

Technical Manual, Remote Display System**© 2011 by Rosen Aviation, LLC**

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1. INTRODUCTION

Rosen's Remote Display System consists of an ultra-thin remote display monitor and a remote electronics box. The remote electronics design provides more mounting options because the video processing electronics box can be located up to 50 feet from the display. The high-definition display monitors are available in a range of sizes and mounting options that allow customers to configure a system that fits their aircraft's cabin interior.

This manual provides general instructions about how to install all models of the Remote Display System onto your aircraft. It contains everything you need to know to wire the components and confirm that the system is functioning correctly.

The model numbers listed are for reference purposes only. A wider range of specialty models is available. For more information about a remote display system, please contact Rosen Sales or Technical Support.

Note: Only trained and qualified personnel should perform installation and service.

1.1. Remote Display Modules

The Remote Monitor Electronics Box (RMEB) will operate one Remote Display Module (RDM), regardless of the size. Remote Display Modules are available in these sizes and configurations:

- 19" monitor – available in flush, semi proud, and proud mounts
- 24" monitor – available in flush, semi proud, and proud mounts
- 26" monitor – available in flush and semi proud mounts

1.2. Additional System Materials

Documentation for the Rosen Remote Display System is available on the Rosen website at www.rosenaviation.com.

- Outline & Installation Drawings for Remote Monitor Electronics Box 0700-1xx series
- Outline & Installation Drawings for each size RDM, bezel, and cosmetic back
- Technical Manual

From the [Rosen Aviation](http://www.rosenaviation.com) home page, select the **Products** tab and browse by product category. Please contact Technical Support if you cannot find the drawing you need.

1.2.1. IR Remotes

The RMEB provides 5V @100mA output to power an external IR receiver. The remote monitors do not have a built-in IR sensor. The following options (sold separately) enable remote inputs with the Remote Display System and adjust the on-screen display (OSD) settings:

- External IR Receiver (P/N **0500-006**)
- HD Monitors IR kit (P/N **0500-023**)
- Universal color display remote control (P/N **0500-020**)

Note: For directions on operating the optional universal remote control, refer to the User's Guide enclosed with the remote.

1.2.2. RMEB Connector Kits

The following connector kits (sold separately) are recommended:

- Connector kit—26-pin female (P/N **0300-043**)
- Connector kit—25-pin female D-sub (P/N **0300-052**)
- CVBS and SDI connector kit—BNC (P/N **0300-051**)
- Component/RGB, digital HDMI/DVI connector kit—25-pin (P/N **0300-029**)

1.2.3. Monitor Connector Kit

All remote monitors use the following connectors:

RJ45 Plug connector kit—(P/N **0300-050**)

DB15 female connector kit— (P/N **0300-053**)

1.2.4. Optional Bezels and Cosmetic Backs

The display monitors can be flush mounted, mounted with a sleek bezel, or proud-mounted between a bezel and cosmetic back plate, as shown below. Please contact Rosen Sales for bezel kit requirements.



Figure 1 Mounting options for remote display modules

- Flush mount – RDM only
- Semi-proud mount – RDM with bezel
- Proud mount – RDM is attached to a cosmetic back plate with bezel

2. VIDEO INPUTS

The Rosen Remote Display System enables viewers to watch high definition video signals in a variety of formats as well as standard video signals. The 0700-104 remote electronics box supplies the following video inputs; however, the available inputs on other models will vary.

- Two 3G-SDI inputs
- Two composite (CVBS)
- Two DVI inputs (HDMI)
- RGB & Component (YPbPr) - through the DVI connectors only
- Accepts inputs up to 1080p, VGA-WUXGA

This unit can be controlled via an IR (infrared) remote interface, RS-232-based 7-button external controller (P/N **0300-408**), or RS-485 external inputs. The display connects to 28VDC aircraft power and receives video through a video distribution amplifier or directly from video sources.

3. INSTALLATION GUIDELINES

You can mount the RMEB in any orientation with a minimum of six #8 screws (three per flange).

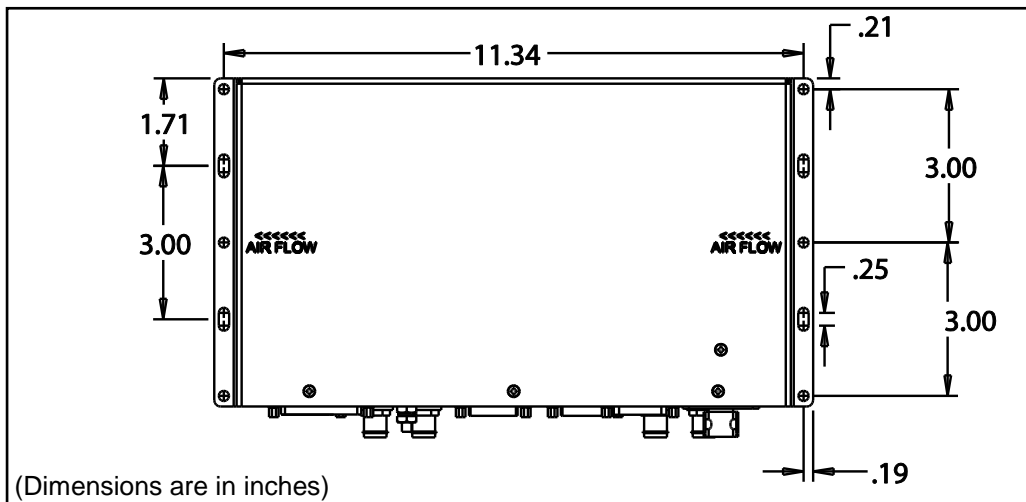


Figure 2 Dimensions for the mounting holes

Use care to prevent debris from entering the housing fan openings during installation.

3.1. RDM Mounting Options

The remote monitors are designed for vertical wall/bulkhead mount applications. They can be flush mounted from the back, through an interior wall, or from the front mounting tabs. Proud mounted RDMs must be mounted from the front into the cosmetic back.

- Minimum fasteners required four 8-32 or eight 4-40; torqued to 7 ± 1 in-lbs.
- Maximum projection of screws into the 19" & 26" flush mount rear chassis is $\frac{1}{4}$ "
- Maximum projection of screws into the 24" flush mount rear chassis is $\frac{3}{8}$ "
- A minimum of $\frac{1}{2}$ " clearance for the top and bottom vents or $\frac{1}{2}$ " clearance to the entire back is required.

The manual groups monitors by size. Outline and Installation drawings are available on Rosen's website www.rosenaviation.com to assist in the installation process. Pay close attention to the dimensions when considering installation requirements. Dimensions for some models may vary, so be sure to consult the latest drawings on Rosen's website for more information.



Touching the LCD with excessive force may leave pressure spots that show in video display. Handle with care.

3.1.1. 19-inch RDMs

The following figures show the general dimensions for the 19" RDM mounting options.

