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ROSEN
AVIATION

7" WideScreen Display



Technical Manual

Model 7002

Technical Manual, 7002 Series WideScreen

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1. INTRODUCTION

This manual describes how to install the Rosen 7" WideScreen 7002 series display onto your aircraft. It contains everything you need to know to wire the display and confirm that it is functioning correctly.

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

1.1. Unpacking

The parts shipped with the 7" WideScreen 7002 series display

- Outline and Installation Drawing 7002 – specific to each display/arm combination
- 7002 display with arm
- Display Manuals CD, (P/N **9003678**)
- 7" WideScreen 7002 User's Guide – (P/N **101327**) – leave in the plane



The *Outline & Installation* drawings—**specific to each display/arm combination**—are also available at www.rosenaviation.com.

From the [Rosen Aviation](http://www.rosenaviation.com) home page, select **Support**→ **Drawings and Pinouts**, and search for the drawing by model number or browsing by product category.

2. DISPLAY CONNECTIONS

There are several ways to connect the 7002 series display to an aircraft's data systems.

Use the following pinout descriptions on page 2 of the Outline and Installation drawing to assist in the wiring process. Pay close attention to the pinout information while completing wiring connections.

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

2.1. Connection Diagram

The typical installation of the 7" WideScreen monitor is one or more monitors on an arm mount, sidewall, or bulkhead. The following connection diagram illustrates how to configure the displays to create a complete cabin entertainment system or integrate a display into an existing system.

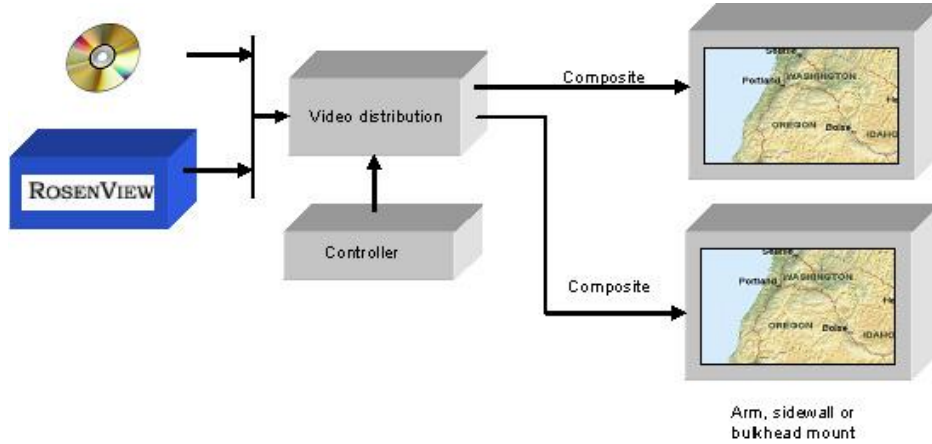


Figure 1 Typical arm mount installation

These displays are typically connected to a video distribution unit, which provides a single composite video signal to each monitor. The video distribution box performs the source selection.

3. INSTALLATION GUIDELINES

Ensure that when plugging the arm into the base receptacle, the set screw in the base follows the arm's keyed slot and the connection is not forced.

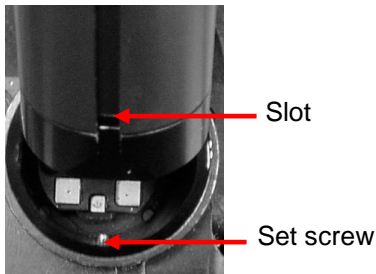


Figure 2 Arm mount base receptacle

3.1. Installing/Removing SlimLine Arm Assemblies

To install or remove a SlimLine arm assembly, press in the arm button all the way.



Figure 3 SlimLine locking arm feature

To release a SlimLine locking arm so that it rotates, press in the arm button only half way.

4. FRONT PANEL BUTTONS

The 7002 series display has buttons on the front panel as its only control method.

