



## Installation and Operation Manual

# FD215CV-C-TS

# FD215CV-C-TS-1

21.5" LCD Touchscreen Display





## Specifications

		<b>FD215CV-C-TS</b>	<b>FD215CV-C-TS-1</b>
Display			
	Panel Technology	<b>21.5" TFT Color LCD</b>	<b>21.5" TFT Color LCD</b>
	Color	<b>16.7 Million Colors</b>	<b>16.7 Million Colors</b>
	Native Resolution Refresh Rate	<b>1920 x 1080</b>	<b>1920 x 1080</b>
	Touchscreen	<b>Capacitive Touchscreen Glass</b>	<b>Capacitive Touchscreen Glass</b>
	Touchscreen Control	<b>USB</b>	<b>RS-232</b>
	Brightness	<b>300 cd/m<sup>2</sup></b>	<b>300 cd/m<sup>2</sup></b>
	Aspect Ratio	<b>19:9</b>	<b>19:9</b>
	Viewing Angle	<b>170° Horizontally 160° Vertically</b>	<b>170° Horizontally 160° Vertically</b>
Power			
	Power	<b>28V DC @ 3 Amps</b>	<b>28V DC @ 2 Amps</b>
	Inrush Current	<b>18.0 Amps @2.0 μS 4.0 Amps @ 2mS 2.0 Amp Steady State @ 3.5mS</b>	<b>18.0 Amps @2.0 μS 4.0 Amps @ 2mS 2.0 Amp Steady State @ 3.5mS</b>
Environmental Conditions			
	Operating Temperatures	<b>5° - 45° C</b>	<b>5° - 45° C</b>
Dimensions			
	External	<b>20.0"(W) x 13.25"(H) x 1.76" (D)</b>	<b>20.0"(W) x 13.25"(H) x 1.76" (D)</b>
	Active Display Area	<b>18.64"(W) x 10.43" (H)</b>	<b>18.64"(W) x 10.43" (H)</b>
	Weight	<b>10 lbs. 13 oz.</b>	<b>10 lbs. 13 oz.</b>
	Materials	<b>Aluminum</b>	<b>Aluminum</b>
Features			
	Menu Control	<b>On Screen Display Menu</b>	<b>On Screen Display Menu</b>
Qualified Testing			
	RTCA DO-160		<b>160G Sec 21 Cat B - Emissions</b>





## Connectivity

PRODUCT	CERTIFICATION	VIDEO IN					VIDEO OUT					COMMUNICATION**										
		VGA	S-VIDEO	COMP	DISPLAY PORT	HDMI	DVI-D	SDI	HDSDI	VGA	S-VIDEO	COMP	HDMI	DVI-D	SDI	HDSDI	USB	RS232	RS485	CAN	IR REMOTE	
FD215CV-C-	PMA																					
TS		✓	✓	✓			✓		✓							✓	✓					
TS-1		✓	✓	✓			✓		✓							✓		✓				

\* NTSC or PAL

\*\* Touchscreen Controller





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## General Information

The FD215CV-C-TS(-1) is a touchscreen enabled, special mission, high resolution, panel mounted 21.5" widescreen LCD.

### Front View



### Additional Information

The LCD features include:

- Five video source inputs are available to include:
  1. HD-SDI (for HD camera inputs)
  2. DVI
  3. VGA (for computer graphics, i.e.; moving maps)
  4. S-Video (via BNC connectors for Y and C components)
  5. Composite
- Dual USB 2.0 powered ports are provided for connection to mission computers for quick and easy access to files via thumb drive. Each port also supplies up to 500mA to power external devices.
- Bezel buttons on front of display for operational convenience of OSD.
- HD-SDI loop through for output to a HD-DVR or other displays.

## Installation Instructions

Use (6) 8-32 Machine screws. See the technical drawing on page 13 for mounting locations and details.

All cabin equipment, such as the FD215CV-C-TS(-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 system should it become necessary.