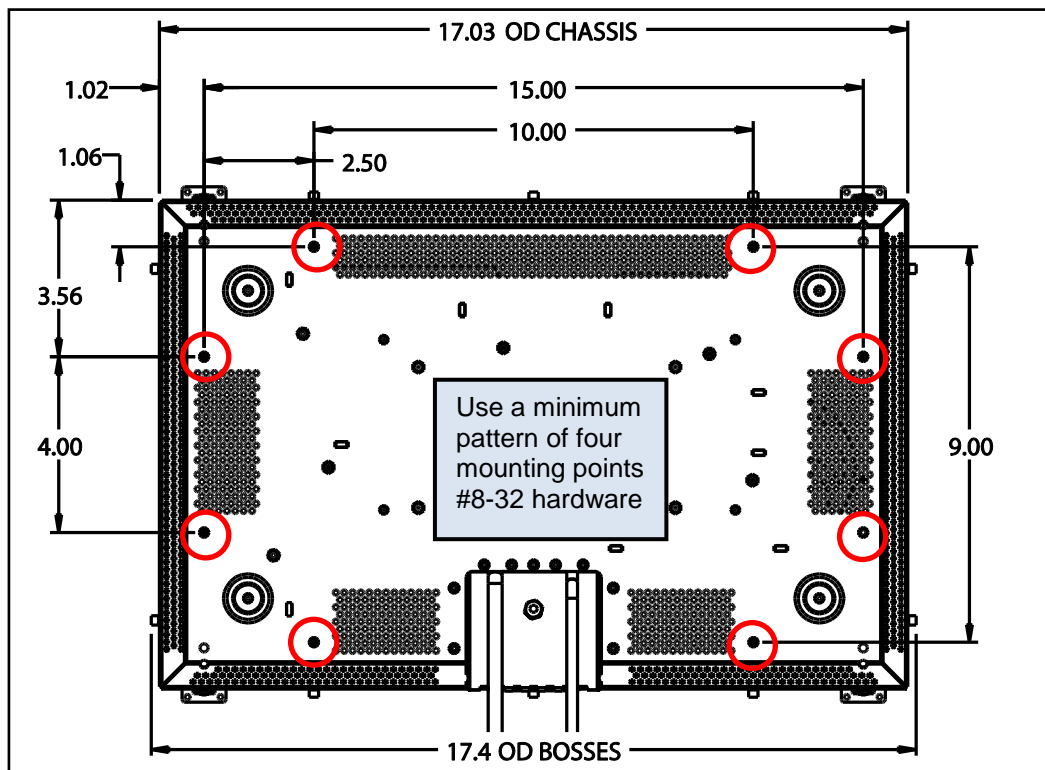


Figure 3 Rear view of a 19" flush mount

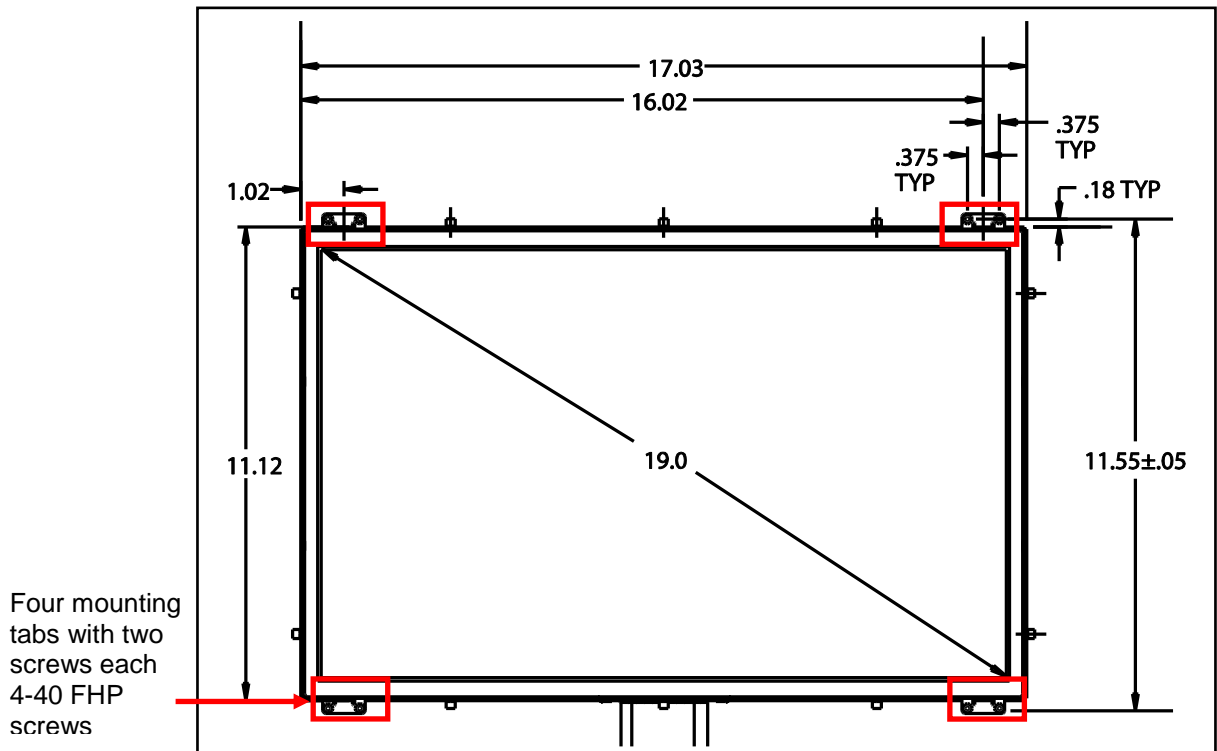


Figure 4 Front view of a 19" flush or semi-proud mount from the front tabs

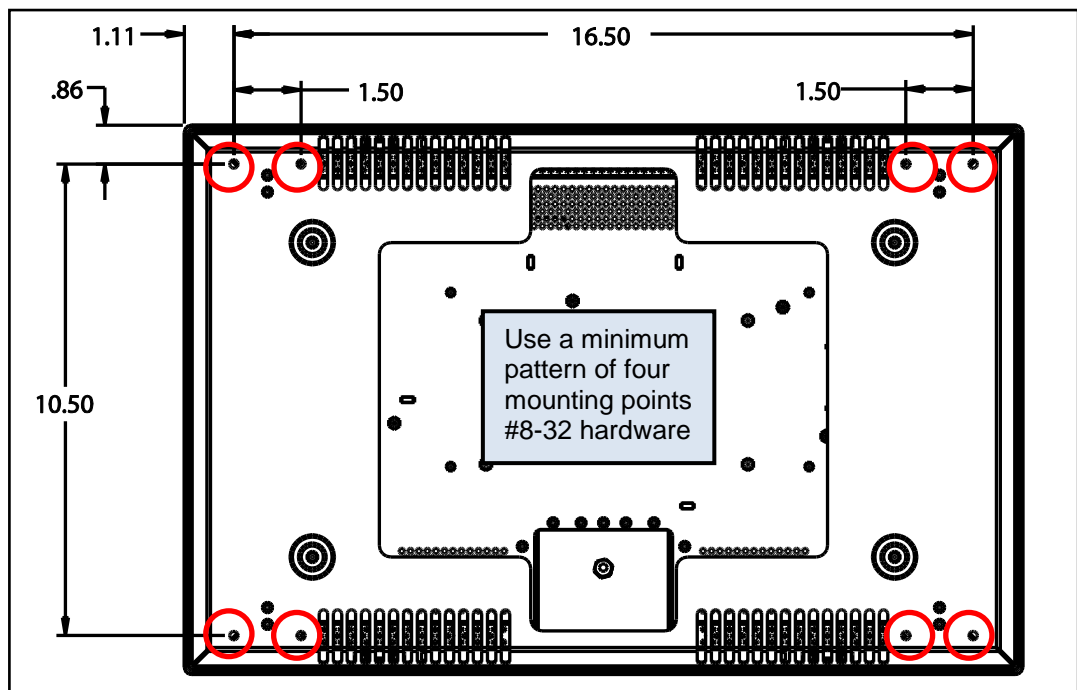


Figure 5 Rear view of the 19" cosmetic back (shown with chassis) for a proud mount

3.1.2. 24-inch RDMs

The following figures show the general dimensions for the 24" RDM mounting options.

