Cambia Automation Limited

Bently Nevada 1900/65A Datasheet

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Cambia Group

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1900/65A General Purpose Equipment Monitor

Product Datasheet

Bently Nevada* Asset Condition Monitoring

Description

The 1900/65A General Purpose Equipment Monitor is designed to continuously monitor and protect equipment that is used in a variety of applications and industries. The monitor's low cost makes it an ideal solution for general-purpose machines and processes that can benefit from continuous monitoring and protection.

Inputs

The 1900/65A provides four transducer inputs and four temperature inputs. Software can configure each transducer input to support 2- and 3-wire accelerometers, velocity sensors or proximity sensors. Each temperature input supports Type E, J, K, and T thermocouples, and 2- or 3-wire RTDs.

Outputs

The 1900/65A provides six relay outputs, four 4-20 mA recorder outputs, and a dedicated buffered output. The user can use the 1900 Configuration software to configure the relay contacts to open or close according to the OK, Alert and Danger statuses of any channel or combination of channels, and to provide data from any variable from any channel on any recorder output. The dedicated buffer output can provide the signal for each transducer input.

A Modbus® Gateway option allows the monitor to provide static variables, statuses, event list, time and date information directly to any Modbus client, including Distributed Control Systems (DCSs), Supervisory Control and Data Acquisition (SCADA) systems, Programmable Logic Controllers (PLCs), or System 1* software. The monitor uses an internal counter and a Modbus client/master time reference to generate time and date information. Users can upgrade monitors without the Modbus Gateway by ordering the 1900/01 Communications Upgrade (see the Ordering Information section). The

1900/65A supports Modbus communications via Ethernet and a software-configurable RS232/485 serial port.

Configuration

The user defines monitor operation and the Modbus Gateway register map by using software running on a laptop or PC to create a configuration file and download the file to the monitor through the built-in Ethernet connection. The 1900/65A permanently stores configuration information in non-volatile memory, and can upload this information to the PC for changes.

Display Module

The 1900/65A supports an optional display/keypad to view channel information or make minor configuration changes. This allows the 1900/65A to operate as a stand-alone package. If desired, the user can mount the display up to 75 metres (250 feet) from the Monitor Module.

Feature List

- Continuous monitoring and protection is suitable for auto-shutdown applications
- Stand-alone operation on general-purpose equipment
- Optional Modbus communications via 10BaseT/100BaseTX Ethernet, or software-configurable 485/232 serial port
- Small package. Monitor Module: 196.9 mm x 149.4 mm x 74.4 mm (7.75" x 5.88" x 2.93"). Monitor Module with attached Display Module: 196.9 mm x 149.4 mm x 97.8 mm (7.75" x 5.88" x 3.85")"
- DIN rail or bulkhead mounting options
- 18 to 36 Vdc power input. (optional 110-220 Vac external supply)
- 24-bit ADC conversion
- Four vibration/position/speed inputs
- Four temperature inputs
- Configurable scale factors and full scale ranges
- Up to four processed variables per channel with independent integration and filter control
- Internal OK checking with status
- Independent Alert and Danger setpoints
- 200-entry event list
- Six relay outputs. Relay operation is programmable
- Buffered outputs for each transducer channel
- Four configurable 4-20 mA recorder outputs
- Optional NEMA 4X/IP66 fiberglass housing with window for display
- Painted or stainless steel weatherproof door for panel-mount display
- Hazardous area approvals
- Maritime Approvals

Specifications

Inputs

Transducer Inputs

Users can configure Channels 1 through 4 to accept input from acceleration, velocity or displacement transducers.

Transducer Channel Types

Channel Types define the functionality for processing that will be applied to an input signal and the kind of variables or measurement values that will be derived from this input. Channel Types also define the kind of sensor that must be used. Transducer Channel Types include:

- Acceleration or Reciprocating Acceleration
- Velocity or Reciprocating Velocity
- Radial Vibration (shaft vibration)
- Thrust (shaft axial displacement)
- Position
- Speed

Acceleration and Reciprocating Acceleration Channel Types

The Acceleration Channel Type and Reciprocating Acceleration Channel Type support two- and three-wire acceleration sensors. The Reciprocating Acceleration channel type has timed OK channel defeat disabled.

Acceleration Variables and Reciprocating Acceleration Variables

Acceleration Variables and Reciprocating Acceleration Variables are filtered and processed

measurements from raw transducer signals. The Acceleration Channel Type and Reciprocating Acceleration Channel Type continuously processes up to four variables per channel.

Vibration:

Up to three bandpass filtered amplitude measurements.

Acceleration Enveloping:

Users can apply the acceleration enveloping algorithm to one Acceleration or Reciprocating Acceleration Variable.

Bias Voltage:

Users may assign the value of the transducer bias voltage to any of the variables.

Configuration Options

Each variable is independently configured with the following options.

Vibration Variables:

- Peak or RMS
- Metric or English units
- Filter corner frequencies
- Full scale range
- Acceleration integrated to velocity

Enveloped Variable:

- Filter corner

frequencies
- Standard or Enhanced demodulation

Filters

Vibration Variable:

0.5 Hz – 25 kHz configurable 4-pole high-pass, 4-pole low-pass

Enveloping High-Pass:

25 Hz to 5 kHz, configurable 4-pole

Enveloping Low-Pass:

125 Hz to 25 kHz, configurable 2-pole

Enveloped Variable High-Pass:

0.1 Hz min., but greater than Enveloped Variable low-pass 2-pole

Enveloped Variable Low-Pass:

Greater than Enveloped Variable high-pass and less than Enveloping high-pass 4-pole

Bias Filter:

0.01 Hz 1-pole low-pass

OK Filter:

2.4 kHz 1-pole low-pass

Full Scale Range

Vibration:

20 to 500 m/s^2 (2 to 50 g)

peak and RMS

Enveloped:

20 to 500 m/s^2 (2 to 50 g) peak and RMS

Integrated:

10 to 100 mm/s (0.4 to 4 in/s) peak and RMS

Bias Voltage:

-24 V

Accuracy

Vibration Variables:

±1% of full scale range

Input Impedance

3-wire Voltage Mode:

10 kΩ

Velocity and Reciprocating Velocity Channel Type

The Velocity Channel Type and Reciprocating Velocity Channel Type support two-wire and three-wire piezo-velocity sensors.

