GenStar II™

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

The GenStar II™, first introduced in 2004, is General Digital's second generation of its incomparable 20.1" SXGA LCD monitor. Following in the footsteps of the original GenStar™ monitor (which has faithfully served the FAA since 1999), the GenStar II is the only monitor that is fully compliant with the STARS Statement of Work for the Primary Tower Display.

General Digital's engineers took full advantage of the opportunity to redesign the monitor and added a variety of innovative features and improvements, resulting in numerous benefits. However, the GenStar II retains its modular design approach, thus enabling it to be reconfigured to meet specific customer performance requirements and budgetary expectations by omitting certain features from the default configuration that might be considered unnecessary.

An enhanced version of the 20.1" display was integrated, which provides a faster response time and reduces image ghosting. A 75% contrast filter has been optically bonded to the display, along with a suite of robust antireflective and antiglare coatings and treatments. Optical bonding of the filter minimizes internal reflections and maximizes contrast in high ambient lighting conditions.

General Digital's proprietary sunlight readable backlight was completely redesigned. While the backlight now uses nearly 40% less power, its longevity has been increased dramatically from 20,000 hours to 50,000 hours. We've also introduced a revolutionary microprocessor-controlled cooling system. Driven by a pair of inverters, the GenStar II's 31 CCFL tubes operate in an alternating pattern—thus, if one inverter fails, the entire viewing area of the display is still backlit and operational.

The GenStar II features the introduction of our Intelligent Backlight Controller (IBC). The IBC communicates with a series of embedded optical, thermal and current sensors to analyze the performance of the monitor's electronics in real time. It can then make intelligent decisions to optimize its performance, avoid critical failures and provide users with analytical feedback to accelerate repair and failure diagnosis. Although the backlight is capable of generating more brightness, the IBC is factory configured to provide a maximum of 620 nits for at least 4,000 hours.

The backlight's additional capacity is utilized to address inevitable bulb decay and performance fluctuations, due to temperature and humidity changes, helping to ensure predictable and consistent performance from one monitor to the next. The IBC also monitors and controls the GenStar II's internal temperature by varying the cooling fan speed to maintain an optimal balance between temperature and noise. Even at maximum fan speed, the GenStar II produces far less than the STARS requirement of 55 dB maximum.

Through the use of a soft failure algorithm, the backlight's brightness, power consumption and heat generation can be automatically reduced, thereby avoiding over-temperature situations, which can lead to critical failures. Any performance anomalies and system events are time/date stamped in nonvolatile memory along with other relevant environmental, settings and system information. ICARUS and DAEDALUS, our Intelligent Replace Before Fail (IRBF) software utilities, can then be accessed for analysis. Failures and status are also communicated to the user via LEDs incorporated into the monitor bezel.

Officially, the 20.1" LCD for the GenStar II is end of life, with no direct replacement available from the sole source supplier. We have introduced the GenStar III™ as a direct replacement, featuring multiple display options, a high performance LED backlight and a new LED controller. Please visit http://www.generaldigital.com/products/standalone_lcd/genstar_lcd.htm for additional information.

OVER 30 YEARS OF FLAT PANEL SOLUTIONS

QUICK LOOK

*Sole-source **Primary Tower Display** for FAA's STARS program since 1999*

ENCLOSURE

- » Weighted to match seismically certified STARS mounting
- » Externally mounted, field-replaceable cooling fans & power supply
- » Active and passive cooling system
  - 0–50° C operation
- » Front accessible, intuitive to operate, user control
- » Rugged, all-metal construction with matte black finish

DISPLAY

- » Vibrant 20.1" LCD, 1280 x 1024, ±85° wide viewing angle
- » 75% Contrast Filter
  - Optically bonded to LCD to minimize internal reflections and optimize contrast in high ambient lighting conditions
  - Vacuum deposited antireflective coating and 72 gloss antiglare etch
- » Proprietary, Sunlight Readable Backlight
  - 31 CCFL backlight, max luminance greater than 900 nits without filter
  - Interleaved bulb drive circuitry sustains operational usability (even after multiple bulb failures)
  - Dual backlight inverters allow uniform backlight operation (even after single inverter failure)
  - High-safety CCFL bulb rail design featuring conformal-coated PCBs with 6K electrolytic capacitors

