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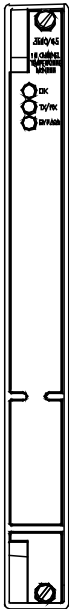
Website: <https://www.joyoungintl.com/>

# 3500/65 16-Channel Temperature Monitor

Bently Nevada\* Asset Condition Monitoring

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## Description



The 3500/65 monitor provides 16 channels of temperature monitoring and accepts both resistance temperature detector (RTD) and isolated tip thermocouple (TC) temperature inputs. The monitor conditions these inputs and compares them against user-programmable alarm setpoints.

The monitor is programmed using the 3500 Rack Configuration Software. You can configure the 16-Channel Temperature Monitor to accept isolated tip thermocouples, 3-wire RTD, 4-wire RTD, or a combination of TC and RTD inputs.

In Triple Modular Redundant (TMR) configurations, you must install temperature monitors in groups of 3 adjacent monitors. In this configuration the monitor uses 2 types of voting to ensure accurate operation and to avoid single-point failures



Specifications and Ordering Information  
Part Number 172930-01  
Rev. D (12/11)

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## Specifications

### Inputs

#### Signal

Accepts from 1 to 16 RTD or isolated tip TC transducer signals.

#### Input Impedance

Greater than 1 M $\Omega$  for each lead input.

#### Power Consumption

3 watts nominal.

#### Transducers

##### TCs

###### Type E

-100 °C to +1000 °C,  
(-148 °F to +1832 °F).

###### Type J

0 °C to +760 °C  
(32 °F to +1400 °F).

###### Type K

0 °C to +1370 °C  
(32 °F to +2498 °F).

###### Type T

-160°C to +400 °C,  
(-256 °F to +752 °F).

##### RTDs

100  $\Omega$  3-wire and 4-wire platinum RTD  
( $\alpha = 0.00385$ );

-200 °C to +850 °C  
(-328 °F to +1562 °F).

100  $\Omega$  3-wire and 4-wire platinum RTD  
( $\alpha = 0.00392$ );

-200 °C to +700 °C  
(-328 °F to +1292 °F).

120  $\Omega$  3-wire and 4-wire nickel RTD:

-80 °C to +260 °C  
(-112 °F to +500 °F).

10  $\Omega$  3-wire and 4-wire copper RTD:

-100 °C to +260 °C,  
(-148 °F to +500 °F).

**Note:** Platinum RTDs with  $\alpha = 0.00385$  are the worldwide industrial standard and are the recommended RTDs for all applications.

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## Outputs

### Front Panel LEDs

#### OK LED

Indicates when the temperature monitor is operating properly.

#### TX/RX LED

Indicates when the temperature monitor is communicating with other modules in the 3500 rack.

#### Bypass LED

Indicates when the temperature monitor is in Bypass Mode.

#### RTD Current-Source Value

913  $\pm$  7  $\mu$ A @ 25 °C per transducer (1 supply for the 4-wire RTD and 2 supplies for the 3-wire).

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## Signal Conditioning

Specified at +25 °C (+77 °F). Full-scale range for each channel is set in the field via 3500 Configuration Software. No calibration is required.

### RTDs and TCs

#### Resolution

1 °C or 1 °F.

## Accuracy

### Internal Termination

Bulkhead Rack:  $\pm 3$  °C at +25 °C ( $\pm 5.4$  °F at +77 °F).

Standard Rack:  $\pm 3$  °C at +25 °C ( $\pm 5.4$  °F at +77 °F).

### External Termination

Bulkhead Rack:  $\pm 3$  °C at +25 °C ( $\pm 5.4$  °F at +77 °F).

Standard Rack:  $\pm 3$  °C at +25 °C ( $\pm 5.4$  °F at +77 °F).

Cold Junction Compensation Sensor (used for TC measurements)  $\pm 2$  °C at +25 °C ( $\pm 3.6$  °F at +77 °F).

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## Alarms

### Alarm Setpoints:

You can use software configuration to set Alert and Danger setpoints for the value measured by the monitor. Alarms are adjustable from 0 to 100% of full-scale for each measured value. The exception is when the full-scale range exceeds the range of the sensor. In this case, software will limit the setpoint to the range of the sensor. Accuracy of alarms are to within 0.13% of the desired value. The 3500/65 16-channel temperature monitor has both under- and over-alarm setpoints.

### Alarm Time Delays

You can use software to program alarm delays as follows:

### Alert Delay

From 1 to 60 seconds in 1-second increments.

## Danger Delay

From 1 to 60 seconds in 0.5-second increments or set to the minimum alarm delay of 225 mS.

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## Proportional Values

Proportional values are temperature measurements used to monitor the machine. The 16-channel temperature monitor returns temperature proportional values.

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## Environmental Limits

### Operating Temperature

-30 °C to +65 °C (-22 °F to +150 °F).

### Storage Temperature

-40 °C to +85 °C (-40 °F to +185 °F).

