

ORBIT 60 SERIES

External Display System

Datasheet

Bently Nevada Machinery Condition Monitoring

154M8401 Rev. B



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.

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/m². 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 ²) |
| 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 |

Standards and Certifications

Refer to External Display Datasheet (154M8401)

15" Hazardous Area Display



15" Hazardous Location Display

| Part Number | 102M8950 |
|------------------------|--|
| Warranty | 1 Year |
| Screen Specifications | |
| Screen | 15" Diagonal Size TFT LCD with LED back light |
| Resolution | 1024 x 768 pixels 4:3 Aspect Ratio |
| Brightness | 350 nits (cd/m ²) |
| Brightness Half-Life | 50,000 hours (5.7 years) |
| Features | |
| 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 |

15" Hazardous Location Display

Power

| | |
|-------------------|---|
| Voltage | 24 Vdc nominal voltage range 12 to 24 Vdc |
| Inrush Current | 2.62 A @ 24 Vdc Less than 500 μ s duration |
| Operating Current | ~100 mA |

Physical Characteristics

| | |
|--------------|--|
| 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) |

Environmental Limits - Indoor Use Only

| | |
|---------------------------|---|
| 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 |

Standards and Certifications

Refer to External Display Datasheet
(154M8401)

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 ²) |
| 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 |

Standards and Certifications

Refer to External Display Datasheet
(154M8401)

Industrial Computer for Display



| 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) |

| CPU Module | |
|--|---|
| LEDs | |
| System | Power |
| 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"> 0.7 g @ DNV GL (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr. per axis 1 g @ DNV GL, random wave, 3-100 Hz, 2.5 hr. per axis |
| Anti-Shock | 50 g, 11 ms ±X, ±Y, ±Z, 3 shocks each axis with SD |
| Standards and Certifications | |
| Refer to External Display Datasheet (154M8401) | |

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 \(108M1756\)](#).

For additional technical documentation, please log in to bntechsupport.com and access the Bently Nevada Media Library.

ATEX/IECEX



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

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)

Ordering Information



For the detailed listing of country and product-specific approvals, refer to the [Approvals Quick Reference Guide \(108M1756\)](#).

For additional technical documentation, please log in to bntechsupport.com and access the Bently Nevada Media Library.

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 |
| 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 |

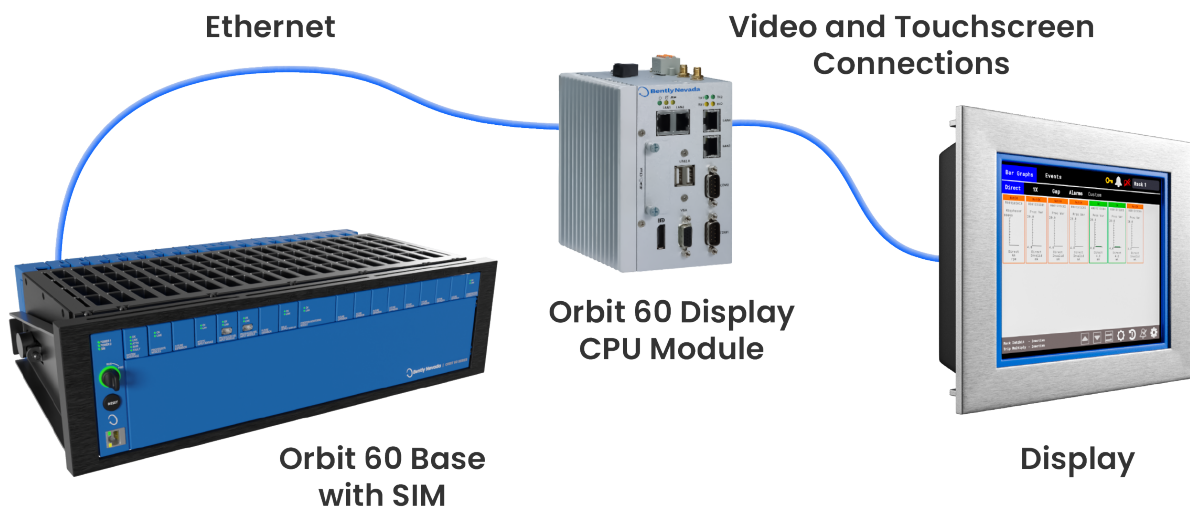
21.5" Industrial Area Display

| | |
|-------------|--|
| 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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