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Remote Display System



Technical Manual

Models

Remote Monitor Electronics Box: 0700-104, 0700-107

Remote Display Modules: 19", 22", 24", 26", 32", 42", 55"

Technical Manual, Remote Display System

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1. INTRODUCTION

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

This manual provides general instructions about how to install all bulkhead configurations 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.

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

1.1. System Overview

The Remote Monitor Electronics Box (RMEB) takes a video signal from various sources and converts it to a serial format for distribution to a high-definition display. The RMEB operates one Remote Display Module (RDM)—the RMEB **0700-107 Mod 02** is the latest model, which replaces the RMEB **0700-104**, and it operates all RDM sizes currently available from Rosen.

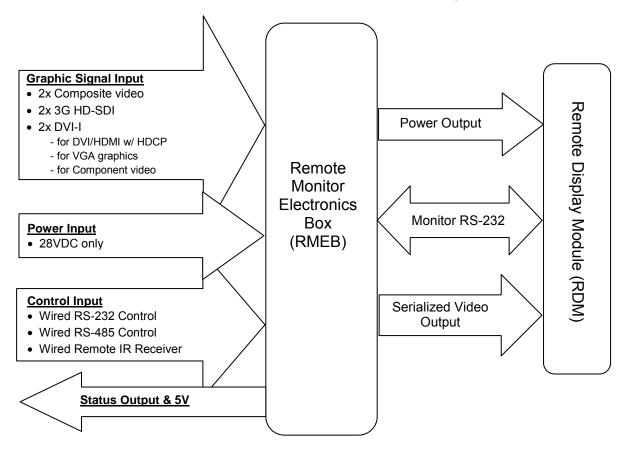


Figure 1 RMEB and RDM functional diagram

1.2. System Components

To learn more about the following Remote Display System components and to access the technical drawings, visit our website at www.rosenaviation.com.

- Remote Monitor Electronics Box (RMEB)
 - RMEB (P/N **0700-104**) operates 19-, 24-, 26-, and 32-inch RDMs
 - RMEB (P/N 0700-107 Mod 01) operates 19 through 42-inch RDMs
 - RMEB (P/N **0700-107 Mod 02**) operates 19 through 55-inch RDMs
- Remote Display Modules (RDM)
- Mounting accessories: front bezel, cosmetic back, and credenza
- Connector kits (sold separately) see the technical drawings for specific P/Ns

For more information about a remote display system, please contact Rosen Sales or Technical Support at 541.342.3802.

1.2.1. Remote Inputs

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 settings:

- HD Monitor IR Kit (P/N 0500-023)
- Universal remote control (contact Rosen Sales for P/N availability)

Alternatively, you can control the unit via a cabin management system using RS-485 or RS-232. For a copy of the *RS-232 External Controller Message Formats* (P/N **9002934**) or *RS485 Network Message Definitions* document (P/N **9002933**), please contact Rosen Aviation Technical Support at 541.342.3802.

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

2. VIDEO INPUTS

The Rosen Remote Display System enables viewers to watch high-definition video as well as standard-definition video. The remote electronics box supplies the following video inputs.

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

The RMEB connects to 28VDC aircraft power and receives video through a video distribution amplifier or directly from video sources.

3. INSTALLATION GUIDELINES

3.1. Mounting Configurations

Rosen's RDMs can be flush mounted, mounted with a sleek bezel (semi-proud), or proud-mounted between a bezel and cosmetic back. The photos below are representative of the different bulkhead mounting options for the remote displays. Please contact Rosen Sales for specific configurations.



Figure 2 Bulkhead mounting options for remote display modules

- Flush mount RDM only
- Semi-proud mount RDM with bezel
- Proud mount RDM with bezel and a cosmetic back

3.1.1. Bulkhead Mounting Requirements

The RMEB and RDMs do not require any external forced-air cooling.

A flush mounted RDM can mount from the back, through an interior wall, or from the front mounting tabs. Proud-mounted RDMs must attach from the front into the cosmetic back.

Technical drawings are available on the Rosen website at 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.



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

4. ASSEMBLY INSTRUCTIONS FOR ACCESSORIES

This section provides instructions about how to assemble the cosmetic backs and bezels. To add a stylish, proud-mount option, mount the cosmetic back to the bulkhead, attach the RDM to the cosmetic back, and then snap on the bezel.

