Electronic components & monitoring systems

Hazard Monitoring Systems
Bearing Temperature Sensors
Misalignment Monitors
Speed Switches
Inductive Sensors
Junction Boxes
Level Indicators
Bearing Temperature Sensors

The WDB, MDB & ADB Series bearing temperature sensors are designed to screw directly into an existing grease zerk fitting on a bearing housing. Each sensor is fitted with a grease nipple to allow lubrication of the bearing without the need for removal of the sensor. Most series are available with either a PTC thermistor with various factory set trip points, or a NTC thermistor with a user adjustable trip point, or as a Pt100 RTD version.

Speed Switches

Monitors rotating machinery for dangerous underspeed conditions. An inductive sensing device located in the nose of the enclosure will detect a metal target. Set to the normal machine RPM, 4B Speedswitches provide alarm and shutdown signals underspeed and stopped motion.

Binswitch

The Binswitch detects level or plug conditions for bulk granular solids or liquids in tanks, bins, or silos and can be used as a plug or choke detector in chutes, conveyors and elevator legs.

Roto Level Series

The Roto Level Series are rotary paddle switches designed to detect high and low levels of bulk granular solids in bins, tanks, silos, and as blockage detectors in spouts.

WDA 3

The WDA Series are non-contacting extended range magnetic sensors used to detect ferrous targets (such as bucket bolts or steel buckets) at a distance of up to 75mm from the sensor. It can also be used as a chain break detector.

Touchswitch

The Touchswitch is an electro-mechanical limit-switch style sensor with no moving parts. It is designed to detect belt tracking and misalignment problems on bucket elevators and conveyors. Unlike a rub block that utilizes friction (heat) to activate, the Touchswitch is pressure sensitive for safer and more reliable monitoring.

Inductive Sensors

4B inductive proximity sensors are designed to detect shaft speed, shaft position, gate position, or object presence. No contact is made between the sensor and the target being monitored. Sensors will detect a ferrous object at 12mm and a non-ferrous metal object at a distance of 8mm.

*Can be used with the Whirligig universal shaft sensor mount.

Autoset Series

The Autoset Series are self-contained point level monitors with digital displays for high, intermediate, or low-level detection of liquids, powders or free-flowing granular solids. The Autoset Series incorporates simple push-button calibration with microprocessor enable/disable switch for total protection of stored values. Once the unit is calibrated for a specific application, it never has to be recalibrated.
Preventative maintenance can help reduce the risk of equipment failure and consequent downtimes. When it comes to monitoring your bucket elevators and belt conveyors, 4B can recommend you the ideal combination of sensors and monitoring systems to suit your requirements and budget.

4B provides an extensive range of their own ATEX / IECEx / CSA / GOST-R approved hazard monitoring systems, misalignment switches and bearing temperature monitors and level controls. We can offer you anything from a replacement sensor to a fully integrated hazard monitoring system which can be operated either as a stand-alone system or connected to your PLC.

And if you do not want to install hazard monitoring sensors on every piece of equipment in your plant straightaway, we can offer you a scalable solution starting with carefully chosen equipment and systems that can be expanded at a later date to encompass other machines in the plant.

We can also offer an installation service, and we do provide competent after-sales technical support to help you overcome any technical problems with your monitoring equipment.

To get a recommendation from our engineers, please contact 4B.
### Combined Monitoring Systems

<table>
<thead>
<tr>
<th>Product</th>
<th>Watchdog Super Elite™</th>
<th>Watchdog Elite™</th>
<th>T500 Elite – Hotbus™</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bearing temperature</strong></td>
<td>(continuous) max. 6 sensors + 2 ambient temp. sensors</td>
<td>(continuous) max. 6 sensors</td>
<td>(continuous) max. 256 inputs*</td>
</tr>
<tr>
<td><strong>Belt speed</strong></td>
<td>(continuous) max. 2 inputs – Differential speed monitoring</td>
<td>(continuous) max. 1 input Single speed monitoring</td>
<td>(continuous) max. 256 inputs*</td>
</tr>
<tr>
<td><strong>Belt alignment</strong></td>
<td>Pulses / Contact / Rub* Blocks 4 inputs</td>
<td>max. 4 sensors (Touchswitch)</td>
<td>max. 256 sensors*</td>
</tr>
<tr>
<td><strong>Plugged condition</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Pulley alignment</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Communication interfaces</strong></td>
<td>Ethernet and RS-485 Onboard</td>
<td>All major industrial protocols supported via F500 Gateway</td>
<td>All major industrial protocols supported via F500 Gateway</td>
</tr>
<tr>
<td><strong>Test function</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Alarm &amp; shutdown function</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>Single elevator or conveyor</td>
<td>Single elevator or conveyor</td>
<td>Multiple elevators &amp; conveyors; remote monitoring across site</td>
</tr>
<tr>
<td><strong>Hazardmon.com</strong></td>
<td>(Ethernet onboard)</td>
<td>N</td>
<td>Y (via F500)</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td>ATEX / CSA / IECEx / GOST</td>
<td>ATEX / CSA / IECEx / GOST</td>
<td>ATEX / CSA / IECEx / GOST</td>
</tr>
</tbody>
</table>

* total number of inputs / sensors, all sensors combined.

