

SABER STANDALONE SOLAR 901D™

MIL-STD-901D-Compliant, High Brightness, Standalone/Mountable LCD Monitors



Unique among its peers, General Digital's **Saber Standalone Solar 901D Series** of rugged LCD monitors have been designed to satisfy the demanding needs of most military COTS (Commercial-Off-The-Shelf) applications.

General Digital's engineers have skillfully designed the packaging of the Saber Standalone Solar 901D Series to satisfy many military performance specifications, while simultaneously giving consideration to often overlooked installation, maintenance and support issues. Louvered ventilation holes

on the rear enclosures allow the monitors to satisfy a 45° drip test. General Digital

has also integrated a military-grade connector for power input. The power supply assemblies are mounted to the rear of the main enclosure to minimize the impact of heat dissipation upon the other electronics and also to serve as an LRU (Lowest Replaceable Unit). And, perhaps most importantly, these rugged monitors are compliant with MIL-STD-901D, Grade A and Class II Lightweight Shock requirements.

The internal display electronics feature General Digital's incomparable chassis monitor. The benefits to this design approach are numerous and distinctive. The chassis monitor serves as a fully functional subassembly and a logical LRU. The chassis monitor can be purchased in advance as a spare to facilitate field service or to expedite depot service. It can also be purchased directly from General Digital as needed. Since the chassis monitor is a high volume, standard product offering that is used on many of General Digital's other monitor designs, it is often available from stock. Service and support issues for the Saber Standalone Solar 901D Series are simplified since the core electronics are built upon a standard product platform.

The LCDs incorporate the latest in technological advances (ASV), offering super-wide viewing angles with greatly reduced color shifting and contrast loss when viewed at acute viewing angles. The internal LCD video controllers will support virtually any video source and afford many basic and advanced features. In addition, the controllers can be optionally configured to support NTSC, SECAM, PAL and RS-170, all using picture-in-picture window capability. We offer several models with both high brightness and NVG-compatible displays.

The power supply assemblies feature military-grade AC input modules and DC-DC converters that provide high operating temperatures, inrush current limiting and input transient protection.

The Saber Standalone Solar 901D Series can be configured with a variety of display overlays including vandal shields, optical filters or touch screens. Additionally, General Digital offers the services of its Optical Bonding Laboratories to bond the display overlays directly to the LCD for improved optical and environmental (shock, vibration, moisture) performance. As always, General Digital offers its experienced engineering services to all of its customers to further customize our enclosures or electronics.

Please feel welcome to consult a Sales Engineer for additional information, or visit www.GeneralDigital.com.

QUICK LOOK

ENCLOSURE

- » Military Grade, Compliant with MIL-STD-901D, Grade A and Class II Lightweight Shock Requirements
- » Designed with the Intent to Meet:
 - MIL-STD-108E
 - MIL-STD-167-1
 - MIL-STD-461E
 - MIL-STD-740-1
 - MIL-STD-740-2
 - MIL-STD-810F
 - MIL-STD-901D
- » Louvered Ventilation Holes
- » Robust 19" Rack Mount Bezel
- » Military-Grade AC Power Connector
- » Rugged, All-Metal Construction

DISPLAY

- » 15" to 24" Diagonal Active Matrix TFT LCDs
- » XGA (1024 x 768 pixels) to WUXGA (1920 x 1080 pixels) Resolution
- » Wide Viewing Angles (Horizontal & Vertical)
- » High Brightness and Contrast Enhance Display Quality

VIDEO CONTROLLER

- » Support for Interlaced and Non-Interlaced Video Sources
- » Support for Analog, Separate, Composite & Sync-On-Green, Digital Video Interface (DVI-D), Serial Digital Interface (SDI) Standards
- » Support for NTSC, SECAM, PAL, RS-170 Video Input
- » Resolutions to 1920 x 1200 @ 60 Hz; Sub-resolutions to 75 Hz
- » Intuitive On-screen Menus for Display Calibration and User's Control
- » Easy Access Programming Port to Implement Firmware Upgrades

POWER

- » 115 VAC Operation
- » MIL-STD-704A Input Transient Protection
- » Inrush Current Limiting
- » Low Power Consumption (<75 Watts)

OPTIONS

- » NVIS-Compatible Displays Compliant with MIL-STD-3009
- » Optical Enhancements
- » Protective Glass Display Overlay
- » Capacitive and Resistive Touch Screens
- » Support for DVI-D Video, HDMI Video, NTSC Video (Composite)
- » Enclosure/Connector Customization
- » Optical Bonding

Designed and Manufactured in the U.S.A.

