

# GENSTAR III™

Sunlight Readable LCD Monitor Approved for STARS (Standard Terminal Automation Replacement System)



The GenStar III™ represents the 3rd generation of General Digital's GenStar™ family of sunlight readable LCD monitors designed specifically to meet the stringent optical and operational requirements of the FAA's Standard Terminal Automation Replacement System (STARS) program. Serving as the Primary Tower Display since 1999, the GenStar family of monitors is ideally suited to meet other Air Traffic Control Tower applications, as well.

Designed in anticipation of the obsolescence of the GenStar II™ display, the GenStar III has been introduced as a "drop-in replacement," incorporating virtually all of the same electronics, optical enhancements and enclosure of its predecessor.

The GenStar III provides multiple benefits from our unrelenting improvements. For a limited time, it can be built incorporating the 20.1" LCD currently used in the GenStar II. The time will come, however, when that is no longer an option. General Digital, after combing the LCD market, has found a 19.0" replacement display that shares the same 1280 x 1024 resolution as the discontinued 20.1" display. In addition, a 21.3" LCD with 1600 x 1200 resolution is offered as a replacement; the higher resolution providing finer on-screen detail.

High performance LED backlights replace the CCFL predecessor. Boasting much lower power consumption, lower cost, and a much longer life expectancy, the LED backlights are a welcome upgrade for the end-user. Although the GenStar III supports the same pair of fans as the GenStar II, they are rarely activated, if ever, due to the lower power consumption/heat dissipation of LED backlights. The net result is a nearly noiseless GenStar III, well below the 55 dBA STARS requirement.

An advanced LED backlight controller continues the cost savings offering improved reliability and longer life than the Intelligent Backlight Controller (IBC) found in the GenStar II. Although some of the IBC features were eliminated at the request of the FAA because they were not utilized by ATC operators (such as ICARUS and DAEDALUS), the LED backlight controller supports most features of the IBC and delivers new capabilities as well.

Another improvement that the GSIII has received is an intelligent USB/OSD controller. Compatible with any of General Digital's display units, this controller allows boot-load firmware upgrades in the field to all four of the embedded controllers. Among its virtues is the ability to tailor performance of system variables, such as corrective action from overtemp condition, backlight brightness, minimum/maximum brightness setpoints, and brightness dimming steps, to name a few. This capability only enhances the GenStar III as a field programmable monitor, allowing creation/modification of system configuration without development software or programming skills.

Continuing the legacy of unprecedented performance and reliability found in the first GenStar (circa 1999), the GenStar III maintains compatibility with the STARS infrastructure, tower video controllers, and seismic-qualified mounting solutions. With new capabilities that improve performance while allowing the customer to reclaim

OVER 35 YEARS OF FLAT PANEL SOLUTIONS

QUICK LOOK

- » Designed as a replacement for EOL (End Of Life) GenStar II
  - Kits available to convert GenStar II monitor or purchase GenStar III new
- » Full compatibility with STARS infrastructure

## RUGGED ENCLOSURE

- » Weighted to match seismically certified STARS mounting
- » Rounded corners promote operating safety
- » Front accessible, intuitive user control
- » Matte black powder coat finish reduces reflections

## DISPLAYS

- » 19.0 inch, 1280 x 1024 resolution,  $\pm 85^\circ/\pm 90^\circ$  H/V viewing angle
- » 19.0 inch, 1280 x 1024 resolution,  $\pm 85^\circ/\pm 80^\circ$  H/V viewing angle
- » 20.1 inch, 1280 x 1024 resolution,  $\pm 85^\circ/\pm 85^\circ$  H/V viewing angle
- » 21.3 inch, 1600 x 1200 resolution,  $\pm 88^\circ/\pm 88^\circ$  H/V viewing angle
- » Optical / Protective Glass
  - 75% contrast (20.1 inch)
  - Clear Float (19.0 inch & 21.3 inch)
  - Vacuum deposited antireflective coatings
  - 72 gloss mechanical etch (to reduce glare)
  - Optically bonded to LCD (to minimize internal reflections and improve contrast in high ambient lighting conditions)
- » LED Sunlight Readable Backlights
  - Much lower power consumption, cost, footprint and cooling requirements than CCFL predecessor
  - Much longer life expectancy (120,000 hours) than CCFL predecessor

