

## Installation and Operation Manual

### FD320LIFT-LP Ver HD

32" High-Definition LCD with Low-Profile Motorized Lift





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## General Information

The FD320LIFT-LP Ver HD is a 32" high-definition LCD with Motorized Lift which allows installation inside a cabinet or credenza. The unit is deployed using a SPDT Center Off momentary switch to either raise or lower the unit. The LCD automatically switches on once the unit nears the upper limit. Built with retrofit aircraft integration in mind, this display can switch between five video input sources using an infrared remote. The low-profile design adds just under 4 inches to the height of the monitor alone. This unique design has the retrofit aircraft in mind, reducing the overall space required for installation. This superior design not only reduces costly modifications to the aircraft, but allows for larger monitors to be installed in a smaller space.

## Front View



## Additional Information

The unit features rugged aluminium slides to provide smooth travel when stowing and deploying. It also incorporates military standard stainless steel wire rope, reinforced phenolic aircraft pulleys and ball bearing connected to a precision gearbox and driven by a heavy-duty 24VDC motor. The unit includes holes on the top to allow for mounting a wood veneer top cover. This feature completely conceals the unit when in its stowed position inside the cabinet or credenza.

The FD320LIFT-LP Ver HD utilizes a self-adjusting tensioner to maintain proper cable tension. Do not apply excessive downward force on the top of the lift/monitor, this could overstress the cable and damage the unit.

The FD320LIFT-LP Ver HD utilizes a state of the art digital video decoding chipset for the analog video input. There are five video source inputs available. They are in order of picture quality: (2) HDMI (high-definition video, such as Blu-ray DVD or Playstation 3), (1) VGA (computer graphics like Moving Maps), (1) S-Video and (1) Composite Video (DVD, camera or VCR). Both NTSC and PAL formats are auto-detected.

The FD320LIFT-LP Ver HD can also be connected to existing video switchers and simply accept a composite video input from a selector interface box. In this case multiple input sources can be selected and displayed on the monitor. You would only use the IR remote to set up the screen during installation. The LCD is protected with a .125" anti-glare/abrasion Lexan lens to prevent scratching of the LCD.

## Specifications

<b>Display</b>	
<b>Display Type</b>	32" TFT Color LCD
<b>Display Color</b>	16.7 Million Colors
<b>Screen Resolution</b>	1600x1200 UXGA
<b>Brightness</b>	500 cd/m <sup>2</sup>
<b>Dimensions</b>	31.00" (W) x 18.70" (H) x 2.55" (D)
<b>Display Size</b>	31.51" (800mm) diagonal
<b>Weight</b>	27.3 lbs
<b>Power</b>	28V DC @ 5A
<b>PC &amp; Video Input</b>	VGA (High Density DB-15 Connector), S-Video, Composite, HDMI (2)
<b>Video Type Supported</b>	NTSC/PAL
<b>Screen Control</b>	On Screen Display Menu
<b>Viewing Angle</b>	178 ° on Both Axis
<b>Materials</b>	Aluminum
<b>DO-160 Testing</b>	Section 21, Category B
<b>Remote Control</b>	IR, included
<b>Operating Temperature</b>	10°C to 30° C
<b>Storage Temperature</b>	-10°C to 40° C

## Specifications (Cont.)

<b>Physical</b>	
<b>Lift Power Requirement</b>	28VDC @ 3 AMP
<b>LCD Power Requirement</b>	28VDC @ 5 AMP
<b>Overall Weight</b>	65 lbs
<b>Materials</b>	Aluminum
<b>Stowed Height</b>	33.18" (W) x 23.0" (H) x 5.48" (D)
<b>Deployed Height</b>	33.18" (W) x 42.5" (H) x 5.48" (D)
<b>Operating Temperature</b>	10°C to 30° C
<b>Storage Temperature</b>	-10°C to 40° C
<b>DO-160 Testing</b>	Section 21 Category B

## Installation Instructions

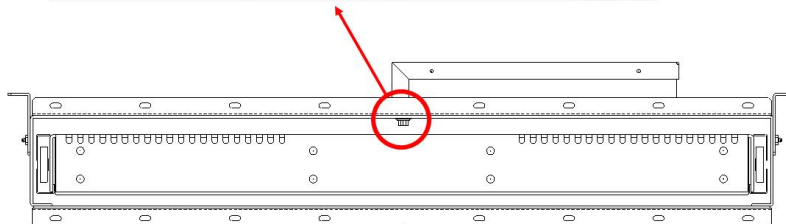
All cabin entertainment equipment, such as the FD320LIFT-LP Ver HD, should be installed on a non-essential bus and have a dedicated circuit breaker. It is a requirement that a switch be installed in the cockpit so that the pilot can de-energize the entertainment system should it become necessary.

