# GENSTAR™ SERIES

*Air Traffic Control Tower Industrial-Grade LCD Monitors*

The **GenStar Series** represents the pinnacle of Air Traffic Control monitors. Originally developed in 1998 for the FAA's STARS program, the GenStar has evolved into its current iteration, incorporating the latest technologies and controller requirements.

The Genstar 19.0 (III & IV) models are true drop-in replacements for our existing TDM displays in ATC towers.

With GenStar, the user has total control over system performance. The inclusion of an access display (ADIS) provides users with an intuitive means to configure performance, view status/faults and calibrate/control without having to block flight-critical data on the main display by using the On-Screen Display (OSD).

HDMI, DisplayPort and DVI ports have been added to GenStar IV models, in conjunction with the analog VGA port, to allow additional flexibility in supporting video sources.

GenStar models are offered in two display sizes, at multiple brightness levels, to suit the unique lighting conditions of air traffic control towers.

Every GenStar IV model includes ADIS,
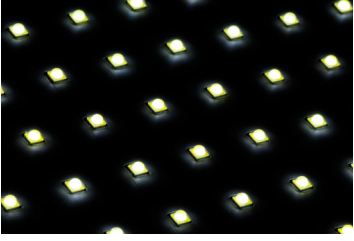a user-programmable Advanced Display Interface System

## STANDARD FEATURES

» 19.0″ & 21.3″ LCDs

» Resolutions to QSXGA (2560 x 2048)

» Sunlight readable levels of brightness and contrast

» Standalone enclosure mounts via VESA/cradle/pedestal

» In compliance with:

› EN 61000-4-2 (ESD), UL 60950, FCC Class A Cert.

» GenStar III™ "evolution" includes LED backlights and a field-programmable Intelligent USB/OSD Controller

» GenStar IV™ completely redesigned:

› Advanced Display Interface System for total control

› Dual ambient light sensors for optimal brightness level

› Internal sensors ensures operation within spec

› USB connectivity for flash upgrades/performance data

› Intelligent field-replaceable power supply

› Field-replaceable cooling fan

› VGA, HDMI, DVI-D video inputs

› Many more "revolutionary" upgrades

## AVAILABLE OPTIONS

» Panel mount bezel adaptor

» Slat wall mounting adaptors

» NVIS-compatible displays in compliance with MIL-STD-3009

» HD-SDI, DisplayPort inputs

» BNC (RS-343A) connector board

» STANAG 3350 A/B/C support

» Custom video input timing

» Pass thru "daisy chain" analog video

» Additional VESA mounting holes

» Custom enclosure mods and finishes

» Custom logos/silkscreens

» Many more

*Screenshot courtesy of Petrovich12/AdobeStock*

**GENERAL DIGITAL**™

*Engineering What's Next*

# GENSTAR LCD MONITORS

### Enhanced Backlight

Genstar models feature either edge-lit or direct-lit backlights. The LED backlights, in conjunction with General Digital's own LED controller, achieve typical display brightness levels from 900 to 1800+ nits, with dimming ratios from 1000:1 to 2000:1. The backlights are controlled via PWM, allowing precise and flicker-free brightness control. The MTBF (half brightness life) of the LEDs exceeds 100,000 hours.

### Advanced Display Interface System (ADIS)

The Genstar IV takes user control to the next level through the integration of a separate character display to configure performance, monitor health and control the GenStar IV's behavior. The programmable display/keypad eliminates the OSD, keeping the main screen clear for data. It allows the user to access OSD controls, select preferred auto-dimming algorithm and brightness zones, configure alarm reporting, and more. Passcode access limits advanced settings to authorized technicians only.

### Field-Replaceable Power Supply

GenStar IV features a modular field-replaceable 100 watt power supply (FAA-G-2100-H compliant) featuring onboard monitoring of AC/DC power, output current and component temperature. The supply proactively disconnects power from the monitor if voltage or current exceeds its predefined limit, and reports status and failures to the intelligent controller for display through the ADIS. Rear-mounted cooling fans are field accessible for replacement when the user is notified via ADIS.

