

3500/94M VGA Display

Product Datasheet

Bently Nevada* Asset Condition Monitoring



Description

The 3500/94M VGA Display uses a standard color VGA monitor with Touch Screen technology to display 3500 data. This product has three components, the 3500/94M VGA Display module and its I/O module, and the VGA display monitor. The display monitor, with standard cabling, can be mounted up to 6.1 m (20 ft) from the rack.

The 3500/94M displays all 3500 Machinery Protection System information, including:

- System Event List
- Alarm Event List
- All module and channel data
- Current alarm data (quick view)
- Nine custom display options.

All are accessed through the Touch Screen.

The 3500/94M modules are configured through the 3500 Rack Configuration Software. You can configure nine custom screens. By default, one bargraph screen shows all of the 1X measurements, while another shows the Gap values. Custom screens may be organized into machine train groupings. You can organize system data into any pages on the custom screen.

Multiple Rack Feature

Selecting the 3500/94M Display Router Box provides an additional viewing feature. This feature allows you to view up to four racks with one display. Each rack must be individually viewed, and the rack address and alarm status of each rack may be shown in the upper right corner of the screen. The Display Router Box must be located within 6 m (20 ft) of each 3500 rack.



Display Monitors

Bently Nevada LLC offers two approved display monitor types, which will properly interface to the 3500/94M VGA modules. Each display is intended to meet different application requirements. It is important that you make the right selection for your application. Each display requires a separate power supply.

As an option, the KVM Extender may be selected for remote viewing at distances up to 305 m (1000 ft). Picture quality can be adjusted by using a PS/2 Keyboard (not supplied) with instructions from the 3500/94M manual. Electrically noisy environments can also negatively impact picture quality. Therefore, you should avoid using the KVM Extender unless the standard cable length is not adequate.

All display monitors use Touch Screens. Because the Touch Screen controllers differ, you must configure each display monitor type using the 3500 Rack Configuration Software.

Specifications

3500/94M VGA Display Unit

Inputs	
Power consumption	4.6 watts max.
High-speed network	Monitor status, data and values
RS232 port (I/O)	Touch controller data

Outputs	
OK LED	Indicates proper operation of the module
TX/RX LED	Indicates communications between other system modules
VGA port (I/O)	Analog red, green, blue and sync signals to the display
Front Port	24 Vdc Power out, VGA signal out, Touch commands in.

Environmental Limits

Operating Temperature	-20 °C to 65 °C (-22 °F to 149 °F)
Storage Temperature	-40 °C to 85 °C (-40 °F to 185 °F)
Humidity	95%, noncondensing

Compliance and Certifications


Electromagnetic Compatibility (EMC)


Standards	EN 61000-6-2 Immunity for Industrial Environments EN 61000-6-4 Emissions for Industrial Environments
European Community Directives	EMC Directive 2014/30/EC

Electrical Safety

Standards	Conforms to: CSA C22.2 61010-1, UL EN 61010-1
European Community Directives	LV Directive 2014/35/EU



 **WARNING**


 **EXPLOSION HAZARD**

Refer to User Manual **BEFORE** making connections.

DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNÉ NON DANGEREUX.


Hazardous Area Approvals

 For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, document 108M1756, at www.GEmeasurement.com



NOTE

The following approvals apply to the 3500/94M monitor, its I/O module, and the 3500/94M Display Router Box.

3500/94M Module

North America	
Approval Option (01)	<p>Canada Ex nC [L] IIC T4 Gc: Certified to CSA60079-0, -11, -15</p> <p>Class I, Division 2, Groups A, B, C and D: Certified to CSA213</p>
	<p>USA Class I, Zone 2: AEx nC IIC T4 Gc: Conforms to: UL60079-0, -11, -15</p> <p>Class I, Division 2, Groups A, B, C and D: Conforms to ISA 12.12.01</p> <p>T4 @ -20 °C ≤ Ta ≤ +65 °C (-4 °F ≤ Ta ≤ +149 °F) Per control drawing 149243</p>
ATEX/IECEX	
Approval Option (02)	<p> II 3 G Ex nA nC ic IIC T4 Gc</p> <p>T4 @ -20 °C ≤ Ta ≤ +65 °C (-4 °F ≤ Ta ≤ +149 °F) Per control drawing 149243</p>

3500/94M VGA Display

North America	
Approval Option (01)	<p>Canada Ex ic nA IIC T4; Certified to CSA C22.2 60079-0,-11,-15</p> <p>Class I, Division 2, Groups A, B, C, D T4; Certified to CSA C22.2 213</p>
	<p>USA Class I, Division 2, Group A, B, C, D T4; Conforms to: ISA 12.12.01</p> <p>Class I, Zone 2, AEx ic nA IIC T4; Conforms to: UL60079-0, -11, -15</p>
ATEX/IECEX	
Approval Option (02)	<p>  II 3G Ex ic nA IIC T4 Gc; -20°C ≤ Ta ≤ +65°C ITS16ATEX401429X</p> <p>Ex ic nA IIC T4 Gc; IP54; -20°C ≤ Ta ≤ +65°C IECEX ETL 16.0046X</p>

Physical

3500/94M VGA Display Module

Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 241.8 mm (9.5 in x 0.96 in x 9.52 in)
Weight	0.73 kg (1.6 lb.)