## Power

This is a **28VDC** monitor that requires 5 Amps of power to operate the LCD, and 3 Amps of power to operate the mechanical lift. It is recommended that the LCD and lift be powered by two separate circuit breakers.

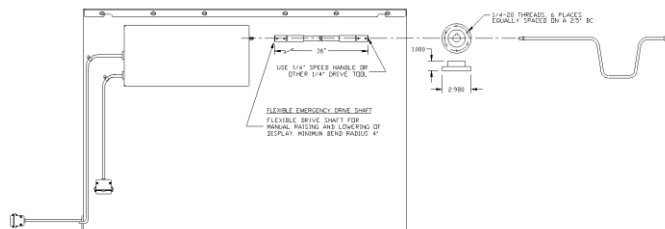
## Adjusting Stowed Position Height

The FD320LIFT-LP Ver HD down limit can be adjusted up to 1-1/2". The unit is pre-adjusted to the lowest stow position. Access the adjustment bolt through the opening on the top of the lift as shown below. Using a 3/8" wrench turn the down limit adjustment bolt clockwise to raise the stowed position (display will stop sooner) or counter-clockwise to lower the stowed position (display will travel further into cabinet).



The upper limit is factory set at the maximum height. In the event this range interferes with the headliner or other equipment some adjustment is possible. Contact FDS Avionics Corp. for additional information.

The FD320LIFT-LP Ver HD can be manually lowered in the event power is lost to the lift. The unit is supplied with a 3-foot flexible drive shaft and panel mount fitting. Attach the flexible shaft to the gear box shaft as shown and tighten the 2 set screws. Attach panel mount fitting at access panel. The display can be raised and lowered with the supplied 1/4" speed handle or other 1/4" square drive tool.



**Caution: Limit switches do not function when manually raising or lowering the display. Be sure not to exceed upper or lower travel limits, this could result in permanent damage to the FD320LIFT-LP Ver HD.**

## Wiring Suggestions

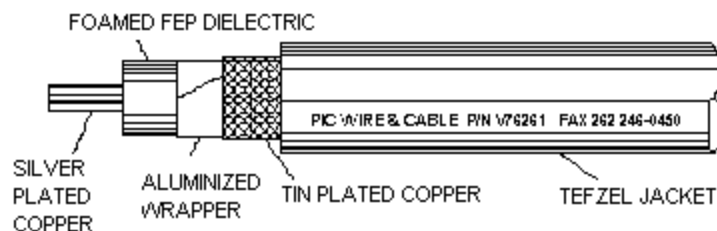
All shields should be grounded to the connector at the source, and floating at the display.

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 V76261. 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).