### Ambient Light Sensor

The Genstar IV boasts dual ambient light sensors to ensure that the display stays at the optimal brightness for the user. The sensors are located on either side of the monitor, ensuring that localized shadows will not impact performance. The ambient light sensor control is firmware-based and can be tailored to meet each specific customer's needs. Settings can be changed on the fly through the monitor 's ADIS control panel.
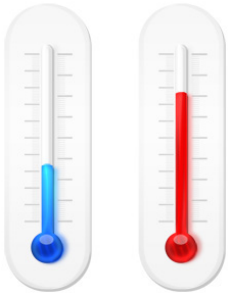
### Internal Sensors

Internal sensors are monitored by the control circuitry within the Genstar IV to ensure that the monitor operates within its specifications and prevents critical failures. The controller polls thermal/optical sensors, fan speed, the LED controller, video controller, and power supply for operating status. As needed, the controller can take actions such as increasing fan speed, adjusting brightness or notifying the user of potential issues through the User Interface Display (UID).

### USB Connectivity

A USB port on the back of the system allows the monitor to be connected to any PC. The connection allows for flash-upgrading of all embedded controller (OSD, Modular Power Supply, Video, LED Backlight, Smart Fan) firmware within the monitor, as well as access to system performance data and user-configurable settings. Monitor performance can be tailored or upgraded in the field without requiring return to the factory.

# GenStar LCD MONITORS

## 19" DISPLAY (Inquire about alternate configurations)

| Properties | 994 Series |
|---|---|
| Size (diagonal) | 19.0" |
| Viewing Area (W x H) | 14.82" x 11.85" |
| Resolution (pixels) | 1280 x 1024 |
| Number of Colors | 16.7 Million |
| LCD Backlight | Enhanced Edge-lit LED |
| Luminance (0° maximum) | 1390 Nits |
| Contrast (maximum) | 993:1 |
| Weber Contrast | 9.25 |
| Display Class | 5 |
| Response Time (rise/decay) | 5 ms (total) |
| Viewing Angle (horizontal – L/R) | ±88° |
| Viewing Angle (vertical – U/D) | ±88° |
| Shock[2] | 120 G, 2 ms ½ Sine Wave |
| Vibration[2] | 1.0 G (10–300 Hz) |
| Temperature, Operating | 0° to 50°C |
| Temperature, Storage | -20° to 60°C |
| Humidity, Operating | 5% to 90% RH Non-condensing |
| Humidity, Storage | 5% to 90% RH Non-condensing |
| Case Dimensions (H x W x D)[3] | |
| GenStar III | 17.00" x 19.50" x 6.50" |
| GenStar IV | 17.00" x 19.50" x 4.50" |
| Construction | 5052-H32 Aluminum: 0.090" Enclosure; 0.50" Milled Bezel |
| Finish | Black Matte Powder Coat and Clear Iridite® |
| Mounting | VESA Standard, 100 x 100 mm; ¼-20 x 0.31" Deep, 4 Places Rear and 4 Places Each Side |
| Weight, Operating | 23–24 Pounds |
| Weight, Shipping | 35–36 Pounds |
| Power Input (default) | 85–264 Vac, 47–63 Hz |