## Power and Ground Wiring

The rated current of the equipment and associated voltage drop should be taken into consideration when selecting wire gauge. The following example is based on an install with a 28VDC power system, 1.5 amp equipment load and a total of 50 feet of wire between the circuit breaker, monitor and ground.

**Example:** 22awg wire has 16.2 Ohms per 1000 feet, this equates to .81 Ohms for 50 feet. 1.5 Amp of current on .81 Ohms will drop 1.22 Volts.

<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
16	4.81
12	2.02
10	1.26
8	.701

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 in order to install the product in compliance with industry standards and safety.

## VGA Wiring

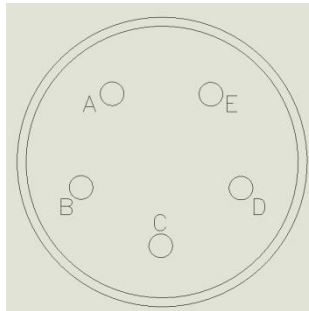
The FD215CV-C-TS(-1) uses standard VGA cables for input.

## Pinouts for FD215CV-C-TS (-1)

### Pinout for 28V PWR- D38999 connector (supplied)

Mating Connector  
 Crimp Contacts

P/N: D38999/26FB5SA or Equivalent  
 P/N: M39029/56-351 or Equivalent



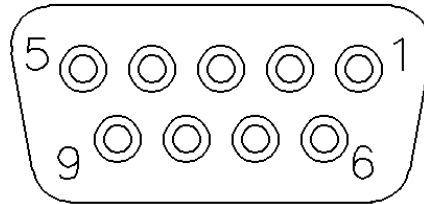
**MATING FACE**

Pin Number	Description
A	28VDC Power
B	28VDC Power
C	28VDC Ground
D	28VDC Ground
E	N/C

## Pinout for Touchscreen Control (DB-9F)

Connector  
 Crimp Contacts

P/N: M24308/2-281 or Equivalent  
 P/N: M39029/63-368 or Equivalent



MATING FACE

Pin	Description	
	FD215CV-C-TS	FD215CV-C-TS-1
1	+5V POWER (FROM USB SOURCE)	N/C
2	DATA (DN) DIFFERENTIAL PAIR	RS-232 TX (Connect to Pin 2 on STD DB9 COM Port)
3	DATA (DP) DIFFERENTIAL PAIR	RS-232 RX (Connect to Pin 3 on STD DB9 COM Port)
4	POWER RETURN	N/C
5	CHASSIS GROUND	RS-232 GND (Connect to Pin 5 on STD DB9 COM Port)
6	N/C	N/C
7	N/C	N/C
8	N/C	N/C
9	N/C	N/C



**Pin out for HD-SDI Input**

(Standard BNC - 75 OHM) - Supplied

Pin	Description
Center	Video Signal
Shell	Video Return

**Pin out for HD-SDI Output**

(Standard BNC - 75 OHM) - Supplied

Pin	Description
Center	Video Signal
Shell	Video Return

**Pin out for S-Video (Luminance - Y Component)**

(Standard BNC - 75 OHM) - Supplied

Pin	Description
Center	Y Signal
Shell	Y Return

**Pin out for S-Video (Chrominance - C Component)**

(Standard BNC - 75 OHM) - Supplied

Pin	Description
Center	C Signal
Shell	C Return

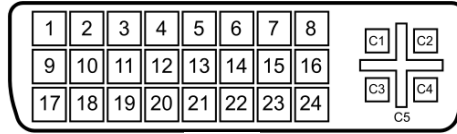
**Pin out for Composite Video**

(Standard BNC - 75 OHM) - Supplied

Pin	Description
Center	Video Signal
Shell	Video Return

### Pin out for DVI-D

Accepts a standard DVI-D (Single Link) male connector (supplied)



