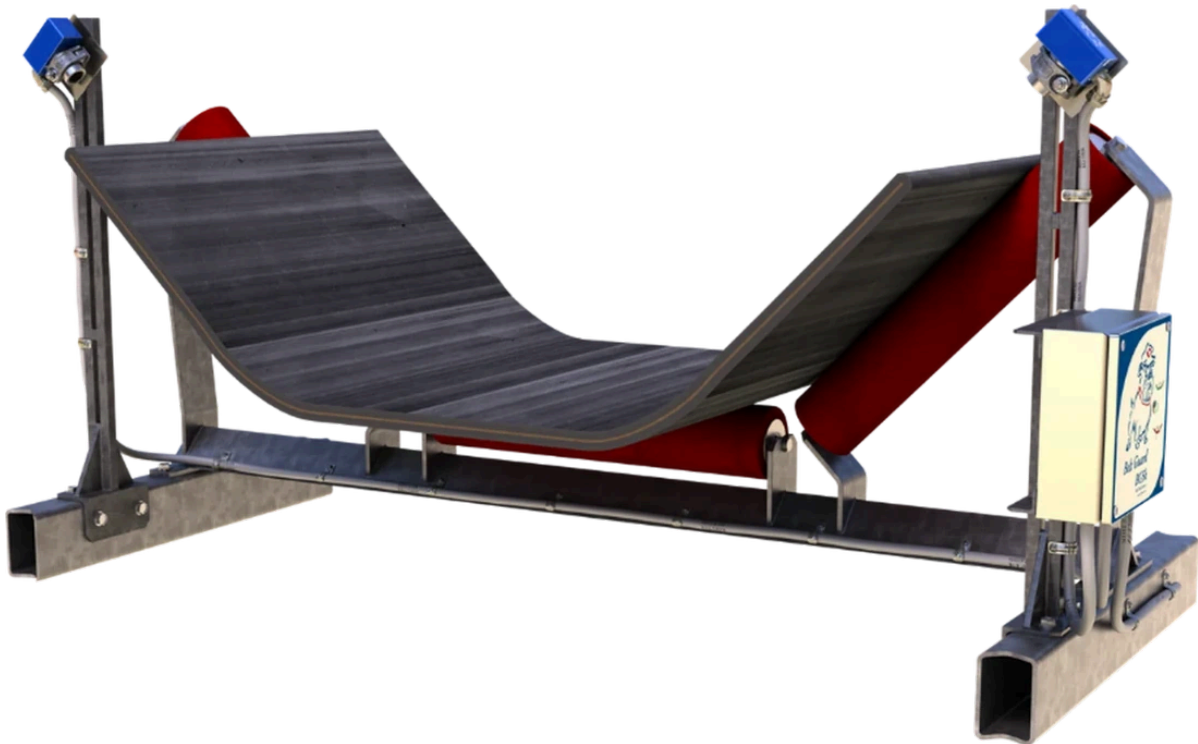


BELT GUARD • RIP DETECTION

BG5k RIP DETECTOR

NON-CONTACT RIP DETECTION — ALL BELT TYPES

Longitudinal rip detection for fabric, PVC and steel cord conveyor belts.



BG5k PROBE FRAME — ONE PROBE AT EACH BELT EDGE

OVERVIEW

RIP DETECTION VIA BELT-WIDTH MONITORING

The Belt Guard BG5k detects longitudinal rips by continuously monitoring the width of the conveyor belt using two non-contact sensors. When a rip causes the torn sections to separate, overlap or fold, the resulting change in belt width triggers an automated conveyor stop via PLC relay or Modbus command.

The system works on all belt types — fabric, PVC and steel cord — and requires no sensor loops, no antennae and no belt modification. It is belt manufacturer independent and can be retrofitted to any existing conveyor structure.

BELT TYPE Fabric • PVC • steel cord	DETECTION Belt width change	FRONT END 2 × ultrasonic
POWER 110/220 VAC • 24 VDC	COMMS. TCP/IP • SCADA	ENCLOSURE 316 stainless • IP66

WHY BG5k



BELT WIDTH MONITORING

Two ultrasonic probes read the position of each belt edge continuously. The system derives belt width from the two readings, live, while the conveyor runs.



