

Belt Scanner MF — Fixed

PERMANENT ELECTROMAGNETIC CONDITION MONITORING — STEEL CORD

— OVERVIEW

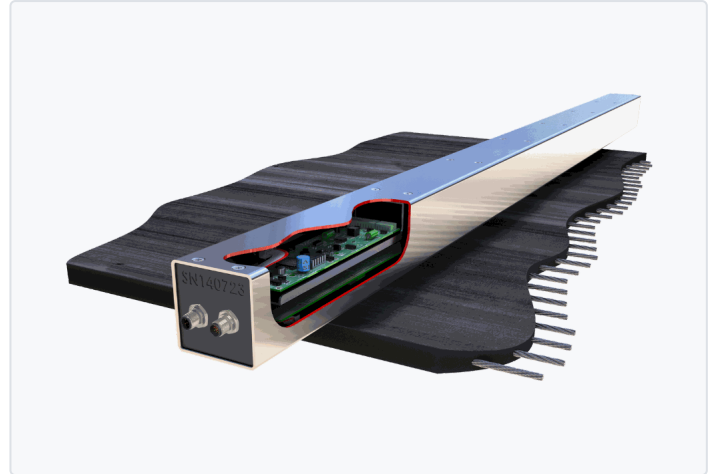
24/7 Condition Monitoring with DED & Programmed Parking

The Belt Scanner MF Fixed is a permanently installed, non-contact electromagnetic condition monitoring system for steel cord conveyor belts. It provides continuous, high-resolution detection and quantification of internal carcass damage — broken cords, corrosion, kinks, fatigue, missing cords, and splice anomalies — at the individual cord level.

Unlike the Portable variant, the Fixed system operates 24/7 and delivers two critical operational features: Disastrous Event Detection (DED) for automated belt stop protection, and Programmed Parking for automated belt positioning during maintenance.

Always online

· DED 24/7 protection · Programmed Parking · Remote scanning



— KEY BENEFITS

Why Belt Scanner MF Fixed

DISASTROUS EVENT DETECTION

24/7 continuous monitoring. When a cord damage threshold is exceeded, DED issues an automated HALT command to the PLC to stop the conveyor.

INDIVIDUAL CORD RESOLUTION

High-resolution analysis of steel cord condition, reported per damage type across the belt width.

ALWAYS ONLINE

Run remote scans at any time. Data download, configuration, and diagnostics via TCP/IP site network or remote broadband.

PROGRAMMED PARKING

Automatically positions any splice or flagged event at a designated maintenance location. Eliminates manual belt-inching.

BELT SYNCHRONISATION

Belt synchronisation matches live data against the stored Belt Signature File — no embedded magnetic signature tags or loops required.

NON-CONTACT

Conditioning heads installed 35mm from belt surface. No belt modification. Belt manufacturer independent.

Electromagnetic Condition Scanning

Two permanent magnet arrays (conditioning heads) are permanently installed above and below the belt, 35mm from the surface. As the belt passes between them, the steel cords are selectively magnetised. Any cord discontinuity produces magnetic flux leakage, which is read by the Belt Scanner positioned downstream of the conditioning heads. Data is processed, stored, and synchronised against the belt’s unique magnetic signature.

01

Condition & Detect

The conditioning heads magnetise the cords. The Belt Scanner reads the magnetic signature of each cord continuously. Damaged cords produce flux leakage anomalies stored in non-volatile memory.

02

Synchronise

The system matches live incoming data against a stored Belt Signature File. When synchronised, the Sync Lock relay toggles — enabling DED and Programmed Parking.

03

Protect & Park

DED monitors the cord damage count at every belt cross-section 24/7. If a threshold is exceeded, HALT is issued. Programmed Parking positions any splice or event at a maintenance location automatically.

DED — DISASTROUS EVENT DETECTION

DED continuously analyses raw data from the Belt Scanner 24/7. The number of damaged cords at any belt cross-section is compared against a site-defined threshold. If violated, a HALT command is delivered to the MEE and the HALT relay is toggled. This relay is hard-wired into the site SCADA environment to stop the conveyor. DED requires belt synchronisation — it is not active when the device is not synchronised. No embedded elements (magnetic signature tags or loops) are required for synchronisation.

PROGRAMMED PARKING

Any splice or event identified in the scan data can be automatically positioned at a designated maintenance location. When invoked, the system calculates the belt distance, runs the conveyor until the target section arrives at the maintenance area, and stops the belt automatically. A dedicated PARK relay toggles to indicate the stop was a parking event, not a DED event. This eliminates manual belt-inching — a slow, hazardous process.

What It Detects

- Broken cords — complete wire breaks within a cord
- Kinked cords — vertical plane deformation from belt handling damage
- Missing cords — absent cords in the belt cross-section
- Rusted / corroded cords — corrosion-induced magnetic changes
- Fatigued cords — filament discontinuity from plastic deformation and ductile failure
- Splice anomalies — deterioration detected via magnetic signature comparison between scans

Relay Outputs — Fixed Systems

RELAY	FUNCTION	DETAILS
Healthy	System operating normally, no faults	Form C, 5A 240VAC
Halt (DED)	Energised when DED event detected and DED enabled	Form C, 5A 240VAC
Sync Lock	Energised when belt is synchronised to magnetic signature	Form C, 5A 240VAC
Park	Energised when conveyor stopped by Programmed Parking	Form C, 5A 240VAC

What’s Included

BSMF Belt Scanner 316 SS, spans the full belt width, mounted 35mm from the belt surface	2× Conditioning Heads 316 SS, permanent magnet arrays, span full belt width + wander	Main Electrical Enclosure Stainless steel. Relay outputs, DED and Park integration, power supply
Termination Enclosure Stainless steel. Belt Scanner cable termination, installed near the Belt Scanner	Non-Contact Tachometer Longitudinal position tracking for belt synchronisation and parking	BSMF Data Viewer + Belt Analysis Scan control, DED config, parking, data analysis. 12 months included free

Technical Data

PARAMETER	VALUE
Belt Type	Steel Cord
Contact	Non-contact (35mm from belt)
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 Size	40 × 40 × L mm (per belt width)
Conditioning Head Weight	7–7.5 kg per metre length (each)
Power Supply	24VDC / 110VAC / 240VAC
Relay Outputs	4× Form C, 5A 240VAC
Operating Temp	-25°C to +70°C
Storage Temp	-40°C to +80°C
Humidity	5–95% RH

Installation

Conditioning heads: Permanently installed above and below the belt at 35mm from the belt surface. Must span the full belt width plus wander allowance. Located in a flat belt path away from electrically noisy equipment.

Belt Scanner: Positioned downstream of the conditioning heads in a flat belt path with minimal flap and droop. Stainless steel construction spans full belt width.

Commissioning: Installation by site personnel under guidance of a Beltscan product specialist. Detailed wiring and mounting specifications supplied. Typically 1–2 days including commissioning.

Ongoing Requirements

Visual inspections should be carried out regularly to ensure all mounts are secure. A light hose down is recommended periodically to keep the system free from product build-up. There are no user-serviceable components inside the Belt Scanner.

Belt Signature: The Belt Signature File should be updated periodically to reflect changes in the belt’s magnetic signature over time. This maintains DED accuracy and prevents false events from known damage.

Where It’s Used

- Critical Overland Conveyors
- Mining Operations
- Coal Handling Plants
- Port Ship-Loading
- Iron Ore Processing
- Alumina / Bauxite
- High-Value Belt Assets
- Splice Condition Trending

Proven at an Australian alumina operation (WA) — seven systems operational for over a decade. Also available with optional Beltscan data analysis service for monthly remote condition reporting.