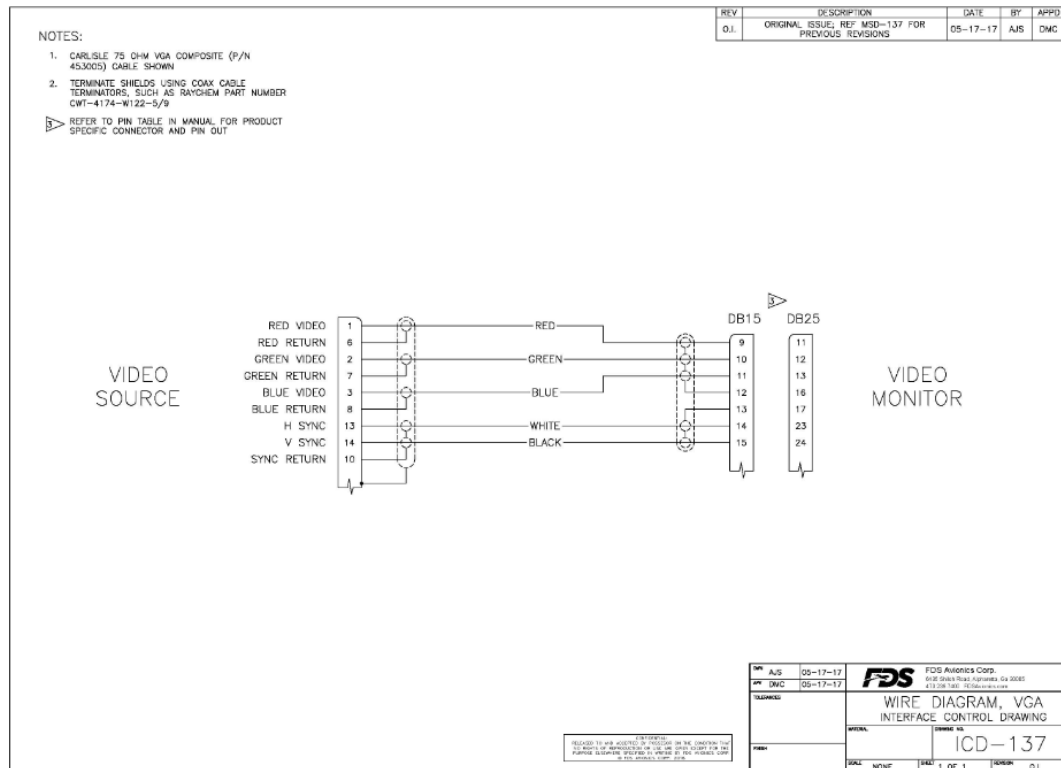


Similar aviation coaxial cable can be used from other vendors, as well.

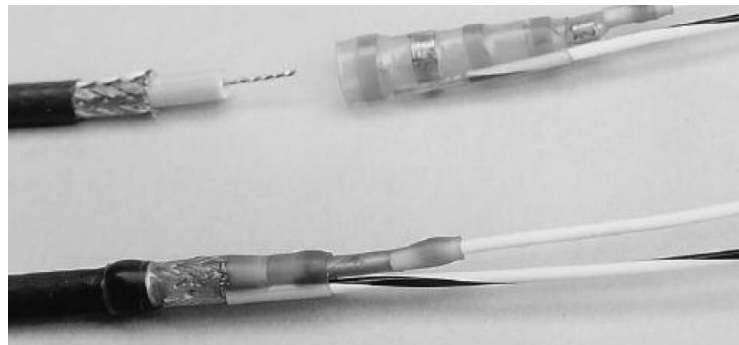
Some aircraft are prone to AC noise - we recommend adding to the composite source a 75 Ohm video isolation transformer such as Deerfield Laboratory, Inc. Part No. 162-1 ([www.deerfieldlab.com](http://www.deerfieldlab.com), (650) 632-4090). In most cases this should be added to the video output of the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



Coax cables should be terminated using solder sleeve coaxial cable terminators, Raychem P/N: CWT-4174-W122-5/9



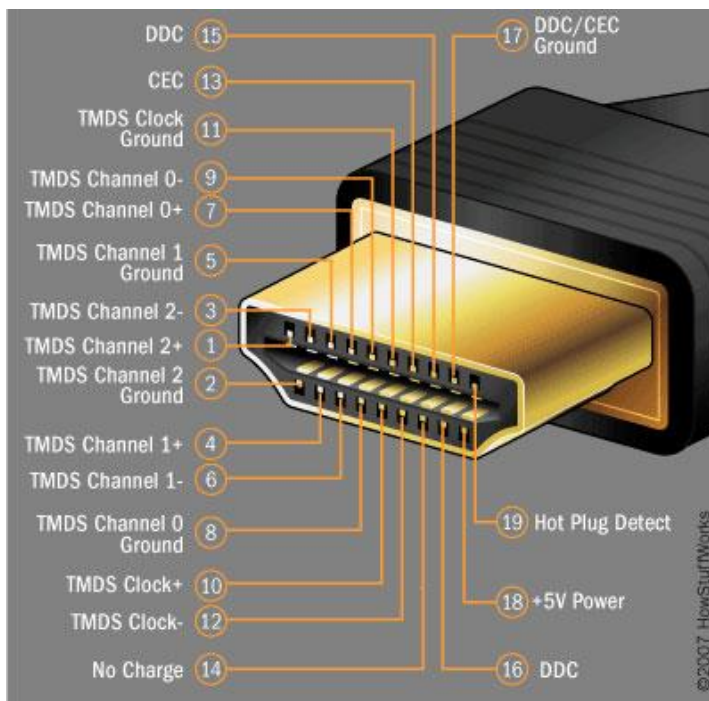


## RS-485 Wiring

Shielded twisted-pair 22 AWG wire is recommended for RS-485 wiring.