### Specialised Monitoring Systems

<table>
<thead>
<tr>
<th>Product</th>
<th>T400N Elite</th>
<th>T400 Elite</th>
<th>A400 Elite</th>
<th>B400 Elite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bearing temperature</strong></td>
<td>(continuous) max. 8 sensors</td>
<td>(discreet PTC) max. 16 sensors</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td><strong>Belt speed</strong></td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td><strong>Belt alignment</strong></td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Plugged condition</strong></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Pulley alignment</strong></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Communication interfaces</strong></td>
<td>Modbus RTU (RS-485)</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td><strong>Test function</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Alarm &amp; shutdown function</strong></td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>Elevators &amp; conveyors</td>
<td>Elevators &amp; conveyors</td>
<td>Elevators</td>
<td>Elevators &amp; conveyors</td>
</tr>
<tr>
<td><strong>Hazardmon.com</strong></td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td>ATEX / CSA / IECEx / GOST</td>
<td>ATEX / CSA / IECEx / GOST</td>
<td>ATEX / CSA / IECEx / GOST</td>
<td>ATEX / CSA / IECEx / GOST</td>
</tr>
</tbody>
</table>
HAZARD MONITORING SYSTEMS

Combined Monitoring Systems

The Watchdog Super Elite™ is a complete elevator and conveyor monitoring system with inputs for most of the types of sensors standard in the industry. Offers top-of-the-class flexibility and approvals. Unprecedented user friendliness via a 3.5” full colour bespoke design graphics screen. Controller settings can be set up either directly on the unit or via a PC application and transferred between the WDC4s and PC via a SD card. In-built Ethernet port with full support for the Hazardmon.com cloud based monitoring service.

The Watchdog Elite™ is a microprocessor controlled unit with combined belt speed, belt alignment, bearing temperature, pulley alignment and plugged condition monitoring for bucket elevators and conveyors. An LCD screen displays machine status messages (available in four different languages) and a super-bright LED display shows belt speed. Calibration and set-up parameters are accessed via a password and front panel touch buttons.

For more detailed product information, please visit: www.go4b.com
HAZARD MONITORING SYSTEMS

Combined Monitoring Systems

The T500 Elite - Hotbus™ is a serial communication system specially designed to monitor up to 256 sensors, including continuous bearing temperature and belt misalignment. With automatic machine shutdown capability and PLC/PC compatibility this advanced microprocessor based system offers low cost installation, versatility and easy system expansion.

**T500 Elite - Hotbus™**

**Features**
- Continuous bearing temperature monitoring with user adjustable trip points
- RS485 serial communication
- Monitors up to 256 sensors
- 4 second scan time with 256 sensors installed
- Works with many types of sensors
- Enter your own sensor/location names for easy identification
- Alarm and shutdown features
- Gateways available for various PLC connections
- HazardMon.com® cloud based hazard monitoring compatible

**Sensor options**
- WDB, MDB, ADB: bearing temperature
- Touchswitch: belt alignment
- M300 Speedswitch: speed
- Autoset Series: level indicator
- Roto-Level Series: level indicator
- Binswitch: level and plug indicator

**Input supply voltage**
- 100 to 240 VAC
- 24 VDC (universal supply)

**Sensor supply**
- Use external 24 VDC supply

**Approvals**
- Europe - ATEX
- USA, Canada - CSA
- Russia and CIS - GOST-R
- Worldwide - IECEx

**H x W x D**
- 246 x 188 x 102mm

**Applications**
- Bucket elevators and conveyors

For more detailed product information, please visit: [www.go4b.com](http://www.go4b.com)

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**Accessories for T500 Elite**

HazardMon.com®

HazardMon.com® 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.

**F500 Elite Fieldbus Gateway**

The F500 is a communications gateway that allows for single point access to a maximum of four T500 Elite Hotbus™ systems via Fieldbus protocol. Fieldbus communication protocols supported include: Ethernet IP, Modbus TCP, Modbus RTU, DeviceNet, Profinet and others.

**R500 Elite Alarm Relay Interface**

The R500 is a microprocessor-controlled unit, which accepts signals from the T500 Elite Hotbus™ monitor, and is able to cause alarm or shutdown of equipment when a sensor exceeds its programmed alarm tolerance.

**Hotbox Node – TN4 (Input Node)**

The TN4 is a four input sensor node, powered by 24 VDC. Each input can be an NTC thermistor, PTC thermistor or Volt-Free Contact input; the types may be interchanged on a single node. The Node has a unique 4 digit address which is used to communicate to the T500 via a two wire RS485 connection. The TN4 Node processes information from electrical inputs into network data inputs for WDB, Binswitch or Touchswitch.

**Hotbox Node – SN2 (Speed Node)**

The SN2 is a two input speed node, powered by 24 VDC. The node is able to monitor two independent pulse (speed) sources for dangerous under speed conditions. The SN2 will support pulses which are PNP or sourced. The Node has a unique 4 digit address which is used to communicate to the T500 via a two wire RS485 connection. The SN2 processes information from electrical inputs into network data.