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## Compliance and Certifications

### EMC

Standards:  
EN 61000-6-2 Immunity for Industrial Environments  
EN 55011/CISPR 11 ISM Equipment  
EN 61000-6-4 Emissions for Industrial Environments

European Community Directives:  
EMC Directive 2004/108/EC

### Electrical Safety

Standards:  
EN 61010-1

European Community Directives:  
2006/95/EC Low Voltage

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## Hazardous Area Approvals

### North American

#### Approval Option (01)

Class 1, Div 2  
Groups A, B, C, D  
T4 @ Ta = -20 °C to +65 °C  
(-4 °F to +150 °F)

## North American

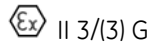
### Approval Option (02)

Ex nC[L] IIC  
Class 1, Zone 2  
Class 1, Div 2, Groups A, B, C, D  
T4 @ Ta -20 °C to +65 °C  
(-4 °F to +150 °F)

### ATEX:

### Approval Option (02)

**For Selected Ordering Options  
with ATEX/North American  
agency approvals:**



Ex nC[L] IIC  
T4 @ Ta = -20 °C to +65 °C  
(-4 °F to +150 °F)

## South Africa

### Approval Option (02)

**For Selected Ordering Options  
with ATEX/North American  
agency approvals:**

Ex nCAL [ia] IIC T4  
Ex nCAL [L] IIC T4  
T4 @ Ta = -20 °C to +65 °C  
(-4 °F to +150 °F)

For further certification and approvals information please visit the following website:  
[www.ge-mcs.com/bently](http://www.ge-mcs.com/bently)

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## Monitor Module

### Dimensions (Height x Width x Depth)

241.3 mm x 24.4 mm x 241.8 mm  
(9.50 in x 0.96 in x 9.52 in).

### Weight

0.91 kg (2.0 lb.).

## I/O Modules

### 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

0.45 kg (1.0 lb.).

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## Rack Space Requirements

### Monitor Module:

1 full-height front slot.

### I/O Modules:

1 full-height rear slot.

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## Ordering Considerations

### General

If you add the 3500/65 to an existing 3500 System your system will require the following or later firmware and software versions:

### 3500/22 Module Firmware

Revision 1.50

### 3500/01 Software

Version 3.85

### 3500/02 Software

Not supported\*

### 3500/03 Software

Not supported\*

### 3500/93 Module Firmware

Revision 2.02

### System 1\* Software

Revision 5.2 with Service Pack 2

\*Attempting to use the 3500/65 with 3500/02 or 3500/03 software may prevent proper operation of the software.

You cannot use external termination blocks with internal termination I/O modules.

When ordering I/O Modules with external terminations, you must order the external termination blocks and cables separately.

When ordering I/O Modules for use with 4-Wire RTDs, order with Modification 179952-01. For further information, see the 3500/65 Manual.

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## Ordering Information

### 3500/65-AXX-BXX

#### A: I/O Module Type

- 01 RTD/Isolated Tip TC with Internal Terminations
- 02 RTD/Isolated Tip TC with External Terminations

#### B: Agency Approval Option

- 00 None
- 01 CSA/NRTL/C
- 02 CSA/ATEX

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**Note:** Agency Approval Option B 02 is only available with Ordering Option A 01.

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## External Termination Block

### 172115-01

RTD/Isolated Tip TC External Termination Block (Euro Style connectors).

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## Cables

### 3500/65 Transducer (XDCR) Signal to External Termination (ET) Block Cable

#### 134544-AXXX-BXX

#### A: Cable Length

- 0005 5 feet (1.5 metres)
- 0007 7 feet (2.1 metres)
- 0010 10 feet (3 metres)
- 0025 25 feet (7.5 metres)
- 0050 50 feet (15 metres)
- 0100 100 feet (30.5 metres)

#### B: Assembly Instructions

- 01 Not Assembled
- 02 Assembled

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## Spares

### 172931-01

3500/65 Manual.

### 145988-02

3500/65 Monitor.

### 172103-01

3500/65 RTD/Isolated Tip TC I/O Module, Internal Terminations

### 173005

Connector Header, Internal Termination, 20-position, Black

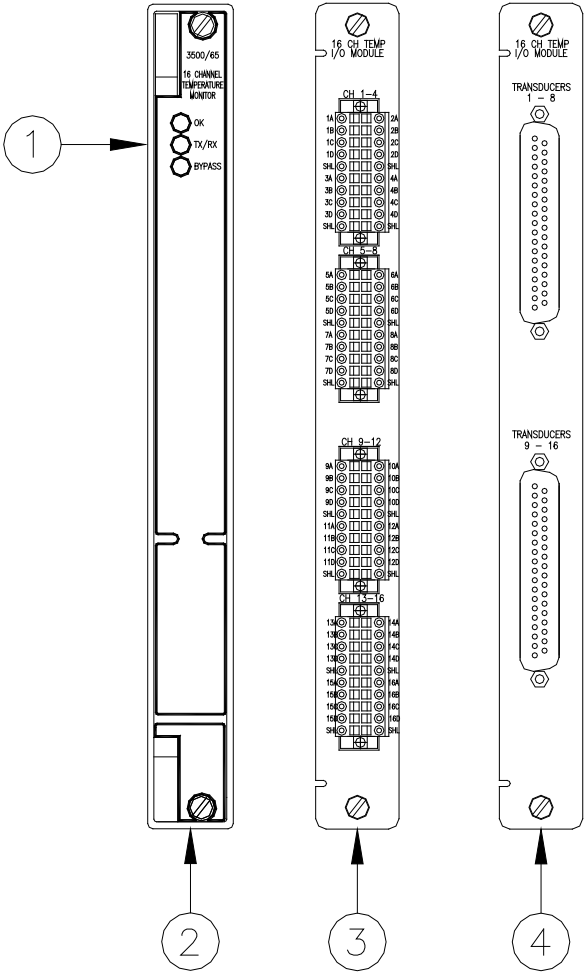
### 172109-01

3500/65 RTD/ Isolated Tip TC I/O Module, External Terminations

### 172115-01

RTD/Isolated Tip TC External Termination Block (Euro Style Connectors)

# Graphs and Figures



1. Status LEDs
2. 3500/65 Main Module Front View
3. RTD/ Isolated Tip TC I/O Module (Internal Terminations)
4. RTD/ Isolated Tip TC I/O Module(External Terminations)