*Screenshot courtesy of Norman Chan/Shutterstock*

GenStar III 19.0
front and rear views

# GENSTAR LCD MONITORS

**21″ DISPLAY** (Inquire about alternate configurations)

| Properties | 809 Series | 858 Series | 995 Series | 996 Series |
|---|---|---|---|---|
| Size (diagonal) | 21.3″ | 21.3″ | 21.3″ | 21.3″ |
| Viewing Area (W x H) | 17.00″ x 12.76″ | 16.63″ x 13.30″ | 17.00″ x 12.76″ | 17.00″ x 12.76″ |
| Resolution (pixels) | 1600 x 1200 | 2560 x 2048 | 1600 x 1200 | 1600 x 1200 |
| Number of Colors | 16.7 Million | 1.07 Billion (10-bit) | 16.7 Million | 16.7 Million |
| LCD Backlight | OEM LED | OEM Edge-lit LED | Enhanced Edge-lit LED | Enhanced Direct-lit LED |
| Luminance (0° maximum) | 670/900 Nits (min./typ.) | 1000 Nits | 1200 Nits | 1900 Nits |
| Contrast (maximum) | >100:1 | 1300:1 | >1100:1 | >1100:1 |
| Weber Contrast | 6.56 | N/A | 14.61 | >13.77 |
| Display Class | 5 | N/A | >6 | >6 |
| Response Time (rise/decay) | 20 ms (total) | 12/13 ms | 20 ms (total) | 20 ms (total) |
| Viewing Angle (horizontal – L/R) | ±88° | ±88° | ±88° | ±88° |
| Viewing Angle (vertical – U/D) | ±88° | ±88° | ±88° | ±88° |
| Shock[2] | 30 G, 11 ms ½ Sine Wave | 30 G, 11 ms ½ Sine Wave | 30 G, 11 ms ½ Sine Wave | 30 G, 11 ms ½ Sine Wave |
| Vibration[2] | 1.2 G (5–100 Hz) | 1.2 G (5–100 Hz) | 1.2 G (5–100 Hz) | 1.2 G (5–100 Hz) |
| Temperature, Operating | 0° to 50℃ | 0° to 60℃ | 0° to 50℃ | 0° to 50℃ |
| Temperature, Storage | -20° to 60℃ | -20° to 60℃ | -20° to 60℃ | -20° to 60℃ |
| Humidity, Operating | 5% to 90% RH NC | 5% to 90% RH NC | 5% to 90% RH NC | 5% to 90% RH NC |
| Humidity, Storage | 5% to 90% RH NC | 5% to 90% RH NC | 5% to 90% RH NC | 5% to 90% RH NC |
| Altitude, Ceiling | 16,000 ft. | 35,000 ft. | 16,000 ft. | 16,000 ft. |
| Case Dimensions (H x W x D)[3] | | | | |
| GenStar III | 17.00″ x 19.50″ x 6.50″ | | | |
| GenStar IV | 17.00″ x 19.50″ x 4.50″ | | | |
| Construction | 5052-H32 Aluminum: 0.090″ Enclosure; 0.50″ Milled Bezel | | | |
| Finish | Black Matte Powder Coat and Clear Iridite® | | | |
| Mounting | VESA Standard, 100 x 100 mm; ¼-20 x 0.31″ Deep, 4 Places Rear and 4 Places Each Side | | | |
| Weight, Operating | 24–25 Pounds | | | |
| Weight, Shipping | 36–37 Pounds | | | |
| Power Input (default) | 85–264 Vac, 47–63 Hz | | | |
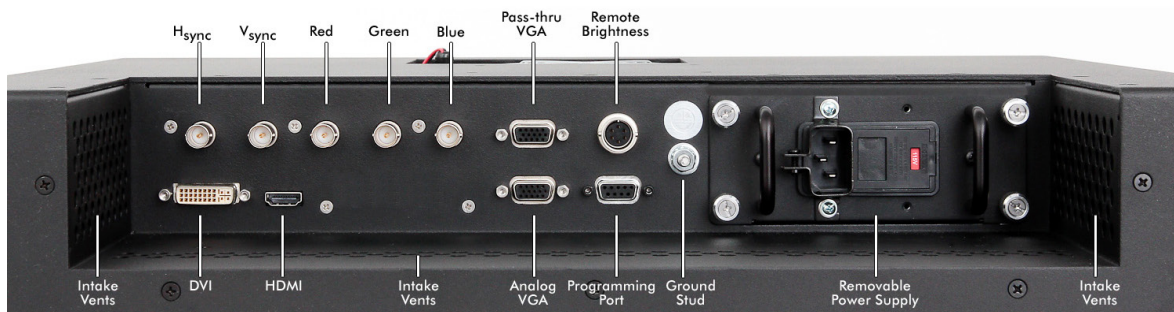