Velocity Variables and Reciprocating Velocity Variables

Velocity Variables and Reciprocating Velocity Variables are filtered and processed measurements from raw transducer signals. The Velocity Channel Type and Reciprocating Velocity Channel Type support up to four continuously calculated variables per channel.

Vibration:

Up to three bandpass filtered amplitude measurements.

Bias Voltage:

Users may assign the value of the transducer bias voltage to any of the variables.

Configurable Options

Each variable is independently configured with the following options.

Vibration Variables:

- Peak or RMS
- Metric or English units
- Filter corner frequencies
- Full-scale range
- Velocity integrated to displacement

Filters

Vibration Variables:

0.5 Hz to 5.5 kHz, configurable 8-pole high-pass, 4-pole low-pass

Bias Filter:

0.09 Hz 1-pole low-pass

OK Filter:

2.4 kHz 1-pole low-pass

Full Scale Range

Vibration:

10 to 50 mm/s (0.5 to 2 in/s) peak and RMS

Integrated:

100 to 500 μm (5 to 20 mils) peak to peak

Bias Voltage:

-24 V

Accuracy

Vibration Variables:

±1% of full scale range

Input Impedance

3-Wire Voltage Mode:

10 kΩ

Radial Vibration Channel Type

The Radial Vibration Channel Type measures radial shaft motion using proximity sensors.

Radial Vibration Variables

Radial Vibration Variables are filtered and processed measurements from raw transducer sensors. The Radial Vibration Channel Type supports up to four continuously calculated variables per channel.

Direct:

Up to three bandpass

filtered amplitude measurements

Gap:

Gap voltage

Vibration:

Up to three bandpass filtered amplitude measurements

Configurable Options

Each variable is independently configured with the following options.

Vibration Variables:

Metric or English units

Filter corner frequencies

Number of filter poles

Full-scale range

Filters

Direct Filter 1:

4 to 4000 Hz (240 to 240,000 RPM)

Direct Filter 2:

1 to 600 Hz (60 to 36,000 RPM)

Direct Filter Characteristics:

High-pass set by attack and decay, 1-pole low-pass

Gap Filter:

0.09 Hz 1-pole low-pass

Vibration Variables:

0.5 Hz to 4 kHz, configurable

1-, 2-, or 4-pole high-pass and low-pass, configurable

OK Filter:

2.4 kHz 1-pole low-pass

Full Scale Range

Direct:

100 to 500 µm (3 to 20 mils) peak-to-peak

Gap:

-24 V

Accuracy

Vibration Variables:

±1% of full-scale range

Input Impedance

Non-configurable:

10 kΩ

Thrust Channel Type

The Thrust Channel Type measures axial shaft motion using proximity sensors.

Thrust Variables

Thrust Variables are filtered and processed measurements from raw transducer signals.

Position:

Axial position of shaft

Gap:

Gap, voltage or position

Configurable Options

Each variable is independently configured with the following options.

Position Variables:

Metric or English units

Full-scale range

Filters

Direct Filter:

1.2 Hz 1-pole low-pass

Gap Filter:

0.41 Hz 1-pole low-pass

OK Filter:

2.4 kHz 1-pole low-pass

Full Scale Range

Position:

1 to 4 mm (50 to 150 mils) span with adjustable zero position

Gap:

−24 V

Accuracy

Position Variables:

±1% of full-scale range

Input Impedance

Non-configurable:

10 kΩ

Position Channel Type

The Position Channel Type measures mechanical motion using proximity sensors.

Position Variables

Position Variables are filtered and processed measurements from raw transducer signals.

Position:

Mechanical position

Gap:

Gap, voltage or position

Configurable Options

Each variable is independently configured with the following options.

Position Variables:

Metric or English units

Full scale range

Filters

Direct Filter:

1.2 Hz 1-pole low-pass

Gap Filter:

0.41 Hz 1-pole low-pass

OK Filter:

2.4 kHz 1-pole low-pass

Full Scale Range

Position:

1 to 28 mm (50 to 1100

mils) span with adjustable zero position.

Gap:

-24 V

Accuracy

Position Variables:

±1% of full scale range

Input Impedance

Non-configurable:

10 kΩ

Speed Channel Type

The Speed Channel Type measures speed using proximity sensors.

Speed Variables

Speed Variables are filtered and processed measurements from raw transducer signals.

Speed:

Up to four speed measurements

Gap:

Gap, voltage

Configurable Options

Each variable is independently configured with the following options:

Gap Filter:

0.09 Hz 1-pole low-pass

OK Filter:

2.4 kHz 1-pole low-pass

Full Scale Range

Speed:

100 - 100,000 rpm

Events Per Revolution

EPR:

0.001 to 1000

Accuracy

Speed Variables:

± 0.5 RPM + 0.015% of reading

Input Impedance

Non-configurable:

10 kΩ

Temperature Inputs (Ch. 5 – 8)

Channels 5 through 8 support Type E, J, K, and T thermocouples, and 2- and 3-wire RTDs.

Temperature Variable

Temperature variables are processed measurements from raw transducer signals. The temperature channel type processes one temperature variable per channel.

Configurable Options

Each Variable is independently configured with the following options.

Units:

°C or °F

Filters

Analog Filter:

50 Hz 1-pole, low-pass

Digital Filter:

Notch filter will attenuate the first 5 orders of 50 Hz and 60 Hz (49 Hz to 61 Hz) by a minimum of 100 dB.

