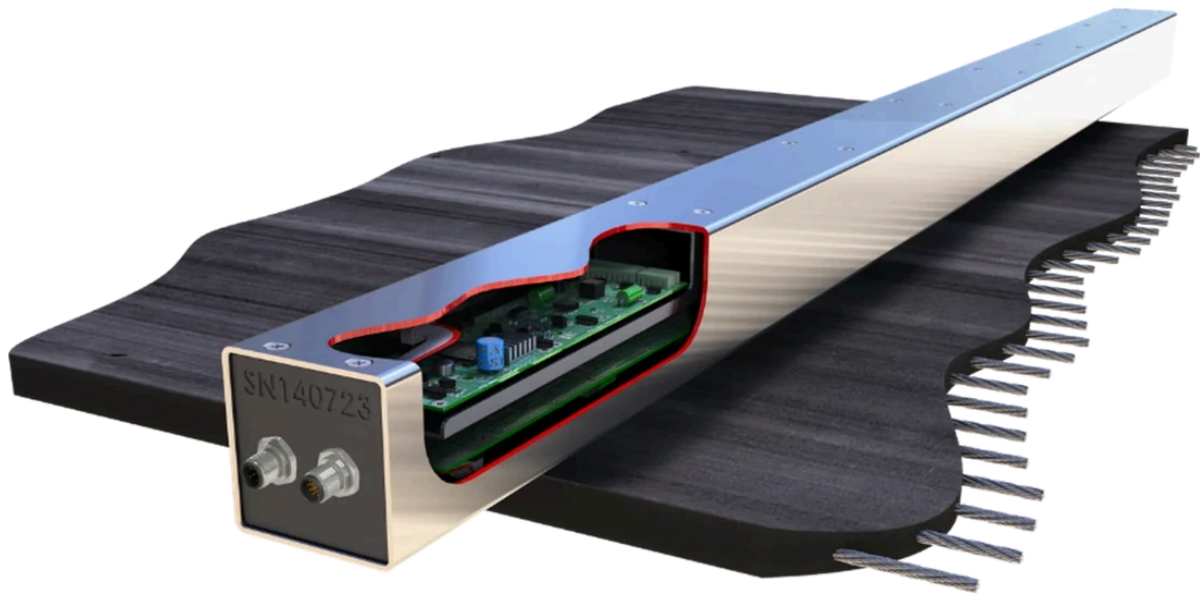


BELT GUARD · CONDITION MONITORING

BELT SCANNER MF PORTABLE

ELECTROMAGNETIC CONDITION MONITORING — MULTI-CONVEYOR STEEL CORD

Electromagnetic condition monitoring for steel cord belts, carried between conveyors.



BELT SCANNER — 316 STAINLESS, CUTAWAY

OVERVIEW

SCAN MULTIPLE CONVEYORS WITH A SINGLE UNIT

The Belt Scanner MF Portable is a non-contact electromagnetic scanning system for steel cord conveyor belts. It detects and quantifies internal carcass damage — broken cords, corrosion, kinks, fatigue, missing cords and splice anomalies — using magnetic flux leakage. The belt passes between permanent magnet conditioning heads while the Belt Scanner reads the magnetic signature of each cord.

Unlike the Fixed variant, the Portable system is powered entirely from a laptop via USB — no mains power required. It can be installed on a running conveyor and moved between conveyors, making it suited to fleet-wide condition assessment programmes.

BELT TYPE Steel cord	SENSING Inductive	SCANNING Belt running
POWER 5 VDC via laptop USB	STANDOFF 35 mm (50 max)	CONSTRUCTION 316 stainless

WHY BELT SCANNER MF PORTABLE



ONE SCANNER, MANY BELTS

Mounting tubes are fitted once to each conveyor. The scanner and tachometer slide in for a scan and come out again, so a single instrument covers a whole site – suited to fleet-wide condition assessment programmes.



POWERED BY THE LAPTOP

A USB to RS485 dongle powers the scanner and carries the data. No mains supply, no field enclosure and no wiring into your control system – which simplifies location selection enormously.



NON-CONTACT

Conditioning heads are installed 35 mm from the belt surface, and the Belt Scanner is also non-contact. No belt modification is required.