**Hotbus™ Node Tester**

The Hotbus Node Tester is a portable testing unit that can be used in the field to determine the operational status of any Hotbus communications node and network to quickly identify wiring or node issues. Simply plug the network connection cable directly to the node. A digital display on the tester will show the status of the node which can determine if the node is operating correctly. The unit can also be connected to a PC for more detailed diagnostics data.
HAZARDMON
Cloud-Based Hazard Monitoring

HazardMon.com® 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:
• Secure Cloud Based Hazard Monitoring
• Works with T500 Elite Hotbus™ & Watchdog Super Elite
• Real Time System Status & Alert Email Notifications
• Data Logged Automatically
• Automated Maintenance
• View on Any Web-Enabled Device

Visit www.hazardmon.com to sign up for a FREE demo account, and see what the cloud can do for you!
4B Commissioning Service

After 4B products have been installed by a qualified electrician, 4B’s commissioning service is available to inspect and certify proper installation of our sensors and control units prior to operation. A brief overview of the service is listed below:

General:
- All rigid and flexible conduits inspected for: cracks, breaks, tightness of connections, and suitability for purpose.
- All wiring inspected for: ground faults, shorts, suitability for purpose.
- All sensors and controls inspected for correct installation, and wiring to National Electrical Code (NEC) standards.
- All sensors and controls inspected for any signs of damage, and tested to insure proper working order.
- Detailed written inspection and testing report with any recommendations given to client.

Belt & Pulley Alignment Sensors:
- Sensors are removed from their location to ensure that they were centered on the belt.
- Each sensor is physically inspected for damage and wear.
- Sensor LED and alarm contacts are tested.
- Wire terminations are inspected.

Temperature Sensors:
- All sensors are inspected and resistance is checked.
- Sensors are also checked for correct identification, location and sensor type.
- Freeze spray is used to ensure that the sensor displays a change in temperature, or the ADB sensor tester is used to heat up the sensor to the alarm / trip point.
- Wire terminations are inspected.

Speed Switches:
- All speed switches are checked for proper installation.
- Sensors are checked for proper underspeed alarm and shutdown set points using 4B’s SpeedMaster™.
- Wire terminations are inspected.

Warning: 4B recommends that all sensors are wired to provide automatic shutdown of monitored equipment, when a hazardous condition is detected.

DUST EXPLOSION PREVENTION

It is well known that transporting certain dry dusty materials, such as grain, can create explosive atmospheres.

Five conditions, known as the “Dust Explosion Pentagon”, have to exist in order for the explosive state to occur. First, there needs to be a high concentration of dust (fuel), followed by an ignition source (heat) and oxygen (oxidizer). If all of these appear in a confined space with dispersion, an explosion can occur.

The most common ignition sources on bucket elevators and conveyors have long been identified as over-heated bearings, misaligned belts and belts that are slipping.

<table>
<thead>
<tr>
<th>IGNITION SOURCE (HEAT)</th>
<th>DISPERSION OF DUST PARTICLES</th>
<th>CONFINEMENT OF THE DUST CLOUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMBUSTIBLE DUST (FUEL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OXYGEN IN AIR (OXIDIZER)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

www.go4b.com

Installation Images

< T500 Elite – Hotbus™>

Watchdog Elite™ >
Temperature Monitoring

The T400N Elite - Hotswitch is a microprocessor controlled temperature monitor, which works in conjunction with NTC temperature sensors to monitor up to 8 bearings and can provide an alarm and automatic shutdown when a high bearing temperature condition is detected.

Features
- Monitors up to 8 NTC bearing sensors
- Includes 2 separate alarm and 2 separate stop relays (2 machines monitored)
- Short circuit/ open circuit fail-safe detection
- Status LEDs provide quick location of the hot bearing condition
- A range of alarms temperatures available from 45°C to 80°C
- Alarm mute with automatic time delayed reactivation
- PLC board (optional)

Sensor options
- WDB - MDB - ADB Series: bearing temperature
- Extensive range of sensors available from 55 - 100°C
- Continuous temperature sensors
- Modbus RTU connection

Input supply voltage
100 to 240 VAC
24 VDC (universal supply)

Sensor supply
24 VDC

Approvals
- Europe - ATEX
- USA, Canada - CSA
- Russia and CIS - GOST-R
- Worldwide - IECEx

Applications
Bucket elevators and conveyors

H x W x D
246 x 188 x 102mm

Belt Alignment Monitoring

The B400 Elite is a microprocessor based control unit which uses sensors to detect belt misalignment by pressure (Touchswitch) from one or two elevators/conveyors. The unit is able to provide an alarm and automatic shutdown of the elevator/conveyor when a belt misalignment condition is detected.

Features
- Uses up to 4 touch or capacitive alignment sensors
- Monitors alignment of belts in two separate machines or top and bottom alignment in one machine
- Includes 2 separate alarm and 2 separate stop relays
- Simple, reliable, consistent. Fully functional test via push button on front panel

Sensor options
- Touchswitch: force activated
- Binswitch: capacitance proxy (open belt conveyors)

Input supply voltage
100 to 240 VAC
24 VDC (universal supply)

Sensor supply
24 VDC

Approvals
- Europe - ATEX
- USA, Canada - CSA
- Russia and CIS - GOST-R
- Worldwide - IECEx

Applications
Belt bucket elevators and conveyors

H x W x D
246 x 188 x 102mm
MISALIGNMENT SENSORS

Touchswitch

The Touchswitch is an electro-mechanical limit switch with no moving parts, that detects the misalignment of both pulleys and belts in conveyors and bucket elevators. The sensor detects the lateral force of the belt or pulley and activates a voltage free relay contact. This relay contact can be used to activate an alarm or shutdown the machine. The sensors are normally installed in pairs on opposite sides of the belt/pulley.