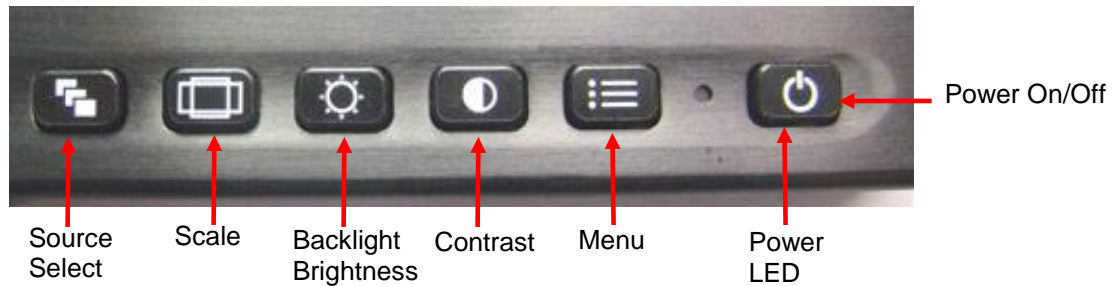


Figure 4 7002 button layout

Table 1 7002 front panel buttons

Button	How it Works
Power On/Off	Turns the power on and off to the display. The LED indicator is red when the power is off, and green when the power is on. Previously adjusted settings of brightness and scaling mode are retained in memory when power is turned off, or when aircraft power is removed.
Menu	Opens a submenu of options to access other settings and fine-tune the display's picture quality. For details about the on-screen menus, see section 4.2 .
Contrast	Adjusts the LCD contrast. See section 4.1.4 for details.
Backlight Brightness	Adjusts the backlight brightness. If the button is held down for more than one second the brightness will continue to step up or down in 1/4"second intervals. See section 4.1.3 for details.
Scale	Four scaling modes: Normal, Wide, Full, and Cinema allow adjustment of the picture expansion that most closely matches the encoding of the source image. See section 4.1.2 for details.
Source Select	Changes between two composite video sources (NTSC, PAL, SECAM), which are customer configurable. Press this button to switch sources.

4.1. Navigational Soft Keys

The icons on the display buttons indicate basic functions. In addition to the basic functions, the buttons act as soft keys that perform secondary navigational functions to adjust picture quality in dialog boxes and the on-screen menus. When you press a button and see a bar of blue soft keys, as shown below, press the corresponding display button.



Figure 5 Soft key buttons

Note: Before changing the display settings, try both default color modes first to determine which set of default colors you like best. See Restore Factory Defaults on page 14 for more information.

4.1.1. Source Select

Switch input sources by pressing the Source Select button (shown below). You will hear a relay click, which indicates the source changed.



Figure 6 Source select button

4.1.2. Scale

Change the scaling mode by pressing the **Scale** button (shown below). Press the ◀ or the ▶ soft key to switch the display between the different scaling modes (described below). Highlight the optimal mode for the image source and press **Set** to set the scaling mode and exit the dialog box.

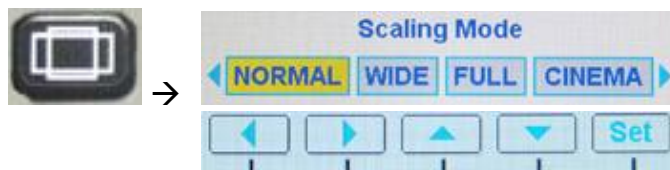


Figure 7 Scale button, settings, and soft keys

Normal Mode

Normal mode displays a standard 4:3 aspect video without alteration. A standard 4:3 source image will appear with vertical black bars on the left and right side of the screen, as shown in Figure 8. If the image source is letterboxed, then there will be horizontal bars at the top and bottom of the image as well.

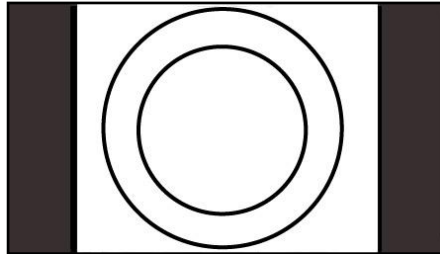


Figure 8 Standard 4:3 aspect test pattern in Normal Mode

Widescreen 16:9 images will appear horizontally compressed with vertical black bars on the left and right side of the screen, as shown in Figure 9.