Full Scale Range

Type E:

-200 to 1000 ºC (-328 to 1832 ºF)

Type J:

-210 to 1200 ºC (-346 to 2192 ºF)

Type K:

-200 to 1370 ºC (-328 to 2498 ºF)

Type T:

-200 to 400 ºC (-328 to 752 ºF)

10 Ω Cu α=0.00427:

-200 to 260 ºC (-328 to 500 ºF)

120 Ω Ni α=0.00672:

-80 to 260 ºC (-112 to 500 ºF)

100 Ω Pt α=0.00385:

-200 to 850 ºC (-328 to 1562 ºF)

100 Ω Pt α=0.00392:

-200 to 700 ºC (-328 to 1292 ºF)

Accuracy

All Thermocouple Types:

±1 °C (±1.8 °F) typical @ 25 °C (77 °F)

±2.5 °C (±4.5 °F) maximum for thermocouple measurements over –100 °C (148 °F)

±5 °C (±9 °F) maximum for thermocouple measurements below –100 °C (-148 °F)

3-Wire RTD (except 10 W Cu):

±1.5 °C (±2.7 °F) + 0.5 % full scale

3-Wire RTD 10 W Cu:

±3 °C (±5.4 °F) + 0.5 % full scale

2-wire RTD Types:

2-wire RTDs have additional errors due to field wire resistance and variations in the field wire resistance due to changes in ambient temperature.

Input Impedance

Thermocouple Inputs:

>1 MΩ

Alarm Status Time Delays

Position / Vibration Inputs

Minimum

0.1 second

Maximum

60 seconds

Adjustment Resolution

0.1 second

Temperature / Speed Inputs

Minimum

1 second

Maximum

60 seconds

Adjustment Resolution

0.1 second

Relays

Relay Logic

The 1900/65A monitor has six relay outputs that users can program to open or close contacts according to user-defined logic statements. Logic statements use the OK, Alert and Danger statuses of any channel, or combination of channels as inputs.

Logical Operators

AND (bypassed channels ignored)

True AND (bypassed channels included)

-**OR**-

Logical Operands

Monitor Inhibit

Monitor Not OK

Monitor Danger

Monitor Alert

Channel Not OK

Channel Danger

Channel Alert

Variable Danger

Variable Alert

Maximum Operands

50 per relay

Relay Configuration

The following configuration options are independent of the relay logic and can be configured for each relay:

- Latching or non-latching independent of alarm status

- Normally energized or normally de-energized

- Normally open and normally closed via contacts

Relay Specifications

Type

Single pole, double throw (SPDT)

Contact Ratings

Minimum Switched Current

12Vdc/100mA

DC specifications (resistive load)

Maximum Switched Current:

5A

Maximum Switched Power:

70W @ 24Vdc

10W @ 48Vdc

9W @ 60Vdc

Maximum Switched Voltage:

60 Vdc

AC specifications (resistive load)

Maximum Switched Current:

5A

Maximum Switched Power:

150VA

Maximum Switched Voltage:

30Vac

Note:Refer to Hazardous Area Special Considerations Section for Relay specifications when used in hazardous area applications.

Contact Life

100,000 cycles @ 5 A, 250 Vac

200,000 cycles @ 1 A, 24 Vdc

Sealing

Epoxy

Insulation Resistance

1000 MΩ minimum @ 500 Vdc

Inhibit, Reset, and Trip Multiply Inputs

Inhibit/Trip Multiply

Users can use software to configure the Inhibit/Trip Multiply input as either Inhibit or Trip Multiply.

When configured for Trip Multiply short-circuiting the Inhibit/Trip Multiply contact to RTN will increase Alert and Danger set points.

When configured for Inhibit the Inhibit input will inhibit (bypass or inactivate) Alert and Danger statuses. Short circuiting the INHIBIT contact to INHIBIT RTN will:

- Set all Variable Danger Statuses to logic 0

- Set all Variable Alert Statuses to logic 0

- Set Bypass and Inhibit Statuses to logic 1

Modbus® Note:**Monitor Alarm Inhibit switch**, and **Monitor Trip Multiply switch** mapped in the Modbus® Gateway will remotely inhibit Alert and Danger statuses or activate Trip Multiply respectively.

Electrical

Activate Inhibit

50 kΩ or less (shorted)

De-activate Inhibit

500 kΩ or greater (open)

Reset

Use the Reset input to reset all latched alarms and latched relays. If the condition driving the status no longer exists, short-circuiting the RESET contact to RESET RTN will:

- Reset all latched Alert statuses

- Reset all latched Danger statuses

- Reset all latched Not OK statuses

- Reset all latched relays

Modbus® Note: Writing a non-zero value to the Modbus register **Reset Latched Statuses** mapped in the Modbus® Gateway will reset the monitor remotely.

Electrical

Activate Reset

50 kΩ or less (shorted)

De-activate Reset

500 kΩ or greater (open)

Transducer Supplies

All outputs are short-circuit protected.

Two-Wire Current Mode

Current Source

3.3 mA ± 5%

Open Circuit Voltage

21 to 24 Vdc

Three-Wire Voltage Mode

Supply Voltage

-24.02 Vdc to –23.47 Vdc

Maximum Rated Current

15 mA

Short Circuit Current

15.1 mA to 23.6 mA

4-20 mA Interface

Number of Outputs

Four outputs, any of which may be configured to provide data from any channel and any variable.

Proportional Value

4 to 20 mA values are proportional to the channel full-scale.

Loop Supply Voltage

18 to 36 Vdc

Loop Resistance

600 Ω maximum

Accuracy

2% over operating temperature range

Update Rate

100 mS

Resolution

10 mA

Clamp Current

2 mA ± 10% (configurable for Not OK and Bypass)

Buffered Outputs

Display Module

A single buffered output on the Display Module provides access to input Channels 1 through 4. The signal does not have gain, and is not scaled. This output is buffered to provide short circuit and EMI protection.

Output Impedance

550 Ω

Bandwidth

40 kHz minimum (Display Module

attached directly to Monitor)

8 kHz minimum (75 m (250 ft.) of cable)

Monitor Module

Each input for channels 1 through 4 has a dedicated buffered output. The signal does not have gain, and is not scaled. Each output is buffered to provided short circuit and EMI protection.

Output Impedance

550 Ω

Bandwidth

40 kHz minimum

Indicators

Monitor Module

Status LED

Indicates when the monitor is functioning properly.

Display Module

OK LED

Indicates when the monitor is functioning properly.

Alert LED

Indicates an Alert condition.

Danger LED

Indicates a Danger condition.

Bypass LED

Indicates that the monitor is in Bypass mode.

Trip Multiply LED

Indicates that the monitor is in Trip Multiply mode.

Channel LED

Indicates channel is active.

Display

Liquid Crystal Display (LCD) with backlight.