Note: Protect cosmetic and sensitive components from scratches, nicks, and debris during hardware installation.

4.1. Mounting Cosmetic Backs to a Bulkhead

The cosmetic backs use two styles of mounting brackets depending on the size of RDM that you install. The cosmetic backs are a universal fit—there is no top or bottom.

Technical drawings for the Remote Display System accessories are available on the Rosen website at www.rosenaviation.com.

Attach the 19", 22", 24", and 26" cosmetic back to the bulkhead using the four mounting brackets and a minimum of four FHP screws (customer supplied) in the .188 mounting holes, as shown below.

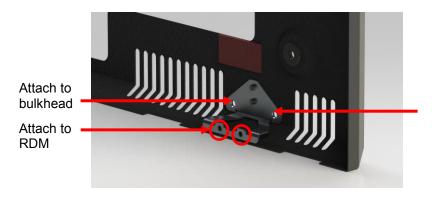


Figure 3 1901-, 2401-, 2201-, and 2601-800 cosmetic back mounting tabs

- Attach the 32" cosmetic back to the bulkhead using six #6 100° FHP screws (customer supplied).
- Attach the 42" cosmetic back to the bulkhead using ten #6 100° FHP screws (customer supplied).
- Attach the 55" cosmetic back to the bulkhead using twelve #6 100° FHP screws (customer supplied).

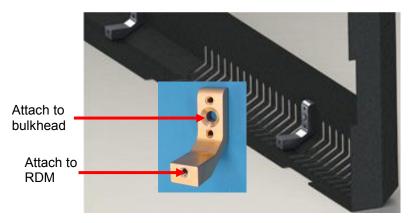


Figure 4 3201-, 4201-, and 5501-800 cosmetic back mounting bracket

4.2. Attaching an RDM to a Cosmetic Back

Figure 5 shows an exploded view of a proud-mount assembly. Align the tabs on the RDM with the mounting brackets on the cosmetic back. Secure with two 4-40 fasteners in each tab/bracket. The number of mounting brackets varies by RDM size. For more dimensional information, see the technical drawings for your specific assembly.

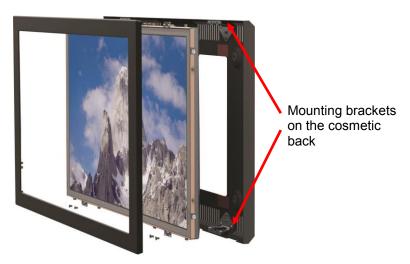


Figure 5 RDM with a proud-mount bezel assembly

4.3. Mounting a Bezel

Mount the cosmetic back and monitor before attaching the bezel. To attach a bezel to an RDM, align the mounting bosses with the monitor standoffs and gently press on the retaining clips to snap the bezel into place.

Bezels attach around the perimeter of the RDMs with retention fasteners. The quantity and type of bezel fasteners varies depending on the size of the bezel and RDM. Figure 6 shows the different assembled retention fasteners on the bezels. See the 55" Bezel Drawing (P/N **5501-900**) for assembly instructions.

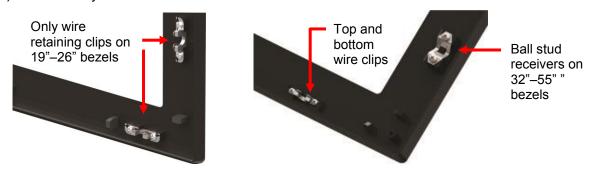


Figure 6 Different bezel retention fasteners

5. SYSTEM CONNECTIONS

The RDM receives power, control, and serialized video from the RMEB located up to 50 feet away, as shown below. The RMEB outputs a serialized video signal via an RJ-45 cable from P4 and provides conditioned power and control to the RDM via a harness with DA15 connectors from P3. To obtain information about interconnect cables, please contact Rosen Aviation's Technical Support at 541.434.4512 and request the *Interconnect Cable Specification for Remote Electronics* (P/N **105821**).