## VIDEO CONTROLLERS

- » Compatible with all STARS-approved video controllers (x7) & video modes/timings (x9)
- » Supports EIA-RS-343, separate, composite, Sync-on-Green video
- » Custom firmware to support 650 ms switch time between primary and secondary video sources

## CONTROL ELECTRONICS

- » LED Backlight Controller
  - Lower cost, improved reliability, and longer life than GenStar II IBC
  - Full featured; supports most features of IBC predecessor as well as new
  - Eliminates features not previously used by ATC operators
  - Improved reliability and extended support
  - Remote brightness control interface, supporting lengths up to 160 feet

## POWER SUPPLY

- » Smaller, less expensive, PFC (new monitors only), compared to GenStar II power supply (reserved for retrofits)
- » Field repairable; accessible without opening enclosure or voiding warranty

## CERTIFICATIONS

- Designed with the intent to meet the following:
- UL60950-1 (Safety)
  - EN 61000-4-2 (ESD)
  - FCC 47CFR Class A

Designed and Manufactured in the U.S.A.

most of the existing monitor's enclosure and electronics, the GenStar III ensures years of extended service and support.

**GD GENERAL DIGITAL™**  
The Innovators of Flat Panel Technology

**DISPLAY/BACKLIGHT**

	Size (Diagonal)	Backlight Type	Viewing Area (W x H)	Resolution (Pixels)	Number of Colors	Luminance (0° Max.)	Contrast (Max.) <sup>1</sup>	Power	Response Time (Typ.)	Horizontal Viewing Angle <sup>2</sup>	Vertical Viewing Angle <sup>2</sup>	Shock <sup>3</sup>	Vibration <sup>3</sup>
UB-19W-992	19.0"	Edge-Lit LED	14.82" x 11.85"	1280 x 1024	16.7M	1390 Nits	993:1 <sup>5,6</sup>	22.5 W	5 ms	± 85°	± 80°	50 G, 20 ms, ½ Sine Wave	1.5 G (10–200 Hz)
UB-19W-994	19.0"	Edge-Lit LED	14.82" x 11.85"	1280 x 1024	16.7M	1040 Nits	717:1 <sup>5,7</sup>	40 W	5 ms	± 88°	± 88°	120 G, 2 ms, ½ Sine Wave	1.0 G (10–300 Hz)
UB-20W-974	20.1"	Direct Backlit LED	15.72" x 12.56"	1280 x 1024	16.7M	620 Nits <sup>4</sup>	>300:1	50 W	25 ms	± 85°	± 85°	30 G, 11 ms, ½ Sine Wave	1.2 G (5–100 Hz)
UB-21U-809	21.3"	OEM Edge-Lit LED	17.00" x 12.76"	1600 x 1200	16.7M	670/900 Nits (Min./Typ.)	1400:1	50 W	20 ms	± 88°	± 88°	30 G, 11 ms, ½ Sine Wave	1.2 G (5–100 Hz)
UB-21U-995	21.3"	Enhanced Edge-Lit LED	17.00" x 12.76"	1600 x 1200	16.7M	> 1510 Nits	> 1100:1	60 W	20 ms	± 88°	± 88°	30 G, 11 ms, ½ Sine Wave	1.2 G (5–100 Hz)
UB-21U-996	21.3"	Enhanced Direct Backlit LED	17.00" x 12.76"	1600 x 1200	16.7M	> 1500 Nits	> 1100:1	67 W	20 ms	± 88°	± 88°	30 G, 11 ms, ½ Sine Wave	1.2 G (5–100 Hz)

**1** Brightness and Contrast values reflect measurements obtained with a Minolta® CS100 photometer; these values are nominal and may vary.

**2** Contrast decreases as viewing angle increases from 0°.

**3** Shock and Vibration data reflect parameters for baseline industrial monitors. Military-grade monitors could sustain even greater shock and vibration levels. Please inquire with a Sales Engineer for more information.

**4** The maximum user brightness is a programmable function. The default maximum user brightness is gated at 620 nits to comply with the FAA's Standard Terminal Automation Replacement System (STARS) Statement of Work. Actual maximum brightness is 1100 nits. By limiting the maximum user brightness, GD is able to minimize power consumption and heat generation.

**5** Contrast measurement taken with an unbonded neutral density filter. The actual contrast will increase in a bonded configuration.