WDA High Power Sensor

The WDA sensor detects moving ferrous material and is designed for use with bucket elevators to detect buckets, for measurement of speed and alignment. It is a non contacting extended range sensor to detect targets which are up to 100mm from the sensor. It can also detect ferrous bolts where non ferrous buckets are being used. The sensor is used in conjunction with a PLC or with a Watchdog, T500 Elite or A400 Elite control unit.

Belt Misalignment Monitors

<table>
<thead>
<tr>
<th>Model</th>
<th>Features</th>
<th>Supply Voltage</th>
<th>Compatible 4B Control Unit</th>
<th>Approvals</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1V4AI</td>
<td>• Hardened, annealed stainless steel face</td>
<td>24 VDC</td>
<td>• Watchdog</td>
<td>• Europe - ATEX</td>
<td>Belt/pulley misalignment on elevators and conveyors</td>
</tr>
<tr>
<td></td>
<td>• External test knob for quick and simple sensor/system testing</td>
<td></td>
<td>• T500</td>
<td>• USA, Canada - CSA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Not affected by dust or material build up</td>
<td></td>
<td>• B400</td>
<td>• Russia and CIS - GOST-R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Visual indication by an LED</td>
<td></td>
<td></td>
<td>• Worldwide - IECEx</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No calibration needed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No moving parts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WDA3V34AI</td>
<td>• Long range magnetic sensor unaffected by material build up</td>
<td>24 VDC</td>
<td>• Watchdog</td>
<td>• Europe - ATEX</td>
<td>Belt alignment and speed sensor</td>
</tr>
<tr>
<td></td>
<td>• Continuously monitors the moving elevator, with visual indication by an LED</td>
<td></td>
<td>• T500</td>
<td>• USA, Canada - CSA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 25-75mm range depending on the size of the target, easily adjusted from the sensor itself or from the optional independent control unit</td>
<td></td>
<td>• A400</td>
<td>• Russia and CIS - GOST-R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mounting bracket included</td>
<td></td>
<td></td>
<td>• Worldwide - IECEx</td>
<td>Chain break monitor (see page 17)</td>
</tr>
<tr>
<td></td>
<td>• Stainless steel construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• High temperature version available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAP21V34AI</td>
<td>• Magnetic sensor unaffected by material build up</td>
<td>12/24 VDC</td>
<td>• Watchdog</td>
<td>• Europe - ATEX</td>
<td>Belt alignment and speed sensor</td>
</tr>
<tr>
<td></td>
<td>• Continuously monitors the moving elevator, with visual indication by an LED</td>
<td></td>
<td>• T500</td>
<td>• USA, Canada - CSA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 12-50mm range depending on the size of the target, easily adjusted from the sensor itself or from the optional independent control unit</td>
<td></td>
<td>• A400</td>
<td>• Russia and CIS - GOST-R</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mounting bracket included</td>
<td></td>
<td></td>
<td>• Worldwide - IECEx</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Stainless steel construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• High temperature version available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

www.go4b.com
**MISALIGNMENT SENSORS**

**CBS2**

The CBS2 is an electro-mechanical system to detect the misalignment of a belt conveyor. Two outputs are given at 15 and 30 degrees which can be used as alarm and stop signals respectively. Works in conjunction with a CBS2 Elite control unit. The sensors are normally installed in pairs, one on either side of the belt, and up to 4 sensors per CBS2 Elite control unit.

**Bulldog**

The Bulldog alignment and rip detection switch is an electro-mechanical system designed to detect dangerous belt misalignment and belt tear damage on open belt conveyors. The switch will detect horizontal misalignment of belts when contact is made with the roller; the roller arm will be forced to pivot by the belt activating a switch at 15° to trigger an alarm, and 30° to trigger a shutdown. The sensors are usually installed in pairs on opposite sides of the belt. A flexible wire is set below the running conveyor belt attached by a rare earth magnet at each end. If the belt is ripped or damaged the wire is pulled away releasing the magnet connection which in turn will activate a switch to trigger an alarm or shut down.

**Pullswitch**

The Pullswitch is a failsafe taut wire emergency pull cord stop switch for open conveyors. PVC coated steel pull wires and pigtails connect between the switches to provide easy installation and continuous emergency stop access along the length of the entire conveyor. Pullswitches can be installed at 50m intervals, reducing overall system cost. Quick location of a tripped switch is provided by a standard reflector or optional flag marker, and the tripped signal can be wired back to an indicator panel, 4B controller or PTC.

**SAFETY SWITCHES**

**Conveyor Belt Alignment Switch**

**CBS2VNA**

**Features**
- Two outputs at 15° & 30° for alarm and shutdown
- Nylon and stainless steel rollers available
- Self assembly adjustable support system

**Supply voltage**
110-240 VAC

**Compatible 4B Control Unit**
- CBS2 Elite

**Approvals**
- Europe - ATEX

**Applications**
Conveyor belt alignment monitoring

---

**Belt Alignment & Rip Detection Sensors**

**Bulldog**

**Features**
- Easy installation without calibration
- Solid construction
- Triggers an alarm at 15° and a shutdown of the machine at 30°
- Wire rope for optional belt rip detection