DISPLAY

	Size (Diagonal)	Viewing Area (W x H)	Resolution (Pixels)	Number of Colors	Luminance (0° Max.)	Contrast (Max.)	Response Time (Rise/Decay)	Horizontal Viewing Angle	Vertical Viewing Angle	Shock [1]	Vibration [1]
SCMG-15X-989	15.0"	11.97" x 8.98"	1024 x 768	16.7 Million	600 Nits	600:1	3/5 ms	± 80°	± 80°	30 G, 11 ms ½ Sine Wave	1.0 G (5–100 Hz)
SNCMG-17W-956[3]	17.0"	13.30" x 10.64"	1280 x 1024	16.7 Million	932 Nits [2]	813:1 [2]	3.5/1.5 ms	± 85°	± 85°	50 G, 20 ms ½ Sine Wave	1.5 G (10–200 Hz)
SNCMG-19W-993[3]	19.0"	14.81" x 11.85"	1280 x 1024	16.7 Million	1000 Nits [2]	700:1 [2]	3.6/1.4 ms	± 85°	± 80°	50 G, 11 ms ½ Sine Wave	1.5 G (10–300 Hz)
SNGD-22D-987[3]	21.5"	18.77" x 10.56"	1920 x 1080	16.7 Million	1040 Nits [2]	7430:1 [2]	20/5 ms	± 89°	± 89°	50 G, 20 ms ½ Sine Wave	1.5 G (10–200 Hz)
SGD-24D-9014	24.0"	20.92" x 11.77"	1920 x 1080	16.7 Million	893 Nits [2]	3340:1 [2]	16/9 ms	± 89°	± 89°	50 G, 20 ms ½ Sine Wave	1.5 G (10–200 Hz)

1 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.

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

3 This model is equipped with a MIL-STD-3009 NVIS-compatible display.

VIDEO CONTROLLER [4]

ddd	Display Supported	Resolution/Frequency [5]							Scaling	NTSC / SECAM / PAL / RS-170	Video Supported
		640 x 480 VGA	800 x 600 SVGA	1024 x 768 XGA	1366 x 768 WXGA	1280 x 1024 SXGA	1600 x 1200 UXGA	1920 x 1200 WUXGA			
115 [6, 7]	All	60, 72, 75 Hz	56, 60, 72, 75 Hz	60, 70, 75 Hz	60 Hz	60, 75 Hz	60 Hz	60 Hz	On/Off	–	Separate, Composite, Sync-On-Green, DVI-D
117 [6]	All	60, 72, 75 Hz	56, 60, 72, 75 Hz	60, 70, 75 Hz	60 Hz	60, 75 Hz	–	60 Hz	On/Off	–	Separate, Composite, Sync-On-Green, DVI-D
121 [6]	All	60, 72, 75 Hz	56, 60, 72, 75 Hz	60, 70, 75 Hz	60 Hz	60, 75 Hz	–	60 Hz	On/Off	Digital Processor, Picture-In-Picture	Separate, Composite, Sync-On-Green, DVI-D

4 Most common video inputs listed. See below for a comprehensive list of supported video standards. Speak with a Sales Engineer for more information.

5 Most common video modes listed. Other video modes supported. Speak with a Sales Engineer for more information.

6 Supports advanced features such as Live Video, Picture-In-Picture (multiple user-selectable sizes), and Picture-By-Picture.