I/O Module

Dimensions (Height x Width x Depth)	241.3 mm x 24.4 mm x 99.1 mm (9.50 in x 0.96 in x 3.90 in)
Weight	0.34 kg (0.75 lb.)

FPM-8151 15" Display

Dimensions (Height x Width x Depth x Diagonal)	422 mm x 338 mm x 68 mm x 381 mm 16.61 in x 13.31 in x 2.68 in x 15 in
Weight	8.5 kg (18.75 lb.)

ANA-D3510-100-A1 10" Display

Dimensions (Height x Width x Depth x Diagonal)	158 mm x 211 mm x 48 mm x 267 mm 6.2 in x 8.3 in x 1.9 in x 10.5 in
Weight	4.0 kg (8.78 lb.)

Rack Space Requirements

Monitor Module


Rack Space	1 full-height front slot
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I/O Module

Rack Space	1 full-height rear slot
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KVM Extender

Mounting	Shelf top
Power Input	12 Vdc and 5 Vdc
Agencies	UL certification for North America only
Temperature Range	0 °C to 45 °C (32 °F to 113 °F)
Humidity	80%, noncondensing
Class I, Division 2	Only the KVM Extender Receiver is Approved for Class I, Division 2 hazardous areas in North America only. The Transmitter must be installed in a Safe Area, or enclosed in a purged housing.
NEMA 4X	Not approved

 Refer to the 3500/94M System Display Hazardous Area Installation Guide, 117M8750, for details.

 KVM Extender picture quality can be adjusted as already noted on [page 2, under "Display Monitors."](#)

3500/94 Display Router Box

Inputs

Power +24vdc +/- 6%	4.7 watts max
Input range	22.5 to 25.5 Vdc input
VGA inputs (4)	Video image
RS232 inputs (4)	Touch controller data

Outputs

OK Status LED	Indicates proper operation
VGA Output (1)	Video image
RS232 Output (1)	Touch control data

Ordering Considerations

The 3500/94M requires the following (or later) firmware and software revisions:

3500/94M Firmware	4.06, Rev. C
3500/01 Software (Rack Config)	Rev 5.6
3500/02 Software (Op Display)	Rev 2.21
3500/03 Software (Data Aqu)	Rev 1.22

The recommended display monitor options are the 15" Advantech FPM-8151H or the 10" ANA-D3510-100-A1. These space-saving and durable displays are designed for excellent viewing quality in industrial applications.

The Display Router Box, which allows one display to serve up to 4 racks, may be used to reduce the number of displays required. When connected, the Display Router Box allows the operator to view all racks by switching between them (note that only one rack can be viewed at a time). All 3500 racks must be located within 20 ft of the Display Router Box.

We recommend locating the display within 20 feet of the 3500 rack as the video driver circuit is optimized for this range. Cabling lengths greater than 20 feet will degrade the picture quality. When an application requires an extension, the KVM Extender may be used.

The KVM Extender will reduce picture quality to some degree, although typically the quality of the picture image will still be acceptable. The KVM Extender must be used indoors. The receiver is rated for Class I, Division 2 hazardous areas, but

the transmitter isn't - so it must be installed in a safe area, or enclosed in a purged housing.

Ordering a Display Router Box

AA option 07 is for the Display Router Box. To order multiple racks with one display, do the following:

1. The first rack should get a router box with router cable (PN# 3500/94M-07-12-XX) – includes router power supply cable.
2. The second rack should be a display with router cable (PN# 3500/94M-(02 to 06)-12-XX) – includes display power cable and power supply.
3. The third and fourth racks should be no display with router cable (PN# 3500/94M-00-12-XX).

The various types of installation are shown graphically. Refer to [Figure 4 on page 11](#)

NOTE

Each 3500 rack requires both a 3500/94M VGA module and associated I/O card. Because of this requirement, each AA option is structured to automatically include these components.

