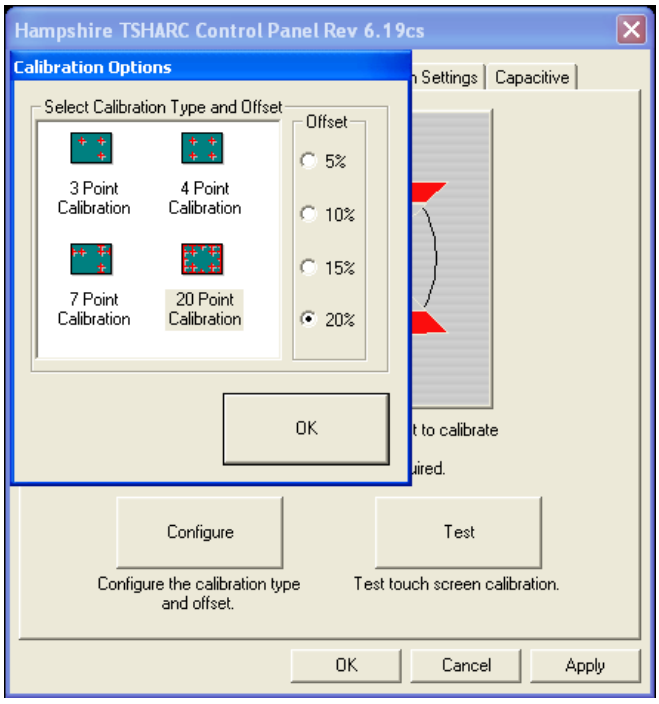


FIGURE 22. **Calibration Options**

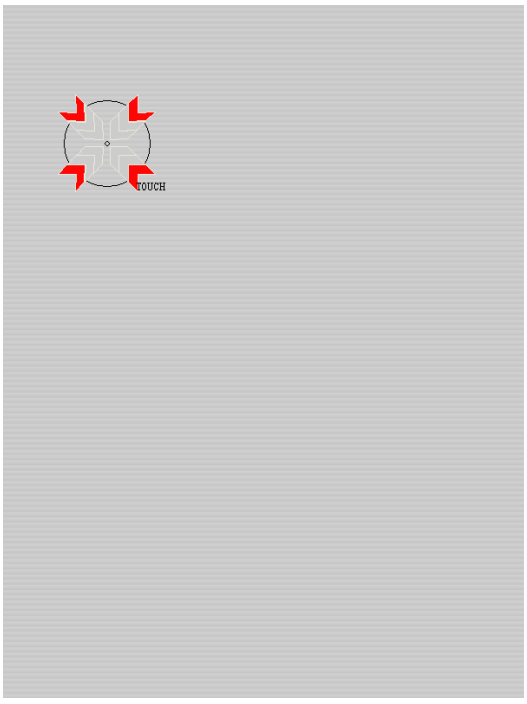


FIGURE 23. **Calibration Window Example**