NON-CONTACT, RETROFITTABLE

Nothing touches the belt and nothing is embedded in it. No sensor loops, no antennae. The probes and enclosure mount to the existing conveyor structure.



BELT TRACKING DATA

Real-time belt lateral position in millimetres as a standard output, so developing mistracking shows up before it does damage.



ALL BELT TYPES

Works on fabric, PVC and steel cord belting – the only Belt Guard rip detector that covers every belt type. Any belt width, any belt speed, any product on the belt.



HALTS ON DEVIATION

If width leaves the OK Window for longer than the Fail Delay, a voltage-free relay signals the site SCADA or pull-wire circuit to stop the belt.



REQUIRES A WIDTH CHANGE

BG5k does not prevent a rip; it limits how far one propagates. If a rip produces no measurable change in belt width, the conveyor is not stopped.

+ BELT TRACKING

Continuous lateral position data in millimetres via Modbus TCP/IP or 4–20 mA – a standard output, not an option, so developing mistracking is visible long before it does damage.

CAPABILITIES

- Non-contact belt-width monitoring
- Continuous real-time belt tracking in mm
- Any belt speed – no limitation
- Automatic buildup detection with blocked probe alert
- Configurable Fail Delay timer
- Belt tracking via Modbus TCP/IP or 4–20 mA
- Belt manufacturer independent
- Works on fabric, PVC and steel cord belting
- Any belt width – no limitation
- Any product type on belt
- Adjustable Belt Width OK Window $\pm$
- HALT output via Modbus TCP or relay
- No sensor loops or antennae required
- Retrofit to existing conveyor structures

SYSTEM OPERATION

HOW IT WORKS

Two sensors are permanently mounted on the conveyor structure, one measuring each belt edge position. They continuously calculate belt width in real time. An operator-set tolerance window defines the acceptable range. Normal belt wander does not trigger a response, because belt width remains constant during lateral movement.

01

MONITOR

Two sensors continuously measure the position of each belt edge, calculating belt width and lateral tracking position in real time.

02

DETECT

When a rip causes the belt to widen, narrow or fold, the measured width deviates beyond the operator-set tolerance window – the Belt Width OK Window $\pm$.

03

HALT

If the deviation persists beyond the configurable Fail Delay timer, a HALT signal is sent to the PLC via Modbus TCP or relay dry contacts, stopping the conveyor.

DETECTION LIMITATION

The BG5k requires a measurable change in belt width following a rip event. This width-change effect has not been noted on all occasions of ripping, particularly on thicker, laterally stiff steel cord belting. If no belt width change occurs, or too little, the BG5k will not stop the conveyor. Contact Beltscan to discuss suitability for steel cord applications where this limitation is a concern.

PLC INTEGRATION

TRIP LOGIC AND OUTPUTS

BELT WIDTH OK WINDOW

± 50 mm factory set, adjustable. Set it after measuring the normal width variation over a full belt revolution.

FAIL DELAY

1–300 s, configurable. The deviation has to persist beyond it before a HALT is issued.

HALT OUTPUT

Modbus TCP or relay dry contacts. Form C, 10 A 240 VAC.

HALT MODES

Continuous, Momentary or Latch.

