# Watchdog Super Elite

*BETTER BY DESIGN*

# Watchdog™ Super Elite
## Bucket Elevator / Conveyor Monitoring System

### APPLICATION
Combined belt alignment, belt speed, belt slip, continuous bearing temperature, pulley alignment and plug condition monitor for bucket elevators and conveyors.

### METHOD OF OPERATION
The Watchdog Super Elite (WDC4) is easy to install and simple to set-up. The system processes signals from sensors for belt misalignment, belt speed & slip, continuous bearing temperature, pulley misalignment and plug condition.  When an alarm is detected it will sound an alarm and provide shutdown control of the elevator/conveyor and feeding system.

A 3.5" LCD screen displays the entire system status at a glance. Password protected controller settings can be set up on the LCD screen, or by a PC application and transferred to the WDC4 via an SD card.

The Watchdog Super Elite can be connected directly to a PLC using the Modbus TCP/IP protocol, or integrated into HazardMon.com®.  This secure cloud based solution provides live system status, graphs and historical data that is viewable on any web-enabled device (smartphone, tablet, desktop PC).

### FEATURES
► Belt Speed Monitoring (Including VFD's)
► Belt & Pulley Misalignment Monitoring
► Temperature Monitoring
► Plug Condition Monitoring
► Jog & Acceleration Monitoring
► Large Color Graphics Display
► System Settings Backup & Transfer
► PLC Communications (Modbus TCP)
► Event & Alarm Logging
► HazardMon.com Connectivity

### PART NUMBERS / ACCESSORIES
► WDC4V46C          Watchdog Control Unit (120 - 240 VAC / 24 VDC)
► WDC4V4C          Watchdog Control Unit (24 VDC)
► WDC4-AUXO-4SSR    PLC Board (Optional)
► WDC4-AUXI-6NTC     NTC Expansion Board (6 Inputs)
► WDC4-AUXI-4PT100   PT100 Expansion Board (4 Inputs)
► WDC4-AUXI-6AN       Analog Expansion Board (6 Inputs)
► TS2V4C            Touchswitch - Belt Misalignment
► KIT-RUB-1          Rub Block 2" x 4" - Belt Misalignment
► P8004V10C        P800 Proxswitch - Belt Speed
► WG1-4B-4          Whirligig Sensor Mount (P800)
► ADB20V3C/D3      Adjustable Depth Bearing Temp. Sensors
► BSE1V10C         Binswitch Elite - Plug Indication
► KIT-LUG-ADB20      ADB Lug Temperature Sensor - NTC Type



ATEX & CE Versions Available

### NEW SUPER ELITE FEATURES
### VS. PREVIOUS WDC3 VERSION
► Belt Speed Monitoring for VFD Drives
► Belt Alignment Monitoring Using Rub Blocks
► More Temperature Monitoring Inputs
► Jog Monitoring
► 3.5" Color Graphics LCD Display
► System Settings Backup & Transfer (SD Card)
► PLC Communications (Modbus TCP)
► Event & Alarm Logging
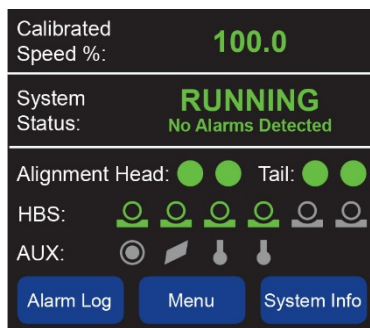► HazardMon.com Connectivity

### New Lug Kits
For surface mount applications, a lug style adapter bolts directly onto a bearing housing, (Flange Bearings and others),  motor, gearbox, or machine casing. The mounting hole is 3/8" from the factory, but can be drilled up to 1/2" if needed.
https://www.go4b.com/usa/products/temperature-sensors/adb-lug.asp

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## Watchdog Main LCD Screen



The main LCD screen (above) provides an overview of system status including any current faults or alarm conditions.

Easily identifiable status icons display the condition of all the belt alignment, bearing temperature, and auxiliary sensors whether they are active, not active, normal or in an alarm condition.

A grey icon indicates not active.
A green icon indicates a normal state.
A red icon indicates an alarm state.

The sensor LEDs provide a quick view status of the head and tail alignment sensors (top left, top right, bottom left, bottom right), along with speed pulse indication and alarm and stop status.
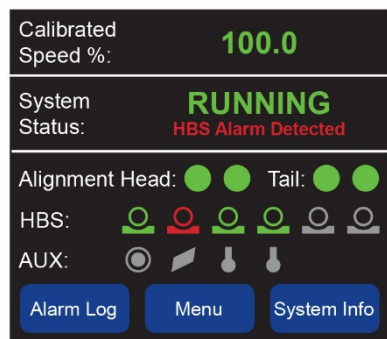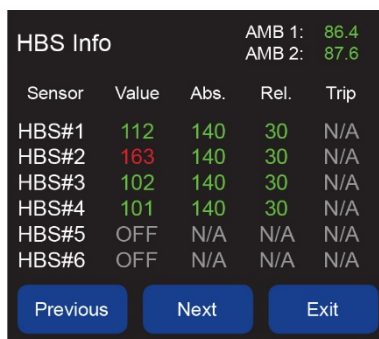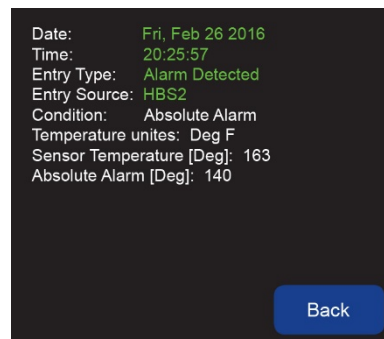
### Sensor Alarm Icons