GenStar IV 19.0 & 21.3 recessed connector panel

# GENSTAR LCD MONITORS

## VIDEO CONTROLLER[4]

| Properties | 117 | 121 | 125 |
|---|---|---|---|
| Maximum Resolution @ Vertical Frequency | 1920 x 1200 WUXGA @ 60 Hz | 1920 x 1200 WUXGA @ 60 Hz | 3840 x 2160 4K UHD @ 30, 60 Hz |
| Video Inputs Supported[5, 6] | ARGB, DVI-D, HDMI | ARGB, Composite, DVI-I, S-Video | DisplayPort, DVI-I, HDMI (x3) |

## VIDEO STANDARDS SUPPORTED[5]

| Analog Computer Video | Digital Computer Video | Composite (Live) Video | HD Video |
|---|---|---|---|
| ARGB, RGB, Separate Sync, Composite Sync, Sync-On-Green, DVI-A, RS-343A (Optional), STANAG 3350 A / B / C (Optional) | DVI-D, HDMI | NTSC, PAL, SECAM, RS-170, S-Video, CCTV | HD-SDI, HDMI |

## CALIBRATION

| Properties | 117 | 121 | 125 |
|---|---|---|---|
| Interface | On-screen Displays Navigated by 8-button Membrane Pad | On-screen Displays Navigated by 8-button Membrane Pad | On-screen Displays Navigated by 8-button Membrane Pad |
| Functions | Brightness, Contrast, Saturation, Backlight Brightness, Input Signal, Aspect Size (Scaling), Image Position (Horizontal & Vertical), Utilities | Brightness, Contrast, Saturation, Hue, Sharpness, Backlight Brightness, Input Signal, Aspect Size (Scaling), Image Position (Horizontal & Vertical), Utilities | Volume, Brightness, Contrast, Saturation, Hue, Sharpness, Backlight Brightness, Display Mode, Input Signal, Aspect Size (Scaling), Information |
| Advanced | Picture-In-Picture (PIP), PIP Size, PIP Position, PIP Transparency, Auto Picture Setup, Auto Color Gain, Wide Screen Mode Detection, Manual Clock/Phase, Auto Source Seek, Auto Power Off, Video Standard, OSD (Position, Timeout, Language [English, Spanish, French, German, Chinese], Transparency, Display Input), Image Freeze, Image Zoom & Pan, Color Temperature, Hot Keys, Backlight Setup | Picture-In-Picture (PIP), PIP Size, PIP Position, PIP Transparency, Auto Picture Setup, Auto Color Gain, Wide Screen Mode Detection, Manual Clock/Phase, Auto Source Seek, Auto Power Off, Video Standard, OSD (Position, Timeout, Language [English, Spanish, French, German, Chinese], Transparency, Display Input), Image Freeze, Image Zoom & Pan, Color Temperature, Hot Keys, Backlight Setup, Image Orientation (Normal, Horizontal Flip, Vertical Flip, Rotate) | Image Rotate, Color Temperature, Gamma, Color Effect, Color Format, OSD (Position, Timeout, Language, Transparency, Rotate, Border Width, Border Color), Picture-In-Picture (PIP), Picture-By-Picture (PBP) |

## I/O CONNECTORS

| Power (DC) | On/Standby (DC) | Analog Video | Composite Video (Optional) | DisplayPort (Optional) | DVI (Optional) | HDMI (Optional) | Serial/Touch Screen (Optional) | Audio (Optional) |
|---|---|---|---|---|---|---|---|---|
| AC Socket (IEC)[7] | LED on Membrane Pad | High Density 15-pin Socket | BNC Socket | DisplayPort | DVI-D / DVI-I | HDMI, Type A | DE-9, Socket | 3.5 mm Headphone Jack |

