

## Installation and Operation Manual

### FD104CV-C-L/R-1

#### 10.4" LCD Monitor Left/Right Arm Mount





FD104CV-C-L/R-1

10.4" LCD Monitor Left/Right Arm Mount

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## General Information

The FD104CV-C-L/R-1 is a special mission . It consists of two separate parts, the LCD monitor and the articulating arm.

Built with retrofit aircraft integration in mind, this display can switch between three video input sources using the buttons on the bezel. Additional functions are added using the 8 bezel keys. These functions are generated by the mission computer.

The arm has 2 pivot points which enable it to have a range of rotation up to 180° at each pivot point. This monitor also tilts back and forth 20° in either direction and can rotate 45° left and right.

### Front View



### Additional Information

The FD104CV-C-L/R-1 is made of all metal components. The milled aluminium arm represents the evolution of several design enhancements for an optimum mounting solution.

The 10.4" LCD utilizes a state of the art digital video decoding chipset for the analog video input. The available video sources are VGA (Computer Video, such as a Moving Map) and Composite Video (Camera).

The FD104CV-C-L/R-1 can also be connected to existing video switchers and can take a composite video input from a selector interface box. In this case, multiple input sources can be selected and displayed on the monitor.

The monitor also features dual USB ports which allows for quick and easy access to files via thumb drive. It also has 8 buttons which can be programmed to meet a specific application.

The LCD features NVG technology which can be switched to Day or Night mode using the rocker switch. The NVG LCD filters out infrared rays in the 1000nm range.

## Specifications

Display Type	10.4" TFT Color LCD
Display Color	262,144 Colors
Screen Resolution	1024x768
Brightness (Day Mode)	800 cd/m <sup>2</sup>
Brightness (NVG Mode)	200 cd/m <sup>2</sup>
Viewing Angle	176° on Both Axis
NVIS Specifications	Type I, Class B, MIL-STD-300G
Mount Dimensions (stowed)	15.71" (W) x 11.95" (H) x 2.90" (D)
Mount Dimensions (deployed)	11.22" (W) x 11.95" (H) x 2.90" (D)
Display Dimensions	8.24" (W) x 6.20" (H)
Weight	5 lbs 7 oz
Power	28V DC @ 1.0 Amp
Video Inputs Supported	Analog RGB, Composite Video
Video Types Supported	XVGA, NTSC
Screen Control	On Screen Display Menu
Mount Materials	Aluminum
DO-160 Testing	Complete

## Installation Instructions

All cabin entertainment equipment, such as the FD104CV-C-L/R-1, should be installed on a non-essential bus and have a dedicated circuit breaker. It is a requirement that a switch be installed in the cockpit so that the pilot can de-energize the entertainment system should it become necessary.

### Power

This is a **28VDC** monitor that requires 1.0 Amps (28 Watts) of power.

## Wiring Suggestions

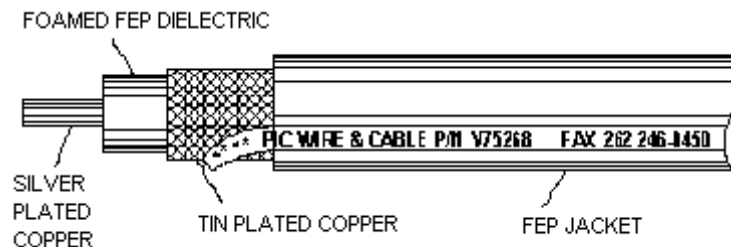
All shields should be grounded to the connector at the source, and floating at the display.

Avoid routing video wiring parallel to:

- AC wiring
- Strobe wiring
- DC motor supply cables
- Inverter cabling
- Or any other potential noise source.

## S-Video/Composite and Audio Wiring

Recommended cable for s-video/composite and audio purposes is PIC 75 Ohm Coax, P/N V75268. This is a lightweight, flexible, and low signal loss cable which meets FAA flammability requirements of FAR 23.1359(d), FAR 25.853(a) and FAR 25.869(a)(4).