| | |
|---|---|
| 🔴 | Hot bearing trip exceeded |
| 🌡 | Ambient sensor trip exceeded |
| 🟥 | Plug condition has been activated |
| ⭕ | Pulley misalignment detected |
| L  R | Misalignment condition |

24/7 Protection

## Sensor Menu and Alarm Log



**Main LCD**



**Hot Bearing Information**

| Sensor | Value | Abs. | Rel. | Trip |
|---|---|---|---|---|
| HBS#1 | 112 | 140 | 30 | N/A |
| HBS#2 | 163 | 140 | 30 | N/A |
| HBS#3 | 102 | 140 | 30 | N/A |
| HBS#4 | 101 | 140 | 30 | N/A |
| HBS#5 | OFF | N/A | N/A | N/A |
| HBS#6 | OFF | N/A | N/A | N/A |

AMB 1: 86.4
AMB 2: 87.6



**Alarm Log Detail**

Date: Fri, Feb 26 2016
Time: 20:25:57
Entry Type: Alarm Detected
Entry Source: HBS2
Condition: Absolute Alarm
Temperature unites: Deg F
Sensor Temperature [Deg]: 163
Absolute Alarm [Deg]: 140

The Main LCD screen above is indicating a hot bearing sensor alarm. The next screen shows all of the bearing sensors, their current temperature values (Value), and their associated alarm trip points (Abs). Note that you can easily see that HBS#2 is in an alarm state.

All alarms are date and time stamped, and can be viewed in the Alarm Log. Alarms are automatically saved onto an SD card and can be imported into a spread sheet program to create more detailed logging and trending reports. If using HazardMon.com, the alarms are accessible from any web-enabled device.

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## Typical Sensor Placement Diagrams
### (Belt Conveyors & Bucket Elevators)



Drive Section

Tail Section
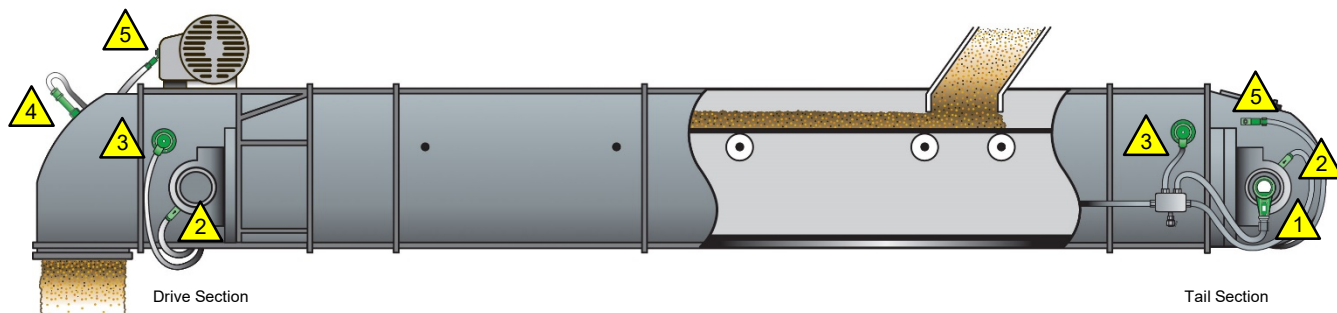
**1 BELT SPEED**
Qty. 1 - One sensor located on either side of the tail or boot shaft.

**2 BEARING TEMPERATURE**
Qty. 4 - One sensor for the bearings at each end of the drive and tail or head and boot shafts.

**3 BELT MISALIGNMENT**
Qty. 4 - Sensors work in pairs, one for each side of the belt on the drive and tail or head and boot sections.