7 Video controller 115 is obsolete and shown for reference only.

VIDEO STANDARDS SUPPORTED All Models

Analog Computer Video	Digital Computer Video	Composite (Live) Video	HD Video	Others
VGA, SVGA, ARGB, RGB, Separate Sync, Composite Sync, Sync-On-Green, DVI-A, STANAG 3350 A / B / C	DVI-D, DVI-I, SD-SDI, HD-SDI	NTSC, PAL, SECAM, RS-170, S-Video, CCTV	HD-SDI, HDMI	CGI, CCI, EGA, RS-343A, EIA-343A, Custom Sync

CALIBRATION All Models

ddd	Interface	Functions	Advanced
115 [7]	On-screen Displays Navigated by 8-button Membrane Pad	Volume, Brightness, Contrast, Saturation, Hue, Sharpness, Input Signal, Aspect Size (Scaling), Image Position (Horizontal & Vertical), Utilities	Auto Source Seek, Auto Picture Setup, Auto Color Gain, Auto Power Off, Picture-In-Picture, Color Temperature, Hot Keys, OSD (Position, Timeout, Language [English, Chinese], Transparency), Manual Clock & Phase, Video Standard, Image Orientation, Gamma
117	On-screen Displays Navigated by 8-button Membrane Pad	Brightness, Contrast, Saturation, Backlight Brightness, Input Signal, Aspect Size (Scaling), Image Position (Horizontal & Vertical), Utilities	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
121	On-screen Displays Navigated by 8-button Membrane Pad	Brightness, Contrast, Saturation, Hue, Sharpness, Backlight Brightness, Input Signal, Aspect Size (Scaling), Image Position (Horizontal & Vertical), Utilities	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)

MTBF

	Display	LED Backlight [8]	LED Controller	Power Supply (Optional)
SCMG-15X-989	50,000 Hours (Minimum)	70,000 Hours (Minimum)	182,000 Hours (Minimum)	Depends on Supply Selected
SNCMG-17W-956[3]	50,000 Hours (Minimum)	50,000 Hours (Minimum)	182,000 Hours (Minimum)	Depends on Supply Selected
SNCMG-19W-993[3]	50,000 Hours (Minimum)	50,000 Hours (Minimum)	182,000 Hours (Minimum)	Depends on Supply Selected
SNGD-22D-987[3]	50,000 Hours (Minimum)	50,000 Hours (Minimum)	182,000 Hours (Minimum)	Depends on Supply Selected
SGD-24D-9014	50,000 Hours (Minimum)	50,000 Hours (Minimum)	182,000 Hours (Minimum)	Depends on Supply Selected

8 The hours for LED Backlight refer to the half-life of the backlight; that is, the point at which the LEDs reach half of their original brightness. *It does not indicate the life expectancy of the backlight.*

9 Represents typical half-brightness life expectancy when operated at maximum brightness; life expectancy will increase if operated below maximum brightness.

ENVIRONMENTAL

	Temperature, Operating	Temperature, Storage	Humidity, Operating	Humidity, Storage	Altitude, Operating	Altitude, Storage
SCMG-15X-989	-20° C to 70° C	-30° C to 80° C	8% to 90% RH Non-condensing	8% to 90% RH Non-condensing	10,000 Feet	30,000 Feet
SNCMG-17W-956[3]	-30° C to 85° C	-30° C to 85° C	8% to 90% RH Non-condensing	8% to 90% RH Non-condensing	10,000 Feet	30,000 Feet
SNCMG-19W-993[3]	-30° C to 85° C	-30° C to 85° C	8% to 90% RH Non-condensing	8% to 90% RH Non-condensing	10,000 Feet	30,000 Feet
SNGD-22D-987[3]	0° C to 50° C	-20° C to 60° C	10% to 90% RH Non-condensing	10% to 90% RH Non-condensing	10,000 Feet	30,000 Feet
SGD-24D-9014	0° C to 50° C	-20° C to 60° C	5% to 90% RH Non-condensing	5% to 90% RH Non-condensing	10,000 Feet	30,000 Feet