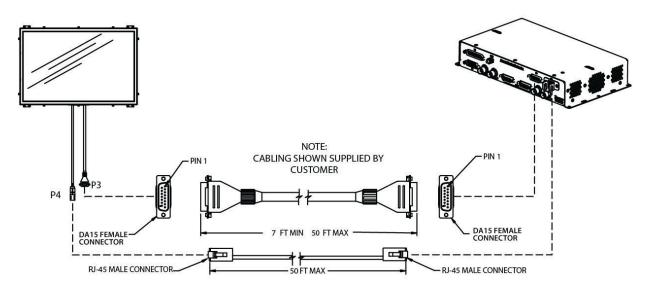


Figure 7 Remote display system connections

5.1. Pinout Connections

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

Follow the pinout descriptions on the technical drawings to assist in completing the wiring connections. Use the pinout information in the *RS-485 Configuration Discretes* table on the technical drawing (P/N **0700-107-CD**) when operating in Auto SDI mode.

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

6. RS-232 AND RS-485 CONTROL INPUTS

Inputs that control the RDMs can come from an IR or via a cabin management system using RS-232 or RS-485. The RMEB accepts the following commands:

Table 1 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

7. INITIAL POWER UP

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

- 1. Ensure low impedance 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.

Verify that the circuit breakers being used with the RMEB meet the power requirements for the display size as stated in the RMEB technical drawing. Also, avoid coiling the power wire as this can cause heat to build up in the wire. If you have more questions about Power Requirements, contact Rosen Aviation's Technical Support at 541.434.4512.

- 4. Attach a DA15 interconnect cable to the RDM's DA15 pigtail and connect to P3.
- Attach an RJ-45 interconnect cable to the RDM's RJ-45 pigtail and connect to P4. We
 recommend grounding and strain relieving the harnesses on the RJ-45 connectors
 using the brackets provided.
- Connect the available video inputs.
- 7. Apply power and wait for a signal on the RDM. The default setting for the RMEB is Auto On and the default source is SDI 1.



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

Removing power while the OSD is open could result in a factory reset.

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

8. IR REMOTE CONTROL

The remote display system uses a remote control to adjust the on-screen display (OSD) settings. The instructions in this manual use the RC5 IR remote in describing how to navigate the OSD. Table 2 shows the RC5 IR remote layout and the button descriptions.

Table 2 RC5 IR remote control



Note: The AUTO button works only when an RGB source is active. The MUTE and VOLUME ± buttons are not used.

How it Works

SOURCE

Switches between any enabled video inputs. Press the **SOURCE** button twice to switch inputs. The first command sent will only display the current source name in the upper-left corner of the monitor; the second command switches the source.

POWER

Turns the display system's power on and off.

MENU

Opens the Main Menu to access other settings and fine-tune the display's picture quality. For details, see Section 9, OSD MENU OPTIONS, on page 14.

EXIT

Closes the OSD and saves settings. Exit does not close control bars.

ENTER

Accepts changes to menu settings. Selects menu options, accepts settings, and closes the control bars.



Controls the navigation in the on-screen display menus. Navigate between the OSD menu pages, options, and change settings.

ASPECT

Changes the aspect ratio or proportions of the picture depending on the video signal. Switches between Full Screen, Pillar Box, and Letterbox Expanded. See also Section <u>9.2.2</u>, <u>Aspect Ratio</u>, on page <u>15</u>.

INFO

Opens the Info page on the OSD. Use INFO to review operating status, verify details about the display, and access the Technician Menu.

AUTO

(**RGB only**) Performs an auto-adjust function without a menu. Forces the display to evaluate the RGB signals and ensure it is interpreting them correctly. See also Section <u>9.2.5</u>, Auto Adjust, on page <u>17</u>.

BRIGHT ±

Opens the Backlight control bar. See also Section $\underline{9.2.1}$, $\underline{Backlight}$, on page $\underline{15}$.

9. 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 9.1. Press the ▲ ▼ buttons to navigate within the menu pages. Press the ▶ ◀ buttons to navigate between the menu page, options, and values columns. Select the **Back** option to switch menu pages. The yellow highlighted area shows the currently selected option in the menu.



Figure 8 OSD menu pages

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 \rightarrow OSD Timeout option. See Section 10.3, OSD Timeout on page 28.

9.1. 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 to close the OSD.