Ordering Information



For the detailed listing of country and product specific approvals, refer to the **Approvals Quick Reference Guide**, document 108M1756, at www.GEmeasurement.com

System Display 3500/94M-AA-BB-CC

AA: Display Size & Mounting:

- 00** None
- 01** 10" Display, Face Mount
- 02** 10" Display, 19" Rack Mount
- 03** 10" Display, Panel Mount (installation hardware included)
- 04** 10" Display, Independent Mount
- 05** 15" Display, 19" Rack Mount
- 06** 15" Display, Panel Mount (installation hardware included)
- 07** Router Box, No Display

BB: KVM Extender & Router Box Cables

- 00** None
- 01** KVM Extender with 250 ft Cable
- 02** KVM Extender with 500 ft Cable
- 03** KVM Extender with 1000 ft Cable
- 12** 20 ft Cable for Router Box

CC: Agency Approvals

- 00** None
- 01** CSA/NRTL/C (Class I Division 2)
- 02** Multi (CSA/ATEX/IECEX)

Accessories and Spares

122M3217	3500/94M Datasheet
122M3218	3500/94M Manual
184826-01	3500/94M Main module
190214-01	3500/94M Normal I/O module
190214-02	3500/94M Power-only I/O module for front-mount display
148637-01	VGA male-female extension cable 20 ft
148638-02	DB9 male-female straight through extension serial touch cable 25 ft
102M8950	FPM-8151, Class I, Division 2, 15" Advantech Display
120M8155-01	ANA-D3510-100-A1, Class I, Division 2, 10" Advantech Display
107M3696-01	Rack Mounted Cable from front of 3500/94M to the Advantech Display, 3 ft
149356-01	Display Router Box
149710-20-AA	Split digital cable for the Display Router Box, 20 ft
	AA: Connector Options 00 Assembled I/O Connector 01 Unassembled I/O Connector
161087-20-00	VGA male-male cable for the Display Router Box, 20 ft (6.1 Meters)
02200794	24 vdc Power Supply, DIN mount, no cable
119M6509-AA	Industrial DC Power Supply to Display, 10 ft
	AA: Connector Option 01 Connector J1 (10" Advantech Display) 02 Connector J2 (15" Advantech Display & RS Power Station) 03 Connector J3 (94M power I/O module) 04 Power cable to 3500/94 Router Box, 10 ft
104M3812-AA	19" EIA mounting plate for the FPM-8151H 15" Display (9U rack mount) 01 RAL 7032 (Pebble Gray) 02 RAL 7035 (Light Gray)

122M3368-01	94M Face Mount for 10" Advantech Display
122M3369-01	94M Rack Mount for 10" Advantech Display
122M3370-01	94M Panel Mount for 10" Advantech Display
122M3371-01	94M Independent Mount for 10" Advantech Display
121M4458-25	94M Display Cable – DB9 with boot for IP54 ingress protection, 25 ft
121M4459-25	94M Display Cable – HDB15 VGA with boot for IP54 ingress protection, 25 ft
123M3410-01	3500/94M KVM Extender
	Transmitter Pepperl+Fuchs CPU KVM: SK-KVM-CPU-NR- 20-CR-N 5 Vdc power supply and P/S 2 cable for KVM Transmitter Note: The KVM transmitter is NOT rated for hazardous area installations, although the receiver is.
148350-AAAA	Receiver Pepperl+Fuchs MON KVM: SK-KVM-MON-NR-20-CR-N, Class I, Division 2 TDK-Lambda DPP30-12 power supply for KVM Receiver, Class I, Division 2 Cable mounting bracket Class I Div 2
	0250 CAT5 cable 250 Foot PVC 0500 CAT5 cable 500 Foot PVC 1000 CAT5 cable 1000 Foot PVC

Display Monitor Specifications

ANA-D3510-100-A1

Size	10" diagonal
Type	LCD
Industrial hardened	Yes
Mounting Styles	Face mount 19" Rack mount Panel mount Independent mount
Power	24 Vdc typical 10 Vdc to 28 Vdc max DC Supply included
Agencies	CE, UL, CUL
IP65	Yes, when used with IP54 cables
Class I, Div 2	Yes
ATEX/IECEX	Yes
Temperature	0 to 65°C for full unit. -20 °C to +65 °C for See notes.
Humidity	10% to 85% RH non-condensing
Touch Interface	GFG Resistive Touch Screen
Manufacturer	Advantech
Dimensions (W x H x D) inches	15.25 x 9.8 x 1.93 Panel cutout size 14.0 x 9.5
Display Size inches	6.45 x 8.5 (10.5 diagonal)
Weight Shipping	3.98 kg (8.75 lb)
Warranty	1 year
Notes	Recommended for industrial use. Best fit for most applications.. Housing is rated to IP54 ingress protection against dust and water spray.