VIDEO CONTROLLER

- » Compatible with all STARS-approved video controllers (x7) & video modes/timings (x9)
- » Supports EIA-RS-343, separate, composite, Sync-on-Green video
- » Supports 650 ms switch time between primary & secondary sources
  - Ensures ATC operators can maintain airspace safety even after critical tower computer failure

POWER

- » Integrated AC Power Supply (Power Factor Correction Optional)
- » Field-replaceable Power Supply and Cooling Fans

ADDITIONAL FEATURES

- » Microprocessor-Controlled Backlight Cooling System
- » Intelligent Backlight Controller™ (IBC)
  - Communicates with embedded optical and thermal sensors to monitor and control performance
  - Auto corrects backlight brightness – max brightness for first 4000 hours
  - Auto adjusts brightness by compensating for bulb decay & temperature/humidity changes
  - Variable frequency digital PWM brightness control with flicker-free operation (500:1)
  - Continually monitors inverters performance disabling them when non-compliant to ensure safety
  - Provides visual LED status of hardware failures
  - Records anomalous performance/failures in non-volatile memory with date/time stamp
  - Monitors internal temperature & controls fan speed to minimize fan noise
  - Remote brightness control interface and controller operates to 160 feet

CERTIFICATIONS

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

Designed and Manufactured in the U.S.A.

GENERAL DIGITAL™

The Innovators of Flat Panel Technology

DISPLAY

Size (Diagonal)	Viewing Area (W x H)	Resolution (Pixels)	Number of Colors	Response Time (Typ.)	Horizontal Viewing Angle [1]	Vertical Viewing Angle [1]	Shock[2]	Vibration[2]
20.1"	15.72" x 12.58"	1280 x 1024	16.7 Million	25 ms	±85°	±85°	30 G, 11 ms Sine Wave	1.2 G (5–100 Hz)

1 Contrast decreases as viewing angle increases from 0°.

2 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.

Contrast Ratio – Typical[3]

Viewing Angle		Low Ambient Contrast (<5000 ft-candle)				High Ambient Contrast (6000 ft-candle)			
Horizontal	Vertical	White	Red	Green	Blue	White	Red	Green	Blue
-80°	0°	128.6	38.5	79.1	12.2	9.4	3.5	6.1	1.7
-45°	0°	180.7	56.9	115.9	19.6	19.4	6.7	12.8	2.9
-30°	0°	221.3	64.5	133.7	24.1	22.7	7.3	14.1	3.3
0°	0°	301.4	85.8	181.3	33.7	24.5	7.6	15.1	3.6
30°	0°	287.8	84.7	172.5	30.2	23.7	7.6	14.6	3.3
45°	0°	252.2	74.3	151.8	25.6	21.2	6.9	13.1	3.0
80°	0°	140.7	42.3	85.3	13.3	8.7	3.3	5.6	1.7
0°	80°	41.1	13.4	27.7	4.3	2.5	1.5	2.0	1.1
0°	45°	153.6	45.6	92.9	16.5	10.3	3.7	6.6	1.9
0°	30°	240.0	71.0	143.0	25.7	18.2	6.0	11.2	2.8
0°	-30°	234.4	68.8	140.8	25.4	19.2	6.3	11.9	2.9
0°	-45°	154.9	46.2	93.5	16.4	11.2	4.0	7.2	2.0
0°	-80°	73.1	19.8	47.1	6.9	4.6	1.9	3.3	1.3

3 Configured with display enhancements, 75% contrast filter and contrast setting @ 90% of maximum.

Contrast Ratio – Typical[4]

