

# ORBIT 60 SERIES External Display System

## Datasheet

Bently Nevada Machinery Condition Monitoring

154M8401 Rev. A



## Orbit Display

The Orbit Display system includes your choice of display screen, an industrial computer with a customized operating system, and software that communicates with one or more Orbit 60 systems. The system can be certified for hazardous locations. Condition monitoring data is communicated to external displays via a Display Port or VGA connection. Touchscreen connection can use USB or Serial connection.

The Orbit Display shows Orbit 60 machinery protection system information such as:

- Direct measurements
- 1X measurements
- Gap measurements
- Measurement alarms
- System event list
- Alarm event list

The standard tabs show direct measurements, 1x filtered vibration measurements, gap values, and other trended variables.



## Display Placement

Expensive KVM Extenders are not needed to place displays far away from Orbit 60 installation locations. Since the Orbit Display connects to Orbit 60 chassis via standard Ethernet network connections, the Orbit 60 Display system can be placed anywhere your Ethernet network infrastructure supports. The display location is only limited by security and network infrastructure necessary to support Orbit Display.

It is possible to place Orbit Display in a variety of locations:



- Physically adjacent to Orbit 60 chassis
- Next to the machines being monitored
- In a local or remote control room

## Touchscreen Display Support

Orbit Display uses a touchscreen display. You can show data from up to twelve Orbit 60 chassis connected via Ethernet on a single Orbit Display.

If necessary, Bently Nevada can produce custom drivers for specific displays and pointing devices. For assistance, or for a list of supported displays and required drivers, contact Bently Support at [Bently.com/support](http://Bently.com/support).

The Orbit Display is backwards compatible with the existing 10.4" and 15" displays currently supported by the 3500 system:

Supported Displays	
120M8155-01	10.4" 640x480 Hazardous Location Display
102M8950	15" 1024x768 Hazardous Location Display
150M1466	21.5" 1920x1080 Industrial Display

## Display Burn-in or Ghosting

All display technologies are susceptible to burn-in or ghosting, which occurs when static and cumulative non-uniform pixel use discolors areas on a screen. Burn-in can be noticed when the display changes and when the display is turned off.

## Display Brightness

The brightness of an LCD display is the amount of light emitted and is measured in nits or candelas per square meter, which has units of nits or cd/m<sup>2</sup>. Most commercial desktop displays have a brightness of 200 to 300 nits. To see a display in outdoor light requires a brightness of about 700 nits or greater. Almost all new LCD displays use some form of white or RGB LED backlight.

## Display Brightness Half-Life

An important characteristic of an LED backlight is the brightness half-life, which is the time measured in hours that the brightness output will decrease by half after running the LED backlight at full brightness. The decrease in brightness will not substantially decrease after the half-life time has elapsed. Most displays have a half-life of around 50,000 hours (or 5.7 years). Some of the brighter displays can have a half-life of 20,000 hours or less.

**Bright Idea:** The brightness life of the display can be dramatically increased and burn-in can be mitigated by allowing the screen saver to dim and/or turn off the display when not in use.

## 10.4" Hazardous Area Display



### 10.4" Hazardous Area Display

Part Number	120M8155-01
Warranty	1 Year
Screen Specifications	
Screen	10.4" Diagonal Size LCD with LED back light
Resolution	640 x 480 pixels 4:3 Aspect Ratio
Brightness	450 nits (cd/m <sup>2</sup> )
Brightness Half-Life	50,000 hours (5.7 years)
Features	
Video Interface	VGA
Touch Screen Type	Resistive Touch Screen
Cable Interface	Serial
Control Settings	Front panel button
Mounting Styles	Panel Mount, 19" EIA Rack Mount, and Independent Mount