## HDMI

HDMI (High-Definition Multimedia Interface) defines the protocol and electrical specifications for the signaling, pin-out, electrical, and mechanical requirements of cable and connectors used for transmitting High-Definition content. The Type A HDMI connector (shown below) has 19 pins with bandwidth to support all SDTV, EDTV, and HDTV modes. The plug's outside dimensions are 13.9 mm wide by 4.45 mm high.



ECS manufactures an HDMI cable that is terminated at the factory. It is ordered as part number 600-19786-XXX, where XXX is the length in inches for the desired cable.

Also available from FDS Avionics Corp. is an HDMI to Cat5e/6 converter, which drastically reduces the cost of cabling while increasing the maximum allowable cable run to 100ft for High-Definition Video. The FDC5TX (Converts HDMI to Cat5e or Cat6) and FDC5RX (Converts Cat5e or Cat6 to HDMI) is available for use with (RECOMMENDED CABLING). Additional information on this product can be found on the FDS Avionics Corp. website and in the associated manual for these products.

## Power and Ground Wiring

This is a 28VDC monitor that requires 10 amps of power to operate. The rated current of the equipment and associated voltage drop should be taken into consideration when selecting wire gauge. To operate properly this monitor requires an input voltage of 25-32VDC allowing a 3 volt drop on the wire, this is the sum of the voltage drop on the 28V power wire and the voltage drop on the ground or power return wire.

The following examples are based on an install with a 28VDC power system and a total of 50 feet of wire between the circuit breaker, monitor and ground.

Example 1: 20awg wire has 9.88 Ohms per 1000 feet, this equates to .494 Ohms for 50 feet. 10 Amps of current on .494 Ohms will drop 4.94 Volts. This exceeds the allowable voltage drop to operate this monitor.

Example 2: 10awg wire has 1.26 Ohms per 1000 feet, this equates to .063 Ohms for 50 feet. 10Amps of current on .063 Ohms will drop 0.63 Volts. This is within the allowable range to operate this monitor.

<b>Resistance of Wire Type M22759/16-**</b> <b>(** = Gauge)</b>	
<b>Gauge (AWG)</b>	<b>OHMS/1000'</b>
24	26.20
22	16.20
20	9.88
12	2.02
10	1.26
8	.701

Some connector pins are only compatible with the smaller gauge wires. If multiple power pins are available then all pins should be used. Multiple strands of wire may be run to the circuit breaker panel, or the multiple small gauge wires may be joined to a larger gauge wire for a single strand run to the circuit breaker panel. Also, use short heavy gauge wire and a clean tight connection for ground.

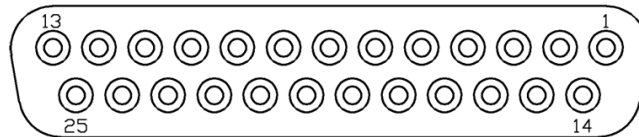
It is the installer's responsibility to understand the product's requirements to install the product in compliance with industry standards and safety.