68.6 mm (2.7 in) wide x 35.6 mm (1.4 in) high

Power Requirements

Input Voltage Range

18 to 36 Vdc

Operating Current

0.35 A typical, 1.0 A maximum

Operating Power

8.5 W typical, 14 W maximum

Physical

Monitor Module

Dimensions (L x W x H)

196.9 mm x 149.4 mm x 74.4 mm (7.75 in x 5.88 in x 2.93 in)

Weight

0.77 kg (1.70 lb)

Display Module

Dimensions (L x W x H)

196.9 mm x 149.4 mm x 32.8 mm (7.75 in x 5.88 in x 1.29 in)

Weight

0.40 kg (0.89 lb)

Mounting

DIN Rail Option

35 mm DIN rail

Bulkhead Option

Bulkhead mounting plate

Weatherproof Enclosure Option

NEMA 4X/IP66 Fiberglass Housing with window, 300.2 mm x 249.4 mm x 209.8 mm (11.82 in x 9.82 in x 8.26 in)

Configuration Software

The 1900 Configuration Software package contains everything necessary to install, configure, and maintain the 1900/65A monitor.

- Feature tools for installing and troubleshooting
- Simple display to help with configuration
- Ability to browse network for 1900 monitors
- Network configuration
- Configuration for channels, variables, setpoints, tag names, recorders and filters
- Configuration for the optional Modbus Gateway
- Configuration for relays and relay voting logic
- Off-line configuration allowing use of software when hardware is not available
- Firmware upgrade function and diagnostics
- Change bypass modes and setpoints on the fly
- Display component for statuses and variables
- Display Hardware Identification and manufacturing information
- Context-specific help

Environmental

Temperature

Operating

-20 to +70 °C (-4 to +158 °F)

Storage

-30 to +90 °C (-22 to +194 °F)

Humidity

Operating

95% non-condensing, maximum

Storage

95% non-condensing, maximum

Supported Transducers

Channel Type	Bently Nevada Transducer
Acceleration and Reciprocating Acceleration	330400 Accelerometer
	330425 Accelerometer
Velocity and Reciprocating Velocity	190501 Velomitor*
	330500 Velomitor
	330525 Velomitor
	330750 Velomitor
Radial Vibration, Thrust, and Speed	3300 5 & 8 mm Proximitor* System
	3300 XL 8mm Proximitor System
	3300 XL 11mm Proximitor System
	3300 XL NSv*Proximitor System
	7200 5 & 8mm Proximitor System
	7200 11mm Proximitor System
	7200 14 mm Proximitor System
Position	3300 5 & 8 mm Proximitor System
	3300 XL 8mm Proximitor System
	3300 XL 11mm Proximitor System
	3300 XL 25mm Proximitor System
	3300 XL 50mm Proximitor System
	3300 XL NSv* Proximitor System
	7200 5 & 8mm

	Proximitor System
	7200 11mm Proximitor System
	7200 14 mm Proximitor System

Note: The 1900/65A provides default configuration settings for Bently Nevada* transducers. The user can configure the 1900/65A to accept other transducers.

Compliance and Certifications

EMC

European Community Directives:

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 Directives:

LV Directive 2014/35/EU

Standards:

EN 61010-1

Maritime

Complies with Det Norske Veritas 'Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards.

Hazardous Area Approvals

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document 108M1756) located at the following website: www.GEmeasurement.com.

This monitor is not certified for installation in Class 1 Div 1 locations, but it will support transducers installed in Div 1 locations via the use of galvanic isolators and barriers. If galvanic isolators are used, no change is necessary to the installation. A removable ground jumper allows the monitor to support zener barrier installations. Removing the jumper will disconnect circuit common from chassis at the monitor so that chassis can be connected at the barrier.

CSA/NRTL/C

Ex/AEx nA nC IIC T4 Gc: Class I, Zone 2: Class I, Division 2 Groups A, B, C and D

T4 @ -20ºC ≤ Ta ≤ 70ºC

Vn = 18 to 36 Vdc @ Imax = 1A per drawing 173089

ATEX/IECEx

II 3 G
Ex nA nC IIC T4 Gc

T4 @-20°C ≤ Ta ≤ 70°C

Hazardous Area Special Considerations

- Hazardous area installations require relay contact voltages below 30 Vac rms, or 30 Vdc to minimize hazard.
- Hazardous area installations require relay contact amperages below 5 Amps DC, or AC to minimize hazard.

Ordering Information

For a detailed listing of country and product specific approvals, refer to the Approvals Quick Reference Guide (document 108M1756) located at the following website: www.GEmeasurement.com.

1900/65A General Purpose Equipment Monitor

1900/65A-AXX-BXX-CXX-DXX-EXX

A: Power Option

0 0 18 to 36 Vdc

0 1 110 to 220 Vac @ 50 to 60 Hz (external supply)

B: Display Option

0 0 No display

0 1 Attached display (no cable)

0 2 Display with 10' PVC cable

0 3 Display with 10' unassembled PVC cable

0 4 Display with 10' TEF cable

0 5 Display with 10' unassembled TEF cable

C: Mounting Option

0 0 None

0 1 DIN rail mount (see Figure 1: DIN Rail Mount)

0 2 Bulkhead Mount (see Figure 2: Bulkhead Mount)

0 3 Fiberglass NEMA 4X/IP66 WP housing with window in door (see Figure 3: NEMA 4X/IP66 WP Housing)

0 4 1900/55 replacement kit(see Figure 4: 1900/55 Replacement Kit)♦

07 ProTIM Housing, Wiring and Mounting Hardware

Note: ♦Uses existing 1900/55 weather-proof housing and requires power option A01 (110/220 Vac to 24 Vdc external power supply)

D: Approvals Option

0 0 None

0 1 Multiple approvals.

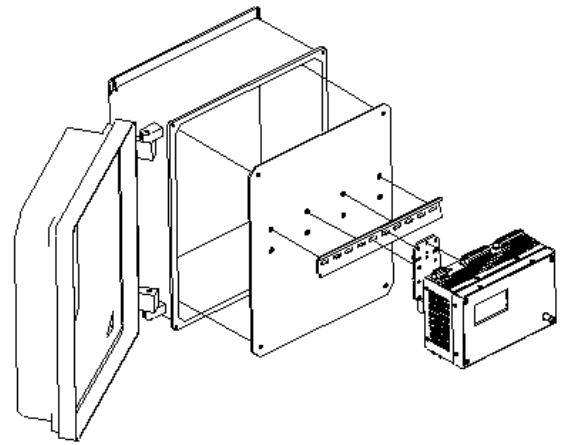Note: See Hazardous Areas Approvals section for specific certifications.

