Installation and Operation Manual

FD200CPU-7/8
Solid State Moving Map CPU
FD200CPU-7/8
Solid State Moving Map CPU

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Flight Display Systems
6435 Shiloh Road
Alpharetta, GA 30005
470-239-7400 Phone
678-867-6742 Fax
sales@FlightDisplay.com
www.FlightDisplay.com

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www.FlightDisplay.com

For more product support information, please visit the following link at
http://support.FlightDisplay.com
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Introduction

I Purpose
This manual provides specifications and instructions required for the proper installation and operation of the FD200CPU-7/8 Moving Map manufactured by Flight Display Systems. The FD200CPU works in a variety of aircraft, and interacts with multiple navigation and flight management systems including Honeywell, Garmin, Universal, and more.

II General Information
For general information on the FD200CPU, please contact your local avionics dealer, or our sales team. (sales@FlightDisplay.com) You can also find more information, manuals, and spec sheets on our website. www.FlightDisplay.com.

III Technical Assistance
For technical information, or advanced troubleshooting, please contact the Flight Display Systems support staff at 470-239-7421.

Abbreviations
ADC – Air Data Computer
ARINC – Aeronautical Radio, Inc.
DTG – Distance to Go
ETA – Estimated time of Arrival
ETE – Estimated Time Enroute
FMC – Flight Management Computer
FMS – Flight Management System
GAMA – General Aviation Manufacturers Association
GNSS – Global Navigation Satellite System
GMT – Greenwich Mean Time
GPS – Global Positioning System
N/C – No Connection
OAT – Outside Air Temperature
P/N – Part Number
S/N – Serial Number
TTG – Time To Go
Chapter 1: System Description

The FD200CPU-7/8 is a Moving Map designed to provide customers with an advanced graphical interface of flight information. The FD200CPU uses computer generated satellite imagery to display an accurate replication of the Earth’s surface. Included are worldwide databases of cities, borders, airports, and other landmarks to enhance the visual effects. The FD200CPU reads data from other avionic systems onboard, and replicates this data onto the map in real-time. This allows passengers to see the exact position of the aircraft anywhere in the world. Also, the FD200CPU displays air data including speed, altitude, time of arrival, and more.

Flight Display Systems has taken advantage of the latest computer technology, and designed the FD200CPU to be the smallest and lightest Moving Map system available in the aviation industry. The FD200CPU-7/8 uses a solid state flash memory hard drive that holds the Microsoft Windows 7 Embedded operating system, the Moving Map program, worldwide imagery and databases. Flash memory and solid state circuit boards allow the FD200CPU to operate smoothly at extreme temperatures, and increases tolerance for vibration and shock.

The CPU comes in two models, depending on the output from the aircraft’s FMS: The FD200CPU-7 is designed for RS-232 input (Garmin, Honeywell/Bendix king KLN Series, etc.). The FD200CPU-8 is designed for ARINC 429 input (Universal, Honeywell, Collins, etc.). Both Moving Maps are also available in a Version H unit for Helicopters. The Version H units are much like the regular versions, but contain street level maps (Continental US Only) with road names for low altitude flying.

The most important thing to remember when working with the FD200CPU is that it runs on a Windows 7 operating system. Editing and copying files is done the same way as on a home computer. The only difference is that the FD200CPU has a write protected hard drive. This is a feature that allows the hard drive to write protected during operation and prevents file system corruption.

When making any changes to the FD200CPU, you must click on the COMMIT CHANGES AND REBOOT icon located on the Start menu. Please allow the unit to fully reboot before powering down.

Instructions for Continued Airworthiness
The FD200CPU-7/8 is a Moving Map designed not to require regular general maintenance.
Limited Warranty

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.

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Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel Atom D510 Dual Core @ 1.66 GHz</td>
</tr>
<tr>
<td>Memory</td>
<td>2 GB DDR2 @ 667 MHz</td>
</tr>
<tr>
<td>Storage</td>
<td>32GB Solid State</td>
</tr>
<tr>
<td>Dimensions</td>
<td>11”(W) x 2”(H) x 6.25”(D)</td>
</tr>
<tr>
<td>Weight – FD200CPU-7</td>
<td>2 lbs. 2 oz.</td>
</tr>
<tr>
<td>FD200CPU-8</td>
<td>2 lbs. 7 oz.</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>28V @ 16 Amps &lt; 1 ms</td>
</tr>
<tr>
<td></td>
<td>28V @ 4 Amps @ 2 ms</td>
</tr>
<tr>
<td></td>
<td>28V @ 2 Amp @ 6 ms</td>
</tr>
<tr>
<td></td>
<td>28V @ .65 Amps Steady State after 10ms</td>
</tr>
<tr>
<td>Video Outputs</td>
<td>VGA*</td>
</tr>
<tr>
<td>Data Input</td>
<td>RS-232 (-7) or ARINC 429 (-8)</td>
</tr>
<tr>
<td>User Inputs</td>
<td>(2) x USB</td>
</tr>
<tr>
<td>Mounting</td>
<td>Horizontal or Vertical</td>
</tr>
</tbody>
</table>

