# BWI EAGLE TAC-MONITOR

# 221-8100-AC

# 221-8100-DC

## Digital Speed Monitor


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**PIB No:** 221-8100

cattron.com/products/bwi-eagle

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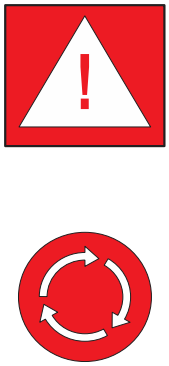
## WARRANTY STATEMENT

BWI Eagle Inc. warrants the Air-Eagle Remote Control System, if properly used and installed, will be free from defects in material and workmanship for a period of **1 year** after date of purchase. Said warranty to include the repair or replacement of defective equipment. This warranty does not cover damage due to external causes, including accident, problems with electrical power, usage not in accordance with product instructions, misuse, neglect, alteration, repair, improper installation, or improper testing. This limited warranty, and any implied warranties that may exist under state law, apply only to the original purchaser of the equipment, and last only for as long as such purchaser continues to own the equipment. This warranty replaces all other warranties, express or implied including, but not limited to, the implied warranties or merchantability and fitness for a particular purpose. BWI Eagle makes no express warranties beyond those stated here. BWI disclaims without limitation, implied warranties of merchantability and fitness for a particular purpose. Some jurisdictions do not allow the exclusion of implied warranties so this limitation may not apply to you. To obtain warranty service, contact BWI Eagle for a return material authorization. When returning equipment to BWI Eagle, the customer assumes the risk of damage or loss during shipping and is responsible for the shipping costs incurred.

## SIGNAL RANGE

Max range statements are estimates based on a clear line of sight with few interferences. Actual range will vary based on transmitting power, orientation of transmitter and receiver, height of transmitting and receiving antennas, weather conditions, electronic interference, terrain, and physical obstacles, including but not limited to; walls, building structures, trees (foliage), metal objects, and landscape (hills, mountains).



## WIRELESS STOP, ASTOP, and E-STOP SYSTEMS

Wireless E-STOP systems should never be considered a primary life-saving device. At least one hard-wired switch must be available in the event the wireless system is not operational. Failure to comply may result in serious injury or death to personnel and damage to equipment.

Wireless STOP and ASTOP transmitters are not failsafe emergency stop controls. They are NOT to be used as a life-saving device. They are designed for wireless control of equipment or vehicle remote operation. Failure to use as intended may result in serious injury or death to personnel and damage to equipment.

SCAN ME




## INTRODUCTION

The BWI Eagle Tac-Monitor converts rotary shaft speed (RPM) into analog 4-20mA output to allow “true slip” monitoring during the critical ramp-up period of conveyors.

The Tac-Monitor interfaces directly with the customer’s PLC. It utilizes non-contacting proximity sensor that can be remotely located up to two miles from the control unit.

Enclosed in a durable DIN-rail mountable polycarbonate enclosure, the control unit conveniently mounts inside an electrical panel or O.E.M. control box. The up-front digital display shows the current RPM in real time.

The Tac-Switch is ideal for conveyors, crushers, fans, motors, and other rotating equipment.

## INSTALLATION

1. Mount the Tac-Monitor inside an existing control panel or other suitable enclosure.
2. Install wiring to the terminal strip. (See TERMINAL STRIP WIRING section.)
3. Install BWI Eagle Proximity Sensor at roller or shaft. (See sensor installation sheet).

## SCREEN RESET

In the event the screen freezes, a screen reset function is available.

1. Press and hold the SEL button.
2. Press the SET button.
3. Release both buttons. The screen will reset to the default display.

## TERMINAL STRIP WIRING

| Terminal | 221-8000-AC | 221-8000-DC |
|---|---|---|
| Terminal 1 | Sensor Input Common (-) | Sensor Input Common (-) |
| Terminal 2 | Sensor Input (+) | Sensor Input (+) |
| Terminal 3 | Not used on this model. | |
| Terminal 4 | | |
| Terminal 5 | 4-20mA Output (-) | 4-20mA Output (-) |
| Terminal 6 | 4-20mA Output (+) | 4-20mA Output (+) |
| Terminal 7 | Not used on this model. | |
| Terminal 8 | | |
| Terminal 9 | | |
| Terminal 10 | | |
| Terminal 11 | | |
| Terminal 12 | | |
| Terminal 13 | | |
| Terminal 14 | | |
| Terminal 15 | 100-250 VAC | (-) 9-36 VDC |
| Terminal 16 | 100-250 VAC | (+) 9-36 VDC |