MECHANICAL

	Dimensions (H x W x D)	Construction	Finish	Mounting Holes	Weight, Operating [10]	Weight, Shipping [10]
SCMG-15X-989	12.50" x 15.00" x 2.50"	5052-H32 Aluminum	Black Matte Powder Coat	VESA Standard, 75 & 100mm, 4 places (x2), rear	15 Pounds	20 Pounds
SNCMG-17W-956[3]	13.50" x 16.00" x 2.75"	5052-H32 Aluminum	Black Matte Powder Coat	VESA Standard, 75 & 100mm, 4 places (x2), rear	16 Pounds	21 Pounds
SNCMG-19W-993[3]	15.00" x 17.75" x 2.84"	5052-H32 Aluminum	Black Matte Powder Coat	VESA Standard, 100mm, 4 places (x2), rear	19 Pounds	29 Pounds
SNGD-22D-987[3]	14.25" x 21.75" x 3.00"	5052-H32 Aluminum	Black Matte Powder Coat	VESA Standard, 100mm, 4 places (x2), rear	24 Pounds	34 Pounds
SGD-24D-9014	17.50" x 22.00" x 3.19"	5052-H32 Aluminum	Black Matte Powder Coat	VESA Standard, 100mm, 4 places (x2), rear	25 Pounds	35 Pounds

10 Add 2 pounds to the weight when a Separate Power Supply is included.

OPTIONS

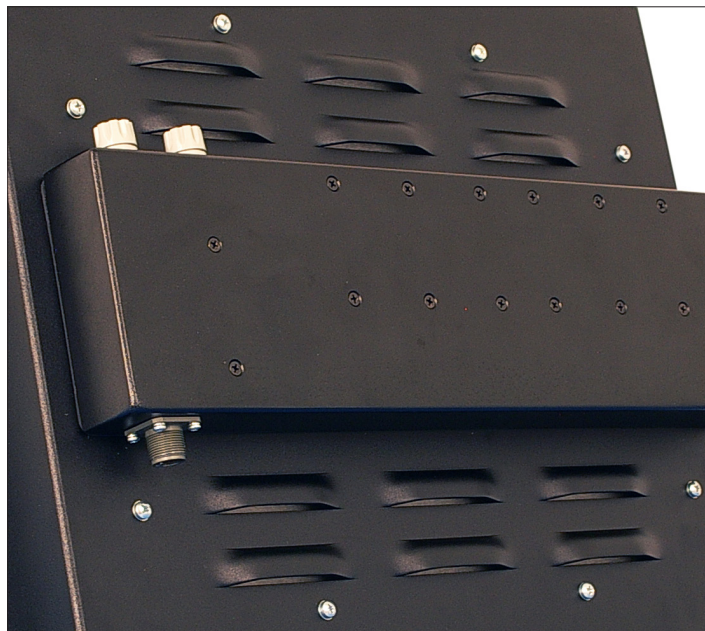
All Models (Ordered separately — Please inquire with a Sales Engineer for additional options and accessories)

INDUSTRIAL ENCLOSURE

ff	Description
00	None
33	Military-Grade Enclosure, Aluminum, Black Powder Coat Finish

DISPLAY OVERLAY (Other overlays available — Please inquire with a Sales Engineer)

gg	Description	gg	Description
00	None	35	Capacitive Touch Screen, Ideal Etch
02	Clear Float Glass, Antiglare Etch Two Sides	51	Resistive Touch Screen
04	Clear Float Glass, Antireflective Coating Two Sides	65	Resistive Touch Screen, 5-Wire, with Laminated ITO Glass
21	Vandal Shield, Polycarbonate or Acrylic		
23	Vandal Shield, Clear Float Glass, Antiglare Etch Two Sides, 2 Panes Bonded (Laminated) Together (Not Bonded to LCD)		
24	Vandal Shield, Soda Lime Glass, Chemically Strengthened (Tempered), Antireflective Coating Two Sides		



Louvered ventilation holes on rear of enclosure

OPTIONS All Models (Ordered separately – Please inquire with a Sales Engineer for additional options and accessories)