*The FD200CPU-7/8 no longer supports composite video. Flight Display Systems recommends using the VGA video output for the best video quality, but an external converter is available for customers that require composite video for a particular installation. Please contact Flight Display Systems to ask about the FDVGA-COMP VGA to composite video converter.*
Chapter 2: Features

1. **Ground Pages**
   The 3 ground pages can be custom made by the user. They will show up during boarding and taxi and will stop showing once the aircraft reaches a speed determined by the user, or they can be set to stay on during flight. Typically these pages will contain company logos, cabin briefings, or welcome aboard messages. The images must be in 1024x768 Windows Bitmap format. Flight Display Systems will format these pages for you at no charge.

2. **Airport Diagrams**
   The Airport Diagram page shows a chart of the airport, and location of the aircraft. Over 600 airports are in the database, and can be turned on or off.
3. **Vector Maps**

The first pages in the cycle are the Vector Maps. You have the option of showing 1, 2, or 3 different zoom levels. All map sizes are customizable by the user. The time to show each zoom is also customizable. By default, levels are set at 2500, 500, and 50 miles. (300, 30, and 3 miles for the Helicopter versions)

4. **Data Pages**

The 1st data page shows altitude, speed, distance to go, estimated time enroute, and current time. The 2nd data page shows distance traveled, time in flight, outside air temperature, destination airport, and estimated time of arrival. The second data page can be turned off, or both pages can be turned off to show the data bar ticker at the bottom of the Vector map pages. Colors, times to show, and languages can all be customized.

<table>
<thead>
<tr>
<th>Speed: 400 KTS</th>
<th>Flight Time: 0:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude: 35000 FT</td>
<td>Total Dist: 8 NM</td>
</tr>
<tr>
<td>Distance: 1681 NM</td>
<td>Temperature: 32.0° F</td>
</tr>
<tr>
<td>ETE: 04:12</td>
<td>LOS ANGELES</td>
</tr>
<tr>
<td>Clock: 6:42 AM</td>
<td>Local ETA: 8:11 AM</td>
</tr>
</tbody>
</table>
5. **Additional Data Screens**

3 new data screens have recently been added. The first is the Graphic Statistics page, or “dashboard”. This page shows speed, heading, and altitude in a graphics format. The second is the world clocks page which shows local times from at any 6 places you choose (customizable). The third page is the Relative Locator that points to the nearest large cities in relation to the aircraft’s heading.

6. **Satellite Maps**

Another recent upgrade is the addition of NASA satellite imagery to the FD200CPU. Like the Vector Maps, there are 3 customizable zoom levels. By default, levels are set at 3500, 600, and 100 miles (1000, 350, and 100 for helicopter versions).

All features of the FD200CPU can be setup to meet any customer’s specifications. We now offer free pre-configuration of Moving Maps before they ship. The pre-configuration form can be downloaded from our website. If you have any questions please contact our customer support staff at 470-239-7421.

* Available in continental US only  
**Available with Satellite Version only  
***Available in continental US with Satellite Version
Chapter 3: Installation

1. Connectors

The FD200CPU-7/8 Moving Map computer has 4 different connectors.

P1 – Dual USB Connector

These are standard USB connectors used for configuration and customization. It is recommended that these ports be easily accessible. If the processor must be mounted behind cabinets or under floor panels, a USB extension cable can be used to extend the connector to a more accessible location, preferably near a monitor.
Power /Video

**P2 Standard Density DB-9F Receptacle Supplied**
(Pinout for COM1 – RS-232 Data Input or Output)

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/C</td>
</tr>
<tr>
<td>2</td>
<td>RS232 RX Data Receive</td>
</tr>
<tr>
<td>3</td>
<td>RS232 TX Data Transmit</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
</tr>
<tr>
<td>7</td>
<td>N/C</td>
</tr>
<tr>
<td>8</td>
<td>N/C</td>
</tr>
<tr>
<td>9</td>
<td>N/C</td>
</tr>
</tbody>
</table>

This connector is used for the following applications:

- FD200CPU-7/8 Map Control from Flight Display Systems Select CMS
- Icarus 3000 or Shadin 8800T Altitude Serializer
P3 High Density DB-15M Plug Supplied
(Pinout for VGA Video Output)

Connector
Crimp Contacts

P/N: M24308/4-264 or Equivalent
P/N: M39029/58-360 or Equivalent

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Red Signal</td>
</tr>
<tr>
<td>2</td>
<td>Green Signal</td>
</tr>
<tr>
<td>3</td>
<td>Blue Signal</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
</tr>
<tr>
<td>5</td>
<td>N/C</td>
</tr>
<tr>
<td>6</td>
<td>Red Return</td>
</tr>
<tr>
<td>7</td>
<td>Green Return</td>
</tr>
<tr>
<td>8</td>
<td>Blue Return</td>
</tr>
<tr>
<td>9</td>
<td>N/C</td>
</tr>
<tr>
<td>10</td>
<td>Sync Return</td>
</tr>
<tr>
<td>11</td>
<td>N/C</td>
</tr>
<tr>
<td>12</td>
<td>N/C</td>
</tr>
<tr>
<td>13</td>
<td>Horizontal Sync</td>
</tr>
<tr>
<td>14</td>
<td>Vertical Sync</td>
</tr>
<tr>
<td>15</td>
<td>N/C</td>
</tr>
</tbody>
</table>
P4  High Density DB-15F Receptacle Supplied
(Pinout for Power and GPS/FMS Data Input)

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

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power 28V</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>N/C</td>
</tr>
<tr>
<td>4</td>
<td>429 High (CPU 8)</td>
</tr>
<tr>
<td>5</td>
<td>429 Low (CPU-8)</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
</tr>
<tr>
<td>7</td>
<td>N/C</td>
</tr>
<tr>
<td>8</td>
<td>N/C</td>
</tr>
<tr>
<td>9</td>
<td>N/C</td>
</tr>
<tr>
<td>10</td>
<td>N/C</td>
</tr>
<tr>
<td>11</td>
<td>N/C</td>
</tr>
<tr>
<td>12</td>
<td>N/C</td>
</tr>
<tr>
<td>13</td>
<td>N/C</td>
</tr>
<tr>
<td>14</td>
<td>232 Signal (CPU-7)429 High 2 (CPU-8 VER DI)</td>
</tr>
<tr>
<td>15</td>
<td>232 Ground (CPU-7)429 Low 2 (CPU-8 VER DI)</td>
</tr>
</tbody>
</table>
2. Power Requirements
   a. The FD200CPU requires a 24V-28V DC input. It is recommended that the power run through an independent circuit breaker rated at 3 amps.

   b. The IFE system should not be powered through the avionics power bus, or any other essential power bus. 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. IFE equipment should not be powered on until all other equipment in the aircraft has powered up and stabilized.

   c. 22 AWG wire is required for the power connection and installing a ferrite core within 6 inches of the P4 connector is recommended.

3. Mounting
   a. The FD200CPU can be mounted in a vertical or horizontal position and secured with #8 machine screws. **DO NOT MOUNT THE UNIT UPSIDE DOWN. THE DUAL USB PLUGS SHOULD BE ON TOP.** It must be mounted inside the pressure vessel of the aircraft. The unit needs to have at least 2 inches of clearance from the top and sides to allow adequate air flow. Incorrect mounting can cause overheating, irregular shutdowns, and serious damage to the FD200CPU.

   b. Sometimes the layout of the aircraft requires mounting the FD200CPU behind cabinetry, under floor panels, or other inaccessible places. If this is the case, adding USB extension cables are highly recommended. The cables can be purchased at most electronics stores. The extension cables should be run from the FD200CPU, to a location in the cabin that is easily accessible and close to a monitor. This will make updating and troubleshooting the FD200CPU easier and faster.

4. Video Wiring
   a. 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.
5. **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.

![Diagram showing VGA connector and pin assignments](image)

The individual wires should be extended with 6” 22awg wires using an environmental splice for the red & green wires, and Raychem caps for the blue, white, and black wires.

![Raychem Coax Solder Sleeve](image)

**Raychem Coax Solder Sleeve**

Part Number – D181-1222-90/9

These solder sleeves should be used with the ECS wire. If you are experiencing breakage, this is the best solution.
6. **Video Noise**

   Check for an incorrect ground in the installation wiring.

7. **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.