### 10.4" Hazardous Area Display

Power	
Voltage	24 Vdc nominal voltage range 10 to 28 Vdc
Inrush Current	3.5 A @ 24 Vdc Less than 500 µs duration
Operating Current	Less than 500 mA
Physical Characteristics	
Weight	4.0 kg (8.78 lbs.)
Dimensions	15.25 x 9.8 x 1.93 in (387.4 x 248.9 x 49 mm)
Panel Cutout	13.5 x 9.0 in (342.9 x 228.6 mm )
Environmental Limits - Indoor Use Only	
IP Rating	Designed for IP54 ingress protection against dust and water spray to the front only.
Operating Temperature	-20 to 65°C (-4 to 149°F)
Storage Temperature	-20 to 70°C (-4 to 158°F)
Ambient Relative Humidity	10 to 85% non-condensing

## 15" Hazardous Area Display



### 15" Hazardous Location Display

Part Number	102M8950
Warranty	1 Year
<b>Screen Specifications</b>	
Screen	15" Diagonal Size TFT LCD with LED back light
Resolution	1024 x 768 pixels 4:3 Aspect Ratio
Brightness	350 nits (cd/m <sup>2</sup> )
Brightness Half-Life	50,000 hours (5.7 years)
<b>Features</b>	
Video Interface	VGA and DVI-D
Touch Screen Type	5-Wire Resistive Touch Screen
Touch Screen Interface	Serial and USB-B
Control Settings	Front panel button
Mounting Styles	Panel Mount and 19" EIA Rack Mount
<b>Power</b>	

### 15" Hazardous Location Display

Voltage	24 Vdc nominal voltage range 12 to 24 Vdc
Inrush Current	2.62 A @ 24 Vdc Less than 500 μs duration
Operating Current	~100 mA
<b>Physical Characteristics</b>	
Weight	8.5 kg (18.74 lbs.)
Dimensions	16.61 x 13.31 x 2.68 in (422 x 338 x 68 mm)
Panel Cutout	15.59 x 11.65 in (396 x 296 mm)
<b>Environmental Limits - Indoor Use Only</b>	
IP Rating	IP65 ingress protection against dust and water spray compliant to the front only.
Operating Temperature	-20 to 60°C (-4 to 140°F)
Storage Temperature	-20 to 80°C (-4 to 176°F)
Ambient Relative Humidity	10 to 95% non-condensing

## 21.5" Industrial Display



21.5" Industrial Display	
Part Number	150M1466
Warranty	1 Year
Screen Specifications	
Screen	21.5" Diagonal Size TFT LED LCD
Resolution	1920 x 1080 pixels 16:9 Aspect Ratio
Brightness	300 nits (cd/m <sup>2</sup> )
Brightness Half Life	50,000 hours (5.7 years)
Features	
Video Interface	VGA and DVI-D
Touch Screen Type	Projected Capacitive Touch Screen
Touch Screen Interface	USB-B and Serial
Control Settings	Control buttons on rear panel
Mounting Styles	Panel Mount and 19" EIA Rack Mount

21.5" Industrial Display	
Power	
Voltage	24 Vdc nominal voltage range 22 to 26 Vdc
Inrush Current	≈ 3 A @ 24 Vdc Less than 500 μs duration
Operating Current	≈ 200 mA
Physical Characteristics	
Weight	8 kg (17.6 lbs.)
Dimensions	21.98 x 13.77 x 1.88 in (558.4 x 349.8 x 47.7 mm)
Panel Cutout	21.67 x 13.46 in (550.3 x 341.8 mm)
Environmental Limits - Indoor Use Only	
IP Rating	IP66 ingress protection against dust and water spray compliant to the front only.
Operating Temperature	-30 to 70°C (-22 to 158°F)
Storage Temperature	-40 to 75°C (-40 to 167°F)
Ambient Relative Humidity	10 to 90% non-condensing