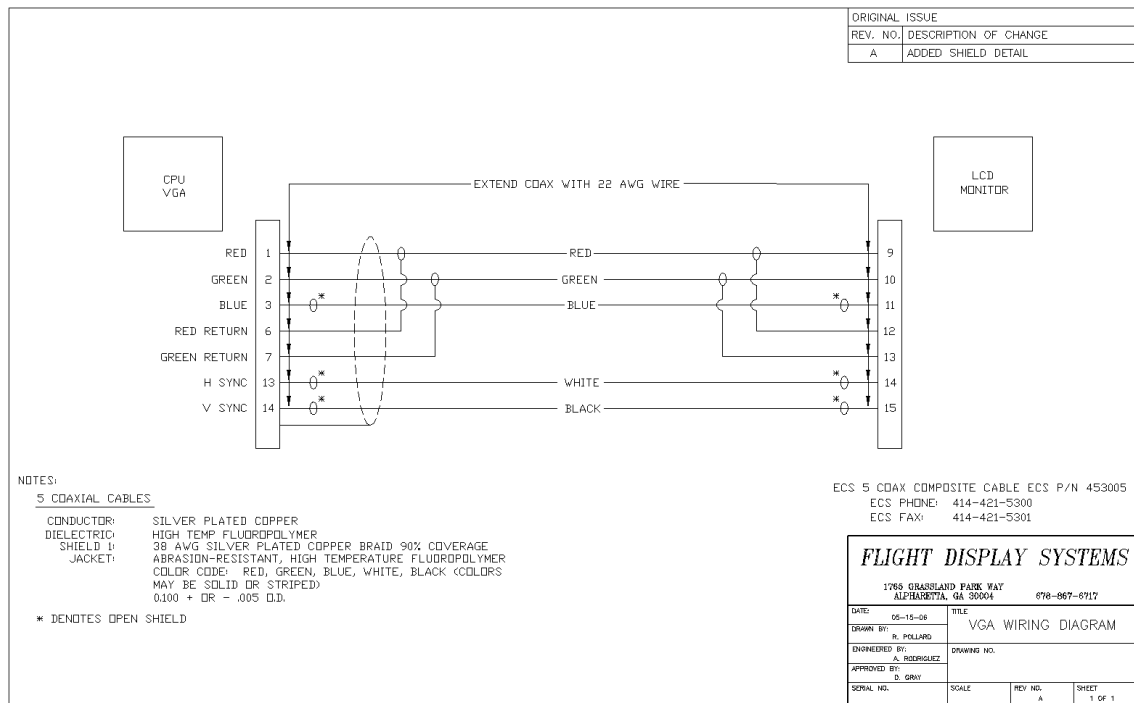


Similar aviation coaxial cable can be used from other vendors, as well.

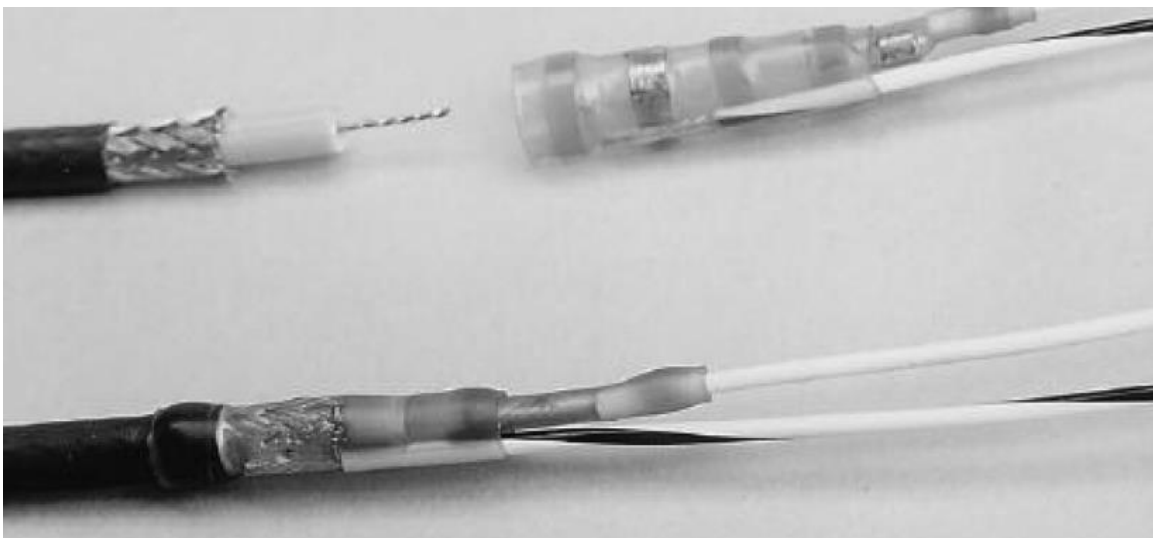
Some aircraft are prone to AC noise - we recommend adding to the composite source a 75 Ohm video isolation transformer such as Deerfield Laboratory, Inc. Part No. 162-1 ([www.deerfieldlab.com](http://www.deerfieldlab.com), (650) 632-4090). In most cases this should be added to the video output of the source.