Note:Maritime approvals included with all approval options.
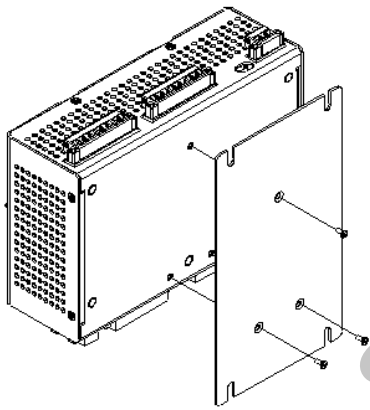
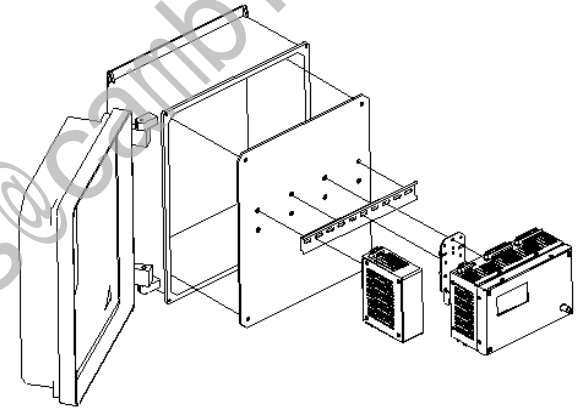**E:** Communications Option

0 0 None

0 1 Modbus® comm.
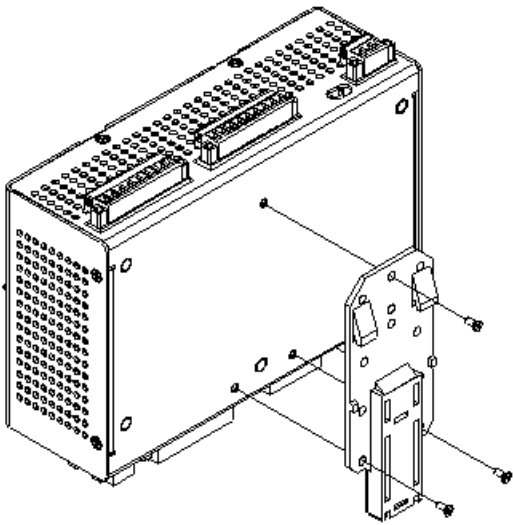
Figure 1: DIN Rail Mount

Figure 2: Bulkhead Mount

Figure 3: NEMA 4X/IP66 WP Housing

Figure 4: 1900/55 Replacement Kit

1900/01 – 1900/65A General Communications Monitor, Communications Upgrade

1900/01-AXX-BXX-CXX-DXX

A: Order Type Option

> **0 1** New order (CD, key, and binder)
>
> **9 8** Replacement licenses (key)

9 9 Configuration Software only (CD)

B: Communications Option

    0 1 Modbus® comm.

C: License Key Option

    0 0 None

    0 1 USB license key

D: License Quantity Option

    X X Total licenses
        (1 to 99)

Accessories

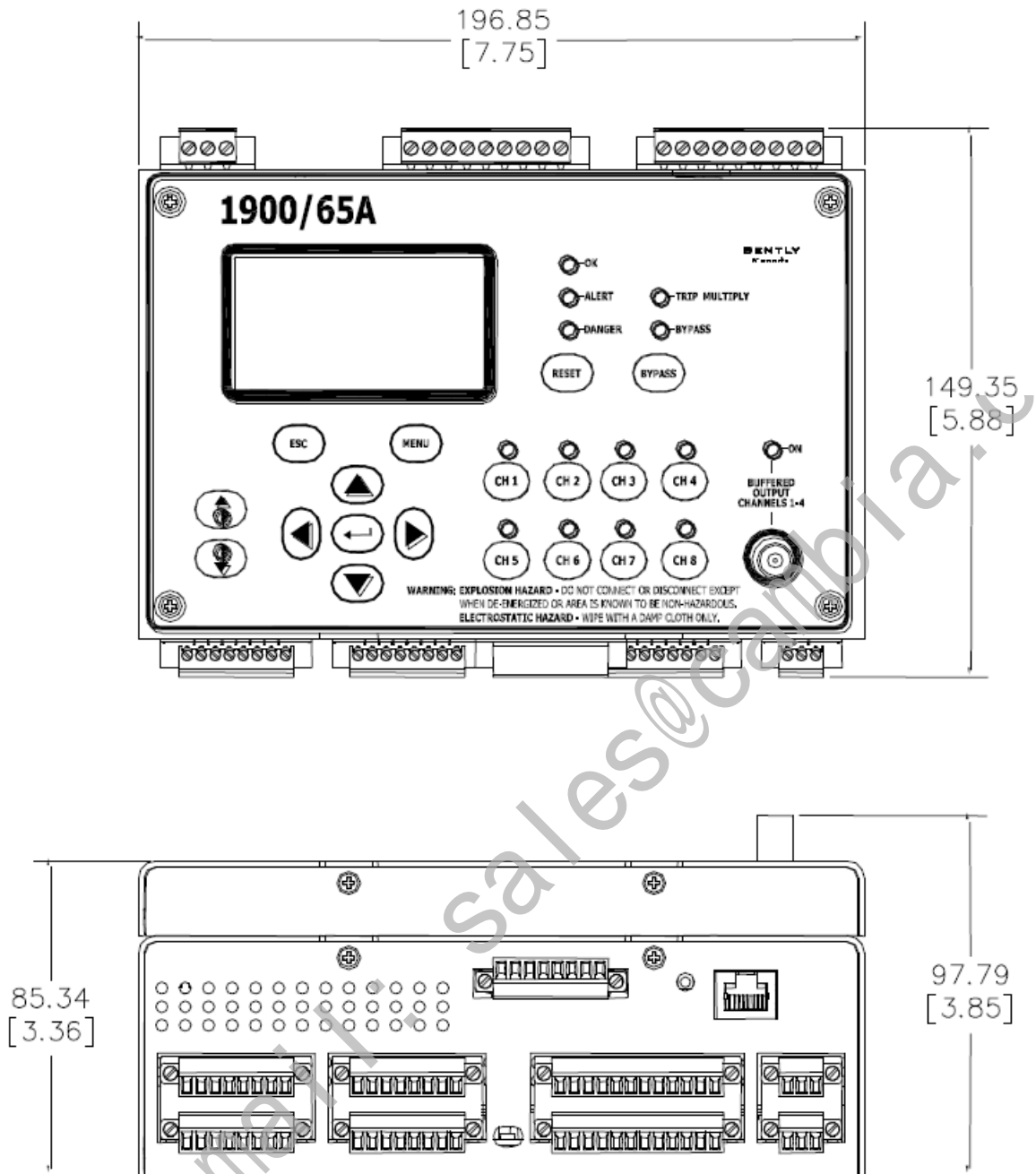| Part Number	Description
167699-02	1900/65A Display Module
173400-01	1900/65A Product Manual
172250-01	1900/65 Modbus Gateway Users Guide
173089-01	1900/65A Field Wiring Diagrams
02200794	Power supply, 110/220 Vac to 24 Vdc 2.5 A DIN rail mount
02200121	DIN rail end bracket
168374	35mm DIN rail mounting clip for 1900/65A Monitor Module
168495	Bulkhead mounting plate
168547-0010-01-01	3 m (10 ft) PVC cable, assembled
168547-0010-01-02	3 m (10 ft) PVC cable, unassembled
168547-0010-02-01	3 m (10 ft) TEF cable, assembled
168547-0010-0202	3 m (10 ft) TEF cable, unassembled
168628	Stainless steel NEMA 4X weatherproof door for panel-mount display assembly
168629	Painted steel NEMA 4 weatherproof door for panel-mount