**Supply voltage**
110-240 VAC

**Compatible 4B Control Unit**
- Watchdog
- T500
- B400

**Approvals**
- Europe - ATEX
- Worldwide - IECEx

**Applications**
Conveyor belt alignment monitoring, belt rip detection.

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**Pullswitch**

**Features**
- Pullwire safety switch provides a safe and reliable means of stopping conveyors
- Double ended pull mechanism as standard
- Slack or taut wire operation
- Tough UV stabilised lightweight polycarbonate enclosure
- Designed for arduous environments e.g. quarries, open cast mines

**Approvals**
- Europe - ATEX
- USA, Canada - CSA
- Worldwide - IECEx

**Applications**
Safety stop switch for open belt conveyors

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For more detailed product information, please visit: [www.go4b.com](http://www.go4b.com)
# SPEED SWITCHES

## Stopswitch
The **Stopswitch** is a straightforward shaft speed monitoring device. The 2-wire technology saves you time and makes installation hassle-free. If the shaft stops rotating, the **Stopswitch** will provide an output. It requires no calibration to operate and is a great tool for process control, motion verification and stopped shaft indication.

<table>
<thead>
<tr>
<th><strong>M100 Stopswitch</strong> Features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Small 18mm diameter</td>
<td></td>
</tr>
<tr>
<td>• Totally sealed</td>
<td></td>
</tr>
<tr>
<td>• 5m cable</td>
<td></td>
</tr>
<tr>
<td>• Status LED’s</td>
<td></td>
</tr>
</tbody>
</table>

**Style**
18mm cylindrical

**Supply voltage**
24 to 240 VAC
12/24 to 240 VDC (universal supply)

**Output**
Stopped motion signal Triac with maximum load of 200mA

**Approvals**
• Europe - ATEX
• USA, Canada - CSA

**Applications**
Process control. Providing a signal when the shaft has stopped rotating.

## Slipswitch
User friendly and easy to install, the **Slipswitch** is a simple shaft speed monitoring device. Available in 2-wire and 5-wire models, the **Slipswitch** is self-calibrating and provides a 20% underspeed output to protect against dangerous belt slip and underspeed conditions.

<table>
<thead>
<tr>
<th><strong>M300 Slipswitch 2 or 5-wire</strong> Features</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>• Totally sealed</td>
<td></td>
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<tr>
<td>• Auto calibration</td>
<td></td>
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<tr>
<td>• 2 or 5-wire connection</td>
<td></td>
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<tr>
<td>• 5m cable</td>
<td></td>
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<tr>
<td>• Status LED’s</td>
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</tbody>
</table>

**Style**
30mm cylindrical

**Supply voltage**
24 to 240 VAC
12/24 to 240 VDC (universal supply)

**Output**
1 x 20% underspeed relay

**Approvals**
• Europe - ATEX
• USA, Canada - CSA
• Worldwide - IECEx

**Applications**
Conveyors, bucket elevators, any speed sensitive shaft for automatic 20% underspeed detection.

## Speedswitch
A solid state unit with no moving parts, the **M800** is maintenance free. It operates using an inductive sensing device and requires no contact with the monitored machine. The **M800** is calibrated to the machine’s normal RPM. If the shaft speed falls by 10%, the **M800** will alarm, and by 20% it will shut the machine down.

<table>
<thead>
<tr>
<th><strong>M800 Speedswitch</strong> Features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Totally sealed</td>
<td></td>
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<tr>
<td>• Auto calibration</td>
<td></td>
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<tr>
<td>• 1/2-inch conduit entry with 2m cable</td>
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<tr>
<td>• Status LED’s</td>
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</tbody>
</table>

**Style**
DIN (40mm x 40mm)

**Supply voltage**
24 to 240 VAC
12/24 to 240 VDC (universal supply)

**Output**
1 x 10% underspeed relay
1 x 20% underspeed relay
1 x opto-isolated pulse (All 3 outputs in 1 unit)

**Approvals**
• USA, Canada - CSA

**Applications**
Conveyors, bucket elevators, any speed sensitive shaft for automatic underspeed detection with 10% alarm and 20% shutdown.

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All 4B speed and inductive sensors are compatible with the Whirligig universal shaft sensor mount.

**Whirligig®**
- Fully Guarded Target for Easy Mounting of Motion Sensors
- For DIN Style and Standard Cylindrical Inductive Sensors
- Easy Installation – Only Requires M12 Tapped Hole in the Machines Shaft or Use a Mag-Con™ for Magnetic Connection
- Available with 1, 2 or 4 Targets

[www.go4b.com](http://www.go4b.com)
INDUCTIVE SENSORS

P100 Inductive Sensor
P300 Inductive Sensor

Inductive proximity sensors used to signal the position of equipment in conveyors, elevators and other mechanical assemblies. Also used as pulse generators for speed detection.

For more detailed product information, please visit: www.go4b.com

Accessories for Speed Switches

WHIRLIGIG

The Whirligig is the new standard for shaft speed monitoring. It is a three-in-one universal shaft sensor mount that makes installation simple and more reliable for all inductive shaft speed sensors. Your sensor mounts to the Whirligig and the complete assembly bolts to the machine’s shaft. Machine and shaft vibration does not affect the performance of the sensor, as the whole assembly moves with the shaft. Personal safety is also improved since the rotating target is completely enclosed behind a tough plastic cover.

50mm diameter magnetic coupler with 150 lb/660N of pulling force for connecting M12 thread to rotating shaft. Saves on drilling and tapping.