**4 PLUG INDICATION**
Qty. 1 - One sensor located near the top of the drive section or spouting by the discharge.

**5 SURFACE TEMPERATURE (ELEVATOR)**
**TAIL PULLEY MISALGNMENT (CONVEYOR)**
Qty. 2 - One sensor located on each side of the conveyor housing on the tail section to detect heat generated by a pulley misalignment.  It is also used to detect overheating motors and gearboxes.
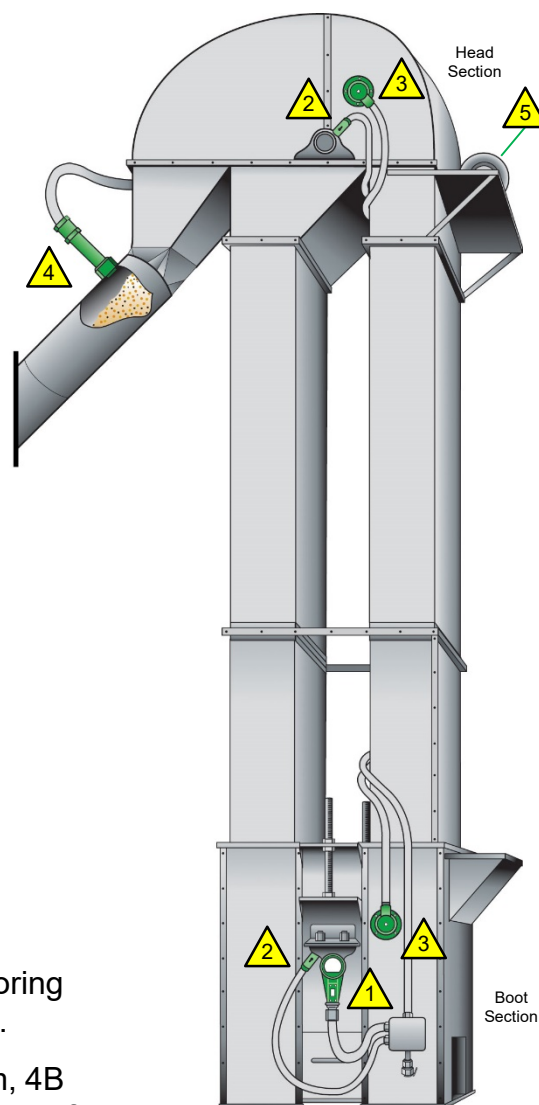
Easy order kits are available for the most common monitoring configurations.  Visit www.go4b.com/watchdog for details.

Not sure what you need for your equipment?  No problem, 4B Engineers can help you design the right system for your specific application.



Head Section

Boot Section

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## HazardMon.com

The Watchdog Super Elite has built in network support for HazardMon.com. HazardMon is a secure cloud based hazard monitoring solution providing status notifications and data logging for bucket elevators and conveyors. Live system status, graphs and historical data can be viewed on any web-enabled device (smartphone, tablet PC, desktop or laptop computer). Emails can be sent to notify users whenever a change in the system's health is detected. An automated maintenance feature allows site operators to verify that all sensors on the system are operational and working correctly.

### FEATURES

- ► Alert Email Notifications
- ► Real Time System Status
- ► Data Logged Automatically
- ► Automated Maintenance
- ► Password Protected Network
- ► Constantly Evolving Features

## TECHNICAL SPECIFICATIONS

### Watchdog Super Elite - Control Unit

| WDC4V46C and WDC4V4C | |
|---|---|
| **Supply Voltage -** | 120 to 240 VAC or 24 VDC (WDC4V46C)<br>24 VDC (WDC4V4C) |
| **Power Consumption (Max.) -** | 12 Watts |
| **Power Terminals -** | 14 AWG / 4 mm² |
| **Signal Terminals -** | 16 AWG / 2.5 mm² |
| **Alarm Relay Contacts -** | 1 Pole Normally Open - 8A @ 250 VAC Voltage Free Changeover |
| **Stop Relay Contacts -** | 1 Pole Normally Open - 8A @ 250 VAC Voltage Free Changeover |
| **Sensor Supply -** | 24 VDC @ 800 mA (Across F1, F2 and F3) |
| **Sensor Inputs -** | 15 (Expandable to 27 with Auxiliary Boards) |
| **Interlock Input -** | 24 VDC or 120 to 240 VAC |
| **Dimensions (H x W x D) -** | 11-3/4 x 9-1/2 x 5-1/4 (inches) / 298 x 241 x 133 (mm) |
| **Fixing Centers (H x W) -** | 10-7/8 x 6 (inches) / 276 x 152 (mm) |
| **Cable Entry -** | 2 Holes 1-1/8 in. Diameter (28 mm) |
| **Weight -** | 3 lbs / 1.3 kg |
| **Protection -** | IP66 |
| **Approvals -** | CSA Class II Div 1 Groups E, F & G (WDC4V4C)<br>CSA Class II Div 2 Groups F & G (WDC4V46C)<br>ATEX, CE & INMETRO (Versions Available) |
| **Auxiliary Boards\* -** | • WDC4-AUXO-4SSR - Discrete PLC input card providing 4 solid state relay outputs for belt speed, belt misalignment, bearing temperature and plug indication.<br>• WDC4-AUXI-6NTC - Adds 6 additional NTC temperature inputs.<br>• WDC4-AUXI-4PT100 - Adds 4 additional PT100 Platinum RTD temperature inputs.<br>• WDC4-AUXI-6AN - Adds 4 current loop (4-20 mA) inputs and 2 voltage inputs. |
| **PLC Connectivity -** | • Modbus TCP/IP (Standard)<br>• ControlLogix® (See ProSoft® Technical Note) |

*\*NOTE: Up to two expansion boards can be added to the WDC4 in any combination.*