## Power/Video

### Pin out for High Density DB-25 (J1 - Power/Control)

Connector  
 Crimp Contacts

P/N: M24308/2-283 or Equivalent  
 P/N: M39029/63-368 or Equivalent



#### MATING FACE

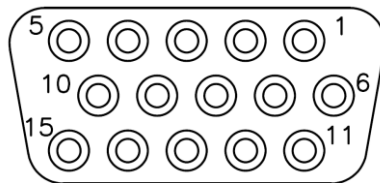
Pin Number	Description
1	28VDC Power In (LCD)
2	Ground In (LCD)
3	28VDC Power In (LCD)
4	Ground In (LCD)
5	28VDC Power In (LCD)
6	Ground In (LCD)
7	N/C
8	N/C
9	N/C
10	N/C
11	N/C
12	N/C
13	N/C
14	28VDC Power In (Lift)
15	Ground In (Lift)
16	24VDC Power Out (Lift)
17	Lift (24VDC In)
18	Retract (24VDC In)
19	Full Up Indicator (24VDC Out)
20	Full Down Indicator (24VDC Out)
21	Moving Indicator (24VDC Out)
22	Video Source Select (RS-485A Optional)
23	Video Source Select Return (RS-485B Optional)
24	N/C
25	N/C

## Power/Video

### Pin out for High Density DB-9 (J2 - Video)

Connector  
 Crimp Contacts

P/N: M24308/2-286 or Equivalent  
 P/N: M39029/57-354 or Equivalent

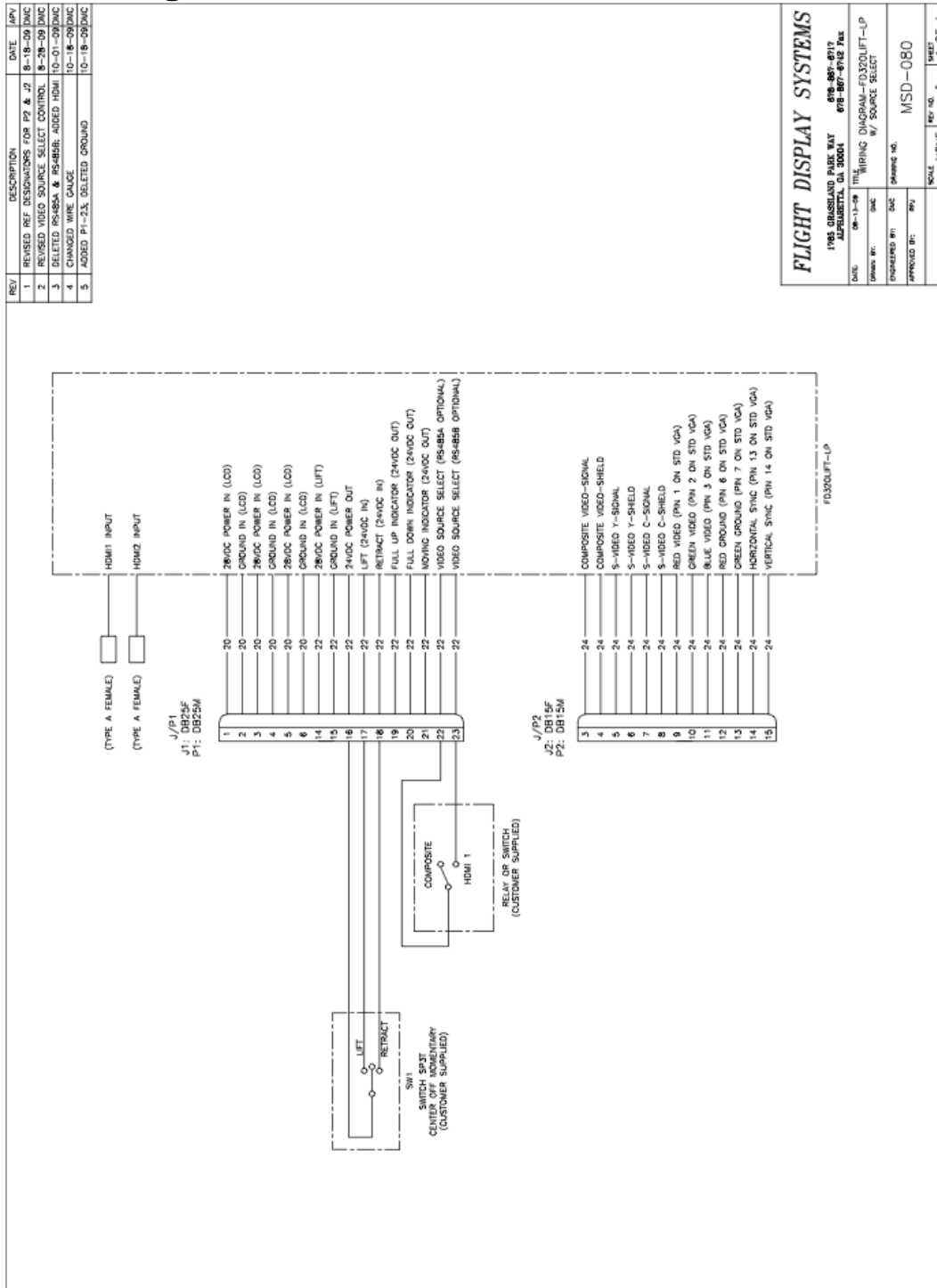


MATING FACE

Pin Number	Description
1	N/C
2	N/C
3	Composite Video - Signal
4	Composite Video - Shield
5	S-Video Y - Signal
6	S-Video Y - Shield
7	S-Video C - Signal
8	S-Video C - 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)



**Technical Drawing**





## RS-485 Control (Optional)

RS-485 is a two-wire communication interface that allows an external device such as a computer or switching unit to control the monitor's functions remotely. Up to 99 monitors can be separately controlled by one unit.

### Command sets for controlling the monitor:

Below are the command sets to control the power, source selection, and backlight brightness. The 13 characters below are shown in hexadecimal. The communication system must be set up for 19200 Baud, no parity, 8 bits of data, and 1 stop bit.