SCAN WITH THE BELT RUNNING

Once the tubes are in place, the scanner is inserted and withdrawn without stopping the conveyor. Conditioning heads and Belt Scanner are positioned while the belt is in operation. No production interruption.



INDIVIDUAL CORD RESOLUTION

Damage is resolved at the individual cord level – broken, corroded, kinked, fatigued and missing cords, plus splice anomalies.



SAME DATA, WITHOUT THE AUTOMATION

The same inductive measurement and the same analysis software as the fixed system. What it gives up is belt synchronisation – and with it Programmed Parking, DED and the fixed system's repeatability between scans.

RENTAL AVAILABLE

Available for purchase or rental, with an optional Beltscan data analysis service – remote scan review and monthly condition reporting. Contact Beltscan for rental options and data analysis service packages.

FIXED VS PORTABLE

CAPABILITY	FIXED BSMF	PORTABLE BSMF
Conveyors scanned	One (permanent installation)	Multiple (moved between conveyors)
Belt stoppage	Not required	Not required
Power source	24 VDC / 110 VAC / 240 VAC	5 VDC via USB (laptop)
Remote scanning	Yes – run scans remotely at any time	No – operator on-site with laptop
Programmed Parking	Yes	No
DED (Disastrous Event Detection)	Yes – 24/7 automated belt stop	No
Belt synchronisation	Yes – improves data repeatability	No
Scan data repeatability	Higher (fixed position, belt sync)	Good (varies with installation)
Installation	Permanent – 2-day commissioning	Site-specific mounts per conveyor

PRINCIPLE OF OPERATION

MAGNETIC FLUX LEAKAGE DETECTION

Two permanent magnet arrays (conditioning heads) are installed above and below the belt with matching magnetic poles facing each other. As the belt passes between them, the steel cords are selectively magnetised. Any discontinuity in a cord — even individual filaments — produces an external magnetic field (magnetic flux leakage). The Belt Scanner, positioned downstream, reads the resulting magnetic signature.

01

CONDITION

Two conditioning heads (one above, one below) magnetise the steel cords as the belt passes between them. Installed 35 mm from the belt surface, 50 mm maximum. Marked side faces the belt.

02

DETECT

The Belt Scanner reads the magnetic signature of each cord. Damaged cords produce flux leakage anomalies. Data is processed and stored in non-volatile memory inside the Belt Scanner.

03

ANALYSE

Scan data is downloaded via USB to the laptop. BSMF Data Viewer and Belt Analysis software identify damage type, severity and longitudinal position using tachometer data. Signature comparison between scans enables splice trending.

MAGNET SAFETY WARNING

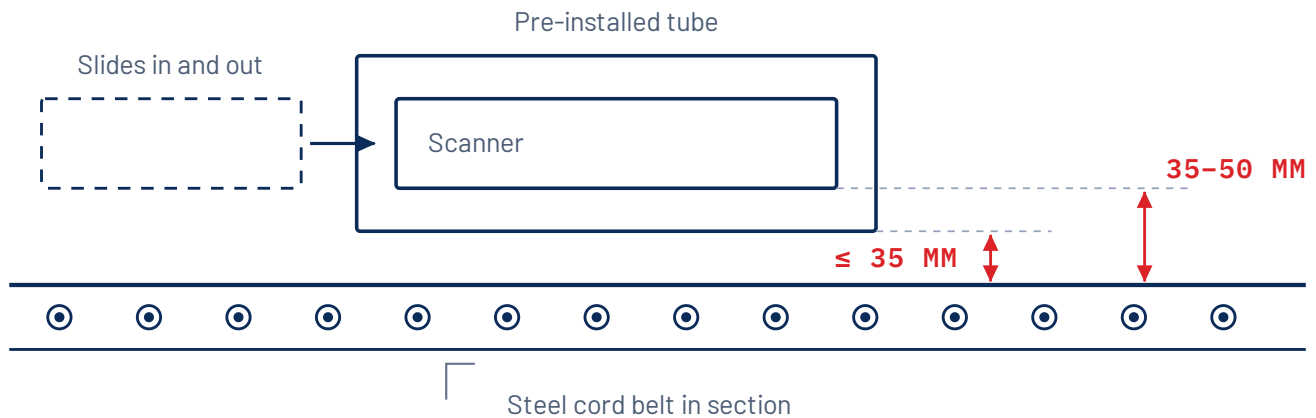
The conditioning heads produce a very strong magnetic field. No magnetically sensitive devices (credit cards, mobile phones, watches) should be allowed within 3.0 metres. Never allow a conditioning head to contact the belt directly during installation or removal — this may induce a magnetic signature in the belt carcass, which typically corrects over multiple belt revolutions. When not in use, separate the two conditioning heads with 25 mm² wooden blocks and tie together.