## SPECIFICATIONS

| | 221-8000-AC | 221-8000-DC |
|---|---|---|
| **Power Supply** | 100-250 VAC, 5 W, 50/60 Hz | 9-36 VDC, 5W |
| **Fuse Protected** | 1 amp | 1 amp |
| **Output** | Proportional 4-20mA D.C. | Proportional 4-20mA D.C. |
| **Linearity** | Better than 1% | Better than 1% |
| **Accuracy** | Better than 1% | Better than 1% |
| **Repeatability** | Better than 0.5% | Better than 0.5% |
| **Enclosure** | Polycarbonate | Polycarbonate |

## ACCESSORIES

| | |
|---|---|
| Threaded PVC Proximity Sensor | 10-7139 |
| I.S. Threaded PVC Proximity Sensor | 10-7039 |
| I.S. Zener Barrier | 10-7072 |

## SET-UP & DISPLAY INDICATORS

When power is applied to the unit, the display will show the following: **0** at the bottom of the screen (displays the actual RPM from the remote speed sensor).

**LINE OPEN** - If displayed, check 4-20mA line. 0-500 ohm is the maximum line resistance.

**RANGE: 10-XXXX RPM** - **D**isplays the current speed range of the Tac Monitor. To change the range follow the steps below.

1. Press the SEL button to highlight RANGE.

2. Press the SET button to begin range set-up. The range is displayed as 4-digit number. The 1000s digit will be highlighted. Use the SEL button to change the number. Press the SET button to move to the 100s digit. Use the SEL button to change the number. Press the SET button to move to the 10s digit. Continue until all digits are set.

3. Review setting for accuracy. To adjust a digit, press the SET button to move through the digits. Use the SEL button to adjust the digits.

4. When digits are entered correctly press and hold the SET button until all digits of the range setting highlight (approximately 2 seconds). Release the SET button.

The range setting will be maintained in memory until changed again by the operator.

Note: If, during the range set-up procedure, no buttons are pressed for 10 seconds, the programming process will time out and revert to the last saved setting.

## APPLICATION/SPEED INFORMATION

All models have a preset low end RPM range of 10 RPM (0.1666hz x 60). The following formulas and examples can be used to determine the Frequency Range (SPAN) and corresponding 4-20mA output at any monitored speed.

1. Convert top end RPM into a frequency in hertz (hz).

   XXXX RPM / 60 = XXX.Xhz

2. Subtract frequency in hertz from 0.1666hz (10 RPM).

   XXX.Xhz – 0.1666hz = XXX.X SPAN in RPM

3. Divide the SPAN in RPM by 160 = RPM per each .1mA increment of the output.

   XXX.X RPM / 160 = XX RPM per .1mA output

**Example of speed information for 150 RPM/Model:**

This example has an INPUT FREQUENCY RANGE of .166hz to 2.50hz. By installing one target on the roller or shaft, the following formula can be used to convert to RPMs.

<< continued >>

## APPLICATION/SPEED INFORMATION (Continued)

INPUT FREQUENCY * 60 = RPM

| Examples: | |
|---|---|
| | 0.166hz * 60 = 9.96 RPM |
| | 1.33hz * 60 = 79.80 RPM |
| | 2.50hz * 60 = 150.00 RPM |

This example unit has a factory set span of 2.334hz (2.50hz - .166hz). Multiplying 2.334hz * 60 will give the span in RPM's.

2.334hz * 60 = 140.04 RPM

Dividing 140.04 / 160 will give the RPM resolution for each .1mA increment.

140.04 / 160 = 0.87 RPM per .1mA output

By adding additional targets to the roller or shaft, a lower RPM range can be obtained. The following examples will show how to calculate the speed range for four targets.

INPUT FREQUENCY * 60 / 4 TARGETS = ACTUAL RPM

| Examples: | |
|---|---|
| | 0.166hz * 60 / 4 = 2.49 RPM |
| | 1.33hz * 60 / 4 = 19.95 RPM |
| | 2.50hz * 60 / 4 = 37.50 RPM |

Conclusion: By changing the number of targets on the roller or shaft, different speed ranges can be obtained from the same model.

| Examples: | |
|---|---|
| | 1 Target = 9.96 RPM to 150.00 RPM |
| | 2 Targets = 4.98 RPM to 75.00 RPM |
| | 4 Targets = 1.77 RPM to 37.50 RPM |

## DIMENSIONS