POWER SUPPLY [11]

hijj	Input Voltage Range	Screen Size			Frequency Range	Line Entry Module/Filter	Power Factor Correction
		15.0"/17.0"/19.0"	21.5"	24.0"			
EP01 (Rear Mount)	85–264 VAC	50 W/+12 VDC (15" Only)	–	–	47–63 Hz	Yes	0.95
EP02 (Rear Mount)	85–264 VAC	75 W/+12 VDC	–	–	47–63 Hz	Yes	0.95
EP03 (Rear Mount)	85–264 VAC	100 W/+12 VDC	–	–	47–63 Hz	Yes	0.95
EP07 (Rear Mount)	85–264 VAC	–	150 W/+12 VDC	150 W/+12 VDC	47–63 Hz	Yes	0.99
IA04 (Internal)	85–132, 170–264 VAC	–	100 W/+12 VDC	–	47–63 Hz	Yes	–
SA30 (Separate)	90–264 VAC	–	–	–	47–63 Hz	–	–
SP31 (Separate)	90–264 VAC	100 W/+12 VDC	100 W/+12 VDC	–	47–63 Hz	–	0.95
90-186 (Separate) [12]	90–264 VAC	–	–	–	47–63 Hz	–	–
0092 (None)	+12 VDC	–	–	–	–	–	–

11 Includes 67" AC Power Cable.

12 Must be ordered as a separate line item.

OTHER

NVIS Compatibility	Night Vision Displays Compliant to MIL-STD-3009
Sunlight Readable LCDs	High Brightness Displays to 1000+ Nits
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, NTSC/PAL/SECAM/RS-170/S-Video/DVI-D/HD-SDI/ SD-SDI/HDMI/HD Component Support, Picture-In-Picture, Picture-By-Picture
Remote Control	IR or Serial Calibration/Control Interface
Customization	Custom Mechanical and Electrical Modifications; Custom Finishing; Custom Software and Performance Modifications; Private Labeling

MODEL NUMBER CONFIGURATOR [13]

Model Style	Size & Resolution (aab)	Display (cccc)	Video Controller (ddd)	Keyboard/Pointer (ee)	Industrial Enclosure (ff)	Display Overlay (gg)	Power Supply (hijj)
SCMG-	15X-	989-	###-	00-	##-	##-	####
SNCMG-	17W-	956-	###-	00-	##-	##-	####
SNCMG-	19W-	993-	###-	00-	##-	##-	####
SNGD-	22D-	987-	###-	00-	##-	##-	####
SGD-	24D-	9014-	###-	00-	##-	##-	####

13 The hashtags (#) indicate customer-defined values.

ORDERING

Model Number [14]	Description
SCMG-15X-989- ddd-00-ff-gg-hijj	Saber Standalone Solar 901D 15.0, MIL-STD-901D Compliant Sunlight Readable 15.0" XGA Standalone/Mountable LCD Monitor
SNCMG-17W-956- ddd-00-ff-gg-hijj	Saber Standalone Solar 901D 17.0, MIL-STD-901D Compliant Sunlight Readable Night Vision Goggle-Compatible 17.0" SXGA Standalone/Mountable LCD Monitor [3]
SNCMG-19W-993- ddd-00-ff-gg-hijj	Saber Standalone Solar/NVIS 901D 19.0, MIL-STD-901D Compliant Sunlight Readable Night Vision Goggle-Compatible 19.0" SXGA Standalone/Mountable LCD Monitor [3]
SNGD-22D-987- ddd-00-ff-gg-hijj	Saber Standalone Solar 901D 21.5, MIL-STD-901D Compliant Sunlight Readable Night Vision Goggle-Compatible 21.5" WUXGA Standalone/Mountable LCD Monitor [3]
SGD-24D-9014- ddd-00-ff-gg-hijj	Saber Standalone Solar 901D 24.0, MIL-STD-901D Compliant Sunlight Readable 24.0" WUXGA Standalone/Mountable LCD Monitor

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

Silicone keypad close-up showing individual buttons for Daylight Mode and NVIS Mode