DAMAGE DETECTION

WHAT IT DETECTS

- **Broken cords** — Complete wire breaks within a cord
- **Rusted / corroded cords** — Corrosion-induced magnetic changes
- **Kinked cords** — Vertical plane deformation from belt handling damage
- **Fatigued cords** — Filament discontinuity from plastic deformation and ductile failure
- **Missing cords** — Absent cords in the belt cross-section
- **Splice anomalies** — Deterioration detected via magnetic signature comparison

HOW IT MOUNTS



IN THE FIELD

- 01 Fit the mounting tubes once per conveyor, **capped at the right positions** so the scanner and tachometer land in the same place every time.
- 02 Set the tube height so the scanner face ends up **35-50 mm from the belt**. With 150 mm PVC the tube itself has to be within 35 mm; square stainless tube sits closer to optimal and gives a flat seat.
- 03 Slide the scanner and tachometer in with the belt running, connect the USB dongle, and scan from the laptop.
- 04 Keep the inductive tachometer far enough off the belt — too close and it picks up splices, which skews the splice signatures.
- 05 Withdraw, move to the next conveyor, and scan again against the same software and the same history.

TUBE MATERIALS

150 mm PVC pipe or square stainless tube. Square tube gives a flat seat and puts the scanner closer to the optimal standoff; PVC works, but its curve costs some of the margin.

SYSTEM COMPONENTS

WHAT'S INCLUDED

BELT SCANNER

316 stainless steel, spans the full belt width, mounted 35 mm from the belt surface

2 × CONDITIONING HEADS

316 stainless steel permanent magnet conditioning heads, spanning the full belt width

USB-RS485 ADAPTER

ABS plastic, 135 × 65 × 45 mm. Powers the Belt Scanner via laptop USB and carries the data

TACHOMETER

Probe plus button magnet for the idler roller, for longitudinal position tracking

ANALYSIS SOFTWARE

BSMF Data Viewer and Belt Analysis — data capture, signature comparison and trending

DOCUMENTATION

Full installation, wiring and operation manuals (PDF)

TECHNICAL DATA

Belt type	Steel cord
Contact	Non-contact
Belt Scanner construction	316 stainless steel
Belt Scanner size	80 × 80 × L mm (per belt width)
Belt Scanner weight	15–17.5 kg per metre length
Conditioning Head construction	316 stainless steel
Conditioning Head size	40 × 40 × L mm (per belt width)
Conditioning Head weight	7–7.5 kg per metre length (each)
Standoff	35 mm from belt surface (50 mm maximum)
Tachometer	Inductive — no power required
USB adapter construction	ABS plastic
USB adapter size	135 × 65 × 45 mm
USB adapter weight	1.3 kg
Power source	5 VDC via USB (laptop / PC)
Operating temperature	–25 °C to +70 °C
Storage temperature	–40 °C to +80 °C
Humidity	5–95 % RH

INSTALLATION

Conditioning heads: installed above and below the belt, marked side facing the belt, each 35 mm clear of the cover. Must span the full belt width plus wander allowance. A difference of more than 10 mm between the two degrades the signature.

Belt Scanner: located in a flat belt path with minimal flap and droop, away from electrically noisy locations such as drive motors and switchgear. Can be positioned above or below the running belt.

Tachometer: sensor probe mounted on an idler roller frame, excited by a button magnet glued to the idler end disc. Confirm no residual magnetic signatures on the end disc before installation. Measure and record roller diameter.

ONGOING REQUIREMENTS

The Belt Scanner MF Portable requires very little maintenance. Keep the system free from product build-up. There are no user-serviceable components inside the Belt Scanner or the USB adapter. Always replace dust caps on connectors after use, and avoid standing on connectors.

WHERE IT'S USED

Multi-Conveyor Sites

Fleet Assessments

Baseline Belt Surveys

Mining Operations

Coal Handling Plants

Port Facilities

Overland Conveyors

Splice Condition Trending