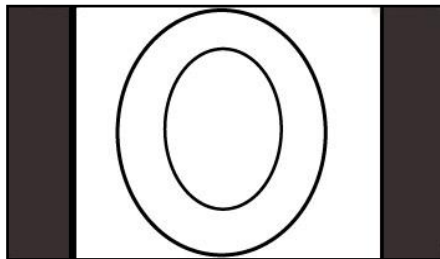


Figure 9 Widescreen 16:9 aspect test pattern in Normal Mode

Wide Mode

Wide mode displays a standard 4:3 source video in 16:9 aspect ratio by expanding the image horizontally. The expansion maintains normal aspect in the center region while stretching the rest of the image to fill the screen, as shown in Figure 10.

Widescreen 16:9 will be displayed full screen with minor central compression, as shown in Figure 11. If the source image is letterboxed, there will be black bars at the top and bottom of the image.

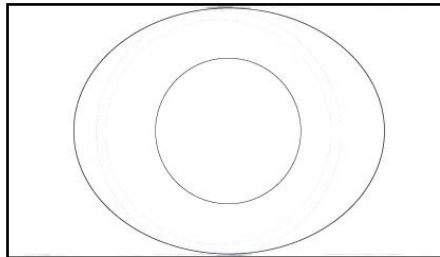


Figure 10 Standard 4:3 aspect test pattern in Wide Mode

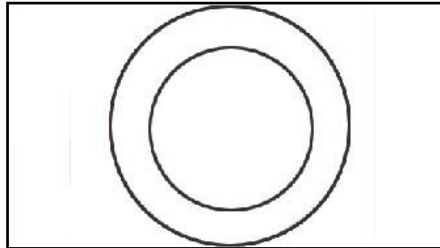


Figure 11 Widescreen 16:9 aspect test pattern in Wide Mode

Full Mode

Displays standard 4:3 source video in 16:9 aspect ratio by expanding the entire image horizontally, as shown in Figure 12. If the source image is letterboxed, there will be black bars at the top and bottom of the image only. Widescreen 16:9 will be displayed full screen without distortion.

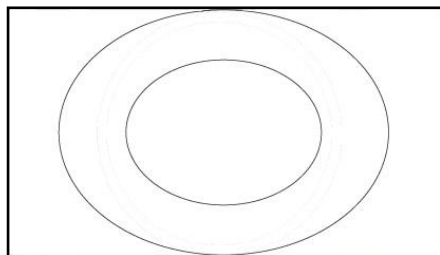


Figure 12 Standard 4:3 aspect test pattern in Full Mode

Cinema Mode

Cinema Mode expands the source video in the vertical and horizontal dimensions to fill the display screen, as shown in Figure 13. Letterbox format DVD disks will have little or no bars showing in this mode, while 4:3 & 16:9 aspect video sources will be expanded beyond the boundaries of the screen, appearing cropped.

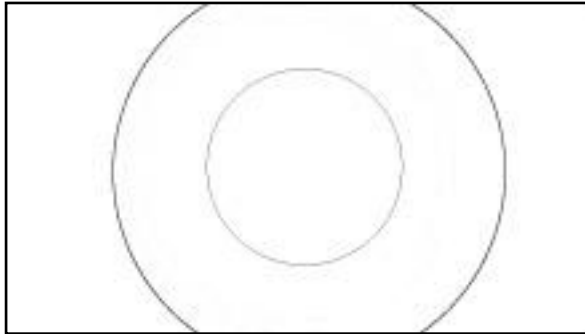


Figure 13 4:3 and 16:9 aspect test patterns in Cinema Mode

4.1.3. Backlight Brightness

Adjust the LED backlight brightness by pressing the **Backlight Brightness** button (shown below). Press the ◀ or the ▶ soft key to decrease or increase the image on the LCD. Press the **Set** soft key to set the brightness and exit the dialog box.



