

# 3500/94 VGA Display

## Datasheet

### Bently Nevada Machinery Condition Monitoring

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#### Description

The 3500/94 VGA Display uses a standard color VGA monitor with Touch Screen technology to display 3500 data. This product has two components, the 3500/94 VGA Display Module and its I/O card, and secondly, the VGA display monitor. The display monitor, with standard cabling, can be mounted up to 10 m (33 ft) from the rack.

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

- System Event List
- Alarm Event List
- All module and channel data
- 3300-style rack view (API-670)
- Current alarm data (quick view)
- Nine custom display options.

All are accessed through a Main Menu using a Touch Screen.

Configure the 3500/94 modules for language and for the type of VGA display through the 3500 Rack Configuration Software. All other types of data configurations are done locally at the display, giving the operator control over the displayed data. You can configure nine custom screens locally. As an example, one custom screen may show all the 1X measurements, while another shows all the Gap values, or the custom screens may be organized into machine train groupings. You can organize all system data into any specified sets assigned the data to a custom screen. An API-670 compatible screen is also selectable. This screen shows "3300-style" bargraph and numerical values for the monitor in each slot of the rack. Direct or Gap values are shown for each module along with OK and Bypass LEDs.

#### Multiple Rack Feature

Selecting the 3500/94 Display Router Box provides an additional viewing feature. This feature allows you to view a maximum of four racks with one display. Each rack must be individually viewed, but the rack address and alarm status of



each rack is always visible in the upper right corner of the screen. The Display Router Box must be located within 6 m (20 ft) of each 3500 rack.



The old EIA rack mount for the Parker RS PowerStation Monitor will not work with the Advantech FPM-8151H Monitor. Likewise, the EIA rack mount for the Advantech FPM-8151H Monitor will not work with the Parker RS PowerStation Monitor.

## Display Monitors

Bently Nevada offers five approved display monitor types, which are the only types that will properly interface to the 3500/94 VGA modules. Each display is intended to meet different application requirements. It is important that you make the right selection for your application. For outdoor installations, all display types require a hood to block direct sunlight. Each display requires a separate power supply.

As an option, the KVM Extender may be selected for remote sites at a distance up to 305 m (1000 ft). While the KVM Extender will meet most viewing requirements, the extender will degrade picture image quality and may be affected by noisy environments. 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.

The 3500/94 offers a Display Router Box that allows up to four 3500 racks to drive a single display. The Display Router Box acts as a switch box that allows the operator to switch the display between racks. An important feature of the Display Router Box is its ability to show the alarm and OK status of each connected rack.

## Specifications

### 3500/94 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

### Environmental Limits

Operating Temperature	-30 °C to +65 °C (-22 °F to +149 °F)
Storage Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Humidity	95%, non-condensing

### Physical

#### 3500/94 Monitor

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 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
Weight	8.5 kg (18.74 lb.)



For dimensions and specifications on the RS Power Station display, refer to the Display Monitor Specifications section at the end of this datasheet.

### 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	100 to 240 Vac, 50-60 Hz
Agencies	CE
Temperature Range	0 °C to 40 °C (32 °F to 104 °F)
Humidity	80%, noncondensing
Class 1, Div 2	Not approved
NEMA 4X	Not approved

### 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

## Physical

### FPM-8151 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
Weight	8.5 kg (18.74 lb.)



For dimensions and specifications on the RS Power Station display, refer to the Display Monitor Specifications section at the end of this datasheet.

## Compliance and Certifications

### FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

### EMC

European Community Directive:

EMC Directive 2014/30/EU

Standards:

EN 61000-6-2 Immunity for  
Industrial Environments

EN 61000-6-4 Emissions for  
Industrial Environments

### Electrical Safety

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1

### RoHS

European Community Directive:

RoHS Directive 2011/65/EU


### Maritime

ABS - Marine and Offshore Applications

DNV GL Rules for Classification – Ships,  
Offshore Units, and High Speed and Light  
Craft

## Hazardous Area Approvals

(missing or bad snippet)

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

North America	
Approval Option (01)	Ex nC [L] IIC T4 Gc: Class I, Division 2, Groups A, B, C and D  Class I, Zone 2: AEx nC IIC T4 Gc: Class I, Division 2, Groups A, B, C and D  T4 @ Ta = -20 °C to +65 °C (-4 °F to +149 °F) Per drawing 149243
ATEX/IECEX	
Approval Option (02)	II 3 G Ex nA nC ic IIC T4 Gc T4 @ Ta = -20 °C to +65 °C (-4 °F to +149 °F)

## VGA Monitor Certification

The following certification information applies to the VGA display monitors only (both the Parker and the Advantech):

UL listed  
 Class I, Division 2 Groups A,B,C,D

## Ordering Considerations

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

3500/94 Firmware	Rev P
3500/01 Software (Rack Config)	Rev 4.8
3500/02 Software (Op Display)	Rev 2.21
3500/03 Software (Data Aqu)	Rev 1.22

The recommended display monitor option is the Advantech FPM-8151H. This space-saving and durable display is 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 20ft of the Display Router Box.


We recommend locating the display within 25 feet of the 3500 rack as the video driver circuit is optimized for this range. Cabling lengths greater than 25 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 and it is not rated for potentially hazardous areas.

