

3500/94M VGA Display Monitor

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, its associated I/O module, and the VGA display monitor. The display monitor, with standard cables, 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 of this information is accessed through the Touch Screen.

The 3500/94M modules are configured through the 3500 Rack Configuration Software. You can configure up to nine custom screens. By default, one bargraph screen shows all of the 1X-filtered vibration measurements, while another shows the proximity transducer 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

The optional 3500/94M Display Router Box allows you to view up to four separate 3500 racks with one display. Each rack must be viewed individually, 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 connected 3500 rack.



VGA Touch Screen Displays

We offer two compatible display units, one with 15" (diagonal) screen and one with 10" (diagonal) screen. Either unit will properly interface to the 3500/94M VGA modules. The display units are intended to meet different application requirements, so it is important to select the display that is most appropriate for your application. Each display requires a separate power supply.

The optional KVM Extender allows installing a display unit up to 305 m (1000 ft) from the 3500 rack, for remote access to the data. Image quality is degraded somewhat with such a long cable run, but it can be optimized by using a PS/2 Keyboard (not supplied) per instructions in the 3500/94M manual, 122M3218. Electrically noisy environments can also negatively impact image quality. Therefore, you should avoid using the KVM Extender unless the standard cable length is not adequate.

Both the 15" and the 10" displays use Touch Screens for user interface. Because the Touch Screen controllers differ, the 3500 Rack Configuration Software accommodates the specific configuration of both types of display.

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.
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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/EU

Electrical Safety

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

**CAUTION**

**HAZARDOUS VOLTAGE**
To prevent shock do not remove cover. No user serviceable parts inside.

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 DESIGNE 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 VGA Display Module

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

10" Advantech ANA-D3510 Display

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

Note: The FPM-8151 15" Display does NOT have hazardous area approval.

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)	422 mm x 338 mm x 68 mm 16.61 in x 13.31 in x 2.68 in
Display Screen (Diagonal)	381 mm (15 in)
Weight	8.5 kg (18.75 lb)

ANA-D3510-100-A1 10" Display

Dimensions (Height x Width x Depth)	249 mm x 389 mm x 48 mm 9.8 in x 15.3 in x 1.9 in
Touch Screen (Diagonal)	267 mm (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	The KVM Extender Receiver is Approved for Class I, Division 2 hazardous areas in North America. The KVM Extender Transmitter does NOT have hazardous area approval, so it must be installed in a Safe Area, or enclosed in an approved enclosure (such as a purged housing or cabinet).
NEMA 4X	Not approved



Refer to the 33500/94M VGA Display Module Operation and Maintenance Manual, 122M3218, for details on installation in a hazardous area.

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 Screen control data

Outputs

OK Status LED	Indicates proper operation
VGA Output (1)	Video image
RS232 Output (1)	Touch Screen 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 VGA Touch Screen display options are the 15" Advantech FPM-8151H and the 10" ANA-D3510-100-A1. These compact, durable displays are designed for excellent viewing quality in industrial applications.

The Display Router Box, which allows one display to serve up to four 3500 racks, may be used to reduce the number of displays required. When connected, the Display Router Box allows the operator to view data from all racks by switching between them (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 image quality. When an application requires locating the display remotely, the KVM Extender accommodates display distances up to 305 m (1000 ft) from the rack..

The KVM Extender will reduce image quality somewhat, 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 is not - so it must be installed in a safe area, or enclosed in an approved enclosure (such as a purged housing).

Ordering a Display Router Box

AA option 07 is for the Display Router Box. To order multiple racks with one display unit, follow these steps:

1. The first rack should get a router box with router cable (Option 3500/94M-07-12-XX). This option also includes a power supply cable for the router box.
2. The second rack should get a display unit with router cable (PN# 3500/94M-(02 to 06)-12-XX). These options also include a power supply and power supply cable for the display unit.
3. The third and fourth racks should not get another display, but should get router box cables for each additional rack. PN# 3500/94M-00-12-XX accommodates these requirements).

NOTE

Each 3500 rack requires both a 3500/94M VGA module and associated I/O card. Because of this requirement, every 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

A: 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, Without Mount
- 07 Router Box, No Display

B: 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
- 012 20 ft Cable for Router Box

C: 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
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
122M4631-01	Face Mount Display Mounting Standoff, for 19" EIA rack with M6 x 1 threaded mounting holes
122M4631-02	Face Mount Display Mounting Standoff, for 19" EIA rack with 10-32 threaded mounting holes
122M4631-03	Face Mount Display Mounting Standoff, for 19" EIA rack with M5 x 0.8 threaded mounting holes
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
148638-01	Serial data cable, male-female, DB9

	connector, 25 ft
161087-20-00	VGA signal cable, male-male, HD15 connector, 20 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. 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
148350-AAAA	0250 CAT5 cable 250 Foot PVC 0500 CAT5 cable 500 Foot PVC 1000 CAT5 cable 1000 Foot PVC

IP65	Yes
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)	387.4 mm (15.25 in) x 248.9 mm (9.8 in) x 49.0 mm (1.93 in) Panel Cutout: 355.6 mm (14.0 in) x 241.3 mm (9.5 in)
Weight Shipping	4.0 kg (8.78 lb)
Warranty	1 year
Notes	Recommended for industrial use. Housing is rated to IP54 ingress protection against dust and water spray.