8. **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.
Chapter 4: Navigation Configuration

All Flight Management Systems output different data and use different data busses to carry information. The FD200CPU-7/8 must be ordered correctly to successfully work with the FMS or GPS it is reading data from. The FD200CPU-8 can be ordered to use ARINC-429 for flight data (Universal, Rockwell Collins, Honeywell, etc.) or the FD200CPU-7 can be ordered to use RS-232 data (Garmin, Trimble, KLN, etc.). Flight Display Systems will configure the navigation settings prior to shipping the FD200CPU-7/8 if a preconfiguration form supplied.

1. USING ARINC-429 DATA (FD200CPU-8)

The FD200CPU-8 contains a built in ARINC-429 bus reader that can accept high or low speed ARINC 429 data. The data is processed and used by the FD200CPU-8 to show information such as position, speed, altitude, etc. The FD200CPU-8 looks standard ARINC 429 labels according to the make and model of your FMS.

The FMS must be properly configured and sending data on an active ARINC-429 high or low speed bus. It is recommended that you use a “General Purpose” or “Cabin Display” output bus to send data to the FD200CPU-8. Check the FMS manufacturer’s installation manual for pin outs and other configuration information.
2. FDS – Serial Terminal

The FDS – Serial Terminal is a program that provides a graphical user interface to configure and check ARINC-429 settings. It acts as a 429 bus reader and is an effective tool for troubleshooting missing data or incompatibility with a FMS.

A. Basic Configuration

1. Plug in the USB keyboard/mouse into one of the USB ports located on the front of the unit. Boot up the system as you normally would, but do not turn on the FMS during configuration.

2. When the system has fully booted, you should be seeing Ground Pages on the monitor. Press the “X” key on your keyboard at the same time. This should close the Moving Map program and take you to a Windows desktop.

3. You should now see a Windows desktop. You should also see the FDS Serial Terminal icon on the windows task bar (bottom). Click the icon to bring the FDS serial terminal to view.
4. Now click the “Settings” button to open a rollout window displaying the ARINC-429 settings.

5. Click on the “Data Profile” drop down menu and select the desired FMS/GPS. If the FMS/GPS is not listed, then select “Custom” and set the label for each data type according to the FMS/GPS ARINC-429 output. Refer to the FMS manufactures installation manual and ICD to determine the labels output on different ARINC-429 buses. (Note Universal FMS systems will always use “Default”)

6. Click the “Save” button then click “Commit Reboot”. The system will now reboot and save the updated settings to the hard drive.

B. Advanced Configuration and Troubleshooting

1. When the FDS Serial Terminal is open, the top console will show the active ARINC-429 data. This is the data that is output to the nmea.dat file that Vist reads to obtain flight data.

   - If the data set is colored RED then no valid data has been received in over 10 seconds and this data set is likely invalid and is showing you an Alert.
• If the data set is colored **BLUE / PURPLE** then the data set is only partially being received and is showing you an Warning.

• If the data set is colored **ORANGE / YELLOW** then some of the data has not been received in over 5 seconds and is showing you a Warning. This will sometimes happen if your data bus is lagging. As long as all labels are present and showing valid data, you shouldn’t have any issues.

• If the data set is colored **GREEN** then all the data is actively being received in a timely matter and is valid.

2. The individual terminal boxes below show each data type with its corresponding value and the current label it is using to be received. The color of each individual data will indicate the validity of that piece of data.

• If the label / data is colored **RED** then the data has not been received in over 10 seconds and is likely invalid

• If the label / data is colored **ORANGE / YELLOW** then the data has not been received in over 5 seconds and may become invalid

• If the label / data is colored **GREEN** then the data is active and valid

3. If a particular data type (altitude, destination, speed, etc.) is not showing up or is incorrect, set the Data Profile to custom and try different labels for the various data types. If a previously invalid or missing label appears and is green, it is possible that the label was found. Click “Save” on the configuration followed by “Commit Reboot”.

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TECHNICAL SUPPORT
470-239-7421 or FlightDisplay.com
3. **ARINC-429 Data Capture**

In some circumstances, the correct labels may be difficult to determine. In this situation Flight Display Systems recommends performing an ARINC-429 data capture. This data capture can then be sent to Flight Display Systems for further support.

1. Open FDS - Serial Terminal then click the **Data Capture** button. The program will then perform a data capture and analyze the incoming 429 data. A progress bar will appear and the process should take around 45 seconds.

   ![Data Capture Screen](image)

2. Once the Data Capture is completed, a window will open up with the folder and all files listed. Look for the most recent file as stated below.

   C:\Vista\Captures\

   The capture file will be labeled:

   FDSST_DC_YYYYMMDD_.log

   Where YYYYMMDD corresponds to the system date set on the unit and the # corresponds to the sequential data capture taken on that day.