Figure 14 Backlight brightness button, settings, and soft keys

4.1.4. Contrast

Adjust the contrast by pressing the **Contrast** button (shown below). Press the ◀ or the ▶ soft key to raise or lower the contrast. Press the **Set** soft key to set the contrast and exit the dialog box.

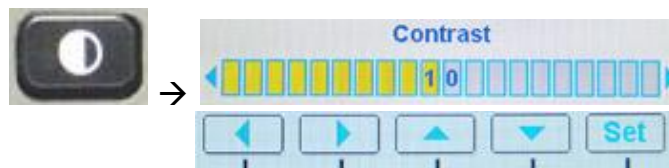


Figure 15 Contrast button, settings, and soft keys

4.2. On-Screen Menus

To open the Main Menu and access the submenu settings, press the **Menu** button, as shown below. Press the ▼ and ▲ soft keys to select (highlight) an option, and press the **OK** soft key to select it.

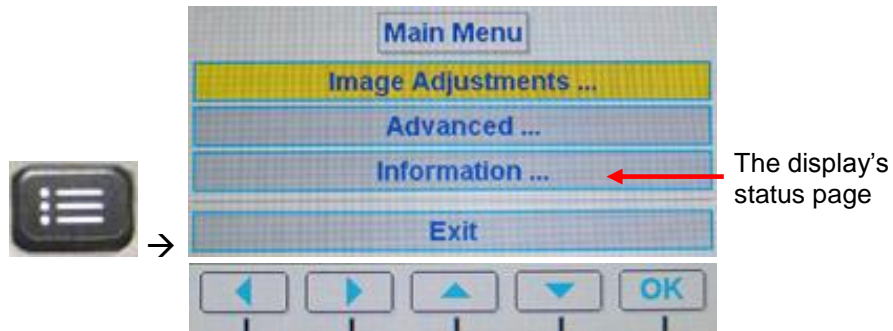


Figure 16 Menu button, submenu, and soft keys

Note: The on-screen menus will timeout and close automatically after no screen activity for a preset amount of time, which is adjustable in the Advanced→Menu Timeout dialog box.

4.2.1. Image Adjustments Menu

Note: If the screen colors are not what you expect, try changing the default color modes to determine which one you like best before adjusting the other screen settings. See Restore Factory Defaults on page 14 for more information.

Use the Image Adjustments menu options, as shown below, to control the color and picture quality. Press the **Menu** button and the **OK** soft key to open the menu. Close the menus using the Back and Exit options, or wait for the menu to close automatically.



Figure 17 Image Adjustments menu and soft keys

Brightness

Press the **OK** soft key to open the Brightness screen, as shown below, and adjust the picture brightness.

Press the ◀ or the ▶ soft keys to change the image on the LCD accordingly.

Press the **Set** soft key to set the brightness and exit the dialog box.



Figure 18 Picture brightness settings and soft keys

Saturation

To adjust the color saturation, press the **Menu** button and then select **Image Adjustments** → **Saturation** using the soft keys.

Press the ◀ or the ▶ soft keys to change the color levels.

Press the **Set** soft key to set the saturation and exit the dialog box.



Figure 19 Color saturation settings and soft keys

Tint (Hue)

To adjust the color hues, press the **Menu** button and then select **Image Adjustments** → **Tint (Hue)** using the soft keys.

Press the ◀ or the ▶ soft keys to change the color hues in the image.

Press the **Set** soft key to set the tint and exit the dialog box.



Figure 20 Tint settings and soft keys

Sharpness

To adjust the picture sharpness, press the **Menu** button and then select **Image Adjustments**→**Sharpness** using the soft keys.

Press the ◀ or the ▶ soft keys to adjust the focus.

Press the **Set** soft key to set the sharpness and exit the dialog box.



Figure 21 Sharpness settings and soft keys

4.2.2. Advanced Menu

Use the Advanced menu options, as shown below, to control the display's functionality. Press the **Menu** button and the **OK** soft key to open the menu. Close the menus using the Back and Exit options, or wait for the menu to close automatically.