Figure 9 Opening screen for the Main Menu

9.2. User Menu

The Main Menu opens to the screen, shown in <u>Figure 9</u> (above). Press the ▶ button to access the User menu options.

Press ▼ ▲ buttons to select a User option and then press **ENTER** to change its value.



Figure 10 User menu page

9.2.1. 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 11 Backlight option

9.2.2. 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 and appear cropped.

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

9.2.3. 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.

9.2.4. Source

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

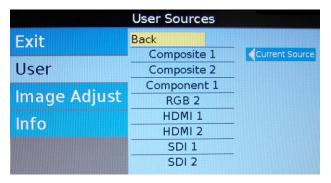


Figure 12 User Sources

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

To switch the 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.

9.2.5. 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 briefly go black while the signals adjust.

9.3. 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.

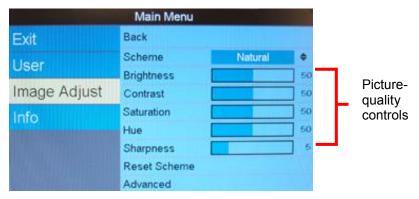


Figure 13 Image Adjust menu options

9.3.1. Scheme

Scheme is also available from the Main Menu \rightarrow User page. For information about how this option works, see Section 9.2.3 on page 16. Changing the Scheme also affects changes you make to the User menu settings and is source specific.

9.3.2. Picture-Quality Controls

The Brightness, Contrast, Saturation, Hue, and Sharpness menu options use control bars to fine-tune different aspects of the picture quality. To adjust these options, press **MENU** and the ▼ arrow to select **Image Adjust**. Choose a menu option, and then press **ENTER** to open a control bar and adjust the value, similar to Figure 14 shown below.

Press the ◀ or the ▶ buttons to change the control bar's value.

Press **ENTER** to set the intensity level and close the control bar.

Press **EXIT** to close the OSD.



Figure 14 Sample picture-quality control bar

9.3.3. Reset Scheme

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.

Select Image Adjust→Reset Scheme and then press ENTER.

Press **EXIT** to close the OSD.

For information about the different scheme modes, see Section 9.2.3 on page 16.

9.3.4. 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 display'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 and press **ENTER**, or press **EXIT** to close the OSD.

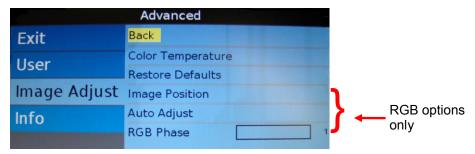


Figure 15 Advanced submenu options

9.3.4.1. Color Temperature

Use the Color Temperature options to change the warmth 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.

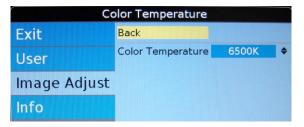




Figure 16 Color Temperature options

Select the **User** setting and then press **ENTER**.

Press ▼ to access the individual colors.

9.3.4.1.1. Color Levels: Red, Green, Blue

Setting the Color Temperature to User will make the Red, Blue, and Green options active. Each color adjusts the low-level registers of its respective color value in the picture.

Select the Image Adjust > Advanced > Color Temperature and press ENTER. Set Color Temperature to User, and then press ENTER.

Press the ▼ button to choose a color level and then press **ENTER** to open a control bar to adjust the value, similar to Figure 17 shown below.

- Red: Press the ■ button to show more cyan-colored tones, and press the button to intensify the red tones.
- Green: Press the

 button to show more magenta tones, and press the
 button to intensify the green tones.
- Blue: Press the

 button to show more yellow tones, and press the

 button to intensify the blue tones.

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

Press **EXIT** to close the OSD.



Figure 17 Sample color-level control bar

9.3.4.2. 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.

Select the Image Adjust-Advanced-Restore Defaults options and then press ENTER. A Defaults Restored message appears in the lower corner of the menu after the restore is complete.

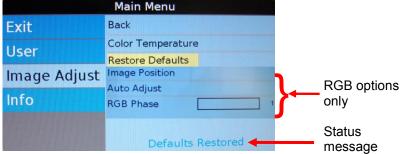


Figure 18 Restore Defaults option

9.3.4.3. 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.

Select the Image Adjust→Advanced→Image Position options and then press ENTER.