## VGA Wiring

Recommended cable for VGA purpose is ECS P/N 453005. This is a single shielded cable containing 5 separate coaxial cables, color-coded to match the functions of the wires.



We recommend coax cables be terminated using solder sleeve coaxial cable terminators such as Raychem Part Number CWT-4174-W122-5/9.





## **Power and Ground Wiring**

22 AWG wire is recommended for Power and Ground applications.





## Power/Video

### Pin out for High Density 26 Position Connector

Part Numbers for HD-26 Connector

Connector, High Density, D-Sub, 26 Position P/N: M24308/2-287F

Contact, Socket, 22 gauge P/N: M39029/57-354



Pin Number	Description
1	28VDC Power
2	28VDC Ground
3	Composite Video #1 - Signal
4	Composite Video #1 - Shield
5	N/C
6	N/C
7	Composite Video #2 - Signal
8	Composite Video #2 - Shield
9	Red Video (Pin 1 on Standard VGA)
10	Green Video (Pin 2 on Standard VGA)
11	Blue Video (Pin 3 on Standard VGA)
12	Red Ground (Pin 6 on Standard VGA)
13	Green Ground (Pin 7 on Standard VGA)
14	Horizontal Sync (Pin 13 on Standard VGA)
15	Vertical Sync (Pin 14 on Standard VGA)
16	N/C
17	N/C
18	N/C
19	N/C
20	N/C
21	N/C
22	USB Data + (Green)
23	USB Data - (White)
24	USB +5VDC (Red)
25	USB Ground (Black)
26	USB Shield

## Operation Instructions

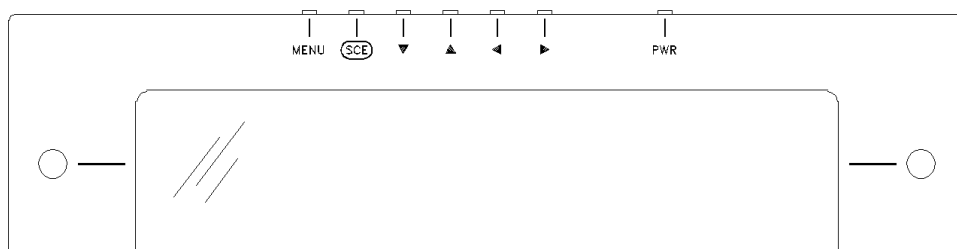
The FD104CV-C-L/R-1 is continuously on but can be de-energized by removing power from the system. No pilot or aircrew action is necessary during flight or ground operation.

The operator will be able to change the video output from the FD104CV-C-L/R-1 using the video source select switch on the LCD monitor.

When applying 28VDC power, the display will turn on and look for a valid input on the last known source. If no input is found, the display will go to standby mode. Pressing the Select button will select new video input.

## Button Controls

Located at the top of the FD104CV-C-L/R-1 are five buttons.



Operations are as follows:

BUTTON	DESCRIPTION
MENU	Used to change the configuration of the picture settings (Backlight, Brightness, Contrast, Saturation, Hue, etc.)
SCE	Used to select the input signal source.
(Down)	Used to decrease the adjustment of a menu option.
(Up)	Used to increase the adjustment of a menu option.
(Left)	Used to move between options on the menu screens.
(Right)	Used to move between options on the menu screens.
Power	Used to turn the unit on or off.