Figure 22 Advanced menu and soft keys

Restore Factory Defaults

Restores the default screen settings. There are two factory color modes: Vivid (default) and Natural. Try both modes to determine which one you like best before adjusting the other picture quality settings.

From the Advanced submenu, press the **OK** soft key to open the Restore Factory Defaults screen, as shown below.

Change the color settings mode with any arrow soft key, and then press **Set** to restore the selected factory defaults.

Close the screen using the Back and Exit options, or wait for it to timeout and close automatically.



Menu Timeout

Set the amount of time the menu items remain on the screen without making any changes.

From the Advanced submenu, press the ▼ soft key to select **Menu Timeout** and then **OK**, as shown below.

Press the ◀ soft key to cycle through the options, and then press the ▶ soft key to cycle through the options in the reverse order.

Press the **Set** soft key to set the timeout and exit the dialog box.



Figure 23 Menu timeout options and soft keys

Power Up Mode

Test different options to turn on the display. From the Advanced submenu, press the ▼ soft key to select **Power Up Mode** and then **OK**, as shown below.

Press either ◀ or ▶ soft key to select the mode.

Press the **Set** soft key to set the power-up time and exit the dialog box.



Figure 24 Power Up mode options and soft keys

Select Switch Active Pulse Width

Test different lengths of the source select signal. From the Advanced submenu, press the ▼ soft key to choose **Select Switch Active Pulse Width** and then **OK**, as shown below.

Press the ◀ soft key several times to decrease the width speed. Press the ▶ soft key several times to increase the width speed.

Press the **Set** soft key to set the timing and exit the dialog box.



Figure 25 Select Switch Active Pulse Width settings and soft keys

Select Switch Repeat Delay

Change the time between sources on the display. From the Advanced submenu, press the ▼ soft key to choose **Select Switch Repeat Delay** and then **OK**, as shown below.

Press the ◀ soft key several times to shorten the timing between repeats. Press the ▶ soft key several times to lengthen the timing.

Press the **Set** soft key to set the timing and exit the dialog box.



Figure 26 Select Switch Repeat Delay settings and soft keys

Temperature Info

From the Advanced submenu, press the ▼ soft key to select **Temperature Info** and confirm the status dialog box (below) opens, and then press **Back** to close it.

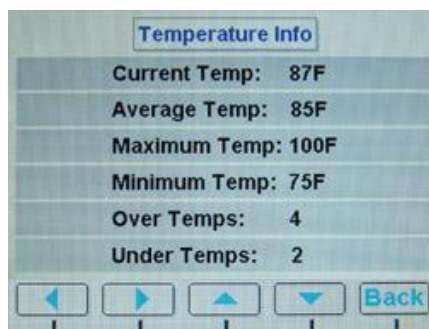


Figure 27 Read-only dialog about temperature status

5. MAINTENANCE: TENSION ADJUSTMENTS

Arm mounting diagrams and the tools required to adjust the tension.