FPM-8151

Size	15" diagonal
Type	LCD
Industrial hardened	Yes
Mounting Styles	Panel mount Or

	19" Rack mount
Power	20 Vdc, 57 W. DC Supply included
Agencies	CE, UL
Class 1, Div 2	Yes
Temperature	0 to 60 °C operation temperature
Humidity	95% RH
Touch Interface	Resistive
Manufacturer	Advantech
Dimensions (W x H x D) inches	16.61x13.31x2.68. Panel cutout 15.59 X 11.65 (wh)
Display Size inches	9 x 12 (15 diagonal)
Weight Shipping	7.80 kg (17.2 lb) 10.0 kg (22 lb)
Warranty	2 years
Notes	Recommended for industrial use. Best fit for most applications. The minimum temperature rating is 0 °C for the electrical components on the rear of the display. When the screen and bezel is to be exposed to temperatures below 0 °C, a heated enclosure is required for the rear components.

Graphs and Figures

The figures in this section show required components and ordering options for various installations. In addition to the various AA, BB and CC "dash options" that are selected, all purchasing options automatically include a 3500/94M VGA Display Module and appropriate I/O Module.

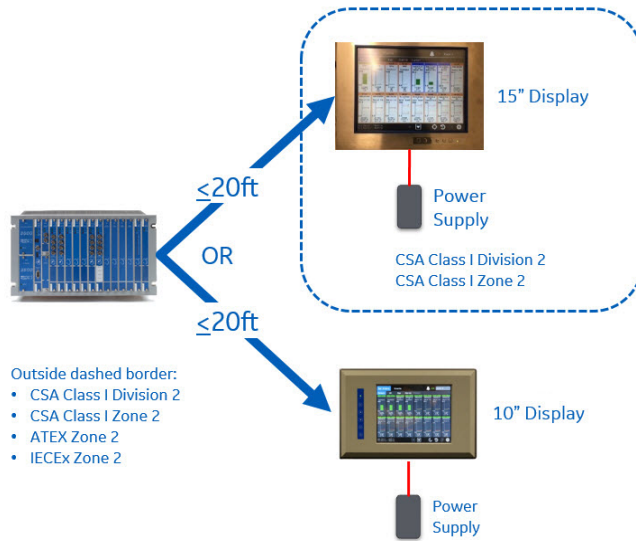
Options are structured as 3500/94M-AA-BB-CC, where AA = Display Size & Mounting, BB = KVM Extender, Router Box & Cables, and CC = Agency Approvals. Separate components are also available individually, and are listed in the Accessories and Spares section of this datasheet.



- CSA Class I Division 2
- CSA Class I Zone 2
- ATEX Zone 2
- IECEx Zone 2

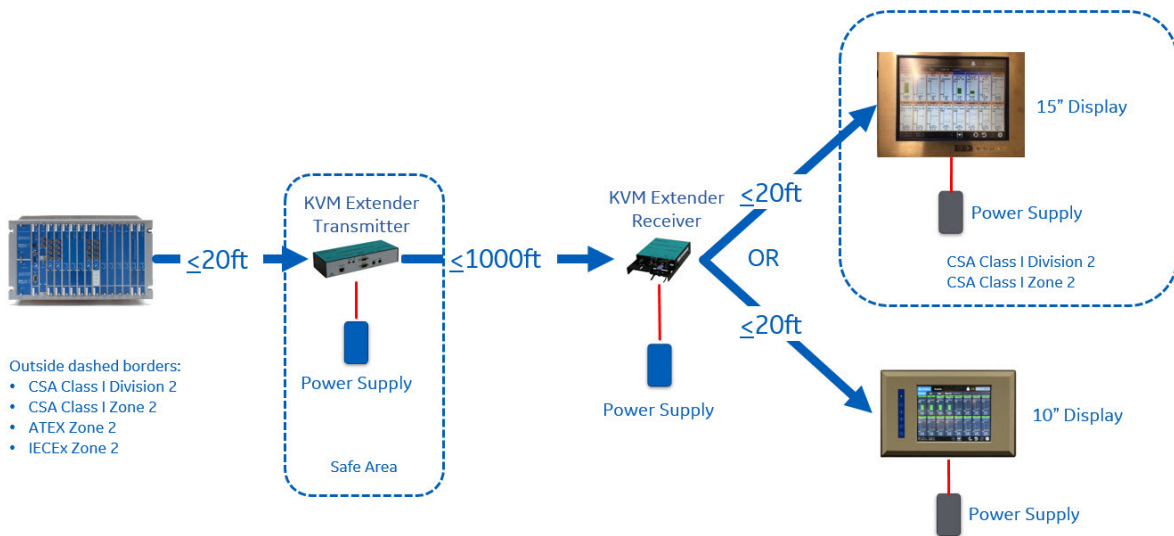
Ordering Option	Description
3500/94M-01-00-00	10" display with hinged face mount for EIA 19" rack