### View into mounted receptacle

Pin Number	Description
1	TMDS data 2-
2	TMDS data 2+
3	TMDS data 2 shield
4	N/C
5	N/C
6	DDC clock
7	DDC data
8	N/C
9	TMDS data 1-
10	TMDS data 1+
11	TMDS data 1 shield
12	N/C
13	N/C
14	+5 V
15	Ground
16	Hot plug detect
17	TMDS data 0-
18	TMDS data 0+
19	TMDS data 0 shield
20	N/C
21	N/C
22	TMDS clock shield
23	TMDS clock+
24	TMDS clock-
C1	N/C
C2	N/C
C3	N/C
C4	N/C
C5	N/C

## Operation Instructions

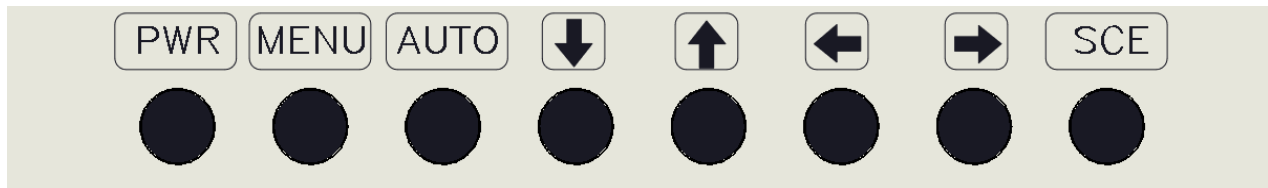
The FD215CV-C-TS(-1) is continuously on but can be de-energized by removing power from the video system. No pilot or aircrew action is necessary during flight or ground operation.

The operator will be able to change the video output from the FD215CV-C-TS(-1) using the video source select button on the display.

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 Source button will rotate through available video inputs.

## Button Controls

Located on the front of the FD215CV-C-TS(-1) are 8 buttons:



BUTTON	DESCRIPTION
PWR	Turns ON/OFF the system.
MENU	Activates the OSD menu for the monitor settings or goes to previous menu.
AUTO	Auto-adjustment in RGB.
↓	Moves the highlight icon down through menu options.
↑	Moves the highlight icon up through menu options.
←	Decreases the adjustment of the selected function.
→	Increases the adjustment of the selected function.
SCE	Cycles through available input sources.

## Touchscreen Driver

The FD215CV-C-TS and FD215CV-C-TS-1 utilize a touchscreen controller manufactured by 3M. The touchscreen driver is supplied by 3M and FDS Avionics Corp. recommends downloading the latest version of the driver during the installation of the FD215CV-C-TS/-1, at the following address:

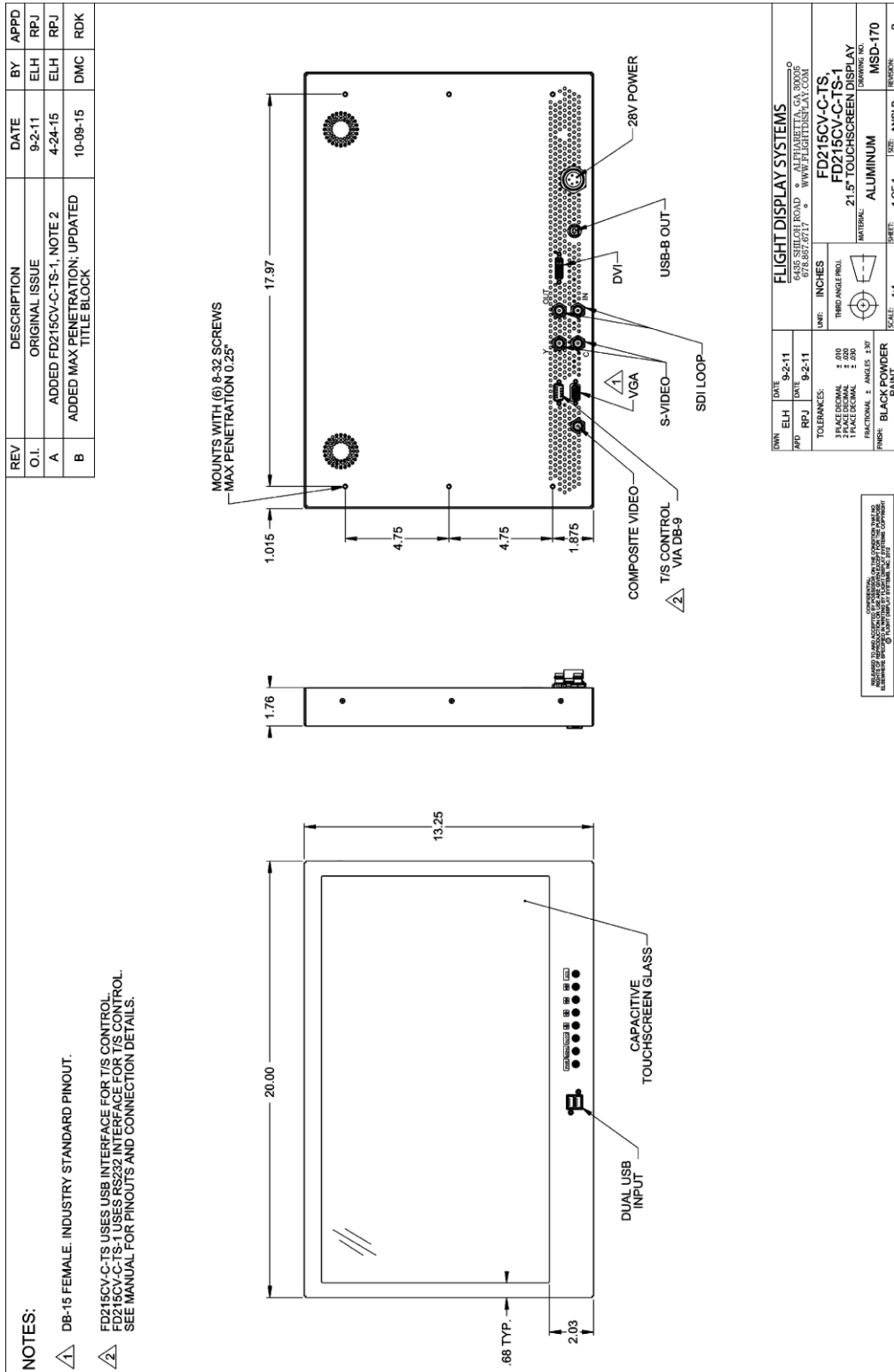
[http://solutions.3m.com/wps/portal/3M/en\\_US/Electronics\\_NA/Electronics/Tools\\_Support/Support/](http://solutions.3m.com/wps/portal/3M/en_US/Electronics_NA/Electronics/Tools_Support/Support/)

Follow the web address above and select the operating system depending on the platform that will be connected to the FD215CV-C-TS (-1). Any of the MT7 drivers should work for either the FD215CV-C-TS or FD215CV-C-TS-1 as long as the correct operating system was selected.

Make sure to follow the installation instructions and plug in the touchscreen controller when asked by the installation software. The FD215CV-C-TS-1 driver installation may require a reboot of the system platform after installation for the RS-232 monitoring service to start.

The MT7 Software Users Guide can also be found at the same location as the driver download. This document has detailed instructions on how to use and setup the MT7 touch screen software. Topics include: Calibration, Linearization, Changing the Touch Down/Touch Up events, changing the audible beep and multi-display configuration.

# Technical Drawing





## Technical Support

Should you have any questions concerning this product or other FDS Avionics Corp. products, please contact our Product Support representatives at (470) 239-7421.

**FDS Avionics Corp.**  
6435 Shiloh Road  
Alpharetta, GA 30005  
Phone: 470-239-7400  
Fax: 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 FD215CV-C-TS(1) is designed not to require regular general maintenance.





## Warranty Information

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	12/06/2012	All	Initial Release
B	10/06/2015	All	Added provision for FD215CV-C-TS-1 RS232 Version. Updated Format, Warranty, Specifications
B	1/10/2017	All	Changed Company Name and Formatting – No Revision Change Necessary.