## Display CPU Module



CPU Module	
CPU	Intel Atom processor E3845 (quad-core, 1M cache, 1.91 GHz)
System Memory	4 GB
Storage	SD 3.0 (SDHC/SDXC) 128 GB
Display	Intel HD Graphics 4000
Peripherals	
USB	2 – USB-A 2.0
VGA	Resolution up to 1920 x 1200 pixels at 75 Hz HDDB-15F port
DisplayPort	Resolution up to 2560 x 1600 pixels at 60 Hz receptacle
Ethernet	4 – Auto-sensing 10/100/1000 Mbps RJ45 ports Magnetic Isolation Protection 1.5 kV
Serial	2 – RS-232/422/485 DB9M ports
Power	
Voltage	12/24 Vdc (11.4 to 36 Vdc)
Power	Less than 30 W (nominal)
LEDs	
System	Power

CPU Module	
Storage	SD
LAN	2 LEDs per port for 100/1000 Mbps
Serial	2 LEDs per port (Tx and Rx)
Physical Characteristics	
Weight	1.75 kg (3.86 lbs.)
Dimensions	132 x 122 x 87 mm (5.20 x 4.81 x 3.43 in.)
Environmental Limits - Indoor Use Only	
Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature	-45 to 75°C (-49 to 167°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Anti-Vibration	<ul style="list-style-type: none"> <li>0.7 g @ DNV GL (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr. per axis</li> <li>1 g @ DNV GL, random wave, 3-100 Hz, 2.5 hr. per axis</li> </ul>
Anti-Shock	50 g, 11 ms ±X, ±Y, ±Z, 3 shocks each axis with SD

## 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

### RoHS

European Community Directive:

RoHS Directive 2011/65/EU

## Electrical Safety

### 10.4" Hazardous Area Display

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1

### 15" Hazardous Area Display

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 62368-1

### 21.5" Industrial Display

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 62368-1

### Industrial Computer

European Community Directive:

LV Directive 2014/35/EU

Standards:

EN 61010-1  
EN 61010-2-201

## Hazardous Area Approvals



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

### 10.4" Hazardous Area Display

#### cNRTLus

Class I, Zone 2: AEx/Ex ic nA IIC T4

Class I, Zone 2: AEx/Ex ic ec IIC T4

T4 @ Ta= -20°C to +65°C (-4°F to +149°F)

#### ATEX/IECEx



II 3 G  
Ex ic ec nA IIC T4 Gc

T4 @ Ta= -20°C to +65°C (-4°F to +149°F)

### 15" Hazardous Area Display

#### cNRTLus

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

### Industrial Computer

#### cNRTLus

Class I, Zone 2: AEx/Ex ec IIC T4 Gc

Class I, Division 2, Groups A, B, C, D T4

T4 @ Ta= -40°C to +70°C (-40°F to +158°F)

#### ATEX/IECEx



II 3 G  
Ex ec IIC T4 Gc  
T4 @ Ta= -40°C to +70°C (-40°F to +158°F)



## Ordering Information



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

## External Display

Bently Nevada offers three display systems with different resolution, capabilities, mounting options, accessories, and certifications. Not all options are available for all displays.

### 60X/EXDAA-BB-CC

#### AA – Display

01	10.4" Hazardous Area Display
02	15" Hazardous Area Display
04	21.5" Display

#### BB – Agency Approvals

00	No Approval Certifications
01	CSA/NRTL/C (Class 1 DIV 2) (only available for the 60X/EXD01 10.4 in display and 60X/EXD02 15 in display)
02	Multi (CSA, ATEX, IECEx) (only available for the 60X/EXD01 10.4 in display)

#### CC – Mounting Options

01	19" Rack Mount Panel
02	Panel Mount Kit
03	Remote Stainless-Steel Enclosure (Select a pole or wall mount option separately as an accessory as needed.)
04	Independent Mount (only available for the 60X/EXD01 10.4 in display)

## Industrial Computer for Display

### 60X/CMP01-AA

#### AA – Agency Approvals

00	No Approval Certifications
01	CSA/NRTL/C (Class 1 DIV 2)
02	Multi (CSA, ATEX, IECEx)

Includes DIN Mounting Kit, 24 Vdc 90-Watt DIN Mountable Power Supply, USB Mouse, 24 Vdc Power Cable, 10' (3 m) Ethernet Cable. A 20' Ethernet cable accessory is available.