Figure 1: Single Rack with 10" Face Mount Display



Ordering Option	Description
3500/94M-02-00-(00/01/02)	10" display for mounting in 19" EIA rack
3500/94M-03-00 (00/01/02)	10" display, panel mount (installation hardware included)
3500/94M-04-00-(00/01/02)	10" display with independent mounting hardware
3500/94M-05-00-(00/01)	15" display for mounting in EIA 19" Rack
3500/94M-06-00-(00/01)	15" display, panel mount (installation hardware included)

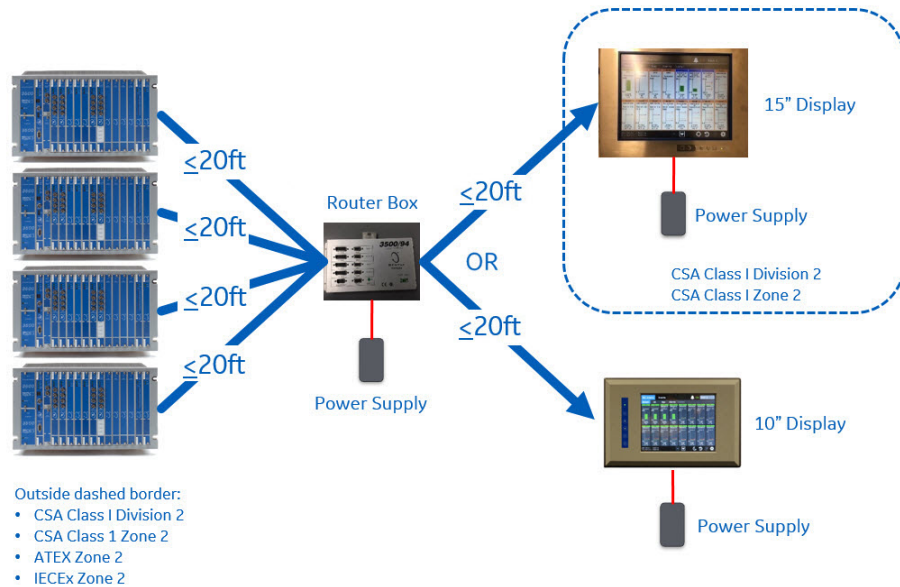
Figure 2: Single Rack with 10" or 15" Remote Display



Ordering Option	Description
3500/94M-02-(01/02/03)-(00, 01 ♦)	10" display for mounting in 19" EIA rack, and KVM extender with either 250, 500, or 1000 ft cable
3500/94M-03-(01/02/03)-(00, 01 ♦)	10" display, panel mount (installation hardware included) and KVM extender with either 250, 500, or 1000 ft cable
3500/94M-04-(01/02/03)-(00, 01 ♦)	10" display with independent mounting hardware and KVM extender with either 250, 500, or 1000 ft cable
3500/94M-05-(01/02/03)-(00, 01 ♦)	15" display for mounting in EIA 19" Rack and KVM extender with either 250, 500, or 1000 ft cable
3500/94M-06-(01/02/03)-(00, 01 ♦):	15" display, panel mount (installation hardware included) and KVM extender with either 250, 500, or 1000 ft cable

♦ Engineering approval is required for Class I Division 2 KVM Extender Installations. ATEX/IECEx approval is NOT available for the KVM Extender.

Figure 3: Single Rack with KVM Extender



First Rack Option - Router Box

Ordering Option	Description
3500/94M-07-12-(00/01/02)	Router box and rack-to-router cables

Second Rack - Display Options

Ordering Option	Description
3500/94M-02-12-(00/01/02)	10" display for mounting in 19" EIA rack, and required cables
3500/94M-03-12-(00/01/02)	10" display, panel mount (installation hardware and required cables included)
3500/94M-04-12-(00/01/02)	10" display with independent mounting hardware, and required cables
3500/94M-05-12-(00/01)	15" display for mounting in EIA 19" Rack, and required cables
3500/94M-06-12-(00/01)	15" display, panel mount (installation hardware and required cables included)

Additional Racks - Router Cables

Ordering Option	Description
3500/94M-00-12-(00/01/02)	Rack-to-router cable

Figure 4: Multiple Racks with Router Box

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