Figure 19 Image Position option

9.3.4.3.1. Horizontal and Vertical Controls

(RGB only) From the Image Adjust→Advanced→Image Position submenu, press the ▼ button to choose either Horizontal or Vertical, and then press ENTER to open a control bar, similar to Figure 20 shown below.

Press the ◀ button to shift the picture left/up or the ▶ button to shift it to the right/down.

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



Figure 20 Sample image positioning control bar

9.3.4.4. 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 **Image Adjust→Advanced** submenu, press the ▼ button to choose **Auto Adjust** and press **ENTER**. (From the remote, close the OSD and press the **AUTO** button.) The screen will go black briefly while the signals adjust.

9.3.4.5. 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 to eliminate jitter.

From the **Image Adjust**→**Advanced** submenu, 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.

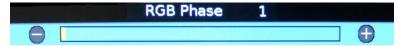


Figure 21 RGB Phase control bar

9.4. Info

Use the Information page to review operating status, view details about the display, and access the Technician Menu.

To open the page, press the **INFO** button on the remote, or use the ▲ ▼ buttons from within the Main Menu and navigate to Info.

Notes:

- Press ENTER or the ▶ button to highlight the Back option—required to access the Technician Menu.
- The Firmware (FM) fields vary by model and are subject to change.

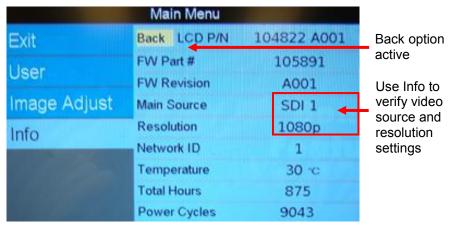


Figure 22 Info page

10. 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.



Whenever there is a change to the Technician Menu, exit the OSD, and cycle power for the changes to be fully accepted.

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. The options you see depend on the Mode Menu settings. Splash Screen and Source Mode menu will appear only when the Mode Menu→Operation Mode is set to Standard.

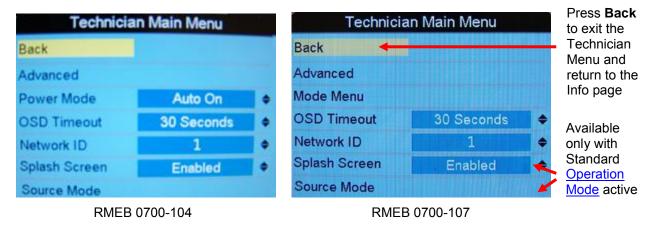


Figure 23 Technician Main Menus

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.

10.1. Advanced Technician Menu

This submenu provides installers and technicians more advanced controls of the image. From the Technician Main Menu, highlight **Advanced** and then press **ENTER**.

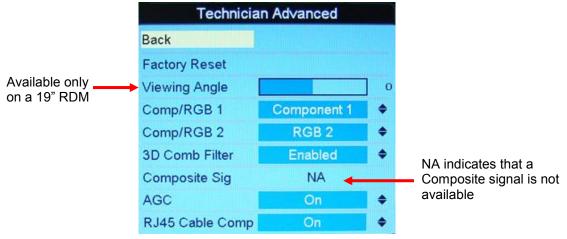


Figure 24 Technician Advanced Menu

10.1.1. 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 options with pre-determined defaults in *both* the User and Technician menus to their factory default settings.

Highlight Advanced→Factory Reset and then press ENTER.

A *Reset Complete* message appears after the display restores the default settings. A Factory Reset will not change the Operation Mode setting.

10.1.2. 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 then 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** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.



Figure 25 Viewing Angle control bar

10.1.3. 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** and press **ENTER** to return to the Technician Menu.

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

10.1.4. 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** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.1.5. 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** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.1.6. Composite Sig (Signal)

(Composite only) This is a read-only screen that shows 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 the <u>AGC (Automatic Gain Control)</u> (below) is set to Off.

10.1.7. AGC (Automatic Gain Control)

(Composite only) 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** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.1.8. RJ45 Cable Compensation

The technology employed to transmit full-rate, high-definition video over an RJ-45 cable may require an initial setup to ensure the highest possible image quality. Shorter cables (0-6 feet) and cables with different impedance characteristics than the Rosen-specified RJ-45 interconnect cable may benefit from turning off RJ45 Cable Comp. If the installed remote display system exhibits video anomalies, turn off the cable compensation.