**6** Per MIL-L-3009, Class 5 (Weber contrast ratio of 9.25:0) when configured with an optically bonded glass filter, antireflective coating on one side and 72 glass etch on the other.

**7** Per MIL-L-3009, Class 5 (Weber contrast ratio of 7.28:0) when configured with an optically bonded glass filter, antireflective coating on one side and 72 glass etch on the other.

**VIDEO CONTROLLER**

dd	Resolution/Frequency <sup>8</sup>						Scaling	Analog Video Supported
	640 x 480	720 x 400	800 x 600	1024 x 768	1280 x 1024	1600 x 1200		
55	60 Hz	60 Hz	56, 60 Hz	60 Hz	60 Hz	—	—	Separate, Composite, Sync-on-Green, DVI-D, NTSC, S-Video
61 <sup>9</sup>	60, 67, 72, 75, 85 Hz	70 Hz	56, 60, 72, 75, 85 Hz	60, 70, 72, 75, 85 Hz	60, 72, 75 Hz	60 Hz	Always On	Separate, Composite, Sync-On-Green

**8** Most common video modes listed. Other video modes supported; speak with a Sales Engineer for more information.

**9** Default video controller, regardless of display selected.

**MTBF**

Mean Time Between Failure @ 25° C

	Display	LED Backlight <sup>10,11</sup>	Video Controller (MTBF is Dependent Upon Specific Model)	Power Supply
UB-19W-992	> 50,000 Hours (Minimum)	> 50,000 Hours	100,000–260,000 hours	See Power Supply table
UB-19W-994	> 50,000 Hours (Minimum)	> 50,000 Hours	100,000–260,000 hours	See Power Supply table
UB-20W-974	> 31,200 hours (Minimum)	> 50,000 hours	100,000–260,000 hours	See Power Supply table
UB-21U-809	> 50,000 Hours (Minimum)	70,000 hours @ 25° C 60,000 hours @ 60° C	100,000–260,000 hours	See Power Supply table
UB-21U-995	> 50,000 Hours (Minimum)	118,000 hours @ 70° C	100,000–260,000 hours	See Power Supply table
UB-21U-996	> 50,000 Hours (Minimum)	118,000 hours @ 70° C	100,000–260,000 hours	See Power Supply table

**10** The hours for **MTBF** refer to the half-life of the bulbs; that is, the point at which the bulbs reach half of their original brightness. *It does not indicate bulb life expectancy.*

**11** The MTBF of the backlight is dependent upon the average daily luminance of the backlight.

**ENVIRONMENTAL**

	Temperature (Operating)	Temperature (Storage)	Altitude (Operating)	Altitude (Storage)
UB-19W-992	0° C to 50° C	-20° C to 60° C	10,000 Feet	30,000 Feet
UB-19W-994	-20° C to 70° C	-30° C to 80° C	16,732 Feet	44,619 Feet
UB-20W-974	0° C to 55° C	-20° C to 60° C	12,000 feet	25,000 feet
UB-21U-809	0° C to 60° C	-20° C to 60° C	16,732 Feet	44,619 Feet
UB-21U-995	0° C to 60° C	-20° C to 60° C	16,732 Feet	44,619 Feet
UB-21U-996	0° C to 60° C	-20° C to 60° C	16,732 Feet	44,619 Feet

**CERTIFICATIONS** Designed with the intent to meet:

UL60950-1 (Safety)
EN-61000-4-2 (ESD)
FCC 47CFR Class A

**MECHANICAL** (All Models)

Enclosure (H x W x D)	Construction	Mounting Holes	Weight, Operating	Weight, Shipping
17.00" x 19.50" x 6.50"	0.090" Aluminum	1/4-20 x 0.31" deep, 4 places each side (L, R)	35 Pounds	44 Pounds

**I/O CONNECTIONS** (All Models)

Power (AC)	On/Off	Analog Video	Analog Video (Opt.)	IBC	Backlight Brightness	Remote Brightness	OSD Controller
AC Socket (IEC)	Rocker Switch	BNC (5)	DE-15, Socket	DE-9, Socket	Potentiometer, 10K, Local/10K, Remote Optional	6-pin, Circular, Locking	Type A USB