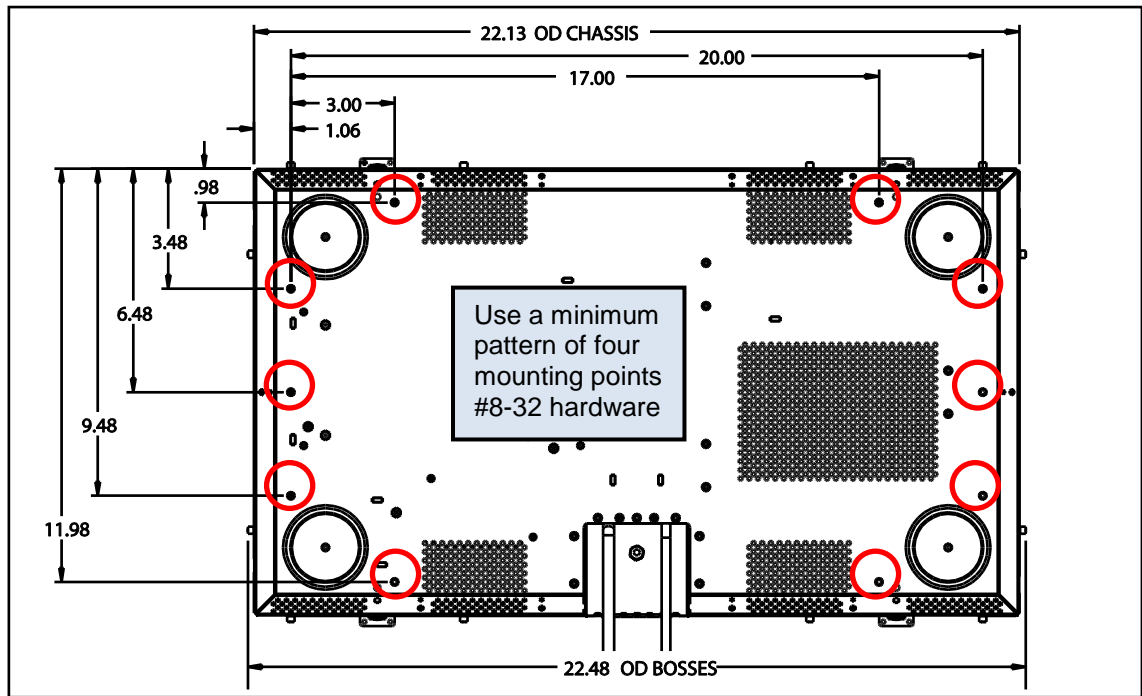


Figure 6 Rear view of a 24" flush mount

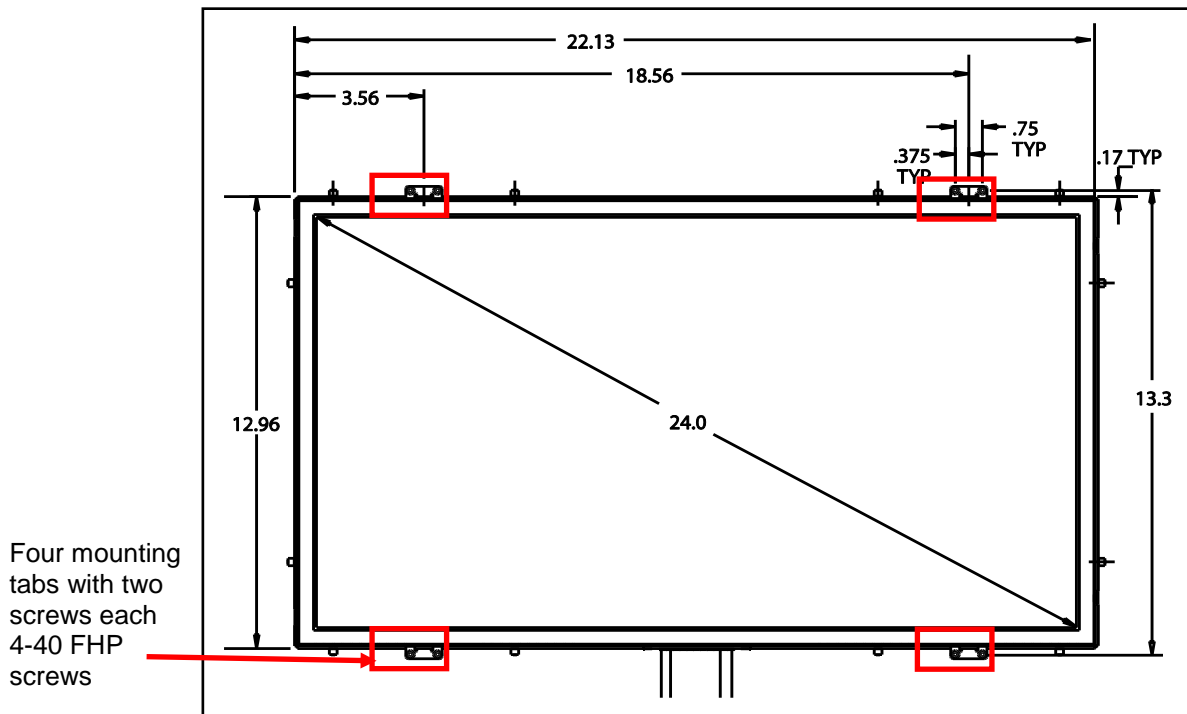


Figure 7 Front view of a 24" flush or semi-proud mount from the front tabs

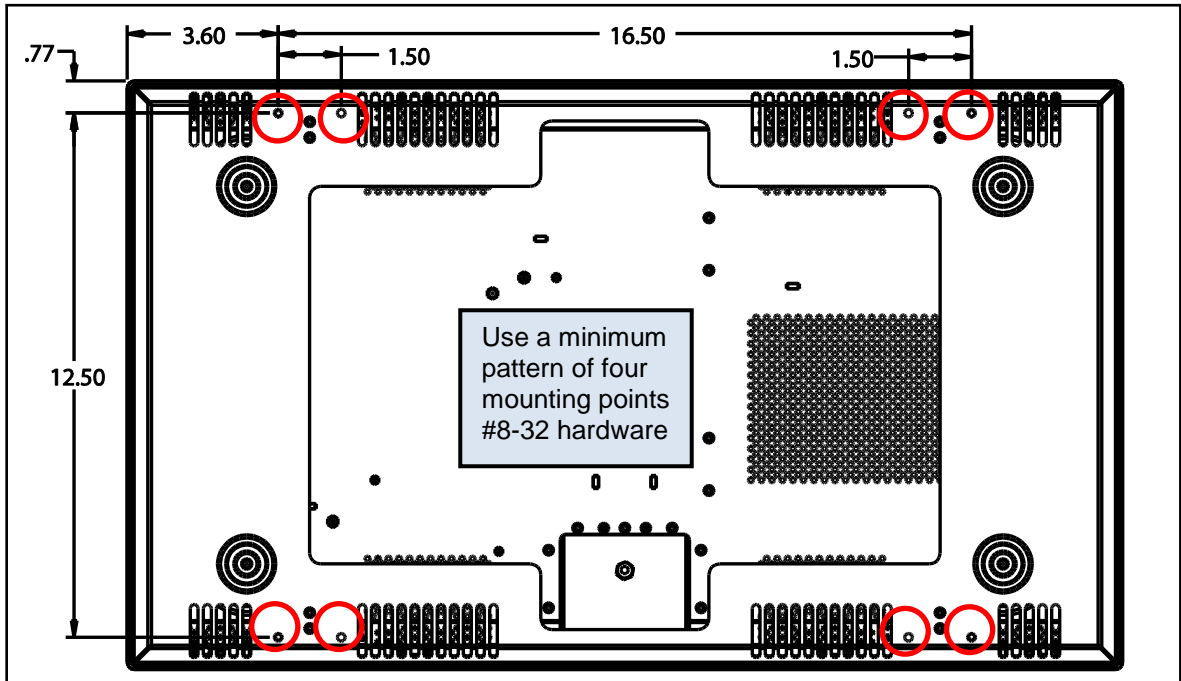


Figure 8 Rear view of the 24" cosmetic back (shown with chassis) for a proud mount

3.1.3. 26-inch RDMs

The following figures show the general dimensions for the 26" RDM mounting options.

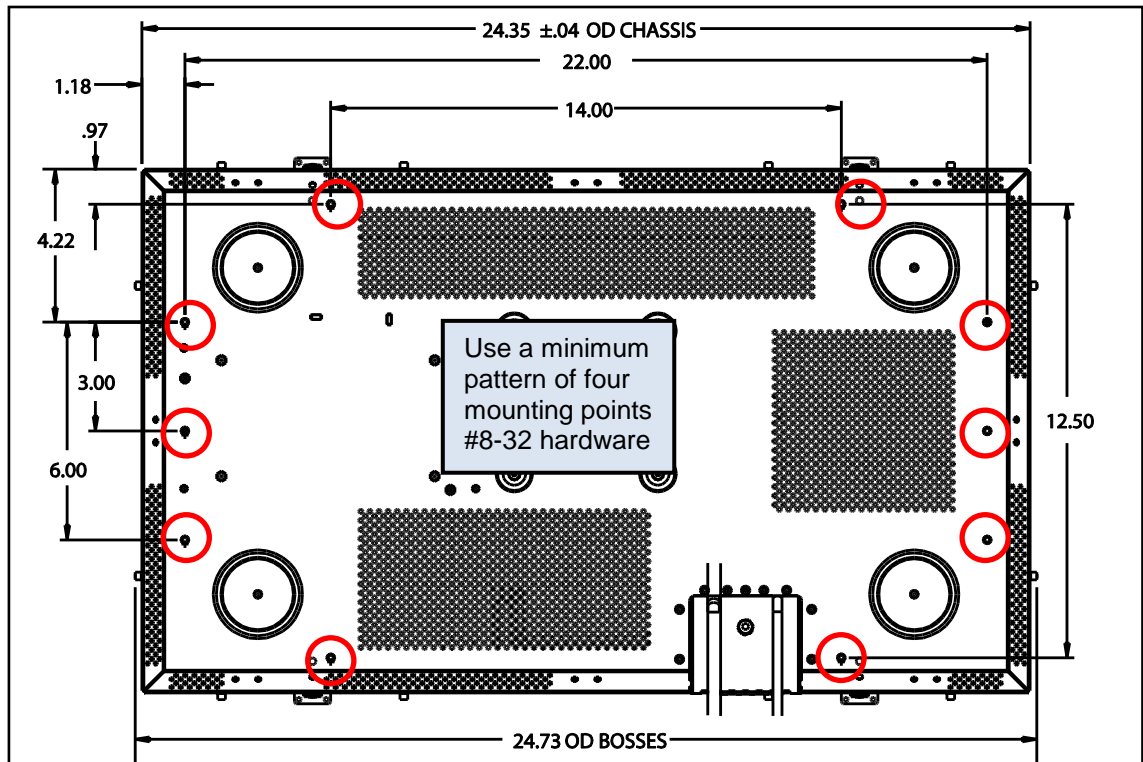


Figure 9 Rear view of a 26" flush mount

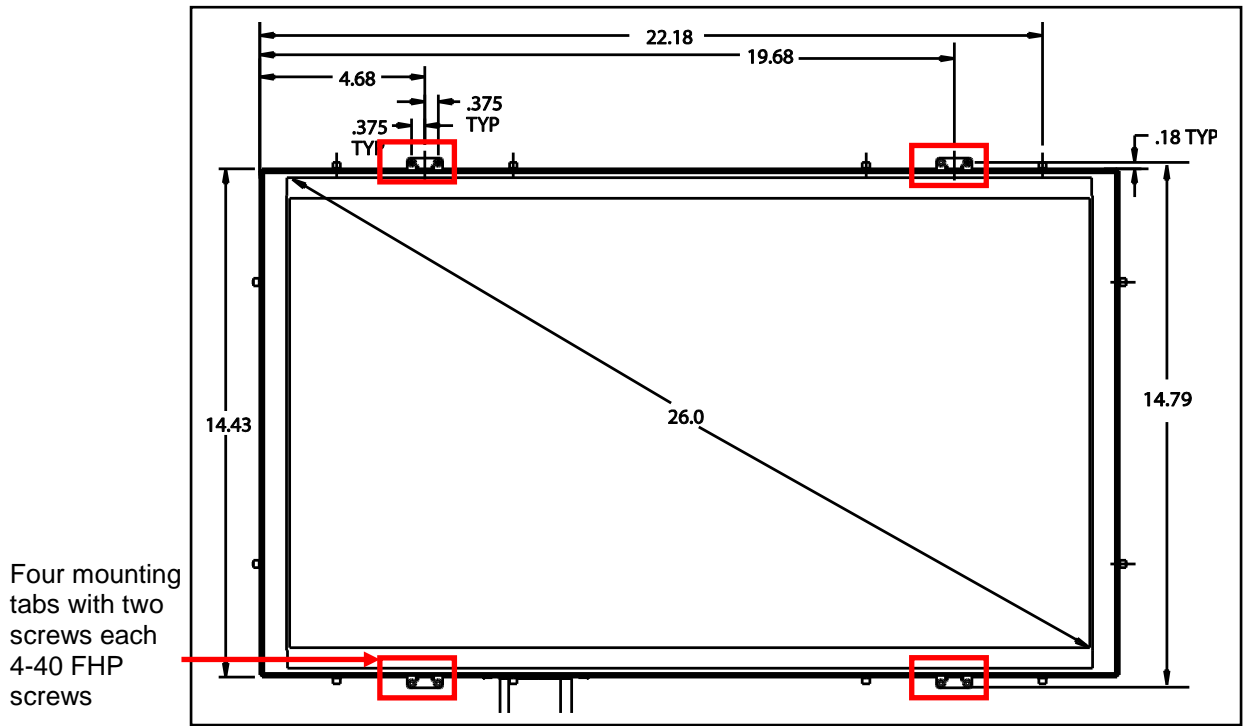


Figure 10 Front view of a 26" flush or semi-proud mount from the front tabs

3.2. Cooling and Ventilation

Do not block the side fans on the RMEB. The fan openings require a minimum of 4 square inches of free air ventilation – 2 square inches per side.

- The RDMs do not require any external forced-air cooling.
- **Venting:** The RDMs require 4.7 square inches of ventilation top and bottom. The area may be split, continuous, or at either end of the unit.
- **Clearance:** The RDMs require a minimum of 1/2 inch of clearance for the top and bottom vents or 1/2" clearance to the entire back of the unit.

3.3. Bezels and Mounting

An optional semi-proud mount attaches a bezel to bosses around the perimeter of the RDM with wire retaining clips. Install the clips to mounting bosses on the bezel after any custom plating using the Bezel Retention Hardware kit (P/N **0500-021**). Figure 11 shows the assembled wire clips on the back of the model 900-style bezel. For further dimensional information, see the Rosen assembly drawing for your specific application.