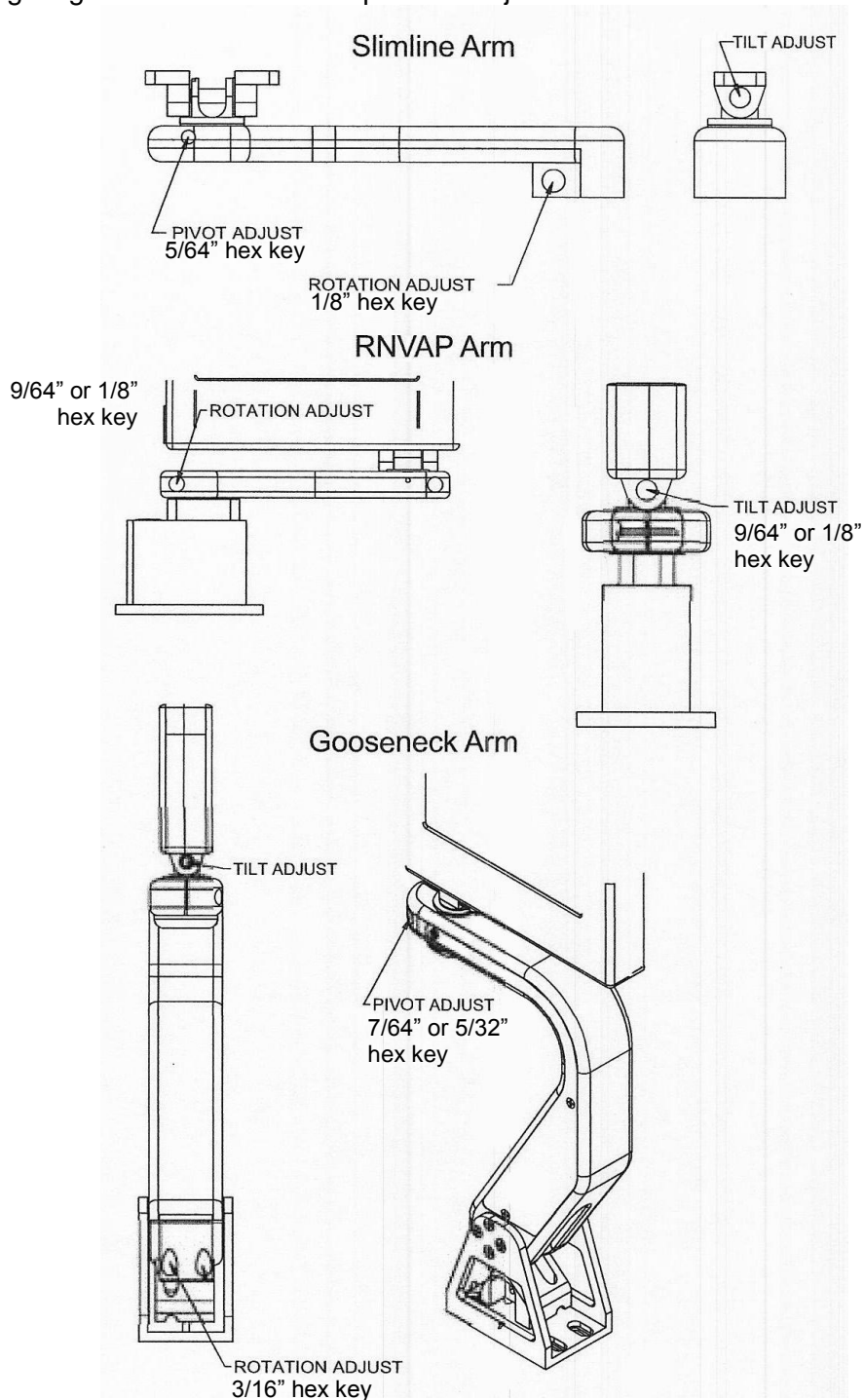


Figure 28 Arm assembly maintenance adjustments

6. TECHNICAL REFERENCES AND SUPPORT



The *Outline & Installation* drawing is also available at www.rosenaviation.com.

From the [Rosen Aviation](http://www.rosenaviation.com) home page, select **Support** → **Drawings and Pinouts**, and search for the drawing by model number or browsing by product category.

6.1. Troubleshooting

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

Table 2 Troubleshooting tips and solutions

Problem	Possible Solutions
Power LED does not illuminate (neither RED nor GREEN)	<ul style="list-style-type: none"> ● Verify pinout to base receptacle is correct (power input connection) ● Verify voltage to monitor is correct ● Check the arm and base receptacle connectors for damaged pins ● Check for damaged pins in base ● Monitor not turned on
Power LED is red	<ul style="list-style-type: none"> ● If pushing the power button does not turn the power LED green, the display failed. Please call customer service.
Power LED is green but no video displays (black screen)	<ul style="list-style-type: none"> ● Verify pinout to base receptacle is correct. ● Check the arm and base receptacle connectors for damaged pins (video input connection) ● Verify that video source is on and displaying video ● Verify that video source is in play mode ● Verify video signal at monitor connector ● Check for damaged pins in base
Distorted image	<ul style="list-style-type: none"> ● Verify that the pinout is correct ● Verify that the signal is present and accurate ● Examine the display for pinched or damaged cables. ● Verify NTSC input ● Check for damaged pins in base ● Ensure the internal system temperature is not above or below the allowed parameters. ● Try changing the scaling mode. See Scale on page 7 for more information.