## Ordering a Display Router Box

AA options 13, 14 and 15 are for the Display Router Box. To order multiple racks with one display, do the following:


1. The first rack must call out an AA option between 01 and 04; this selects the desired display type.
2. The second rack must call out an AA option of 13 or 14; this selects the Display Router Box (including cables for two racks). Option 13 does not include a power supply. If an AA option of 01 through 04 was selected on the first rack, the power supply is already included. If an AA options of 05 through 08 was selected on the first rack, option 14 will be required (on the second rack) to include the power supply for the Display Router Box.
3. The Third rack must call out an AA option of 15; this selects the cables necessary for a third rack.
4. The fourth rack must call out an AA option of 15; this selects the cables necessary for a fourth rack.

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 Each 3500 rack requires a 3500/94 VGA module and an I/O card; because of this, each AA option is structured to automatically include them.

## Ordering Information

### System Display

 For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from [www.Bently.com](http://www.Bently.com).

#### 3500/94-AA-BB-CC

##### A: Display Monitor Option:

<b>01</b>	FPM-8151H Panel mount DC Supply-Industrial included
<b>02</b>	FPM-8151H 19-inch EIA Rack mount DC Supply-Industrial included
<b>03</b>	FPM-8151H Panel mount Class 1, Division 2 DC Supply-Industrial included
<b>04</b>	FPM-8151H 19-inch EIA Rack mount Class 1, Division 2 DC Supply-Industrial included
<b>05</b>	Discontinued
<b>06</b>	Discontinued
<b>07</b>	Discontinued
<b>08</b>	Discontinued
<b>09</b>	Discontinued
<b>010</b>	Discontinued
<b>011</b>	Discontinued
<b>012</b>	Discontinued
<b>013</b>	Display Router Box (cables included for two racks)
<b>014</b>	Display Router Box with +24vdc Supply (cables included for two racks)
<b>015</b>	Cables for display Router Box (one rack)

##### B: Extender and Cable Length Option:

<b>00</b>	None
<b>01</b>	KVM Extender 250 Foot (76.25 meters) PVC cable
<b>02</b>	KVM Extender 500 Foot (152.5 meters) PVC cable
<b>03</b>	KVM Extender 1000 Foot (305 meters) PVC cable

##### C: Agency Approvals Option

<b>00</b>	None
<b>01</b>	CSA/NRTL/C
<b>02</b>	CSA/ATEX/IECEX

### Accessories and Spares

148635	3500/94 Datasheet
148636	3500/94 User Guide
145988-01	3500/94 Main module
147663-01	3500/94 I/O module
148637-01	VGA Extension cable 20 Foot
148638-01	Serial Touch Cable 25 Foot
148654-01	Spare display — RS Power Station
102M8950	FPM-8151, class 1, division 2
148653-01	RS Power Station, class 1, division 2 option
149356-01	Display Router Box

#### 149710-AA-BB

##### Split digital cable for the Display Router Box

###### A: Cable Length Option

<b>01</b>	10 Feet (3 Meters)
<b>02</b>	20 Feet (6.1 Meters)
<b>033</b>	33 Feet (10 Meters)

###### B: Connector Options

<b>00</b>	Assembled I/O Connector
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#### 161087-AA-BB

##### VGA cable for the Display Router Box

###### A: Cable Length Option

<b>01</b>	10 Feet (3 Meters)
<b>02</b>	20 Feet (6.1 Meters)
<b>033</b>	33 Feet (10 Meters)

###### B: Connector Options

<b>00</b>	All VGA Connectors Assembled
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149710-33-00	Split digital cable for the Display Router Box (33ft)
161087-33-00	VGA cable for the Display Router Box (33ft)
161264-01	DC Supply-Industrial (used with the RS Power Station and Display Router Box)
104M3812-01	19" EIA mounting plate, FPM-8151H
103M7873-01	3500/94 KVM Extender

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148350-0250	CAT5 cable 250 Foot PVC
148350-0500	CAT5 cable 500 Foot PVC
148350-1000	CAT5 cable 1000 Foot PVC

## Display Monitor Specifications

### PowerStation RS

Size	15"
Type	LCD
Industrial hardened	Yes
Mounting Styles	Panel mount Or 19" Rack mount
Power	20 to 36 Vdc, 48 W. DC Supply included
Agencies	CE, UL, CUL
NEMA 4X	Yes
Class 1, Div 2	Optional
Temperature	0 to 65°C for full unit. -30°C to 65°C for bezel and screen. See notes.
Humidity	95% RH
Touch Interface	Resistive
Manufacturer	CTC-Parker Automation
Dimensions (W x H x D) in inches	16.8 x 13.3 x 3.8. Panel cutout 15.90 X 12.40 (W x H)
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.

### FPM-8151

Size	15"
Type	LCD
Industrial hardened	Yes

Mounting Styles	Panel mount Or 19" Rack mount
Power	20 Vdc, 57 W. DC Supply included
Agencies	CE, UL
IP65 compliant	Yes
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) in inches	16.61 x 13.31 x 2.68. Panel cutout 15.59 X 11.65 (W x H)
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.