Figure 11 Wire clip mounting boss assembly on bezel

Separate installation instructions come with the hardware kit. The number of wire clips required will vary depending on the size of the bezel and RDM.

To add a stylish, proud-mount option, attach a cosmetic back plate to the RDM chassis and then snap on the assembled bezel. Figure 12 shows an exploded view of the proud-mount assembly. Align the four tabs on the monitor with the four mounting brackets on the cosmetic back plate. Secure with two 4-40 fasteners in each tab/bracket, and torque screws to 7 ± 1 in-lbs. For further dimensional information, see the Rosen assembly drawing for your specific application.



Figure 12 RDM proud-mount bezel assembly

4. SYSTEM CONNECTIONS

The RDM receives power, control, and serialized video from the RMEB via connectors P3 and P4 on the RMEB from up to 50 feet away, as shown below. The RMEB outputs a serialized video signal via CAT6 cable from P4 and provides conditioned power and control to the RDM via a harness with DB15 connectors from P3. We suggest using shielded harnesses to improve EMI performance. See the wiring tables on the Outline & Installation drawings for details.

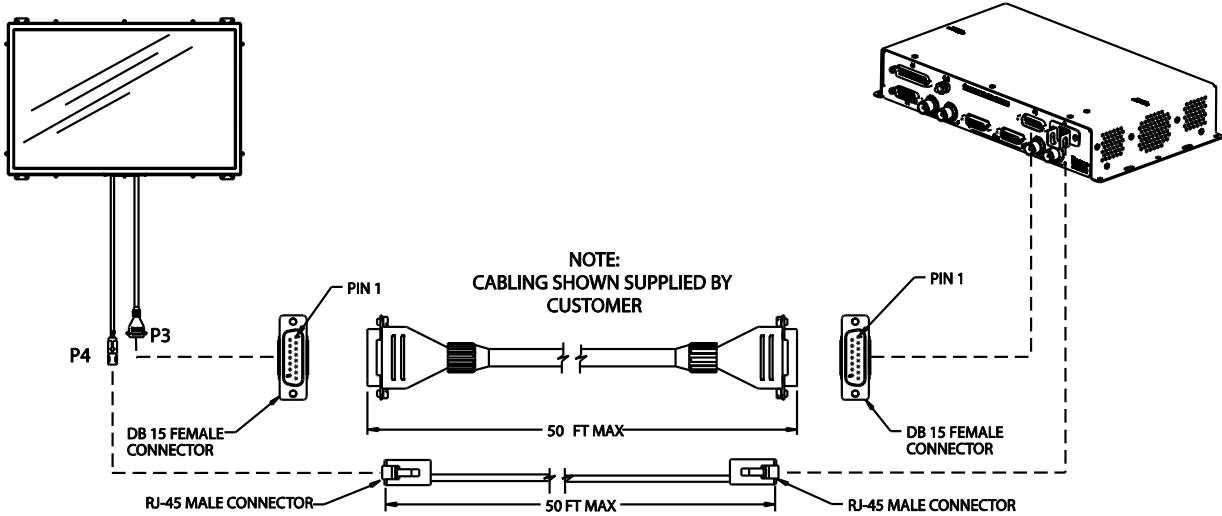


Figure 13 Remote display system connections

4.1. Remote Electronics Box Connectors

This section describes the RMEB connectors and their corresponding functions. All of these video inputs are functional on the **0700-104** RMEB; however, the inputs available vary by model.



Figure 14 RMEB connectors

Table 1 RMEB connectors and functions

Connector	Function
P1	Communication for RS-232, RS-485, External IR control
P2	Power in / Ethernet in
P3	Conditioned power out to the monitor
P4	Video signal out to the monitor
3G SDI 1 & 2	3G SDI video in
DVI-I 1 & 2	HDMI / DVI / Component / RGB video in
CVBS 1 & 2	Composite video in

4.2. Pinout Connections

There are several ways to connect the remote display system to an aircraft's entertainment system.

Pay close attention to the pinout descriptions on the *Outline and Installation* drawings to assist in completing the wiring connections.

Note: This display is for entertainment purposes only; connect to a non-critical power bus.

5. RS-232 AND RS-485 CONTROL INPUTS

Inputs that control the RDMs can come from an IR, RS-232-based 7-button external controller (P/N **0300-408**), or via a cabin management system using RS-232 or RS-485. The **0700-104** RMEB accepts the following commands:

Table 2 RS-485 and RS-232 commands

Control	Description
Power ON	Turn the display on
Power OFF	Turn the display off
Source Composite 1	Select composite 1 video input
Source Composite 2	Select composite 2 video input
Source HD-SDI 1	Select HD-SDI 1 video input
Source HD-SDI 2	Select HD-SDI 2 video input
Source VGA 1	Select analog VGA 1 video input
Source VGA 2	Select analog VGA 2 video input
Source DVI 1	Select DVI 1 video input
Source DVI 2	Select DVI 2 video input
Source YPbPr 1	Select YPbPr 1 component video input
Source YPbPr 2	Select YPbPr 2 component video input
Ping Address (RS-485 only)	Used by master device to detect all devices attached to the network
Exit	Exit the menu
OK/Enter	Selects active option when OSD is active
Control	RS-232 7-button External Controller Command Set
Power	Toggles the display on or off
Source	Scrolls through enabled video inputs
Menu/Select	Displays OSD. Selects active option when OSD is active
Left	Navigate left through the OSD menu
Right	Navigate right through the OSD menu
Up	Navigate up through the OSD menu
Down	Navigate down through the OSD menu

6. INITIAL POWER UP

Make sure that power is turned off and connect the following harnesses to the RMEB connectors:

1. Ensure positive ground connections on the RMEB housing and monitor chassis grounding lugs.
2. Connect an external IR control or RS-232/RS-485 communication harness to P1.
3. Connect 28VDC power to P2.
4. Attach extra cabling length to the RDM DB 15 pigtail and connect to P3.
5. Attach extra cabling length to the RDM RJ-45 RDM pigtail and connect to P4. Ground and strain relieve harnesses on RJ-45 connectors using the brackets provided.
6. Connect the available video inputs.
7. Apply power and wait for a signal on the RDM. The default setting for the **0700-104** RMEB is Auto On and the default source is SDI 1.

➔ NOTICE

Do not plug or unplug the display connector while power is applied.

When cycling power, leave unit off for 20 seconds before restoring power.

7. OSD MENU OPTIONS

The OSD contains screen settings and options in menus and informational readouts that display over the image, as shown below. Press **MENU** on the remote to open the Main Menu, as shown in Section 7.1. Press the **▲▼** buttons to navigate within the menu pages. Press the **▶◀** buttons to navigate between the menu page, options, and values columns. The yellow highlighted area shows the currently selected option in the menu.

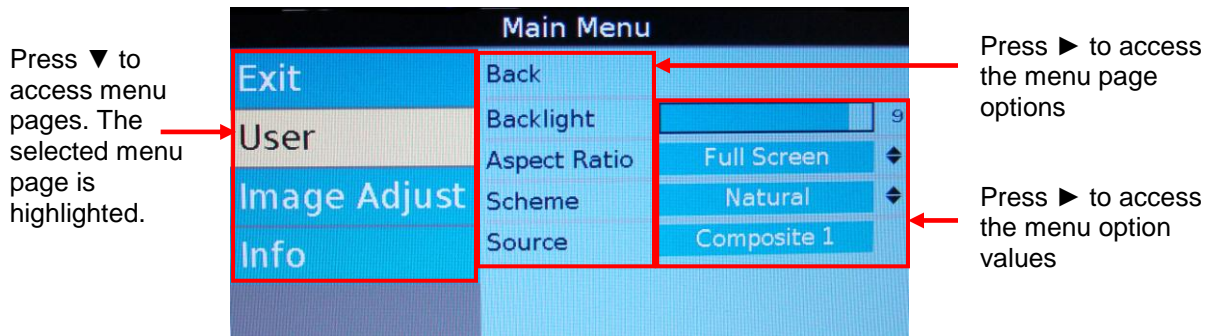


Figure 15 OSD menu options

The available menu options will vary depending on which source signal is active.

- Press **MENU** to choose a setting or an option.
- Select the **Back** option to switch menu pages.
- Press **EXIT** to close the OSD and save settings.

Note: The on-screen display will timeout and close automatically after no screen activity for a preset amount of time, which is adjustable on the Technician Menu→OSD Timeout option. See Section [8.3, OSD Timeout](#), on page [29](#).

7.1. Exit

Use Exit to close the OSD. When you press **MENU** on the remote, the OSD opens to this screen, as shown below. Press **MENU** again to close the OSD from this screen.

Press the **▲▼** buttons to access the other menu pages in the OSD.

From other settings within the OSD, press **EXIT** on the remote control.

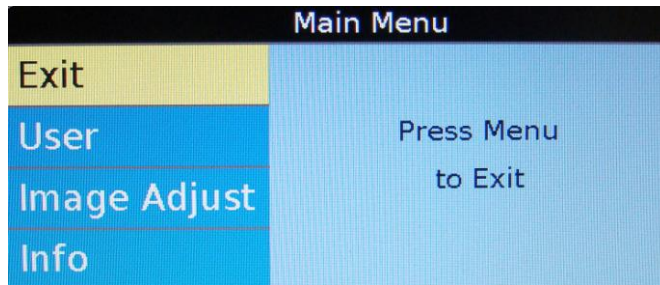


Figure 16 Opening screen for the Main Menu

7.2. User Menu

The Main Menu opens to the User Page, shown in [Figure 16](#) (above). Press the **▶** button to access the User menu options.

Press **▼▲** buttons to select a User option and press **ENTER** to change an option's value.



Figure 17 User menu options

7.2.1. Backlight

Use this setting to adjust the intensity of the LCD backlight.

From the User page, press the **▶** and **▼** buttons to select Backlight and then press **ENTER** to open the control bar shown below.

Press the **◀** or the **▶** buttons to change the value on the control bar accordingly.