3. Copy this file to a USB thumb drive and email to support@flightdisplay.com. Please let a CPU technician know the file is inbound.
4. **USING RS-232 DATA (FD200CPU-7)**

The FD200CPU-7 accepts RS-232 input on connector P4. Data can be read at 4800 or 9600 baud. The RS-232 data stream is more uniform than the 429, so little configuration is needed. FMS’s that will require configuration are the Honeywell/Bendix King KLN Series, and Trimble 2100 Series.

**A. Configuration**

1. Plug in the USB keyboard, and a USB flash drive into one of the USB ports located on the front panel. Boot up the system as you normally would, but **do not turn on the FMS during configuration.**

2. When the system has fully booted, you should be seeing Ground Pages on the monitor. Press the **“ALT”** key and the **“X”** key on your keyboard at the same time. This should close the Moving Map program and take you to a Windows desktop.

3. You should now see a shortcut on the desktop for **“VISTA.ini”**. Double click this icon. This will open the Vista.ini file. It opens in notepad format for easy editing. If you do not have a shortcut on your desktop, click on **START**, **RUN**, and type in “C:\Vista\Vista.ini” and press ENTER

4. Scroll down to the **[Locator]** section. Change the settings in the [Locator] settings as described below for the specific installation.

   [Locator]
   GPS Provides Altitude= True
   Using CNX-80 GPS= (set to True if using a Bendix King KLN FMS)
   Use Argus Extended Information= False
   Use Avionica Interface= (set to False for 232)
   Use Altitude ONLY From Avionica= False
   Use Distance From Avionica= set to False for 232)
   Use Time From Avionica= (set to False for 232)
   Group= (2 for Garmin 400/500, KLN) (1 for Garmin portable, units 296/496) (10 for Trimble 2100 series)
   Port= 2
   Calculate Track and Speed= False
   Number of location/time to consider= 5
   Location/time interval (sec)= 0
   Honeywell Apex= (set to True if using a Honeywell Apex system)

5. On the Menu bar, click on **File**, and **Save**. Close the file. Click on the **START** button, and **Commit Changes and Reboot**.
5. **RS-232 Data Capture**

If the FD200CPU-7 is not showing all data RS-232 correctly, a data capture can be taken to troubleshoot the issue. This data can be sent to Flight Display Systems for further analysis.

1. Plug in the USB Keyboard and a USB Flash drive.
2. Power on the Map and wait for the "Welcome Aboard" screens
3. Press (Alt-X) to exit the map and enter the Windows Desktop
4. Click on the "Realterm" icon on the Windows Desktop
5. Click on the "Port" tab located in the middle-left
6. Set the port number to Port 2
7. Set the Baud rate to 9600 or 4800 depending on the GPS in use.
8. Click the "Open" button to open the port with the current settings
9. The terminal will start streaming data
10. Click on the "Capture" tab
11. In the "File" box type in "LTR:\DataCaptures\232Data.txt" where LTR corresponds to the drive letter of the USB Flash Drive plugged into the unit
12. Click "Start Overwrite" to begin writing the streaming data to a file. The window should turn red
13. Wait for approx. 30 seconds and click the "Stop Capture" button to finish writing the file
14. The data file is now saved on your USB drive. Email this data file and also your Vista.ini (configuration settings) files to Support@FlightDisplay.com.

**Check RS-232**

This can be used to check if valid RS-232 data is incoming.

1. Plug in the USB Keyboard and a USB Flash drive.
2. Power on the Map and wait for the "Welcome Aboard" screens
3. Press (Alt-X) to exit the map and enter the Windows Desktop
4. Click on the "Realterm" icon on the Windows Desktop
5. Click on the "Port" tab located in the middle-left
6. Set the port number to Port 2
7. Set the Baud rate to 9600 or 4800 depending on the GPS in use.
8. Click the "Open" button to open the port with the current settings
9. The terminal will start streaming data
4. USING AN ICARUS SERIALIZER FOR ALTITUDE

Some navigation systems such as the Honeywell/Bendix King KLN 90 Series do not output altitude information on the 232 or 429 data bus. To resolve this we recommend using an Icarus 3000 altitude serializer to transmit altitude information to the Moving Map.

A. Installing the Icarus 3000
   1. Install the serializer per the Icarus installation manual.
   2. Connect the RS-232 output from the serializer to connector P2 on the FD200CPU. Use pin 2 for signal, and pin 5 for ground.