POWER						
POWER OFF	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x01	0x01	0x00	CR
POWER ON	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x00	0x01	0x00	CR
SOURCE SELECTION						
VGA	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x00	0x02	0x00	CR
Composite	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x01	0x02	0x00	CR
S-Video	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x02	0x02	0x00	CR
HDMI 1	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x06	0x02	0x00	CR
HDMI 2	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x07	0x02	0x00	CR
BACKLIGHT						
0%	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x00	0x03	0x00	CR
Increment by 1%	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	Increment by 0x01	0x03	0x00	CR
100%	0xBE 0xEF 0x02 0x06 0x00 0x1F 0xD1 0x26 0x00	0x00	0x64	0x03	0x00	CR
Notes	1	2	3	4	5	

#### Notes:

1. The first nine characters will remain the same for any command.
2. For connecting multiple monitors to one controller; the number can be set to 0x00 to control all monitors at once, 0x01 to control monitor number 1, 0x02 monitor number 2, and so on until 0x63 for monitor number 99.
3. The number will change depending on command.
4. Identifier for the group of commands.
5. All commands need to end with a Carriage Return

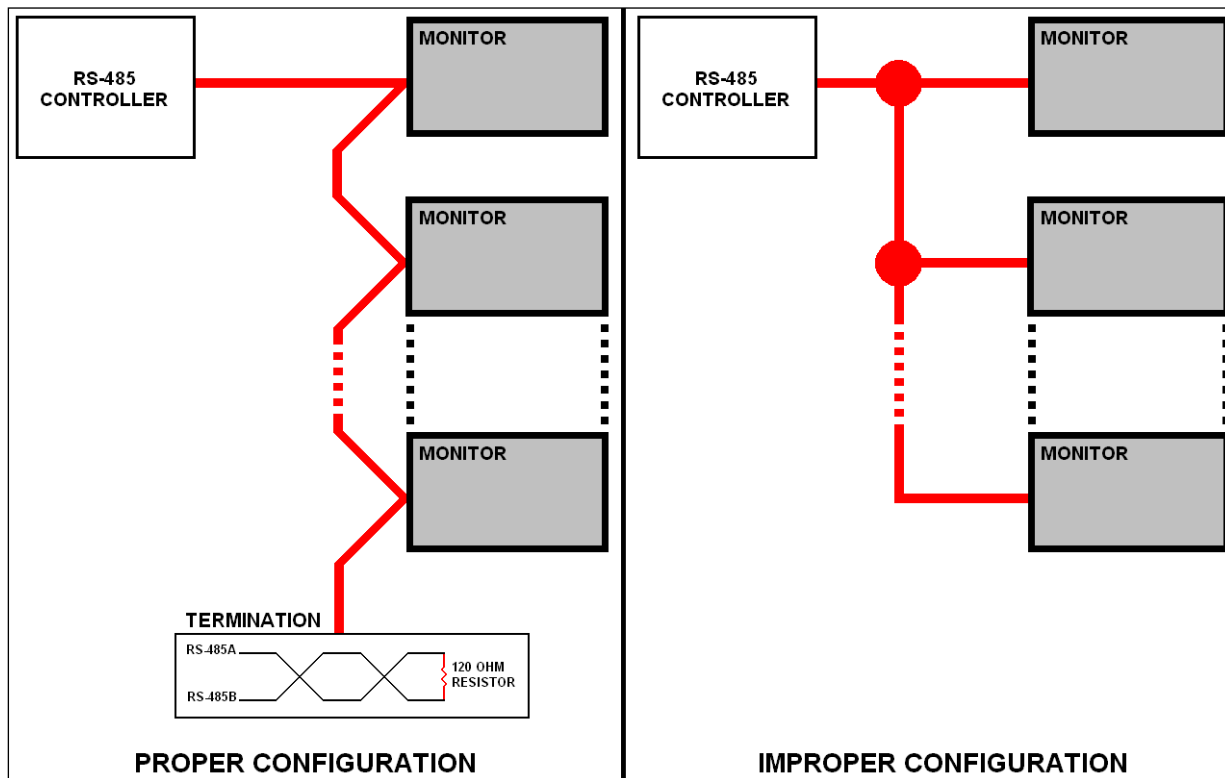
The RS-485 connector carries information between the Infrared received and the LCD controller board. Any connections to the RS-485 bus must be tolerant to the existing control signals. Devices connected to the RS-485 Bus should not send traffic that interferes with the existing RS-485 messages.