Viewing Angle		Low Ambient Contrast (<5000 ft-candle)				High Ambient Contrast (6000 ft-candle)			
Horizontal	Vertical	White	Red	Green	Blue	White	Red	Green	Blue
-80°	0°	109.9	31.8	68.0	10.8	9.7	3.5	6.4	1.8
-45°	0°	189.8	55.8	113.2	22.1	32.7	10.2	19.8	4.5
-30°	0°	206.2	58.5	125.5	22.9	35.7	10.7	22.0	4.7
0°	0°	262.8	72.4	159.0	30.9	39.7	11.6	24.4	5.4
30°	0°	259.1	73.4	157.9	28.9	38.0	11.4	23.5	5.0
45°	0°	234.0	67.2	142.3	24.7	34.6	10.5	21.3	4.4
80°	0°	122.8	35.8	79.9	12.0	12.0	4.1	8.1	2.0
0°	80°	61.3	18.3	38.5	6.5	4.3	1.9	3.0	1.3
0°	45°	144.7	42.4	87.8	15.8	17.6	5.8	11.1	2.7
0°	30°	205.8	58.4	124.7	23.0	29.5	9.0	18.2	4.1
0°	-30°	236.4	65.7	143.4	26.9	33.6	10.0	20.7	4.6
0°	-45°	162.4	46.9	98.0	17.8	20.1	6.4	12.5	3.0
0°	-80°	61.3	18.2	38.2	6.4	4.0	1.8	2.8	1.3

4 Configured with display enhancements, 62% contrast filter and contrast setting @ 90% of maximum.

Reflectance[5]

	Diffuse Reflectance			Specular Reflectance		
	Tile Brightness	Screen Brightness	Diffuse Reflection	Reflection Off Standard	Display Surface Reflectance	Specular Reflection
Low Ambient	1398 nits	1.93 nits	0.14%	463 nits	2.37 nits	0.51%
High Ambient	4232 nits	4.96 nits	0.12%			

Luminance (max.)

Clear/Notch Filter	75% Contrast Filter	62% Contrast Filter	32% Contrast Filter
1000–1200 nits	750–900 nits	620–744 nits	320–384 nits

5 Recommended configuration with display enhancements and 75% contrast filter.

VIDEO CONTROLLER

	Resolution/Frequency[6]						
dd	640 x 480	720 x 400	800 x 600	1024 x 768	1280 x 1024	Scaling	Analog Video Supported
61	60, 67, 72, 75, 85 Hz	70 Hz	56, 60, 72, 75, 85 Hz	60, 70, 72, 75, 85 Hz	60, 72, 75 Hz	Always On	Separate, Composite, Sync-On-Green

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

MTBF

Mean Time Between Failure @ 25° C

Display	Backlight[7, 8]	Video Controller	Backlight Inverter	Power Supply
>31,2000 hours	>50,000 hours	>100,000 hours	>20,000 hours	See Power Supply table

7 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.*

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

ENVIRONMENTAL

Temperature (Operating)	Temperature (Storage)	Altitude (Operating)	Altitude (Storage)
0° C to 50° C	-20° C to 60° C	12,000 feet	25,000 feet

CERTIFICATIONS

UL60950-1; EN 61000-4-2; FCC Class 47CFR A

MECHANICAL

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

Power (AC)	On/Off	Video	IBC	Backlight Brightness	Remote Brightness
AC Socket (IEC)	Rocker Switch	BNC (5)	DE-9, Socket	Potentiometer, 10K, Local/10K, Remote Optional	6-pin, Circular, Locking

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

POWER SUPPLY[9]

hijj	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	30,000 hrs.
EA46 (Rear Mount)	140 Watts	85–264 VAC	47–63 Hz	Yes	Yes	TBD

9 Includes 6'7" AC Power Cable.

MODEL NUMBER CONFIGURATOR

Model Style	Size & Resolution (***aab***)	Display (***ccc***)	Video Controller (***dd***)	Keyboard/Pointer (***ee***)	Industrial Enclosure (***ff***)	Display Overlay (***gg***)	Power Supply (***hijj***)
UB-	20W-	803-	*dd*-	00-	01-	63-[10]	EA*jj*

10 A 75% contrast filter is provided as standard equipment; speak with a Sales Engineer for other display overlay options.

ORDERING

Model Number[11]	Description
UB-20W-803-***dd***-00-01-63-EA***jj***	GenStar II: 20.1" Diagonal, SXGA, Sunlight Readable, Standalone/Mountable, Ruggedized LCD Monitor, Designed for FAA Towers and Navigation Applications

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

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