B. Check Incoming Data
   1. Attach the keyboard, and boot up the FD200CPU.
   2. Once fully booted, press “ALT” and “X” at the same time on the keyboard.
   3. Click on the START button, and click the PORT1 icon (red phone)
   4. This will open the PORT 1 hyperterminal. You should see altitude information scrolling down the window.

C. Configuring the Icarus 3000
   1. Close the PORT1 hyperterminal
   2. You should now see a shortcut on the desktop for VISTA SETTINGS”. Double click this icon. This will open the Vista.ini file. It opens in notepad format for easy editing. If you do not have a shortcut on your desktop, click on START, RUN, and type in “C:\Vista\Vista.ini” and press ENTER.
   3. Scroll down to the [Icarus] Section. In the line Use Icarus=False, set to Use Icarus=True. Do not change the Port=1, and Baud=9600.
   5. Click on the START button, and click Commit Changes and Reboot
Chapter 5: Moving Map Customization

The Vista.ini file controls settings for the moving map functionality. To edit this file you can open the file directly and change the configuration lines manually with appropriate values, or you can use the Vista Configurator in the FDS Serial Terminal. The Vista Configurator provides you an easy to use interface to change the configuration of the Vista.ini file without the possibility of corrupting the file. To use the Vista Configurator open up FDS Serial Terminal and click on the "Map Settings" button. This will open up a new window with all the configuration options split up into categories located on the left. To edit settings select a category on the left side, and the settings will be displayed on the right side. After making any changes make sure to click the "Save" button located in the bottom left, and on the main FDS Serial Terminal window click "Commit Changes and Reboot". This will ensure that your settings have been written to the Vista.ini file and that they have also been permanently written to the hard drive.

1. General Configuration

   This section allows you to configure some of the more commonly changed settings such as logo screens, units of distance / speed, cutoff speeds (controls when logos / airports turn off and maps turn on). Logos and welcome screens should be formatted as the same resolution as the FD200CPU-7/8. The Aircraft icons are located in the C:\Vista\3DIcons\ or C:\Vista\Icons\ folder.
2. Pages

This section allows you to configure the timing for which each page is displayed as well as disabling them if desired. You can also set up breadcrumbs and Airport Diagrams in this section.

To turn off a page from displaying, change the “Seconds To Show Mapping Pages to “0”. This will keep a page from cycling through.

The following should always be set to zero. These are features that are incompatible with the FD200CPU-7/8.

TerraColor=0
Quad Maps=0
Virtual Flight=0
3. **Statistics**

This section allows you to customize the Statistics pages by adjusting the location of each data item as well as changing the windows color, enabling the data bar, and changing the language.

The “Statistics to Display” check mark disables a statistic from appearing on the statistics pages.

The “Page Number” value changes which statistic page (first or second) where the statistic will be shown.

The “Line Number” value changes the sequential top to bottom order the statistic is shown on the selected page.

The “Data Bar” check box disables the statistics pages and enables a data bar across the bottom of the unit that cycles through the statistics.
4. Locator

This section controls many data related settings such as switching data source between ARINC 429 and 232. You can also change the settings of the Relative Locator page such as color, font, text size, search interval, and search distance. CMS Remote Control and Altitude Serializers can also be enabled / disabled from this section.

The “Serial Remote Control” checkmark should be enabled and set to Port 1 to receive commands from an Flight Display Systems Cabin Management System.

One of the “Altitude Serializer” checkmarks (Icarus or Shadin) should be enabled and set to Port 1 to receive altitude from an altitude serializer. The Icarus 3000 and the Shadin 8800T have been tested with the system.

If using ARINC-429 data, all items with the (429) tag should be checked.

If using RS-232 data, all items with (429) tag should be unchecked. The Port should be selected to 2 by default and the Group will be dependent up on the GPS in use: (2 for Garmin 400/500, KLN, G1000) (1 for Garmin portable, units 296/496) (10 for Trimble 2100 series).
5. Render

This section allows you to configure the zoom level of each Satellite pages as well as the corresponding level of detail for each.

Flight Display Does not recommend adjusting these values for most users. Adjusting the render settings may cause viewing problems with the map pages.
6. Clocks

This section allows you to configure the World Clocks page by easily searching for a city and clicking Select under the desired clock to change. (Note that each city will take into account DST only at the time in which the city is set, so if you need to update the time after a DST change you can simply set that city again and it will automatically account for DST enabled or disabled based upon the current date)
7. Vmap

This section controls the majority of the visual configuration of information displayed on the map. Here you can configure the colors, fonts, and sizes for all things displayed on the map such as Cities, States, Borders, and Points of Interest. To adjust settings select the desired information type on the left, and adjust its corresponding settings on the right.