ENCODERS

Encoder

The Encoder is a safe heavy-duty option for protecting against dangerousunderspeed and belt slip conditions. With its tough aluminium or stainless steel construction (polyester version available), the Encoder is used in the most severe industrial environments. It requires no guards as rotating components are encased inside the aluminium encoder. And since the encoder is bolted to an moves with the shaft, it needs no brackets.

1 Shaft Encoder
Heavy-duty shaft mounted speed monitor/encoder
2 Wheel Encoder
Return belt mounted heavy-duty belt speed monitor/encoder

Tacho Display

Bright 25mm high LED display unit for connection to any PNP or NPN transistor output sensor to indicate shaft speed. The unit incorporates a user-adjustable underspeed relay contact output. Quadrature display also available.

Speed Relay

DIN rail mounted speed relay can be used with any PNP or NPN pulsed output sensor for providing a user-adjustable underspeed relay contact output to alarm or shutdown machinery.

SpeedMaster™

Speed Switch Tester

The Speedmaster is a calibration and testing device that accurately tests the calibration of a speed switch, and allows testing of the 10% alarm and 20% shutdown features of the sensor while installed on the machine shaft.
The ADB series have been designed to allow the depth of the sensor to be adjustable depending on your application. Three standard versions are available with probe lengths of 50, 100 and 200mm (other lengths available for special order). The sensors screw directly into a bearing housing through the existing grease zerk thread. Each sensor is fitted with a grease zerk to allow lubrication of the bearing without the need for removal of the sensor. The ADB style sensors are available with a standard NTC thermistor for 4B’s Hotbus and Watchdog systems, or a 4-wire Pt100 - RTD type for PLC and DCS systems.

The WDB8 series is a range of bearing temperature sensors designed to screw directly into an existing 1/4” BSP grease zerk fitting on a bearing housing. Each sensor is fitted with a grease nipple to allow lubrication of the bearing without the need for removal of the sensor. The WDB Series is available with either a PTC thermistor with various factory set trip points or an NTC thermistor with a user adjustable trip point.

The MDB series is a range of bearing sensors manufactured to screw directly into a bearing housing through the existing 1/4” BSP threaded grease zerk (can be installed in 1/8” NPT grease zerk fitting with an adapter). Each sensor is fitted with a grease zerk to allow lubrication of the bearing without the need for removal of the sensor. The sensor is fitted with a M12 connector for use with a separately supplied cable and socket assembly which can be connected directly to a PLC or to a hazard monitoring system, such as 4B’s T500 Hotbus Elite, Watchdog Elite, or T400 Elite. The connections are not polarity sensitive therefore special connection requirements are eliminated.

The WDB7 series is a lug style NTC, PTC, Pt100 thermistor model for continuous surface temperature monitoring and has been designed to bolt directly onto a bearing housing, motor, gearbox, or machine casing. The mounting hole is 8mm from the factory, but can be drilled up to 13mm if needed. The sensor can be connected to a PLC or to a hazard monitoring system, such as 4B’s T500 Hotbus Elite, Watchdog Elite, or T400 Elite. The connections are not polarity sensitive therefore special connections requirements are eliminated.

For more detailed product information, please visit: www.go4b.com
Bearing Sensor Accessories

ADB Bearing Sensor Tester

The ADB Sensor Tester has been designed to test 4B adjustable depth bearing (ADB) temperature sensors in the field. This hand held test unit features an integrated heating block specifically designed to have a 4B ADB sensor directly inserted. With integral controls and temperature display, the unit heats the sensor to the desired trip point, and allows quick and easy real life testing of the sensor and temperature monitoring system.

During planned maintenance or periodic testing, the ADB Sensor Tester can be used as a diagnostic tool to verify the alarm and shutdown sequences of the control unit are functioning as expected. To test, the heater block should be set above the control units alarm operating temperature. Remove the ADB bearing sensor probe from the housing and insert it into the heater block. As the heater block reaches the alarm temperature, the ADB sensor will relay this data to the control unit, allowing you to verify that the alarm and shutdown sequences run as expected.

Features:
- ADB Bearing Sensor Tester
- Hand Held Portable Unit
- Exact Alarm Point Testing
- Exact Shutdown Point Testing
- Easy To Read Display

ADB Sensor Installed on Conveyor Bearing

JUNCTION BOXES

4BJ Junction Boxes

4B Atex approved junction boxes allow for the easy installation of sensors in potentially explosive dust hazard environments.

Features:
- Robust glass reinforced nylon casing
- Up to 4 gland inputs
- Dust and water tight seal
- Detachable cover for easy terminal access

Terminal springs
6 x 2.5mm² or 12 x 2.5mm²

Approvals
Europe – ATEX zone 21, IP66

Applications
Electrical installations in dust – explosive environments

D5M Inline Junction Box

The D5M’s unique moulded body with Atex approved glands and mounting clip/bracket allows for in-line connection closer to the sensors simplifying connections and reducing the time of intervention during maintenance operations or repairs.

Features:
- Inline junction box ideal for extending sensor cables within Atex hazard areas.
- ID zone 20 rated
- Complete with Atex glands and mounting bracket

Terminal springs
5 x 2.5mm²

Approvals
Europe – ATEX zone 20, IP66

Applications
Electrical installations in dust – explosive environments

VISIT OUR WEBSITE FOR DETAILED TECHNICAL INFORMATION:

www.go4b.com

- Technical Manuals
- Installation Guides
- Wiring Guides
- CAD Drawings
- Certificates...
LEVEL INDICATORS

Auto-Set™
A user friendly, reliable point indicator for bulk granular solids, powders and liquids. Digital display, push-button calibration and material build-up compensator make this unit the elite point level sensor.