## RS-485 Network:

If there is more than one monitor connected to the aircraft's RS-485 controller system, then it is strongly recommended to connect the system in series, or daisy-chain, and terminate the twisted pairs with a 120 OHM resistor. This configuration improves the reliability of the system.

It is highly recommended to use 22 AWG twisted pairs for runs longer than 20 feet. Connect all RS-485A pins together, all RS-485B pins together.



## Setting ID Numbers for Multiple Monitors:

When two or more monitors are installed on the same RS-485 Network, an ID number must be assigned to each monitor. To assign an ID:

- Press the menu button (either on the monitor or remote control)
- Navigate to the "image" tab
- Navigate down to "set ID"
- Press left or right to assign a number to the monitor
- Press menu twice to exit

## Operation Instructions

The FD320LIFT-LP Ver HD is continuously on but can be de-energized by removing power from the entertainment system. No pilot or aircrew action is necessary during flight or ground operation.

The passengers will be able to change the video output from the FD320LIFT-LP Ver HD using the video source select button with the included IR remote. Point the IR remote towards the top of the LCD to cycle thru the different sources.

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

## Button Controls

While the lift is in use, there is no access to the buttons on the LCD. All control is with the remote.

BUTTON	DESCRIPTION
POWER	Pressing will turn the monitor ON or OFF from Standby mode.
SOURCE	Select video source with the following order: RGB (PC), Composite, S-Video, HDMI-1, HDMI-2
UP	Press while in menu- Adjust selection UP. Press out of menu – Brightness (Use up or down to change.)
DOWN	Press while in menu- Adjust selection DOWN. Press out of menu – Contrast (Use up or down to change.)
MENU	Opens the menu, changes between selections.



## Remote Control







## Technical Support

Should you have any questions concerning this product or other FDS Avionics Corp. products, please contact our Product Support representatives at (407) 239-7421.

**FDS Avionics Corp.**  
6435 Shiloh Road  
Alpharetta, GA 30005  
Phone: +1 (470) 239-7400  
Fax: +1 (470) 239-7439  
Email: [sales@FDSAvionics.com](mailto:sales@FDSAvionics.com)

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

## Instructions for Continued Airworthiness

The FD320LIFT-LP Ver HD is designed not to require regular general maintenance.





## Limited Warranty

All FDS Avionics Corp. (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.

FDS Avionics Corp. 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.





## Log of Revisions

Rev	Date	Page	Description
A	11/06/2009	---	Initial Release
B	01/06/2010	2,3	Amp Revise
C	08/27/2012		Update format, warranty and non-PMA info
D	7/3/2017	All	New Company, New Logo, New Branding