Display Monitor Specifications

ANA-D3510-100-A1

Screen Size	10" diagonal
Type	LCD with LED backlight
Industrial hardened	Yes
Mounting Styles	Face Mount 19" Rack Mount Panel Mount Independent Mount
Power	24 Vdc power supply included. (Permissible voltage range 10 Vdc to 28 Vdc) Inrush Current: 3.5 A @ 24 V (< 500 µs) Operating Current: < 500 mA
Agencies	CE, UL, CUL

FPM-8151H

Screen Size	15" diagonal
Type	LCD with LED backlight
Industrial hardened	Yes
Mounting Styles	19" Rack Mount Panel Mount
Power	24 Vdc power supply included. (Permissible voltage range 12 Vdc to 24 Vdc) Inrush Current: 2.62 A @ 24 V (< 500 μ s) Operating Current: < 500 mA
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	422 mm (16.61 in) x 338 mm (13.31 in) x 68.0 mm (2.68 in) Panel Cutout: 396 mm (15.59 in) X 296 mm (11.65 in)
Weight Shipping	8.5 kg (18.74 lb)
Warranty	2 years
Notes	Recommended for industrial use. The minimum temperature rating is 0 °C for the electrical components on the rear of the display unit. When the screen and bezel is exposed to temperatures below 0 °C, a heated enclosure is required for the rear components.

Graphs and Figures

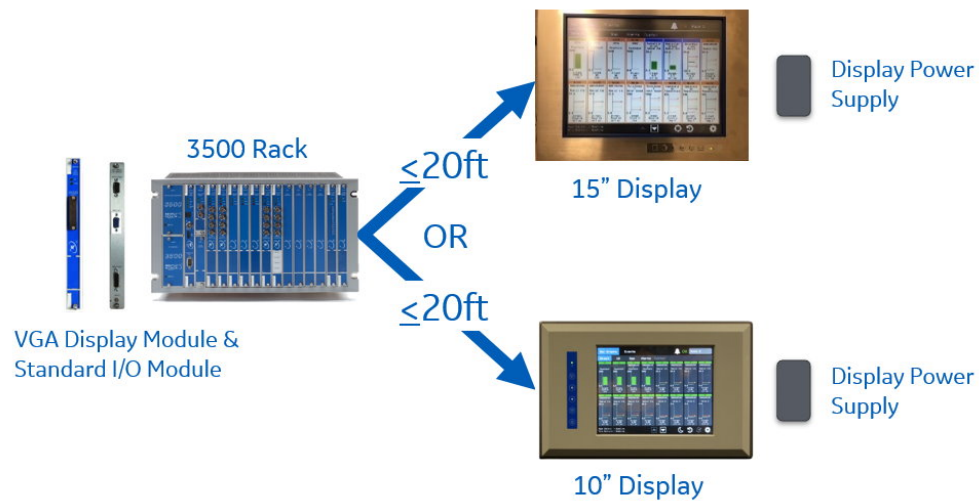
The examples in this section show included components and installation arrangements for the various ordering options. In addition to the AA, BB and CC "dash options" that are selected, all purchasing options automatically include a 3500/94M VGA Display Module and appropriate I/O Module.

Ordering 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.