- RJ45 Cable Comp **ON** for RJ-45 cable length 7-50 feet (default setting)
- RJ45 Cable Comp OFF for RJ-45 cable length 0-6 feet

Highlight Advanced→RJ45 Cable Comp, and then press ENTER.

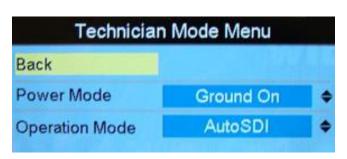
Use the ▲ ▼ buttons to set the option, and then press **ENTER**.

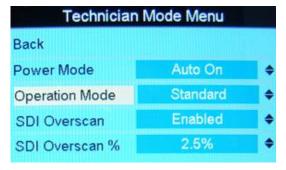
Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.2. Mode Menu

(Available on RMEB 0700-107 only) Use the Mode Menu options to configure the basic modes of operation for the system, and with 0700-107 MOD 01, you can enable the SDI Overscan settings. From the Technician Main Menu, highlight **Mode Menu**, and then press **ENTER**.





RMEB 0700-107 MOD 00

RMEB 0700-107 MOD 01

Figure 26 Technician Mode Menus

10.2.1. Power Mode

Use Power Mode to set the display's startup state. Power Mode works the same on all RMEB models.

From the Technician Menu, highlight **Mode Menu→Power Mode**, and then press **ENTER**.

Use the ▲ ▼ buttons to set the desired power mode, and then press **ENTER**.

Power Mode cont.
Options include the following:

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

Select **Back** and then press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.2.2. Operation Mode

Use Operation mode to specify a default-operating mode. The Operation Mode setting affects the OSD settings you will see and determines the factory default settings when you perform a Factory Reset command.

From the Technician Menu, highlight **Mode Menu Operation Mode**, and then press **ENTER**.

Use the ▲ ▼ buttons to set the option, and then press **ENTER**. The screen will briefly go black if you switch Operation Mode settings.

Options include the following:

- Standard: (Default) All video sources and functions are available. Power Mode will default to Auto On.
- Auto SDI: The unit will always display SDI and use only a subset of OSD options. The Power Mode will default to Ground On. See Power Mode on page 25. If Composite is connected, the unit will display Composite over SDI.

Table 3 Mode Menu settings

	3				
Operation Mode	Power Mode	Technician Menu			
Standard	Auto On	Splash Screen & Source Mode are ON			
Auto SDI	Ground On	Splash Screen & Source Mode are N/A			



When operating in Auto SDI mode, the RS-485 ID is configured via discretes; otherwise, it is configured via the network address. For more information, see the *RS-485 Configuration Discretes* table on page 2 of the technical drawing (P/N **0700-107-CD**).

Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.2.3. SDI Overscan

Use SDI Overscan to enable or disable video overscan for SDI at 480i and 576i resolutions. When enabled, the setting cuts off a small percentage (2.5% by default) around the edges of the image and resizes it to fit full screen. When set to disabled, a zero percent overscan is applied to all SDI resolutions. You can also enable/disable this feature via the RS-232 and RS-485 protocols.

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

Use the ▲ ▼ buttons to set the option to **Enabled** or **Disabled**, and then press **ENTER**.

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

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

10.2.4. SDI Overscan %

Use SDI Overscan % to set the amount of overscan applied to the picture's edges of SDI signals at 480i and 576i resolutions. The setting percentages are 0.0%, 2.5% (default), 3.0%, 5.0%, and 10.0%. The overscanned image will automatically update when you switch between percentage values. You do not have to cycle power for the change to take effect. You can also change the overscan value via the RS-232 and RS-485 protocols.

From the Technician Menu, press the ▼ button to select **Mode Menu→SDI Overscan %** and then press **ENTER**.

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

Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.3. 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**.

Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.4. Network ID

Use this option to specify the IR and RS-485 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 on a scale of 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.

Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.5. Splash Screen

(Available on RMEB 0700-107 when the Operation Mode is set to Standard) Use this option to turn a 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 $\blacktriangle \blacktriangledown$ buttons to set the option and then press **ENTER**.

Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

10.6. Source Mode

(Available on RMEB 0700-107 when the Operation Mode is set to Standard) 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.

10.6.1. Momentary Mode

Momentary enables you to specify those sources that will be available to 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 allowing access to those sources that are set to On.

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

Highlight **Technician**→**Source Mode** and press **ENTER**. Momentary is the default setting for the Source Select option. If Source Select is set to Constant, highlight **Source Select** and press **ENTER**. Use the ▲ ▼ buttons to switch to **Momentary**, and then 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** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

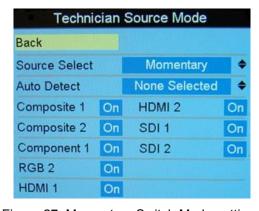


Figure 27 Momentary Switch Mode settings

10.6.2. Constant 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 to open and press **ENTER**.

Press ▼ to select Ground and press ENTER.

Select which video input will be set to ground and press ENTER.

Select **Back** and press **ENTER** to return to the Technician Menu.

Press **EXIT** to exit the OSD.

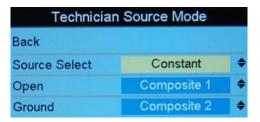


Figure 28 Source Select Constant options

11. TECHNICAL REFERENCES AND SUPPORT



Always check the <u>Rosen Aviation</u> website under the Products tab to ensure that you are working with the most current revision of technical documentation.

11.1. Troubleshooting

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

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

Table 4 Troubleshooting tips and solutions

Problem	Possible Solutions			
No video (signal)	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 another display.			
	Check that the Power Control Pin is Open. See <u>Power Mode</u> on page <u>25</u> for more information.			
	Verify that the pinout is correct.			
Screen is black	Verify that the display is receiving power.			
	Check <u>Power Mode</u> settings on page <u>25</u> .			
	Verify that the pinout is correct.			
	Verify that the video source is supplied and playing.			
	Verify all connections between the source and the display.			
Image flickers	Verify proper RJ-45 cable			
	Try changing the RJ45 Cable Comp setting on page 25.			
	Verify that the signal cable is secure.			
	Verify that the vertical frame frequency of the incoming video is 60 HZ or less.			
Distorted Image	Verify proper RJ-45 cable.			
	• Try changing the RJ45 Cable Comp setting on page 25.			
	Verify supported resolution.			
	Check <u>Power Mode</u> settings on page <u>25</u> .			
	Verify that the pinout is correct.			
	Verify that a signal is reaching the display using another display.			
	Examine the display for pinched or damaged cables.			
Wrong Colors	Verify proper RJ-45 cable			
	 If the screen colors are not what you expect, reset the current scheme. For more information, see <u>Reset Scheme</u> on page <u>18</u> and <u>Restore Defaults</u> on page <u>19</u>. 			

Table 5 Technical references

Product	Part Number	Location		
Universal Remote Control	Contact Rosen Sales for part number availability			
55" Bezel Drawing	5501-900 Contact Rosen Technical Support			
RS-232 External Controller Message Formats	9002934	Contact Rosen Technical Support		
RS-485 Network Message Definitions	9002933 Contact Rosen Technical Suppo			
HD Monitor IR Kit	0500-023	www.rosenaviation.com		
Interconnect Cable Specification for Remote Electronics	105821	Contact Rosen Technical Support		

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.

11.2. Cleaning the Display

To clean the LCD, very gently wipe the screen with a clean, commercially approved LCD cleaning cloth and alcohol-free LCD cleaning solution. Use one firm cleaning motion instead of circular or repeated side-to-side scrubbing.

11.3. 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 6 The remote display system is compliant with the following DO 160F test categories

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			
Altitude	4.6.1	A1			
Decompression	4.6.2	A1	8,000 – 50,000 ft.		
Overpressure	4.6.3	A1			
Temperature Variation	5				
Temperature Variation	5.3.1	С			
Humidity	6				
Humidity	6.3.1	Α			
Operational Shocks & Crash Safety	7				
Operational Shocks	7.2.1	В			
Crash Safety (Impulse)	7.3.2	В			