**CALIBRATION**

Interface	Functions	Advanced
On-screen Displays (OSD) Navigated by 5- or 7-button Membrane Pad (Front Access Via Hinged Panel)	Horizontal Image Position, Vertical Image Position, Size (Internal Pixel Clock), Focus, Brightness, Contrast, Auto Adjust (Position and Width), Color, On-screen Diagnostics, OSD Position, Gamma, Language, Auto Gamma Correction	Image Expansion to Fill Screen

**DISPLAY OVERLAY** (Other Overlays Available – Please Inquire with a Sales Engineer)

gg	Description
63	75% Solar Gray, 72 Gloss Etch, Antireflective Coating (One Side), Bonded to LCD <sup>12</sup>
74	Clear Float Glass, 72 Gloss Etch, Antireflective Coating (One Side), Bonded to LCD <sup>13</sup>

**12** Default overlay for the 20.1" monitor.

**13** Default overlay for the 19.0" and 21.3" monitors.

**POWER SUPPLY**<sup>14</sup> *hijj*

<i>hijj</i>	Consumption (typ.)	Voltage Range	Frequency Range	Line Entry Module/Filter	Power Factor Correction	MTBF
EA25 (Rear Mount)	140 Watts	90–132 & 180–264 VAC	47–63 Hz	Yes	No	300,000 hrs.
EA46 (Rear Mount)	140 Watts	85–264 VAC	47–63 Hz	Yes	Yes	147,872 hrs.

**14** Includes 67" AC Power Cable.

**MODEL NUMBER CONFIGURATOR**

Model Style	Size & Resolution ( <i>aab</i> )	Display ( <i>ccc</i> )	Video Controller ( <i>ddd</i> ) <sup>15</sup>	Keyboard/Pointer ( <i>ee</i> )	Industrial Enclosure ( <i>ff</i> )	Display Overlay ( <i>gg</i> )	Power Supply ( <i>hijj</i> )
UB-	19W-	992-	##-	00-	01-	##- <sup>16</sup>	###
UB-	19W-	994-	##-	00-	01-	##- <sup>16</sup>	###
UB-	20W-	974-	##-	00-	01-	##- <sup>16</sup>	###
UB-	21U-	809-	##-	00-	01-	##- <sup>16</sup>	###
UB-	21U-	995-	##-	00-	01-	##- <sup>16</sup>	###
UB-	21U-	996-	##-	00-	01-	##- <sup>16</sup>	###

**15** Video Controller 61 is provided as standard equipment; other controllers are available that may better suit a particular application. Please speak with a Sales Engineer to discuss your options.

**16** Clear float glass is optically bonded to the LCD as standard equipment; other display overlays are available that may better suit a particular application. Please speak with a Sales Engineer to discuss your options.

**ORDERING**

Model Number <sup>17</sup>	Description
UB-19W-992- <b>dd</b> -00-01- <b>gg-hijj</b>	GenStar III 19.0" Standalone/Mountable Sunlight Readable Edge-Lit LED LCD Monitor – Designed for FAA Towers and Navigation Applications
UB-19W-994- <b>dd</b> -00-01- <b>gg-hijj</b>	GenStar III 19.0" Standalone/Mountable Sunlight Readable Edge-Lit LED LCD Monitor – Designed for FAA Towers and Navigation Applications
UB-20W-974- <b>dd</b> -00-01- <b>gg-hijj</b>	GenStar III 20.1" Standalone/Mountable Sunlight Readable Direct Backlit LED LCD Monitor – Designed for FAA Towers and Navigation Applications
UB-21U-809- <b>dd</b> -00-01- <b>gg-hijj</b>	GenStar III 21.3" Standalone/Mountable Sunlight Readable OEM Edge-Lit LED LCD Monitor – Designed for FAA Towers and Navigation Applications
UB-21U-995- <b>dd</b> -00-01- <b>gg-hijj</b>	GenStar III 21.3" Standalone/Mountable Sunlight Readable Enhanced Edge-Lit LED LCD Monitor – Designed for FAA Towers and Navigation Applications
UB-21U-996- <b>dd</b> -00-01- <b>gg-hijj</b>	GenStar III 21.3" Standalone/Mountable Sunlight Readable Enhanced Direct Backlit LED LCD Monitor – Designed for FAA Towers and Navigation Applications

**17 Bold Italicized letters** refer to standard customer-defined configurations (see Model Number Configurator above).