## Troubleshooting

### VGA Shadowing

Most of shadowing problems are due to shielding on the wire. Locate the point where all of the shields are connected. Cut away the shields, one at a time, while viewing the display on the screen to observe which shield is causing the noise. Cutting away one shield at a time will allow you to focus and isolate the video noise issue.

- Twisted pair wiring is prone to video noise. ECS VGA Wire (Detailed under “Video Wiring Suggestions”) is recommended.

### Snow or Sweeping Lines

Lines that slowly sweep up and down are a result of AC noise. This AC noise can be generated by a power cart on the aircraft. Take the power cart off of the aircraft. Be careful of inverter wiring, which can also cause noise. Stand off the wires, if necessary.

If snow or sweeping lines persist, it is possible that the ground is at an incorrect point in the aircraft. Try moving the ground to another location.

### No power to Monitor, or No video Input

- Verify correct wiring. Check the base receptacle connectors for possibly damaged pins.
- Check that the video source is:
  1. Powered on,
  2. In Play mode, and
  3. Displaying video.

### Color Distortion

- Adjust brightness and contrast settings using the buttons on the monitor.



## Technical Support

Should you have any questions concerning this product or other Flight Display Systems products, please contact our Product Support representatives at 470-239-7421.

### **Flight Display Systems**

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For further product information, technical data and sample wiring diagrams, please click on the **Dealers** section of our web site at [www.FlightDisplay.com](http://www.FlightDisplay.com)

## Instructions for Continued Airworthiness

The FD104CV-C-1 is designed not to require regular general maintenance.





## Warranty Information

All Flight Display Systems (FDS) products are warranted to be free from material or manufacturing defects for a period of 24 months from the date of shipment for General Aviation customers or 12 months from the date of shipment for Government/Special Mission customers. Any material or repair workmanship for in warranty repair service will be specifically warranted for 90 days or the remainder of the original warranty period, whichever is longer. If the original warranty period has expired, the 90 day repair warranty is limited to the material and workmanship specific to the repair activity completed.

The following conditions are exclusions to warranty coverage:

1. Labor costs associated with installation, removal or reinstallation of any product.
2. Damage to or malfunction caused by any unauthorized alteration made to the product.
3. Resolving signal quality issues caused by externally generated noise introduced by aircraft electrical systems or other components connected to any FDS product.
4. Any malfunction caused by improper installation or connection to aircraft wiring, industry standard cabin management/ inflight entertainment systems, or third party commercial equipment not specifically identified as compatible with FDS products.
5. Any malfunction caused by installation that does not conform to precautions associated with operating environments listed in the operating manual or consistent with industry best practices such as; high temperature, adequate ventilation, high humidity, high dust, or power surges.
6. Cosmetic damage or damage to internal components caused by installation or removal, failure to follow installation or operating instructions, or any neglect or misuse of the product.
7. Any product that is returned for service with a broken tamper evident seal, indicating tampering or improper handling of the product by an unauthorized person. Violation of product tamper evident seals or modification of factory installed serial and PMA labels voids any warranty, either expressed or implied.

The FDS technical support team is available to provide distance troubleshooting support during business hours (8:00am to 5:00pm EST) Monday through Friday at (470) 239-7421.

Many repair requests can be resolved through distance support and may not require return of merchandise to the factory. If a product must be returned to the factory for repair, an RMA number will be issued as directed by the technical support team and communicated by the repair coordinator.

Upon request by the customer, FDS may send a service technician onsite to repair any non-PMA products. The travel expenses incurred to include transportation, lodging and meals along with the technician's hourly rate shall be payable by the customer in accordance with FDS' applicable rates and procedures.

Flight Display Systems will, upon receipt of returned merchandise, remanufacture or replace the unit at our discretion and return the product by Ground Return Shipping. Express return shipment will be the responsibility of the sender.