Flight Display Systems does not recommend changing these settings for most users.
Chapter 6: Personalize

We are constantly working to give the FD200CPU-7/8 more features, while becoming more user friendly. Users can now personalize their FD200CPU at no additional cost, and without uninstalling the unit to mail back in. All you will need is the Mini-Keyboard issued in the FDINSTALL kit and a USB flash drive. This chapter focuses on adding user waypoints, adding custom ground pages, and adding custom icons.

1. Adding User Waypoints
   The FD200CPU Moving Map comes installed with a robust database of cities, airports, and other landmarks. In addition, users can also add custom waypoints. Popular custom waypoints are vacation homes, business locations, and private airports.

   a. Plug in the Keyboard to P1 on the FD200CPU.
   b. Apply power and allow the FD200CPU system to fully boot up.
   c. After the system has fully booted, press the “U” key on the keyboard. This will open the Add New User Point dialog box.

   ![Add New User Point Dialog Box](image)
d. Press the Tab key to navigate through the fields. Start by naming your User Point (12 character limit). Enter the Coordinates and Hemisphere. Elevation is not necessary, and Magnetic Variation will calculate automatically. **TIP:** If you do not know the Coordinates of your point, an easy trick is to use a virtual globe program such as Google Earth.

e. Press the TAB key until the OK button is selected and press enter to save.

f. Repeat to add more user points. You can store up to 500 user points.

g. When you have added all points hold the “ALT” key and press “X”.

h. Click on the START button, and click on the Commit Changes and Reboot icon. This will save all changes and reboot the system.

2. **Custom Ground Screens**
The FD200CPU allows you to display up to 3 custom screens while the aircraft is on the ground. These screens can be anything from welcome messages and cabin briefings, to advertisements from partner companies. The images are easy to load, and can even be set to stay on while in flight.

a. Copy your logo file to the USB thumb drive provided with your installation kit using a computer. The logo file must be in Windows Bitmap format (extension .BMP) at 1024X768 resolution. If you want, you can send the images into Flight Display Systems to have them formatted for you.

b. Plug in the USB keyboard, and USB flash drive into the USB ports located on P1. Boot up the system as you normally would, but **do not turn on the FMS during configuration.**

   1. On the keyboard, hold down the “ALT” key, and press the “X” key.

   2. You should now see a Windows desktop with the Flight Display Systems logo.

   3. Click on the START button and open the Run command.
4. In the Run dialog box, type in D: and press the Enter key, or click OK.

5. This will open a window containing your USB flash drive’s files. From here, you can drag and drop files to and from your USB flash drive.

c. Now, Click on the START button and open the VISTA folder.

d. Drag the files from your USB flash drive, and drop them in the Vista folder.

e. In the Vista folder, you should now see your image file. Open the Vista (configuration settings) file.

f. Edit the Logo Filename line in the [Flight Display] section as described in Chapter 5, Section III.

g. On the menu bar, click File, and Save. Close the file, and click on the START button, and click the Commit Changes and Reboot icon.
3. Custom Aircraft Icons

The FD200CPU gives you the ability to load your own custom aircraft icon. You can choose one of the pre-loaded icons, or contact Flight Display Systems to have an exact replica of your aircraft made. Contact sales@flightdisplay.com for more information.

- CITATION-SM
- GULFSTREAM
- BELL
- 737
- AGUSTA
- CARAVAN
- A320
- CHALLENGER
- CITATION-LG
- PC-12
- FALCON-LG
- HAWKER
- LEARJET-LG
- LEARJET-SM
- PHENOM
- SIKORSKY
Troubleshooting

**CPU Operation**

FD200CPU will not power up, or there is no display
1. Verify power to FD200CPU and monitor(s).
2. Check that the monitor is on the correct source.
3. Test with a VGA computer monitor and the FD200CPU, using a standard VGA cable to connector P3.
4. Test the monitor(s) using a laptop with VGA output.

Video is off center, or part of the screen is black
1. Use the Menu options on the monitor to select auto-detect, or auto adjust.
2. Click on Start, Settings, Control panel. Open the display properties, click settings, advanced, monitor, and change the screen refresh rate to 60hz. Click OK.

Monitors display the BIOS during boot up, but then lose signal
1. If using VGA, test with a computer monitor.

FD200CPU boots up, but shows a constant white/grey screen
   d. The system cannot find the 1st ground page. Check and make sure you have the correct file name and file path in the Vista.ini file’s “Logo Filename=” line.