*ATS6*
- **Features**
  - Push button calibration
  - Digital display
  - Internal timer
  - Automatic material build-up compensator
  - Attachable SS probes
- **Style**
  - 1 inch BSP
- **Supply voltage**
  - 120/240 VAC
  - 24 VDC (universal supply)
- **Output**
  - 1 set of voltage-free changeover relay contacts
- **Approvals**
  - Europe - ATEX
  - USA, Canada - CSA
- **Applications**
  - Material point level indication in silos, bins and other vessels. Plug condition in chutes and discharges.

*ATS6 with Extended Power Shield*
- **Features**
  - Push button calibration
  - Digital display
  - Internal timer
  - Automatic material build-up compensator, 12 or 16 inches long
  - Attachable SS probes
- **Supply voltage**
  - 120/240 VAC
  - 24 VDC (universal supply)
- **Output**
  - 1 set of voltage-free changeover relay contacts
- **Approvals**
  - Europe - ATEX
  - USA, Canada - CSA
- **Applications**
  - Material point level indication in thick-walled silos.

*ATS6 Flush Probe*
- **Features**
  - Push button calibration
  - Digital display
  - Internal timer
  - Automatic material build-up compensator
  - No moving parts
- **Style**
  - 100mm diameter probe with integral mount
- **Supply voltage**
  - 120/240 VAC
  - 24 VDC (universal supply)
- **Output**
  - 1 set of voltage-free changeover relay contacts
- **Approvals**
  - Europe - ATEX
  - USA, Canada - CSA
- **Applications**
  - Material point level indication in thick-walled concrete silos.

For more detailed product information, please visit: www.go4b.com
**LEVEL INDICATORS**

### RLI Shaker

The RLI “Shaker” rotary paddle switch is used to detect high / low levels of bulk granular solids in bins, tanks and silos. It can also be used to detect plug conditions in spouts, where long life and failsafe detection is required. Utilizing a unique stepper motor drive, the RLI “Shaker” rotates clockwise, then counter-clockwise and then shakes to shed any excess material build-up. If the paddle rotation is impeded at any time by the bulk material then the electronic circuit provides a signal for level indication or control.

**Features**
- Failsafe rotation detection
- Glass-fibre reinforced nylon housing
- Vertical extensions to 2m (maximum) wire rope
- Shaking action for shedding material build-up
- User adjustable torque control
- Direct stepper motor drive
- No clutch and no gearbox
- Built in adjustable timer

**Style**
- Rotary level indicator with 1 1/4-inch NPT mounting thread

**Supply voltage**
- 110/240 VAC
- 24 VDC (universal supply)

**Output**
- 1 set of voltage-free changeover relay contacts

**Approvals**
- Europe - ATEX

**Applications**
- Material point level indication in bins, silos, hoppers and other vessels where failsafe detection is required, or for dust hazard areas.

### Roto-Safe™

Rotary level indicators for point level indication of bulk granular materials in bins and silos. These electro-mechanical rotary units are simple to use and reliable. The Roto-Safe incorporates a sensor to detect that the paddle is rotating for failsafe monitoring.

**Features**
- Failsafe paddle rotation detection
- Glass-fibre reinforced nylon housing
- Vertical extensions to 5m are available
- Internal sensitivity adjustment
- Adjustable timer
- Automatic power shut-off

**Style**
- Rotary level indicator with 1 1/4-inch NPT mounting thread

**Supply voltage**
- 110/240 VAC
- 24 VDC (universal supply)

**Output**
- 1 set of voltage-free changeover relay contacts

**Approvals**
- Europe - ATEX
- USA, Canada - CSA

**Applications**
- Material point level indication in bins, silos, hoppers and other vessels where failsafe detection is required, or for dust hazard areas.

### Binswitch

A popular range of capacitance proxy level/plug detectors for detecting dry bulk granular material level in bins, silos, hoppers and chutes. Available in 2-wire and 5-wire models, this simple but robust point level indicator has no moving parts, is self-contained with all potted electronics, and can be used in areas of high vibration. The units are simple to install on the sides or tops of steel bins/hoppers and are small enough to be used as plug detectors in discharge chutes.

**Features**
- User adjustable sensitivity
- LED status lights
- Fully potted electronics
- 5m cable
- 2 or 5-wire device
- Relay contact output

**Style**
- Binswitch capacitive proximity sensor
- 2 or 5-wire version available

**Supply voltage**
- 2-24 VDC

**Output**
- 1 set of voltage-free changeover relay contacts

**Approvals**
- Europe - ATEX
- USA, Canada - CSA
- Worldwide - IECEx

**Applications**
- Dry free flowing material level detection in bins, silos, hoppers and chutes.

## Accessories for Level Indicators

### Auto-Set™ Probes

A selection of screw-on stainless steel probes to suit your application.

### Rotary Level Paddles

Complete range of stainless steel paddles for Roto-Level Indicators.

### Mounting Plate

Powder-coated mild steel mounting plates with 1 1/4-inch NPT or 1 inch BSP, half or full coupling. Use with Autoset, Roto-Level Indicators and Binswitches with adapters. (Also available in stainless steel.)