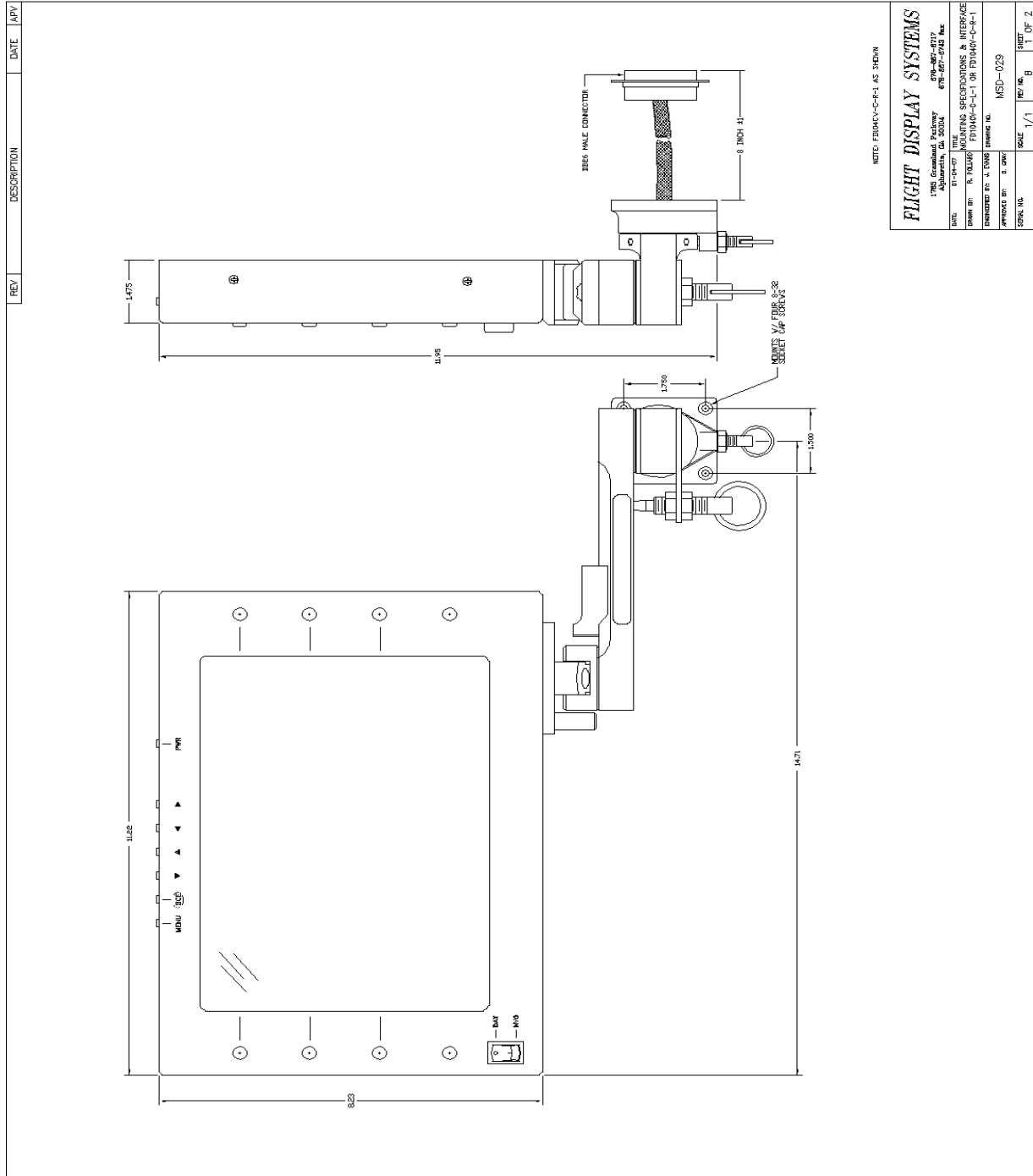
This warranty is not transferable.