FD200CPU stays in Ground Mode
1. Verify that the FMS has acquired satellite signal.
2. Verify that there is data reaching the FD200CPU using the FDS Serial Terminal, or Realterm.
3. Check your interface settings to the FMS (CH 4)

Video is off centered, or part of the screen is black.
   e. Use the Menu options on the monitor to select auto-detect, or auto-adjust.

Aircraft icon is always pointing North
1. Check FDS Serial Terminal for any red labels (Particularly heading labels).
2. Verify that your FMS is outputting label 313, 314 or 320.

There is no line to destination, and/or no DTG or ETE
1. Verify your flight plan’s destination is a valid ICAO identifier
2. Check FDS Serial Terminal for any red labels (Particularly destination labels).
3. Verify that your FMS is outputting label 304, 305, 306 or 307.

The ETA and/or World Clocks page is wrong
   f. Verify that your system clock in set to the GMT Daylight Time zone, with the current GMT time and date.
Appendix 1 – Keyboard Commands

The following is a list of commands and their functions that can be used in the Moving Map program.

D – The “D” key is used to enter a destination when using the built-in Simulator mode, or when the destination is not provided by FMS/GPS.

P – The “P” key is used to open the Port Reader program, used to troubleshoot wiring issues, in addition to RS-232 data on the FD200CPU-7.

S – The “S” key is used to set the starting position, altitude, track, and speed when using the built-in Simulator mode.

U – The “U” key is used to enter Custom User Waypoints.

Alt-Tab – The “Alt-Tab” combination is used on the FD200CPU-8 to switch programs to the ARINC Port Monitor service, to troubleshoot 429 data issues.

Alt-X or X – The “Alt-X” combination is used to shut down the FD200CPU program, in order to access the desktop when updating software, or customizing an INI file.
Appendix 2 – Changing the System Clock

![System Clock is located here](image)

Click on the Time/Date to expand
Appendix 2 – Changing the System Clock (Continue)

Click here to adjust the Time/Date to reflect GMT
Appendix 2 – Changing the System Clock (Continue)

After making changes be sure to click on the Commit Changes and Reboot Icon

If Commit Changes and Reboot icon is not located on the Desktop it can be found in the Start menu

If you need help with this process please contact our Technical Support Staff at 470-239-7421 or support@flightdisplay.com
### Log of Revisions

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<th>Rev</th>
<th>Date</th>
<th>Page</th>
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<td>A</td>
<td>01/25/2007</td>
<td>2, 6, 9, 10, 12, 14, 15, 19</td>
<td>Added information regarding Weather Upgrade Information updated on RS-232 Data Out Updated start-up time to “3-5 minutes” Changed references to Config program Changed Appendix B to Config program</td>
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<tr>
<td>B</td>
<td>05/16/2007</td>
<td>3</td>
<td>Added information regarding weather upgrade, and aircraft icons.</td>
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<tr>
<td>C</td>
<td>10/05/2007</td>
<td>8, 15, 16, 20</td>
<td>Corrected DB part number. Removed references to Config program.</td>
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<td>E</td>
<td>05/20/2008</td>
<td>8</td>
<td>Added VGA &amp; Composite info</td>
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<td>G</td>
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<td>1, 18</td>
<td>Updated specifications, warranty info</td>
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<td>H</td>
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<td>29</td>
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<td>I</td>
<td>10/26/2009</td>
<td>16</td>
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<td>J</td>
<td>01/05/2009</td>
<td>18, 33</td>
<td>Removed “Do not power on…” line, Correct typos under Logo Filename, Format Change</td>
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<td>L</td>
<td>07/12/2010</td>
<td>11</td>
<td>Remove Quad Screen Feature</td>
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<tr>
<td>M</td>
<td>08/13/10</td>
<td>7, 8, 20</td>
<td>Added Operating Temp, Warranty update, replaced VGA Drawing</td>
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<td>N</td>
<td>01/11/2012</td>
<td>15</td>
<td>Revised DB-09 Male Connector</td>
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<td>P</td>
<td>11/15/2013</td>
<td>All</td>
<td>Updated Hardware Specifications, Added in-rush current, updated pin outs and specifications to reflect composite and s-video no longer supported, updated navigation configuration section to reflect use of FDS Serial Terminal, Updated Both Data Capture Sections, Updated Moving Map Configuration Section to reflect GUI interface instead of manually editing GUI.</td>
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TECHNICAL SUPPORT
470-239-7421 or FlightDisplay.com
| Q | 04/28/2017 | TOC, 13’ | Removed references of Weather Upgrade capability |

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