Press **ENTER** to set the backlight brightness and close the control bar.

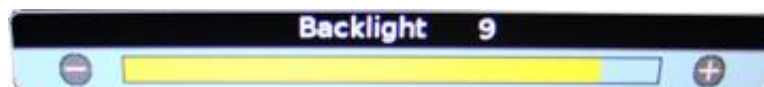


Figure 18 Backlight option

7.2.2. Aspect Ratio

Use Aspect Ratio to adjust the picture expansion to match the encoding of the source image most closely. Select **User→Aspect Ratio** and then press **ENTER**. To switch the display between aspect ratio modes (described below), press the **▲ ▼** buttons. Watch for proportional changes in the background picture and choose the optimal mode for the source. Press **ENTER** to set the mode and press **EXIT** to close the **OSD**.

To change the Aspect Ratio from the remote, press **ASPECT**.

Full Screen: Displays standard 4:3 source video in 16:9 aspect ratio by expanding the image horizontally. Circles will appear as ovals in the central and outer portions of the screen. If the source image is letterboxed, there will be black bars at the top and bottom of the image. A 16:9 widescreen source will fill the screen with minimal distortion.

Pillar Box: A standard 4:3 source image will appear with vertical black bars on the left and right side of the image. If the image source is letterboxed, then there will also be horizontal bars at the top and bottom of the image as well.

Letterbox Expanded: Expands the source video in the vertical and horizontal dimensions to fill the display screen. Letterbox-format DVDs will have small or no bars showing in this mode, while 4:3 aspect video sources will expand beyond the screen boundaries, appearing cropped.

Note: This mode is not available for RGB or a graphic, PC-based HDMI/DVI source.

7.2.3. Scheme

There are two default color settings or schemes: Natural and Vivid. If the screen colors are not what you expect, select Scheme and press the **▲ ▼** buttons to toggle between the settings. The background picture's colors change as you toggle between the settings. Vivid uses a higher color saturation level above the Natural level.

Try both schemes to determine which one you like best before adjusting the other picture quality settings.

Select **User→Scheme** and then press **ENTER** to access the settings.

Select the setting and press **ENTER** to accept the changes, and then select **Back** and press **EXIT** close the **OSD**.

7.2.4. Source

The Source page lists all of the available sources and shows which source is current.

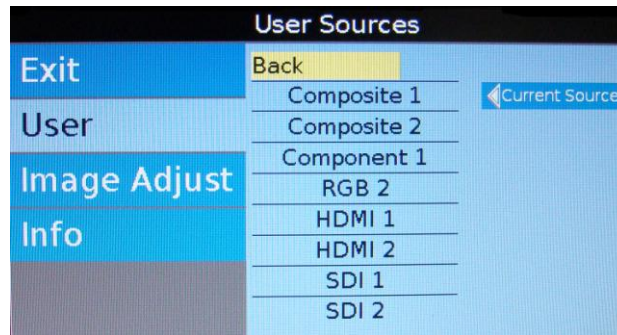


Figure 19 User Sources

Select **User**→**Source** and press **ENTER** to access the settings.

To switch the current source, press the ▲ and ▼ buttons.

Press **ENTER** to accept any changes, and press ◀ to remain in the OSD or **EXIT** to close the OSD.

To switch sources directly from the remote control, close the OSD and press the **SOURCE** button twice for each input.

7.2.5. Auto Adjust

(RGB only) Use Auto Adjust when the RGB source is active to force the display to evaluate the RGB signals and ensure that it is interpreting them correctly. To perform an Auto Adjust within the OSD, select the option and press **ENTER**. (From the remote, close the OSD and press the **AUTO** button.) The screen will go black briefly while the signals adjust.

7.3. Image Adjust

Use the Image Adjust menu pages, as shown below, to control the color and picture quality. Highlight Image Adjust and press the ► button to highlight the options, and then press **ENTER** to change the option values.

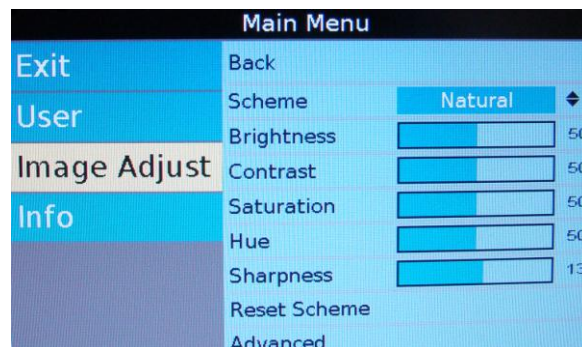


Figure 20 Image Adjust menu pages

7.3.1. Scheme

Scheme is also available from the Main Menu→User page. For information about how this option works, see Section [7.2.3](#) on page [18](#). Scheme affects changes you make on the User menu page settings, too.

7.3.2. Brightness

To adjust the picture brightness, press **MENU** and the ▼ arrow to select **Image Adjust→Brightness**, and then press **ENTER** to open the screen below.

Press the ◀ or the ▶ buttons to change the brightness on the LCD accordingly.

Press **ENTER** to set the brightness and close the control bar.

Press **EXIT** to close the OSD.

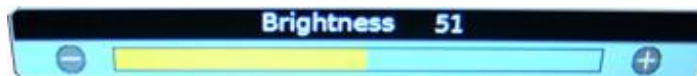


Figure 21 Image Brightness control bar

7.3.3. Contrast

To adjust the contrast, press **MENU** and the ▼ arrow to select **Image Adjust→Contrast**, and then press **ENTER** to open the screen below.

Press the ◀ or the ▶ button to raise or lower the contrast.

Press **ENTER** to set the contrast and close the control bar.

Press **EXIT** to close the OSD.



Figure 22 Contrast control bar

7.3.4. Saturation

To adjust the color saturation, press the **MENU** button and the ▼ arrow to select **Image Adjust→Saturation**, and then press **ENTER** to open the screen below.

Press the ◀ or the ▶ button to raise the color levels.

Press **ENTER** to set the saturation and close the control bar.

Press **EXIT** to close the OSD.

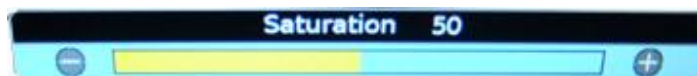


Figure 23 Saturation control bar

7.3.5. Hue

To adjust the color hues, press the **MENU** button and the ▼ arrow to select **Image Adjust→Hue**, and then press **ENTER** to open the screen below.

Press the ◀ or the ▶ button to raise the color hues in the image.

Press **ENTER** to set the hue and close the control bar.

Press **EXIT** to close the OSD.



Figure 24 Hue control bar

7.3.6. Sharpness

To adjust the picture sharpness, press the **MENU** button and the ▼ arrow to select **Image Adjust→Sharpness**, and then press **ENTER** to open the screen below.

Press the ◀ or the ▶ button to adjust the focus.

Press **ENTER** to set the sharpness and close the control bar.

Press **EXIT** to close the OSD.

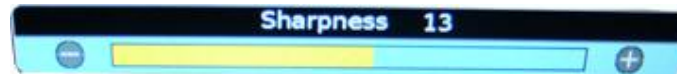


Figure 25 Sharpness control bar

7.3.7. Reset Scheme

Only restores the values of the current scheme to their default settings, and it affects only the current source. Use Reset Scheme to revert to the default screen colors if the other Image Adjust options did not correct the screen quality changes that you expected.

Select **Image Adjust→Reset Scheme** and then press **ENTER**.

Press **EXIT** to close the OSD.

For information about the different scheme modes, see Section [7.2.3](#) on page [18](#).

7.3.8. Image Adjust Advanced (Submenu)

Use the Image Adjust→Advanced submenu options, as shown below, to fine-tune the primary screen colors and to restore the monitor’s factory screen settings. Press the **MENU** button and the ▼ arrow to select **Image Adjust→Advanced**, and then press **ENTER** to open the menu.

To close the menu, select the **Back** option, or press **EXIT** to close the OSD.

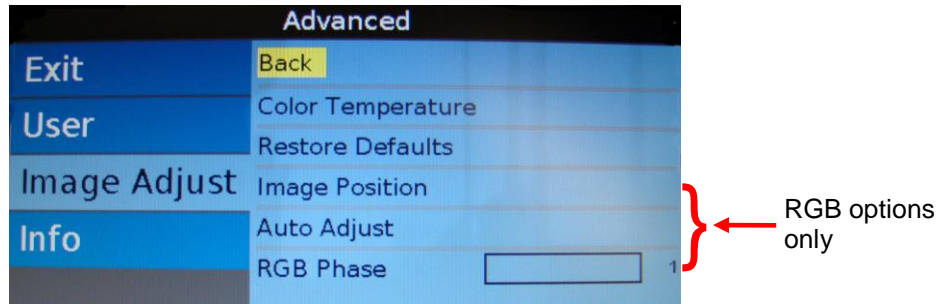


Figure 26 Advanced submenu options

7.3.8.1. Color Temperature

Use the Color Temperature options to change the white point of the picture in all sources. When you select Color Temperature, the screen changes, and a toggle appears to switch between User and 6500K, as shown below.

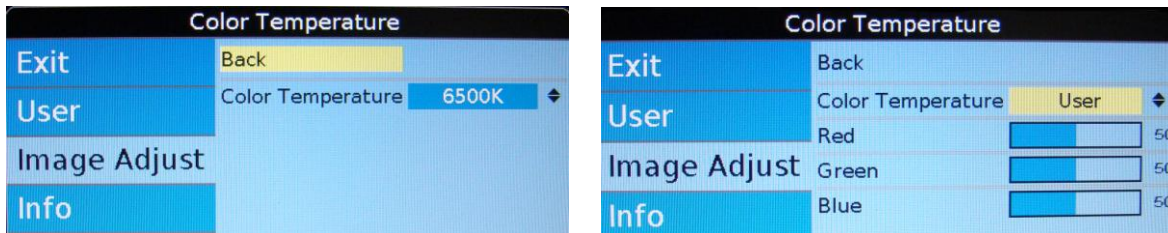


Figure 27 Color Temperature options

Select the **User** setting and then press **ENTER**.
Press ▼ to access the individual colors.