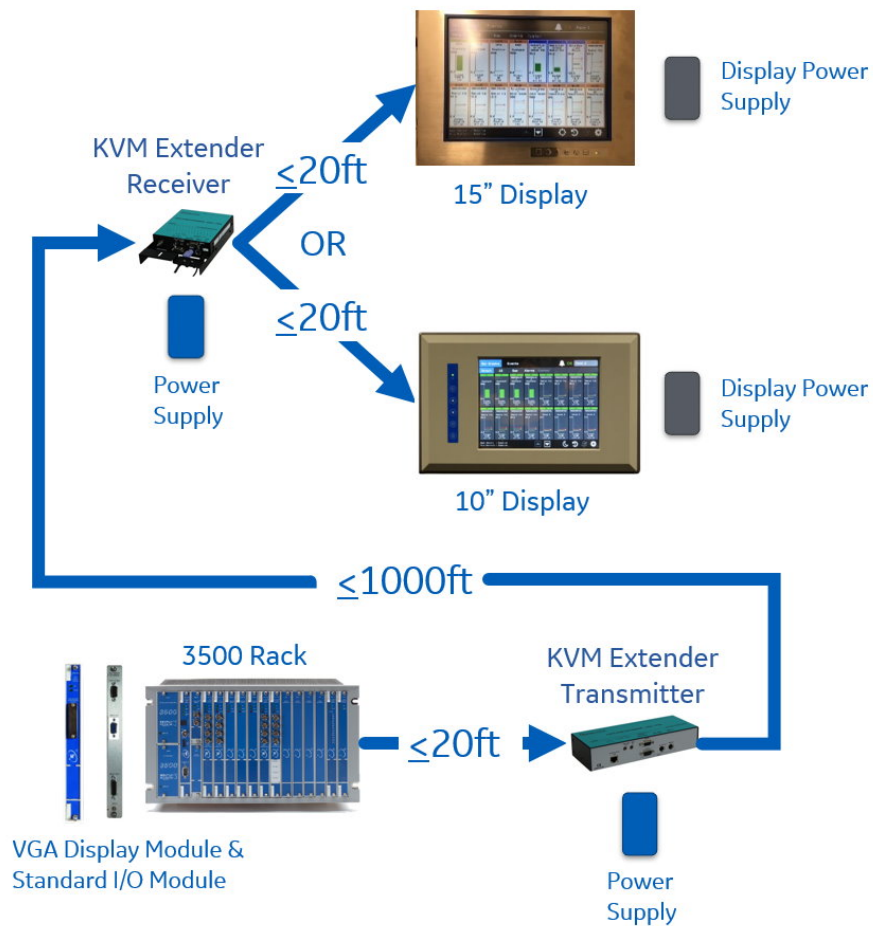
Ordering Option	Description
3500/94M-01-00-00	10" display with hinged face mount for EIA 19" rack

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

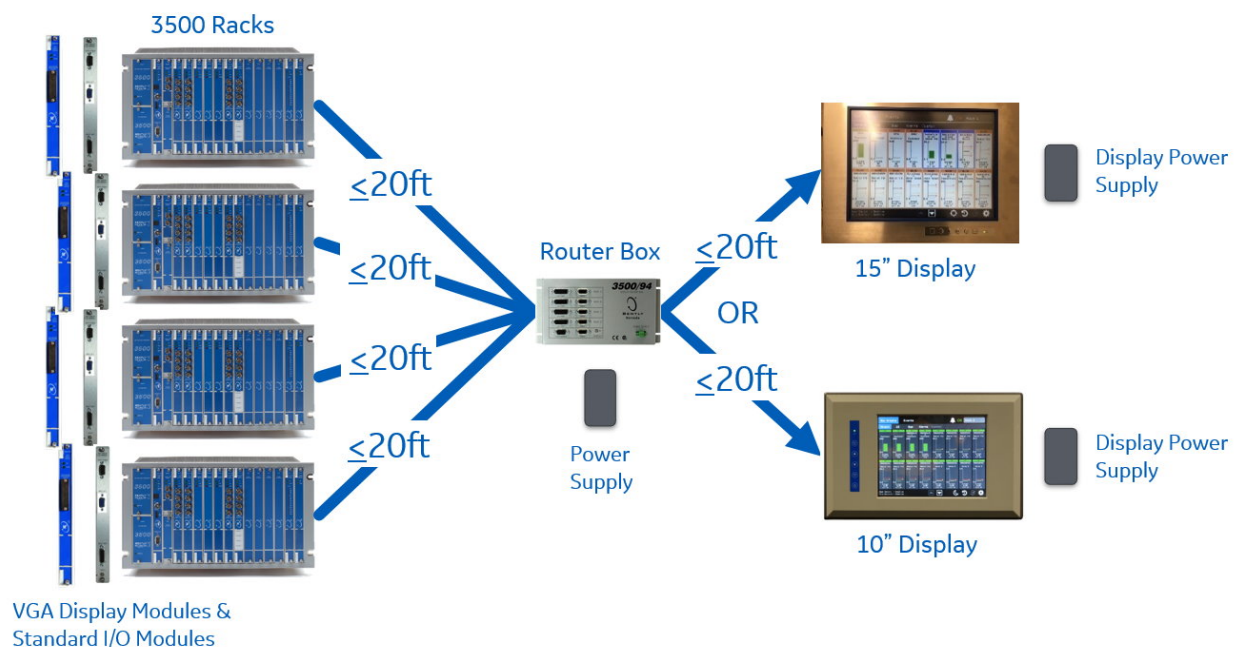


Ordering Option	Description
3500/94M-02-(01/02/03)-(00, 01 ♦)	10" display for mounting in 19" EIA rack, and KVM extender with either 250, 500, or 1000 ft cable
3500/94M-03-(01/02/03)-(00, 01 ♦)	10" display, panel mount (installation hardware included) and KVM extender with either 250, 500, or 1000 ft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

Third and Fourth Rack - Router Cable for each additional rack

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

Figure 4: Multiple Racks with Router Box