Rear view of GenStar IV 21.3 mounted to pedestal

# GENSTAR LCD MONITORS

## OPTIONS & ACCESSORIES

General Digital provides an ample selection of options and accessories to complement your LCD monitor. A partial listing of popular choices is provided below. Please visit our Web site for more choices, or inquire with a Sales Engineer to discuss your specific requirements. Note that nearly all options and accessories are ordered separately, at additional cost.

### DISPLAY OVERLAY (Popular choices listed—contact General Digital for additional selections)

| DO Option No. | Description |
|---|---|
| 63 | 75% Solar Gray, 72 Gloss Etch, Antireflective Coating (One Side), Bonded to LCD |
| 74[8] | Clear Float Glass, 72 Gloss Etch, Antireflective Coating (One Side), Bonded to LCD |

### POWER SUPPLY[9] (Popular choices listed—contact General Digital for additional selections)

| PS Option No. | Input Voltage Range | Output | Frequency Range | Line Entry Module/Filter | Power Factor Correction |
|---|---|---|---|---|---|
| EA25 (Rear Mount) | 90–132 & 180–264 Vac | 140 W/+12 Vdc | 47–63 Hz | Yes | No |
| EA46 (Rear Mount) | 85–264 Vac | 140 W/+12 Vdc | 47–63 Hz | Yes | Yes |

### MISCELLANEA

| NVIS Compatibility | Night Vision displays in compliance with MIL-STD-3009 |
|---|---|
| Optical Enhancements | Bonding of filter and display using indice-matched optical materials; Brightness- and contrast-enhancing films and laminations |
| Power Supplies | AC and DC supplies; Various input ranges, input frequencies; Separate or attached; Power Factor Correction; AC and DC power cables |
| Video Accessories | Video cables; Signal extenders; Picture-In-Picture (PIP); Picture-By-Picture (PBP); NTSC ǀ PAL ǀ SECAM ǀ RS-170 ǀ S-Video ǀ DisplayPort ǀ DVI-D ǀ HD-SDI ǀ SD-SDI ǀ HDMI ǀ HD Component Support |
| Remote Control | IR or Serial calibration/control interface |
| Customization | Custom mechanical and electrical modifications; Custom finishing; Custom software and performance modifications; Private labeling |

Rear view of GenStar IV 21.3 mounted to cradle

# GENSTAR LCD MONITORS

Ambient Light Sensor



Backlight Brightness Potentiometer

BRIGHTNESS

FANS
TEMP
POWER

Tri-State Status LEDs

User Access Display

Backlit Silicone Keys

Ambient Light Sensor

GenStar IV key features

## FOOTNOTES

**1**  Available on GenStar IV 19.0 only.

**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.

**3**  Standard base enclosure dimensions listed. For a control drawing with complete dimensions, please contact a Sales Engineer.

**4**  Maximum video resolution listed. Speak with a Sales Engineer for a complete list of available resolutions.

**5**  Primary video inputs listed. Speak with a Sales Engineer about other video modes supported.

**6**  Although the video controllers can support multiple video inputs, space limitations may prevent access to certain connectors or routing of certain cables. Discuss your requirements with a Sales Engineer to devise a configuration that best suits your needs.

**7**  Default connector; specific configuration may require a different connector type.

**8**  Default overlay for all models.

**9**  Includes 6′7″ AC power cable.

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**GENERAL DIGITAL**
*Engineering What's Next*

**ISO 9001:2015 QUALITY MANAGEMENT SYSTEM CERTIFIED**

60 Prestige Park Road

East Hartford, Connecticut 06108

**Phone** 860.282.2900 | **Toll-Free** 800.952.2535

**E-mail** gdc_info@generaldigital.com

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