7.3.8.1.1. Red

Red adjusts the low-level registers of the red values in the picture. From the **Image Adjust** → **Advanced Menu**, press the ▼ button and **ENTER** to access Color Temperature.

Press ▼ to select **Red** and press **ENTER** to open the screen below.

Press the ◀ button several times; the image should show more cyan-colored tones. Press the ▶ button several times to intensify the red tones.

Press **ENTER** to set the color and close the control bar.

Press **EXIT** to close the OSD.

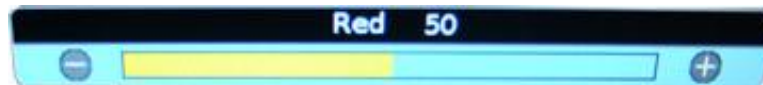


Figure 28 Red control bar

7.3.8.1.2. Green

Green adjusts the low-level registers of the green values in the picture. From the **Image Adjust** → **Advanced Menu**, press the ▼ button and **ENTER** to access Color Temperature.

Press ▼ to select **Green** and press **ENTER** to open the screen below.

Press the ◀ button several times; the image should show more magenta tones.

Press the ▶ button several times to intensify the green tones.

Press **ENTER** to set the color and close the control bar.

Press **EXIT** to close the OSD.



Figure 29 Green control bar

7.3.8.1.3. Blue

Blue adjusts the low-level registers of the blue values in the picture. From the **Image Adjust** → **Advanced Menu**, press the ▼ button and **ENTER** to access Color Temperature.

Press ▼ to select **Blue** and press **ENTER** to open the screen below.

Press the ◀ button several times; the image should show more yellow tones.

Press the ▶ button several times to intensify the blue tones.

Press **ENTER** to set the color and close the control bar.

Press **EXIT** to close the OSD.

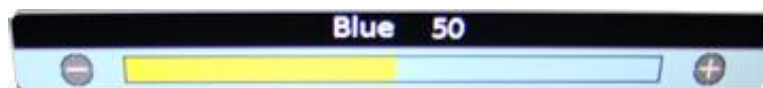


Figure 30 Blue control bar

7.3.8.2. Restore Defaults

This option restores the default screen settings from the user menus for all video sources. It does not erase Technician Menu settings or change the internal time and date. A Defaults Restored message appears in the lower corner of the menu after the restore is complete.

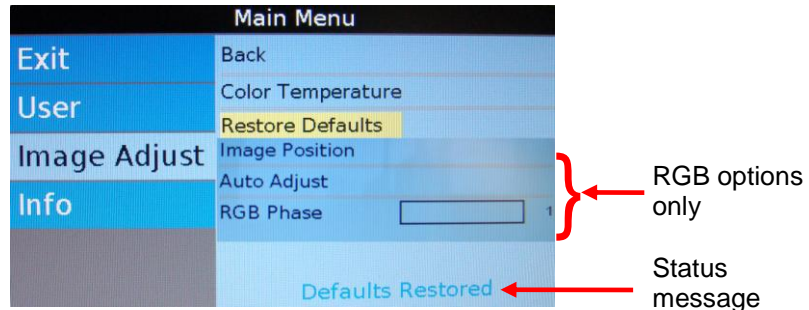


Figure 31 Restore Defaults option

7.3.8.3. Image Position Submenu

(RGB only.) Use the Image Position options to center an RGB picture horizontally or vertically on the screen. **Note:** Changing the resolution, source, or cycling power will reset any adjustments to this submenu’s settings.



Figure 32 Image Position option

7.3.8.3.1. Horizontal

From the **Image Adjust**→**Image Position** menu, press the ▼ button to choose **Horizontal** and then press **ENTER** to open the screen, as shown below. Press the ◀ button to shift the picture left or the ▶ button to shift it to the right. Press **ENTER** to set the phase value and close the control bar.

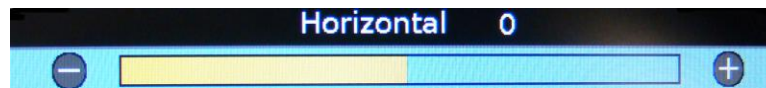


Figure 33 Image Position-Horizontal option

7.3.8.3.2. Vertical

From the **Image Adjust**→**Image Position** menu, press the ▼ button to choose **Vertical** and then press **ENTER** to open the screen, as shown below. Press the ◀ button to shift the picture up or the ▶ button to shift it down. Press **ENTER** to set the phase value and close the control bar.



Figure 34 Image Position-Vertical option

7.3.8.4. Auto Adjust

(RGB only.) Use Auto Adjust when the RGB source is active to force the display to evaluate the RGB signals and ensure that it is interpreting them correctly. To perform an Auto Adjust within the OSD, select the option and press **ENTER**. (From the remote, close the OSD and press the **AUTO** button.) The screen will go black briefly while the signals adjust.

7.3.8.5. RGB Phase

(RGB only.) Use RGB Phase to adjust the default phase value used for RGB signals. Each RGB video source can have different phase values, which can result in the RGB video image appearing to jitter. RGB Phase enables you to adjust the RGB video image without any jitter.

From the Technician Menu, press the ▼ button to choose **RGB Phase** and then press **ENTER** to open the control bar, as shown below.

Press the ► button to increase the RGB phase value until the jittering stops.

Press **ENTER** to set the phase value and close the control bar.

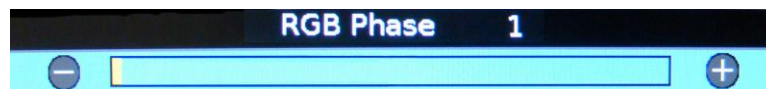
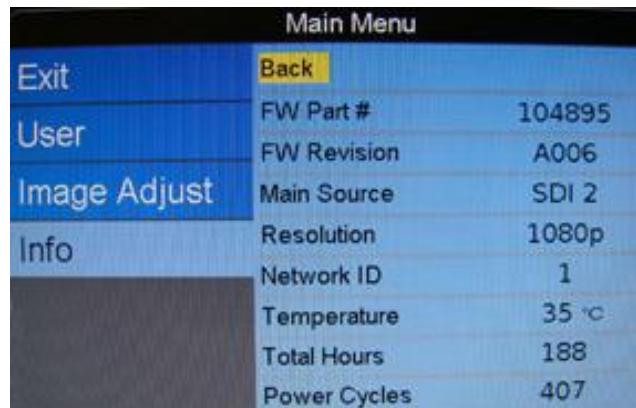


Figure 35 RGB Phase control bar

7.4. Info

Use the Information page to review operating status of the monitor. To access the Technician Menu, you must highlight the Back option. For more information about the [Technician Menu](#), see Section 8 beginning on page 26.

To open the page, press the **INFO** button on the remote, or use the ◀▶▲▼ buttons from within the OSD menu.



Info is different for each input

Figure 36 Info page

8. TECHNICIAN MENU

To protect the display from accidental or unintentional adjustments, the Technician Menu is accessible only with a special button combination. To avoid repeating this button sequence after each change, the menu remains active until you manually close it.



To ensure proper operation, perform a power cycle after changing a setting in the Technician Menu.

To open the Technician Menu, start with the display on, and press the following buttons in this order:

1. Press **INFO**.
2. With the **Back** option highlighted on the Main Menu, press the ▲▼▲▼▲▲▲ buttons and then press **MENU**.
3. The Technician Menu opens.



Press **Back** to exit the Technician Menu and return to the Info page

Figure 37 Technician Main Menu

To navigate the menu options, press the ▲ or ▼ buttons.

To close the Technician menu and return to the Info Page, select the **Back** option and press **MENU**. To close the Technician menu and the OSD, press **EXIT**.

Note: The Main Menu options are not selectable while the Technician Menu is open.

To open the Technician Menu from the universal remote, follow these steps:

1. Press the **HD Monitor** page, and then press the appropriate **Monitor** (numbered).
2. Touch the lower-right corner of the screen, and press the **Tech Menu** button.

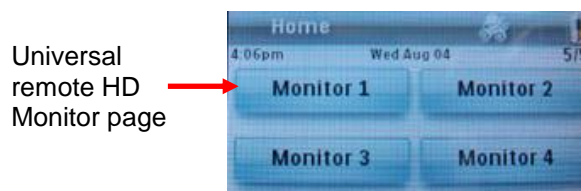


Figure 38 Universal remote HD Monitor screen

8.1. Advanced Technician Menu

This submenu provides installers and technicians more advanced controls of the image.

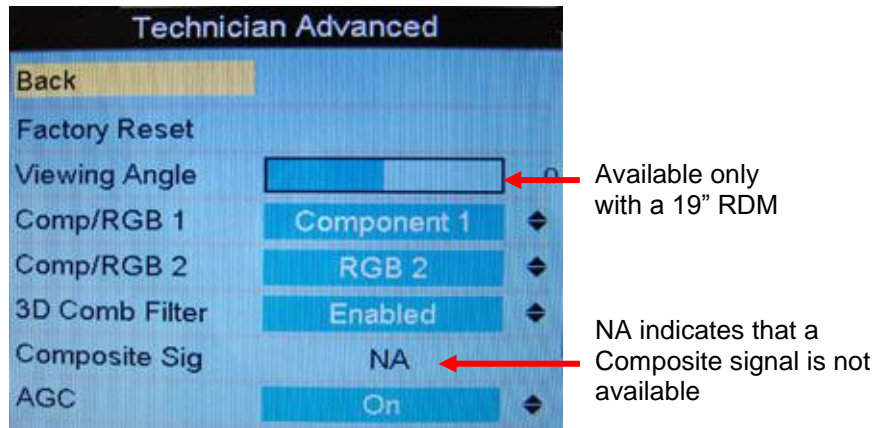


Figure 39 Technician Advanced Menu

8.1.1. Factory Reset

Choose this option to perform a complete factory restore. It is similar to Reset Scheme in the Main Menu→Advanced submenu; however, Factory Reset returns all items with pre-determined defaults in *both* the User and Technician menus to their factory settings.