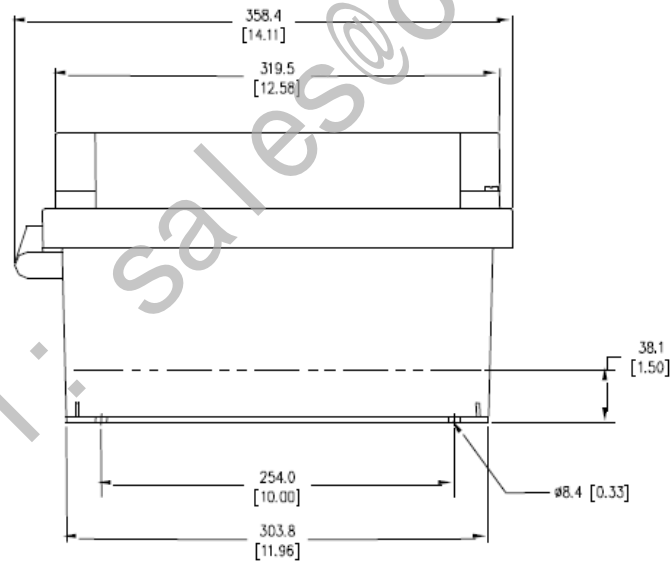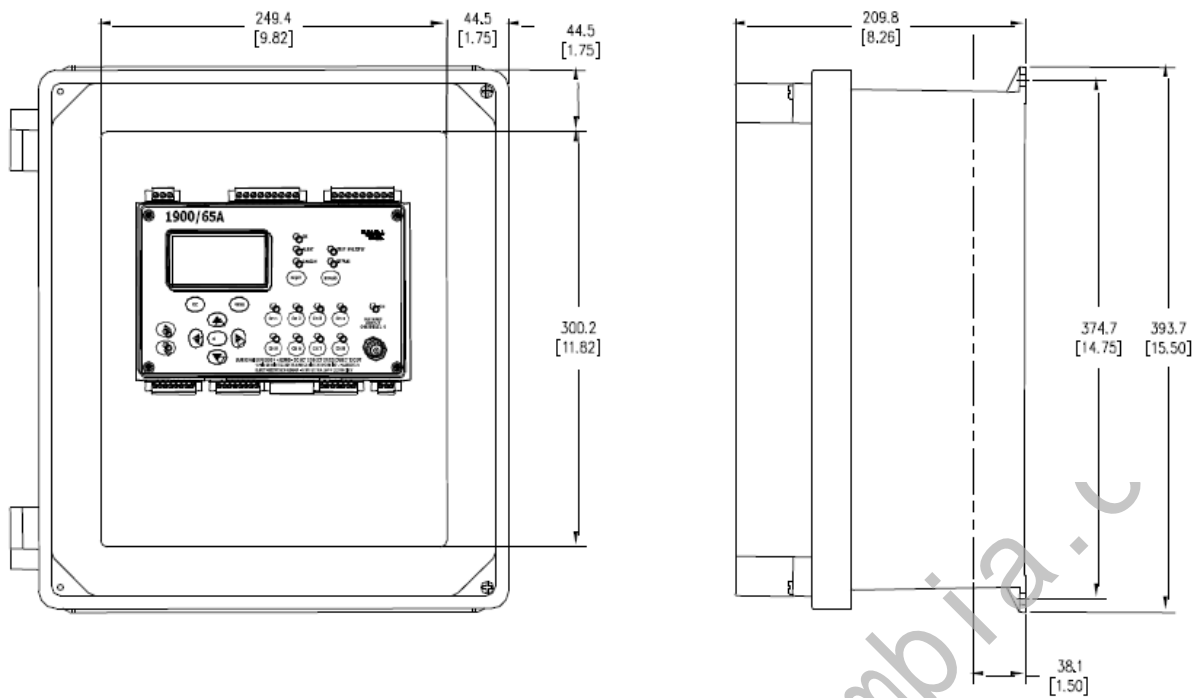| Part Number	Description
	display assembly
168944	Fiberglass NEMA 4X/IP66 weatherproof housing with window in door
284785	MTL 7728(-) barrier
175502	MTL 7796(-) barrier
172555	Modbus®/TCP (Ethernet) to Modbus®/RTU (Serial) Converter
169825-01	Training CD

Figures

Note: All dimensions shown in millimeters (inches) except as noted.