### BAS3 Abrasion Shield

Polyethylene abrasion shield for ATEX Binswitch.

### BMPA Mount

Urethane compression fitting mount for use with Binswitch. 1 1/4-inch NPT external thread.

### Gland Mount

Plastic mount for use with the Binswitch.

### BTAS Teflon Abrasion Shield

Teflon Abrasion Shield screw-on end cap for ATEX Binswitch.

## Installation Images

- Binswitch Installed on Bucket Elevator Spouting (with SMB BAS & conduit adapter)
- Auto-Set™ Flush Probe Installed on Belt Conveyor Discharge
- Auto-Set™ Flush Probe Installed on Screw Conveyor Discharge

[www.go4b.com](http://www.go4b.com)
Slack Chain Detection

The 4B high power WDA reluctance sensor will detect a moving ferrous object up to 4” away. It is not affected by dust or material build up. It can be used as a slack/broken chain detector when installed as shown below. The sensor has an adjustable sensing range (1” – 4”) and an LED helps with field adjustment.

Using the mounting block supplied, cut a 4” diameter hole in the sheet metal and position the mounting block so that the sensor is centered on this hole. Alternatively, the sensor and mount can be installed on a stainless steel plate without drilling a hole for the sensor. In this case, the sensor will not be affected because the sensing field can pass through the stainless steel plate.

**WARNING** - Make sure that there is no ferrous steel (such as the machine’s frame) within the sensing field.

### Option 1
**Sensor Detecting Bolt Installed on the Paddle**

Under normal running conditions, the target bolt passes through the sensor’s field and a pulse is sent to the speed relay. If the chain becomes slack, the target bolt will drop below the field and the pulses will stop, causing the relay contact to change state.

### Option 2
**Sensor Detecting Steel Flight**

Under normal running conditions, the steel flight passes through the sensor’s field and a pulse is sent to the speed relay. If the chain becomes slack, the steel flight will drop below the field and the pulses will stop, causing the relay contact to change state.

### Option 3
**Sensor Waiting to Detect Steel Flight**

Under normal running conditions, the steel flight is out of the sensor’s field, so no pulses are sent to the speed relay. If the chain becomes slack, the steel flight comes into the sensor’s field and a pulse is sent to the speed relay, causing it to change state.

Detailed specification, wiring diagrams and installation/operating instructions available immediately upon request.

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**Tools & Services**

4B offers an array of **tools and services** to support you and your products. The 4B Tech Team can answer your installation and operating questions, and provide on-site inspection, testing or commissioning services for our products. 4B has developed testing tools to easily check our sensors in the field during routine maintenance. We also have a selection of tools available to help with the installation of our products.

**SpeedMaster™**

The SpeedMaster™ is the only device that accurately tests the calibration of a speed switch, and allows testing of the alarm and shutdown features of the sensor while installed on the machine shaft.

- Speed Switch Calibration Testing
- Exact Alarm & Shutdown Point Testing
- No Need To Modify Sensor Assembly For Testing

**Hotbus™ Node Tester**

The Hotbus Node Tester is a portable testing unit that can be used in the field to determine the operational status of any Hotbus communications node and network to quickly identify wiring or node issues.

- Portable & Compact
- Optional PC Connection for extensive data analysis

**ADB Bearing Sensor Tester**

The ADB sensor tester has been designed to test 4B adjustable depth bearing (ADB) style temperature sensors in the field. With integral controls and temperature display, the unit heats the sensor to the desired trip point, and allows quick and easy real life testing of the sensor and temperature monitoring system.

**Touchswitch™ Belt Alignment Sensor Hole Saw**

- Recommended Tool for Touchswitch™ Sensor Installation
- 57mm Carbide Teeth for Optimum Performance and Durability
- Cobalt Steel Pilot Drill with Split Point Tip Prevents Walking
- Built in Flange Stop Prevents Over Drilling
- Ejector Spring Makes Removal of Slug Easier
Bucket Elevator Components

The World’s Largest Range of Elevator Buckets
- Pressed seamless steel, stainless steel and welded steel
- High density polyethylene, nylon and polyurethane
- For agricultural and industrial applications

Elevator Bolts
- EURO BOLTS
- EASIFIT BOLTS
- REF 70
- FANG BOLTS

A Full Range of Elevator Belting and Belt Fasteners
- SBR / NBR
- HOT OIL
- FRASOR
- T150 - High Temperature
- FDA - White Food Quality
- STEEL WEB

4B Explosion Vent Panels
Open at a predetermined pressure, controlling any excessive pressure of flames, and containing fragments within a safe area in the event of an explosion.

Conveyor Chains

Drop Forged Chains
- Made from special heat treated alloy steel
- Case hardened to Rockwell C57 - C62, with ductile core hardness of Rockwell C40
- Maximum shock and wear resistance

Double / Triple Links
- For use with 2 and 3-strand chain applications
- Ultimate strengths
- For high capacity applications

Bolt ‘n’ Go Chains
- Easy assembly system using bolt-on flights instead of welding
- Available for forged and round link chains

Sprockets & Trailers
- For drop forged chains
- Manufactured from high grade heat treated steel
- Minimum hardness of 57 HRC
Our policy is one of continuous improvement; therefore we reserve the right to amend specification without prior notice. All information contained herein is provided in good faith and no warranty is given or implied. E&OE.