Highlight **Advanced**→**Factory Reset** and press **ENTER**.

A *Reset Complete* message appears after the display restores the default settings.

8.1.2. Viewing Angle

(Available on 19" RDM only.) Use Viewing Angle to adjust the settings for viewing angles from different seat positions. Changes to the Viewing Angle adjustment will affect other User→Image Adjust settings.

Highlight **Advanced**→**Viewing Angle** and press **ENTER**.

Press the ◀ or ▶ to adjust the viewing angle in 5-degree increments from -20 to +20 degrees.

Press **ENTER** to set the viewing angle and close the control bar.

Select **Back** to return to the Technician Menu

Press **EXIT** to exit the OSD.

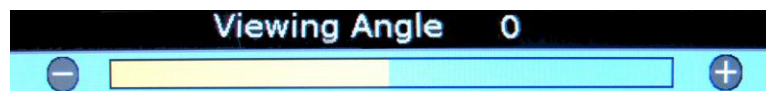


Figure 40 Viewing Angle control bar

8.1.3. Comp/RGB 1

Use Comp/RGB 1 to specify which input source the Component/RGB channel 1 will use. The options for channel 1 to display are either Component or RGB.

Highlight **Advanced**→**Comp/RGB 1** and press **ENTER**.

Use the **▲ ▼** buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu

Press **EXIT** when you are ready to exit the OSD.

8.1.4. Comp/RGB 2

Use Comp/RGB 2 to specify which input source the Component/RGB channel 2 will use. The options for channel 2 to display are either Component or RGB.

Highlight **Advanced**→**Comp/RGB 2** and press **ENTER**.

Use the **▲ ▼** buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu

Press **EXIT** to exit the OSD.

8.1.5. 3D Comb Filter

(Composite only.) When set to Enabled, the display will eliminate dot crawl and some noise on stationary portions of the picture.

Highlight **Advanced**→**3D Comb Filter** and press **ENTER**.

Use the **▲ ▼** buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu

Press **EXIT** to exit the OSD.

8.1.6. Composite SIG (Signal)

This is a read-only screen about the signal strength of the currently viewed composite source. Composite Signal Strength ranges from 0 to 1.25 Vpp in 0.25V increments. It will read NA (not available) if a Composite source is not active or AGC (below) is set to disabled.

8.1.7. AGC (Automatic Gain Control)

This option is a signal compensation tool that will accommodate for strong and weak Composite signals.

Highlight **Advanced**→**AGC** and press **ENTER**.

Use the **▲ ▼** buttons to set the option and then press **ENTER**.

Select **Back** to return to the Technician Menu

Press **EXIT** to exit the OSD.

8.2. Power Mode

Use Power Mode to set display's on/off state.

From the Technician Menu, press the ▼ button to select **Power Mode** and then press **ENTER**.

Use the ▲▼ buttons to set the option and then press **ENTER**.

Options include the following:

- **Auto-On:** The display always starts up in the ON state when 28V is applied (default).
- **Auto-Off:** The display always starts up in the standby state when 28V is applied.
- **Restore Previous:** The display returns to the previous power settings after any power interruption.
- **Ground-On:** The display always starts up in the ON state when the power pin is grounded, and ignores all power commands from the IR, RS-232, and RS-485. This setting will not take effect until you close the OSD.
- **Open-On:** The display always starts up in the ON state when the power pin is open (not grounded), and ignores all power commands from the IR, RS-232, and RS-485. This setting will not take effect until you close the OSD.
- **Momentary:** The LCD power will toggle between on and off after the external power discrete is momentarily grounded.

Select **Back** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

8.3. OSD Timeout

Use OSD Timeout to set the amount of time the menu screens and control bars are visible, without making any changes, before they timeout and close automatically.

There are three increments: 6 Seconds, 15 Seconds, and 30 Seconds.

From the Technician Menu, press the ▼ button to select **OSD Timeout** and then press **ENTER**.

Use the ▲▼ buttons to select a time increment and press **ENTER**.

Press **EXIT** to exit the OSD.

8.4. Network ID

Use this option to specify the IR and RS485 network addresses to control multiple displays from a single cabin management system or remote. For example, the monitor ID numbers on the Pronto remote correspond to the Network ID.

Each display requires a unique address on the RS-485 network. Setting this address sets the value for both interfaces. Network settings for Rosen displays are scaled from 1 to 31.

From the Technician Menu, press the ▼ button to select the **Network ID**, and then press **ENTER** to open the screen.

Use the ▲▼ buttons to select an address between 1 and 31 for the display and press **ENTER**.

Press **EXIT** to exit the OSD.

8.5. Splash Screen

Use this option to turn a custom splash screen on or off. The splash screen appears for approximately eight seconds when 28V power is first applied to the display.

When enabled, the Rosen Aviation splash screen appears. When disabled, the screen remains black.

Highlight **Technician**→**Splash Screen** and press **ENTER**.

Use the **▲ ▼** buttons to set the option and then press **ENTER**.

Press **EXIT** to exit the OSD.

8.6. Source Mode

This submenu enables you to set the Source Select mode to a specific state: either Momentary Switch Mode or Constant Switch Mode.

Highlight **Technician**→**Source Mode** and press **ENTER**.

Use the **▲ ▼** buttons to set the option and then press **ENTER**.

Note: To ensure proper operation, perform a power cycle after changing a setting.

8.6.1. Momentary Switch Mode

Momentary enables you to specify those sources that will be On or Off. This mode also contains an option to specify an Auto Detect source.

If the source specified in the Auto-Detect option is connected, the display will ignore all source commands. When that source is removed, the monitor will return to normal momentary operation.

Note: When auto-detecting a source, sources 1 & 2 are no longer selectable during normal momentary operation.

Highlight **Technician**→**Source Mode**→**Momentary** and press **ENTER**.

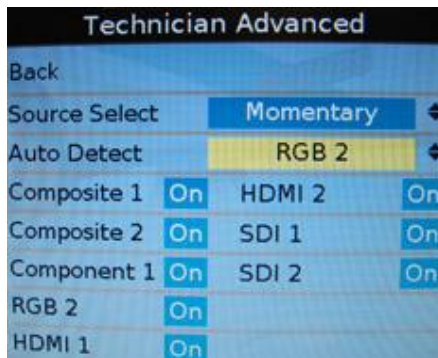
Use the **▼** to select **Auto Detect** and press **ENTER**.

Select which video input will be in an auto-detected state and press **ENTER**.

Use the arrow buttons to turn the other video inputs On/Off and press **ENTER**.

Select **Back** to return to the Technician Menu

Press **EXIT** to exit the OSD.



Set Auto Detect to **None Selected** if Source Select will be Constant mode

Figure 41 Momentary Switch Mode settings

8.6.2. Constant Switch Mode

Constant enables you to specify the two sources the monitor will switch between when the constant switch goes between an open state and a ground state.

Highlight **Technician**→**Source Mode**→**Source Select** and press **ENTER**.

Select Constant and press **ENTER**. Press **▼** to select **Open** and press **ENTER**.

Select which video input will be set in an open state and press **ENTER**.

Press **▼** to select Ground and press **ENTER**.

Select which video input will be to a ground state and press **ENTER**.

Select **Back** to return to the Technician Menu, or press **EXIT** to exit the OSD.

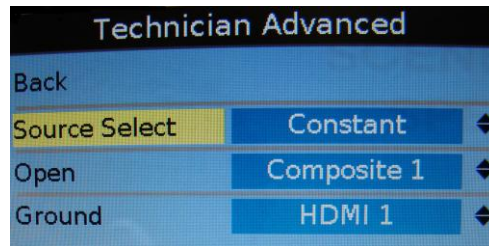


Figure 42 Source Select Constant options

9. TECHNICAL REFERENCES AND SUPPORT



Always check the [Rosen Aviation](http://www.rosenaviation.com) website under the Products tab to ensure that you are working with the most current revision of technical documentation.

Table 3 Technical references

Product	Part Number	Location
Universal Color Remote Control	0500-020	www.rosenaviation.com
RS-232 7-button External Controller	0300-408	www.rosenaviation.com
Bezel Retention Hardware Kit	0500-021	Rosen Sales

If you need assistance in configuring a universal remote control to work with a remote display system, please contact Rosen Aviation Technical Support at 541.342.3802.

9.1. Troubleshooting

If the display does not function properly, refer to the following troubleshooting table for symptoms and possible solutions before contacting Rosen field support.

Note: Always use an oscilloscope to verify the video signal. Always use a multimeter to verify voltages. Check actual results against the requirements described in this manual.

Problem	Possible Solutions
No video (signal)	<ul style="list-style-type: none"> • Verify that the display is turned on and the video is on. • Verify that you are in the correct source mode. • Verify that a signal is reaching the display using an oscilloscope or another display. • Check Power Mode settings on page 29. • Verify that the pinout is correct.
Screen is black	<ul style="list-style-type: none"> • Verify that the display is receiving power. • Check Power Mode settings on page 29. • Verify that the pinout is correct. • Verify that the video source is on and DVD installed. • Verify all connections between the source and the display.
Image flickers	<ul style="list-style-type: none"> • Verify proper CAT6 or 5E Ethernet cable • Verify that the signal cable is secure. • Verify that the vertical frame frequency is 75 HZ or less.
Distorted Image	<ul style="list-style-type: none"> • Verify proper CAT6 or 5E Ethernet cable • Verify supported resolution. • Check Power Mode settings on page on page 29. • Verify pinouts. • Verify that a signal is reaching the display using an oscilloscope or another display. • Examine the display for pinched or damaged cables.
Wrong Colors	<ul style="list-style-type: none"> • Verify proper CAT6 or 5E Ethernet cable • If the screen colors are not what you expect, reset the current scheme. For more information, see Reset Scheme on page 21 and Restore Defaults on page 24.

9.2. RTCA DO-160F Qualifications for Displays

The table below shows the DO160 compliance of the remote display system, unless otherwise noted. Omitted categories are not applicable to this product or its expected installation.