Figure 1:   Monitor Module Dimensions

21.84
[0.86]

1900/65A

OK
ALERT — TRIP MULTIPLY
DANGER — BYPASS

RESET   BYPASS

ESC   MENU

CH 1 CH 2 CH 3 CH 4

ON
BUFFERED
OUTPUT
CHANNELS 1-4

CH 5 CH 6 CH 7 CH 8

WARNING! EXPLOSION HAZARD – DO NOT CONNECT OR DISCONNECT EXCEPT
WHEN DE-ENERGIZED OR AREA IS KNOWN TO BE NON-HAZARDOUS.
ELECTROSTATIC HAZARD – WIPE WITH A DAMP CLOTH ONLY.

134.62
[5.03]

20.32
[0.80]

32.77
[1.29]

196.85
[7.75]

Figure 2:   Display Module Dimensions

Figure 3: Combined Dimensions

Figure 4: Weatherproof Housing Dimensions
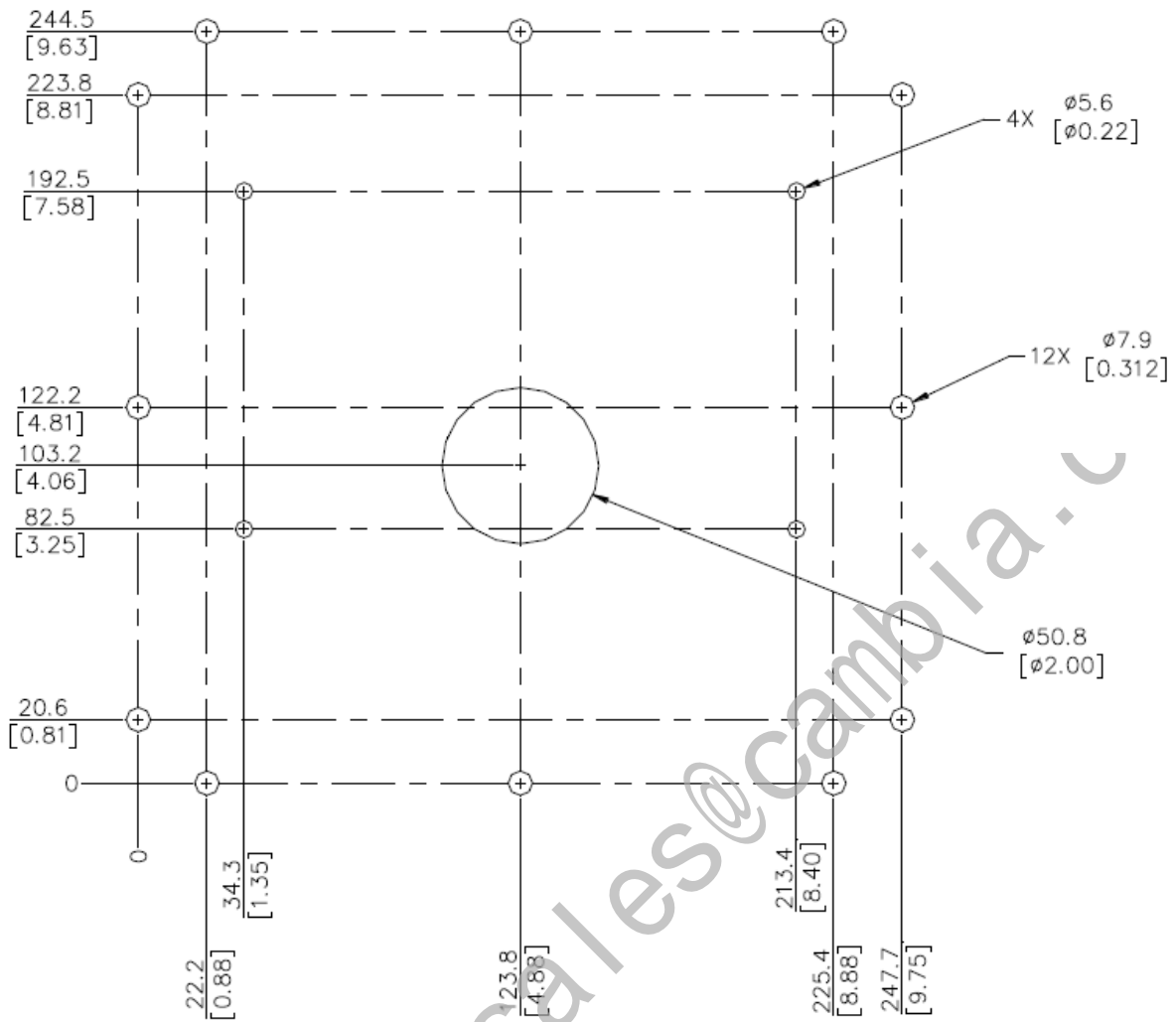
Figure 5: Weatherproof Door Drill Pattern
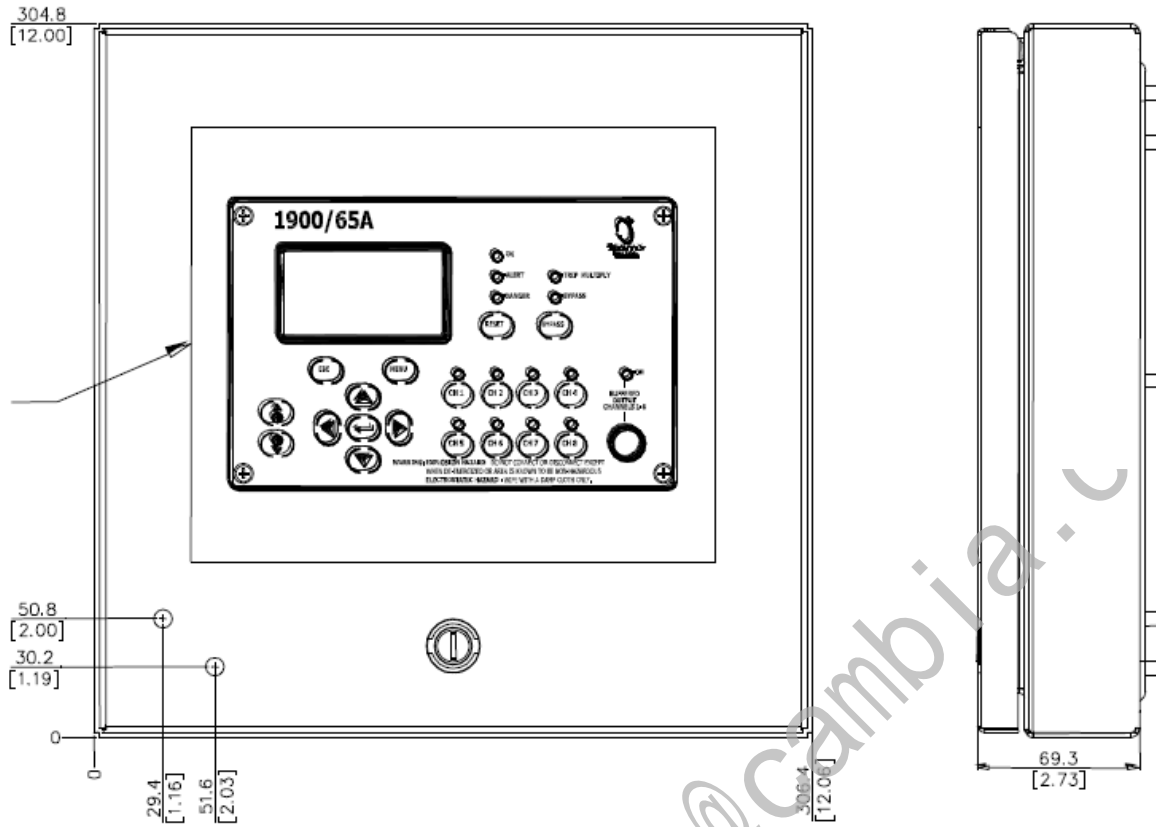
Figure 6: Weatherproof Door Dimensions