Description	Section	Category	Comments	
Crash Safety (Sustained)	7.3.3	В		
Vibration	8			
Random Vibration – Fixed Wing Aircraft	8.5.2	S (Curve B)		
Magnetic Effect	15			
Magnetic Effect	15.3	В		
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)	A: for single power interrupts up to 200 msec	
Normal Surge Voltage (DC)	16.6.1.4	Z		
Engine Starting Under Voltage Operation (DC)	16.6.1.5	Z		
Abnormal Operating Conditions	16.6.2			
Voltage Steady State (DC)	16.6.2.1	Z		
Low Voltage Conditions	16.6.2.2	_	N/A (CAT B equip. only)	
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	Α		
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	Т		
Radiated Susceptibility (RS) – 100MHz to 18GHz	20.5	Т		

Description	Section	Category	Comments
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	Α	
Flammability	26	N/A	Flammability testing in accordance with 14 CFR 25.853 Appendix F

11.3.1. 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)

11.4. Supported Video Specifications

11.4.1. DVI/HDMI Graphic Resolutions

640x480p/60 VGA

800x600p/60 SVGA

1024x768p/60 XGA

1152x864p/60

1280x768p/60 WXGA

1360x768p/60 WXGA

1440x900p/60 WSXGA

1280x1024p/60 SXGA

1400x1050p/60 SXGA+

1680x1050p/60 WSXGA+

1600x1200p/60 UXGA

1920x1200p/60 WUXGA

11.4.2. 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

11.4.3. VGA Resolutions

640x480p/60 VGA

800x600p/60 SVGA

1024x768p/60 XGA

1152x864p/60

1280x768p/60 WXGA

1360x768p/60 WXGA

1440x900p/60 WSXGA

1280x1024p/60 SXGA

1400x1050p/60 SXGA+

1680x1050p/60 WSXGA+

1600x1200p/60 UXGA

1920x1200p/60 WUXGA

11.4.4. 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

11.4.5. CVBS/Composite Resolutions

NTSC (480i/29)

PAL (576i/25)

SECAM (576i/25)

RS-170 B&W (480i/29)

11.4.6. 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, 1080p/50, 1080p/59, 1080p/60

12. DEFINITIONS

3G HD-SDI Newer, high-definition serial digital interface with a single 2.970 G/bit/s serial link

A Amps

AF Audio frequency

CFR Code of Federal Regulations

CVBS Composite video blanking and sync

CS Conducted susceptibility

DA15 A 15-pin D-subminiature connector with shell size A

DC Direct current

DCV Direct Current Volts – voltage from an aircraft battery or generator

DVI Digital Visual Interface

ESD Electrostatic discharge

FHP Flat head Phillips

HD High Definition

HDMI High Definition Multimedia Interface

HD-SDI High Definition Serial Digital Interface

IR Infrared

LCD Liquid Crystal Display

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.

P/N Part Number

RDM Remote Display Module

RF Radio frequency

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.

RTCA Radio Technical Commission for Aeronautics

SDI Serial digital interface

SECAM (*Séquentiel couleur à mémoire*) French for "sequential color with memory," an analog color video system first used in France.

SVGA Super Video Graphics Array

SXGA Super Extended Graphics Array

UXGA Ultra Extended Graphics Array

VDC Volts direct current – voltage from an aircraft battery or generator

VGA Video Graphics Array

Vpp Volts peak-to-peak

W Watts

WSXGA Widescreen Super Video Graphics Array

WUXGA Widescreen Ultra eXtended Graphics Array

WXGA Widescreen Extended Graphics Array

XGA 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).

13. 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
Α	04/24/12	Initial release	12-0219
В	10/03/12	Add 42" RDM, bezel, cosmetic back, universal RMEB 0700-107; add Power Mode Menu to OSD; update the interconnect cable and Momentary switch mode; remove duplicate content contained in technical drawings; consolidate instructions for setting similar Image Adjust and Image Position menu options; re-sequence Section 4 to match installation	12-0498
С	04/10/13	Add 22 RDM, bezel, cosmetic back; RC5 remote; functional diagram; circuit breaker and wire routing requirements in power up; SDI Overscan options to Mode Menu; update technical references and troubleshooting; remove references to 7-button controller 0300-408; new template	13-0142
D	03/13/14	Update cover photo and Section 11.2, cleaning the display	14-0076
F	06/23/14	Add 55" RDM, bezel, and cosmetic back	14-0242