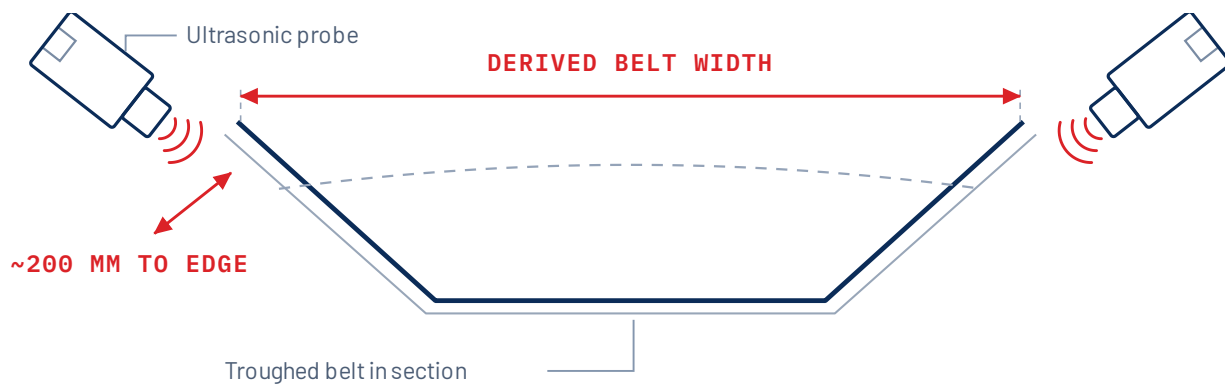
HEALTHY RELAY

De-energises if a sensor becomes blocked and the device reports an unhealthy state.

BELT TRACKING OUTPUT

Continuous lateral position in mm via Modbus TCP/IP or 4–20 mA.

HOW IT READS



IN THE FIELD

- 01** Mount the probes **10–20 m after the load point**, in the carry path — one at each belt edge, offset ~300 mm along the conveyor.
- 02** Set each probe snout **~200 mm from the belt edge**, with the beam axis parallel to the wing idler rollers.
- 03** Run a full belt revolution to learn the normal width variation, then set the **OK Window $\pm$** above it so normal wander doesn't trip.
- 04** Wire the HALT relay to the site SCADA or the existing pull-wire circuit, and choose **Continuous, Momentary or Latch**.

CALIBRATION

The Belt Width OK Window must be set after measuring the normal width variation over a full belt revolution. The factory default of ± 50 mm may require adjustment to prevent false tripping.

MULTI-POINT DEPLOYMENT

Install multiple units along a conveyor, one after each load point, to minimise potential rip length. The closer a unit sits to the load point, the shorter any resulting rip.

SYSTEM COMPONENTS

WHAT'S INCLUDED

SENSING PROBES

2 × buildup-detecting probes with mounting hardware

SENSOR MOUNTS

2 × mounting hardware for attachment to the conveyor structure

MAIN ELECTRICAL ENCLOSURE

316 stainless steel, IP66. All control electronics and the PLC interface

TECHNICAL DATA

Belt type	Fabric, PVC, steel cord
Belt width	No limitation
Belt speed	No limitation
Contact	Non-contact
Sensors	2 × ultrasonic, buildup-detecting
Detection	Belt width change
Belt Width OK Window	±50 mm (factory set), adjustable
Fail Delay	1-300 s
HALT relay	Form C, 10 A 240 VAC
Power supply	110/220 VAC or 24 VDC
Communication	Modbus TCP/IP or control cables
Belt tracking output	Modbus TCP/IP or 4-20 mA
MEE enclosure	316 stainless steel, IP66
MEE size	H400 × W300 × D250 mm
Operating temperature	-25 °C to +70 °C
Storage temperature	-40 °C to +80 °C
Humidity	5-95 % RH

INSTALLATION

Location: 10-20 m after each load point in the carry path. Multiple units are recommended on conveyors with several load points – the closer the sensor to the load point, the shorter any resulting rip.

Installation: performed by site personnel from detailed wiring and mounting specifications. It consists of sensor mounting hardware and the PLC connection. Typically one day for installation and commissioning.

ONGOING REQUIREMENTS

The BG5k requires very little maintenance. The sensors are buildup-detecting when powered: if one becomes blocked, the device reports an unhealthy state and de-energises the HEALTHY relay. An audible buzz from each sensor confirms operational status.

If cleaning is needed, hose down or wipe the sensor face with an alcohol wipe. The MEE should be protected from direct sunlight and aggressive hose down.

WHERE IT'S USED

Coal Handling

Grain Terminals

Aggregate Processing

Cement Plants

Port Facilities

Fabric Belt Conveyors

PVC Belt Systems

Multi-Load-Point Conveyors

Particularly suited to fabric and PVC belt operations where sensor loop systems cannot be used, and as a secondary rip detection layer on steel cord systems.