Table 4 DO 160 Level F test criteria

Description	Section	Category	Comments
Temperature and Altitude	4		
Ground Survival/Short-Time Operating Low Temp	4.5.1	A1	
Operating Low Temperature	4.5.2	A1	
Ground Survival/Short-Time Operating High Temp	4.5.3	A1	
Operating High Temperature	4.5.4	A1	
In-flight Loss of Cooling	4.5.5	–	Not applicable
Altitude	4.6.1	A1	
Decompression	4.6.2	A1	
Overpressure	4.6.3	A1	
Temperature Variation	5		
Temperature Variation	5.3.1	C	
Humidity	6		
Humidity	6.3.1	A	
Operational Shocks & Crash Safety	7		
Operational Shocks	7.2.1	B	
Crash Safety (Impulse)	7.3.2	B	
Crash Safety (Sustained)	7.3.3	B	
Vibration	8		
Random Vibration – Fixed Wing Aircraft	8.5.2	S (Curve B)	
Magnetic Effect	15		
Magnetic Effect	15.3	A	
Power Input	16		
Normal Operating Conditions (DC)	16.6.1		
Average Value Voltage (DC)	16.6.1.1	Z	
Ripple Voltage (DC)	16.6.1.2	Z	
Momentary Power Interruptions (DC)	16.6.1.3	Z (A)	
Normal Surge Voltage (DC)	16.6.1.4	Z	
Engine Starting Under Voltage Operation (DC)	16.6.1.5	Z	

Description	Section	Category	Comments
Abnormal Operating Conditions	16.6.2		
Voltage Steady State (DC)	16.6.2.1	Z	
Momentary Under Voltage (DC)	16.6.2.3	Z	
Abnormal Surge Voltage (DC)	16.6.2.4	Z	
Voltage Spike	17		
Voltage Spike	17.4	A	
Audio Frequency Conducted Susceptibility	18		
AF Conducted Susceptibility- Power Inputs	18.3.1	Z	
Induced Signal Susceptibility	19		
Magnetic Fields Induced Into Equipment	19.3.1	AC	
Magnetic Fields Induced Into Interconnecting Cables	19.3.2	AC	
Electric Fields Induced Into Interconnecting Cables	19.3.3	AC	
Spikes Induced Into Interconnecting Cables	19.3.4	AC	
Radio Frequency Susceptibility	20		
Conducted Susceptibility (CS) – 10kHz to 400MHz	20.4	T	
Radiated Susceptibility (RS) – 100MHz to 18GHz	20.5	T	
Emission of Radio Frequency Energy	21		
Conducted RF Emission	21.4	M	
Radiated RF Emission	21.5	M	
Electrostatic Discharge (ESD)	25		
Electrostatic Discharge (ESD)	25.5	A	
Flammability	26	N/A	Flammability testing in accordance with 14 CFR 25.853 Appendix F

9.2.1. Other Certification Considerations for RDMs

Description	Comments
Static Abuse Load (300 lbs.)	Testing in accordance with DO 313 section 4.2(a), Glass in the Cabin
Mechanical Strength (Ball Impact)	Testing in accordance with UL 61965
Inertia Loads	Testing in accordance with 14 CFR 25.561(b) (3)

9.3. Specifications

Table 5 Remote Monitor Electronics Box performance specifications

Video inputs	See sections below for supported resolutions
Inrush Peak	20 A
Op Voltage Range	18-32 VDC
Weight	2.85 lbs [1.3 kgs.] \pm 5%
Nominal Voltage/Current Draw	See appropriate-sized RDM spec table below
Operating Temperature	-15°C – 55°C (stand-by mode below 0° and above 50°C)

Table 6 19" Remote Display Module performance specifications

Screen size	19" diagonal, 16x10 format
Native Resolution	1440 x 900
Video inputs	See sections below for supported graphic resolutions
Viewing Angles: Horizontal and Vertical	Horiz: \pm 80° Vert: \pm 80°
Screen Brightness	300 cd/m ² typical
Contrast Ratio	1000:1
Color Depth	8 bits
Weight (RDM only)	7.1 lbs [3.2 kgs.] \pm 10%
System Nominal Voltage/Current Draw	28VDC/1.3 A (includes RMEB and RDM)
Power Dissipation	RMEB: 14W RDM: 23W
Operating Temperature	-15°C to 55°C (stand-by mode below 0° and above 50°C)

Table 7 24" Remote Display Module performance specifications

Screen size	24" diagonal, 16x10 format
Native Resolution	1920 x 1080
Video inputs	See sections below for supported resolutions
Viewing Angles: Horizontal and Vertical	Horiz: \pm 89° Vert: \pm 89°
Screen Brightness	250 cd/m ² typical
Contrast Ratio	3000:1
Color Depth	8 bits
Weight (RDM only)	7.7 lbs [3.5 kgs.] \pm 10%
System Nominal Voltage/Current Draw	28VDC/1.8 A (includes RMEB and RDM)
Power Dissipation	RMEB: 17W RDM: 34W
Operating Temperature	-15°C to 55°C (stand-by mode below 0° and above 50°C)

Table 8 26" Remote Display Module performance specifications

Screen size	26" diagonal, 16x10 format
Native Resolution	1920 x 1080
Video inputs	See sections below for supported resolutions
Viewing Angles: Horizontal and Vertical	Horiz: $\pm 89^\circ$ Vert: $\pm 89^\circ$
Screen Brightness	400 cd/m ² typical
Contrast Ratio	1000:1
Color Depth	8 bits
Weight (RDM only)	9.52 lbs [4.32 kgs.] $\pm 10\%$
System Nominal Voltage/Current Draw	28VDC/2.4 A (includes RMEB and RDM)
Power Dissipation	RMEB: 18W RDM: 50W
Operating Temperature	-15°C to 55°C (stand-by mode below 0° and above 50°C)

9.3.1. Supported DVI/HDMI Graphic Resolutions

640x480p/60 VGA
 800x600p/60 SVGA
 1024x768p/60 XGA
 1152x864p/60
 1280x768p/60 (68.250MHz) WXGA
 1280x768p/60 (79.500MHz) WXGA
 1360x768p/60 WXGA
 1440x900p/60 WSXGA
 1280x1024p/60 SXGA
 1400x1050p/60 (101.000MHz) SXGA+
 1400x1050p/60 (121.750MHz) SXGA+
 1680x1050p/60 WSXGA+
 1600x1200p/60 UXGA
 1920x1200p/60 (154MHz) WUXGA reduced-blanking

9.3.2. Supported DVI/HDMI Standard Resolutions

480i/29, 480i/30
 480p/59, 480p/60
 576i/25,
 576p/50
 720p/50, 720p/59, 720p/60
 1080i/25, 1080i/29, 1080i/30
 1080p/23, 1080p/24, 1080p/25, 1080p/50, 1080p/60

9.3.3. Supported VGA Resolutions

640x480p/60 VGA
800x600p/60 SVGA
1024x768p/60 XGA
1152x864p/60
1280x768p/60 (68.250MHz) WXGA
1280x768p/60 (79.500MHz) WXGA
1360x768p/60 WXGA
1440x900p/60 WSXGA
1280x1024p/60 SXGA
1400x1050p/60 (101.000MHz) SXGA+
1400x1050p/60 (121.750MHz) SXGA+
1680x1050p/60 WSXGA+
1600x1200p/60 UXGA
1920x1200p/60 (154MHz) WUXGA reduced-blanking

9.3.4. Supported YPbPr/Component Resolutions

480i/29, 480i/30
480p/59, 480p/60
576i/25,
576p/50
720p/50, 720p/59, 720p/60
1080i/25, 1080i/29, 1080i/30
1080p/50, 1080p/59, 1080p/60

9.3.5. Supported CVBS/Composite Resolutions

NTSC (480i/29)
PAL (576i/25)
SECAM (576i/25)
RS-170 B&W (480i/29)

9.3.5.1. Supported SDI Resolutions

480i/29
576i/25
720p/50, 720p/59, 720p/60
1080i/25, 1080i/29, 1080i/30
1080p/23, 1080p/24, 1080p/25, 1080p/29, 1080p/30, 1080p50, 1080p159, 1080p160

10. DEFINITIONS

CFR	Code of Federal Regulations
CVBS	Composite Video Baseband Signal
DCV	Direct Current Volts – voltage from an aircraft battery or generator
DVI	Digital Visual Interface
HD	High Definition
HDMI	High Definition Multimedia Interface
HD-SDI	High Definition Serial Digital Interface
IR	Infrared
LCD	Liquid Crystal Display
LED	Light Emitting Diode
NTSC	National Television Standards Committee. A video standard used in the United States, Canada, Japan, Mexico, the Philippines, South Korea, Taiwan, and some other countries.
OSD	On Screen Display – the actual user/technician menu, and any informational readouts displayed on the image.
PAL	Phase Alternating Line. A video standard used in Europe, China, Malaysia, Australia, New Zealand, the Middle East, parts of Africa, and other parts of the world.
PCB	Printed Circuit Board – an electronics assembly that performs tasks
P/N	Part Number
RDM	Remote Display Module
RGB	Red, Green, Blue
RMEB	Remote Monitor Electronics Box
RS-232	Standard for serial binary data interchange
RS-485	Standard for allowing multiple devices to share a common set of serial data communication lines.
SECAM	(<i>Séquentiel couleur à mémoire.</i>) French for "sequential color with memory," an analog color video system first used in France.
SDI	Serial Graphics Array
VGA	Video Graphics Array
Vpp	Volts peak-to-peak

W Watts

WUXGA Widescreen Ultra eXtended Graphics Array

YPbPr Analog video signal carried by component video cable in consumer electronics. Y carries luma (brightness) information. Pb carries the difference between blue and luma (B - Y). Pr carries the difference between red and luma (R - Y).

11. REVISION HISTORY



Revision E is limited to draft or prototype documents. Revisions I, O, Q, S, X and Z are not to be used.

Revision	Date	Revision Description	EC
A	08/08/11	Initial release	11503