Problem	Possible Solution
Wrong colors	<ul style="list-style-type: none"> If the screen colors are not what you expect, change modes in Advanced Menu→Restore Factory Defaults. Two modes are available: Normal and Vivid. Try both modes to determine the one you like best before adjusting the other screen settings. See Restore Factory Defaults on page 14 for more information.

6.2. DO-160E Qualifications

Table 3 DO 160E Test Criteria to which we test the 7002 series displays

Description	DO-160E Section	DO-160E Category
Temperature and Altitude	4.0	A1
Temperature Variation	5.0	C
Humidity	6.0	A
Operational Shocks & Crash Safety	7.0	B
Vibration	8.0	S, Curve B
Explosive Atmosphere	9.0	N/A
Waterproofness	10.0	N/A
Fluids Susceptibility	11.0	N/A
Sand and Dust	12.0	N/A
Fungus Resistance	13.0	N/A
Salt Fog	14.0	N/A
Magnetic Effect	15.0	A
Power Input	16.0	Z,B
Voltage Spike	17.0	B
Audio Frequency Conducted Susceptibility – Power Inputs	18.0	Z
Induced Signal Susceptibility	19.0	AC
Radio Frequency Susceptibility (Radiated and Conducted)	20.0	TT
Emission of Radio Frequency Energy	21.0	B
Lightning Induced Transient Susceptibility	22.0	N/A
Lightning Direct Effects	23.0	N/A
Icing	24.0	N/A
Electrostatic Discharge (ESD)	25.0	A
Fire, Flammability	26.0	C

6.3. Technical Support

If you need assistance with an installation, please contact Rosen Aviation at 541.342.3802 or 888.668.4955.

6.4. Specifications

Table 4 7002 display specifications

Size	7" diagonal, 16 : 9 format
Resolution	800 x 480 (WVGA)
Viewing Angle (U/D/L/R)	40/60/60/60
Brightness	400 cd/m ²
Contrast Ratio	300 : 1
Video Input	1Vp-p, 75 ohms
Weight	1.4 lbs [0.6350 kg] (monitor only)
Dimensions	7" (W) x 5" (H) x 1" (D) [17.78 cm (W) x 12.7 cm (H) x 2.54 cm (D)]
Power Requirements	28V DC
Operating Temperature	0°C - 50°C
Warranty	2 year

7. DEFINITIONS

- DC** Direct Current – voltage from an aircraft battery or generator.
- GND** Ground
- IR** Infrared
- LCD** Liquid crystal display
- LED** Light emitting diode
- NTSC** North American Television Standards Committee – the analog video specification used in North American countries
- OSD** On screen display – a menu of user options
- PAL** Phase alternate (by) line – the analog video specification used by most European countries and their former colonies world wide
- PCB** Printed circuit board – an electronics assembly that performs tasks
- PS2** Personal system 2 (trademarked IBM keyboard specification)
- RS-232** Standard for transmitting serial information using single-ended signaling (data lines referenced to ground).
- RGB** Red, green, blue. An abbreviation commonly used for analog computer graphics video that transmits the three primary colors on separate wires.

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

USB Universal serial bus. A high-speed differential signaling serial bus typically used to connect peripheral devices to a personal computer.

Vp-p Volts peak-to-peak; the maximum range of a sine wave.

8. REVISION HISTORY

Revision	Date	Revision Description	EC #
A	01/14/08	New release	07429
B	01/31/08	Add restore factory default options	08042
C	09/18/08	Correct date from TBD to current date	08391