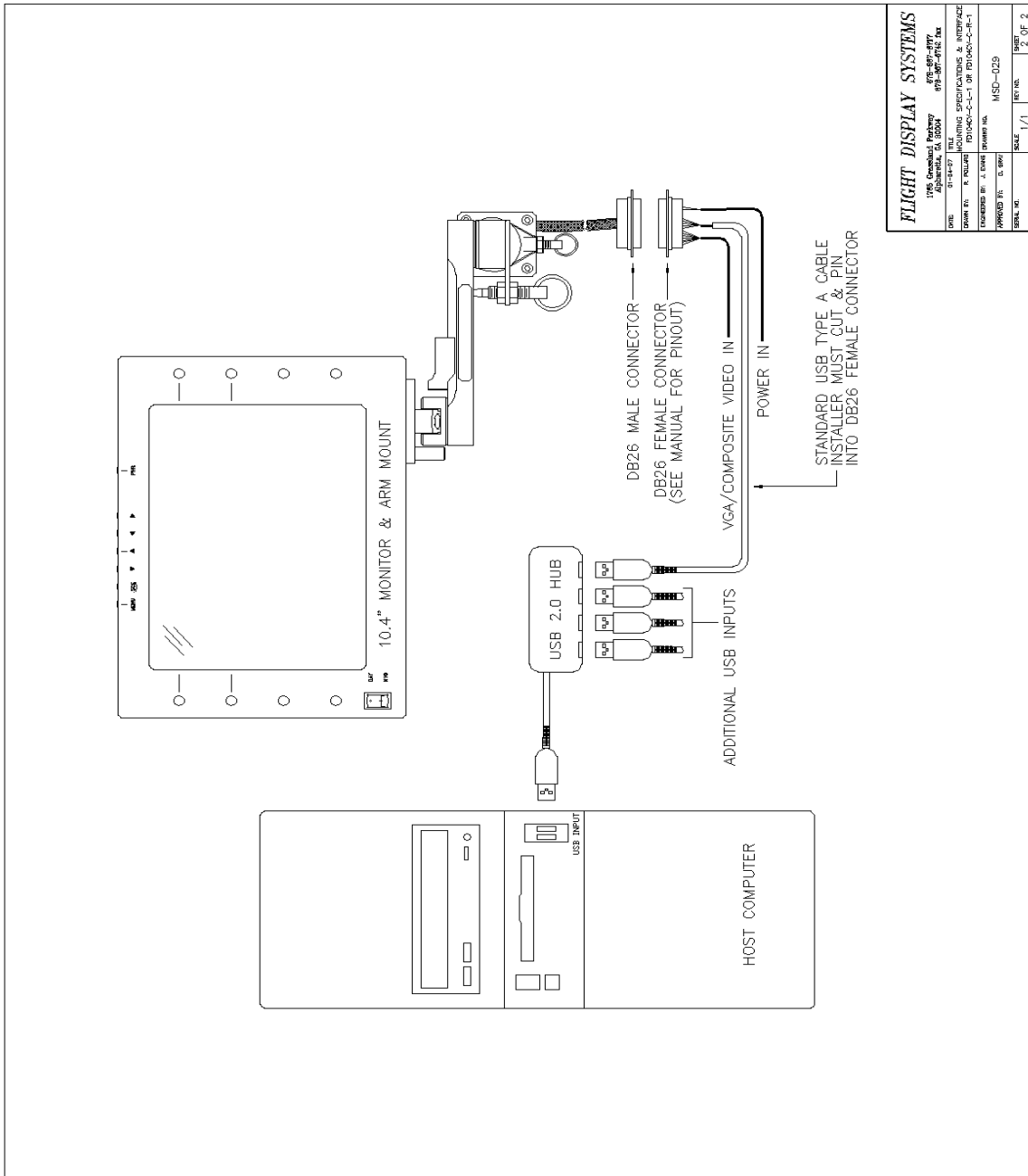
Any implied warranties expire at the express limited warranty expiration date. FDS shall not be held liable for any indirect, special, punitive, incidental or consequential damages.

Some states do not allow limitation on the length of an implied warranty. In such states, the exclusions or limitations of this limited warranty may not apply.



# Installation Drawing







## Log of Revisions

Rev	Date	Page	Description
A	12/10/2008		Initial Release
B	09/21/2009	2,10	Update testing and warranty info
C	08/10/2010	12	Warranty info, Format Change
D	08/28/2012		Update format, warranty and non-PMA info