NEMA 4X/IP 66
FIBERGLASS HOUSING

1900/65

19.31 [491]

17.32 [440]

9.58 [243]
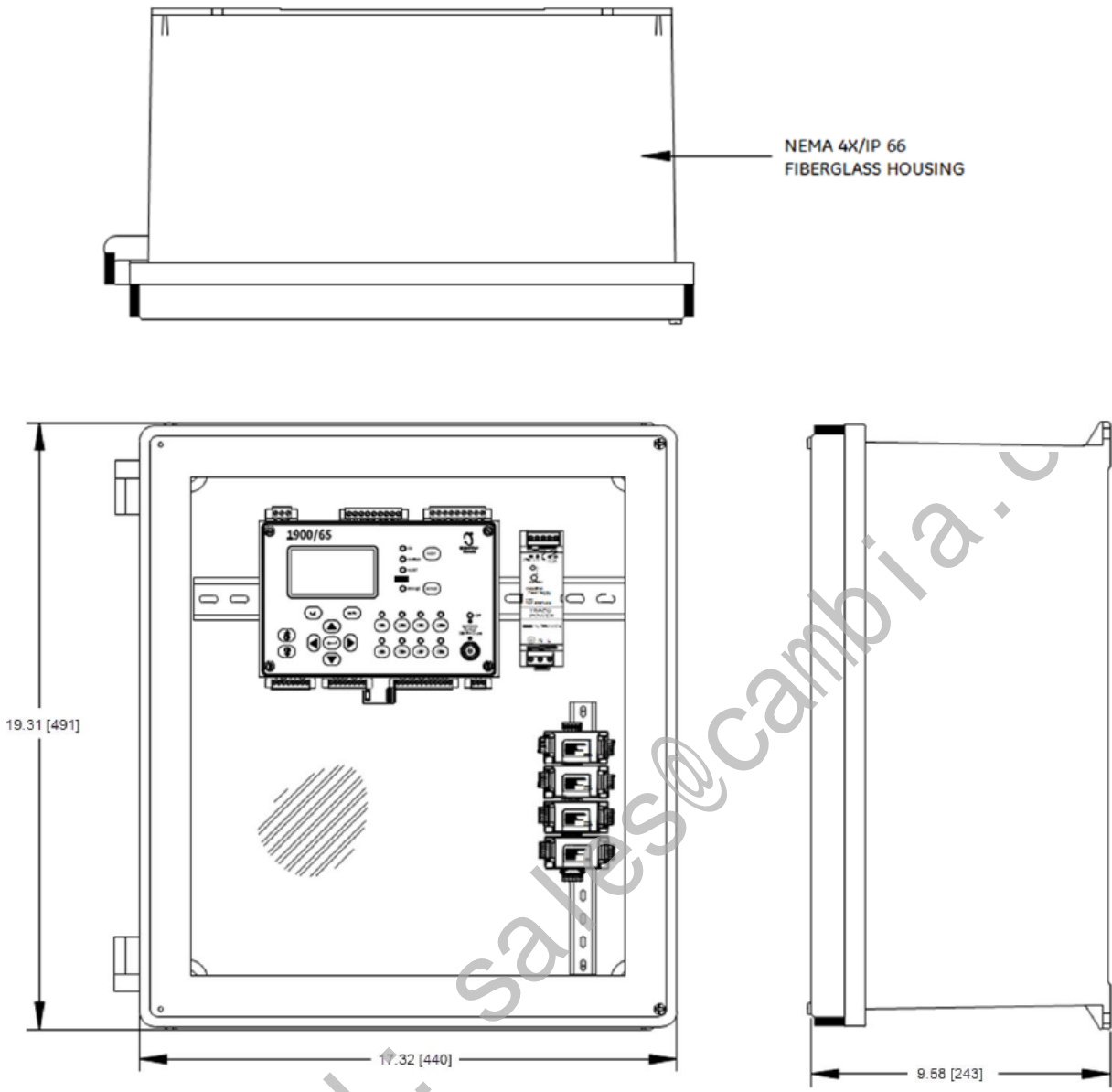
Figure 7: ProTIM Housing Dimensions