## Display Accessories

### 10.4" CID2 Hazardous Area Display

120M8155-01	Bently Nevada 10.4" Hazardous Area Display
122M3369-01	Rack Mount kit for 10" Display
122M3370-01	Panel Mount kit for 10" Display
122M3371-01	Independent Mount for 10" Display

### 15" CID2 Hazardous Area Display

102M8950	15" Hazardous Area Display
104M3812-01	Rack Mount Kit for 15" Display

### 21.5" Industrial Area Display

150M1466	21.5" Industrial Display
150M0633-01	19" Rack Mount Panel for 21.5" Display

### Display Cables

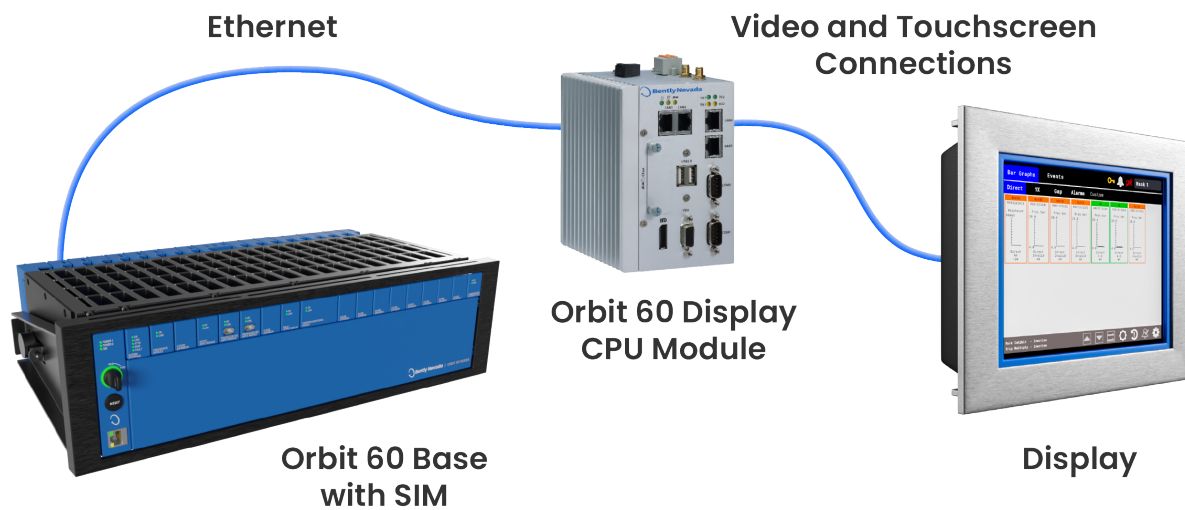
		10.4"	15"	21.5"
02200794	24 Vdc 90-Watt Power Supply	X	X	X
119M6509-01	10' Power cable/plug	X		
119M6509-02	10' Power cable/ plug		X	X

161087-10-00	10' VGA cable	X	X	X
161087-20-0	20' VGA cable	X	X	X
148638-01	10' Serial cable	X	X	
148638-02	25' Serial cable	X	X	
174013	3m (9.8') USB Cable			X
149M1306	7m (25') USB Cable			X

**Bently Nevada Industrial Computer**

142M4200	Industrial Computer
02200794	24 Vdc 90-Watt Power Supply (both computer and display)
119M6509-05	10' Power cable and plug
149M1309	USB Mouse
149M1310	3m (10') Ethernet patch cable
138131-010	3m (10') shielded Ethernet cable
149M1311	7m (25') Ethernet patch cable
138131-025	7m (25') shielded Ethernet cable

## Graphs and Figures



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