SMARTSCAN | NG

MODEL 2300 | PRODUCT PROFILE

Product Overview

The Model 2300 NG Defect Detector is a dual-microprocessor based system designed to perform all traditional defect inspections. There are more than 1000 units in service on Class I and other heavy-haul railroads worldwide.

Each Model 2300 NG includes:

- Connections for Southern Technologies Bearing Scanners & Wheel Scanners
- VHF Voice Radio and IP Network Communications
- Integrated AEI Interface
- DTMF Prompted Rebroadcasts
- Open Contact Auxiliary Alarm Device Inputs
- Train Presence Detection — 2-Wire Audio Overlay Track Circuit
- Support for the Southern Technologies Precision Ambient Temperature Probe

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Main Assembly

The system electronics, consisting of a chassis assembly and a controller module, contains all the surge suppression and interconnection hardware to fulfill the requirements of a full-featured defect detection system.

Once alarm conditions are detected, they are announced in a clear human voice on a pre-selected VHF radio channel to alert train crews to the presence of dangerous conditions. Defects are identified by axle number and position in real-time. The Controller Module can provide remote data reporting over an IP network.

Modular Design

The Model 2300 NG system is modular by design, allowing custom configuration for specific environments. The basic system is delivered as a Hot Bearing Detector. Additional capabilities can be added by attaching input devices, such as wheel scanners, a dragging equipment detector, high/wide load detectors, and the TransCore® MPRR - RFID module. The system software of the NG^2 already contains support for each of these options —merely adding the hardware required for the desired function and activating it in the software enables these capabilities.

The chassis assembly accommodates the Ritron DTX-160 VHF radio transceiver. Optionally, an external communication interface connector provides all the signals necessary to connect an external mobile radio transceiver equipped with similar connections.

AEI Integration

The Model 2300 NG system is designed to seamlessly integrate data from a TransCore MPRR - RFID reader module. The addition of an MPRR reader module enables the system to include car identification information, including Owner Codes and Car Numbers, in defect alarm announcements and train reports. Also, the car identification information can be used by the system's Velocity module to generate S-9203A and S-9203B reports. In the event of a detected defect, alarm announcements delivered over the radio will include the car number with the defect. The NG system maintains records of the last 100 trains that it has scanned. The record files can be delivered over an IP network or copied to a local PC through a serial connection and viewed in a standard ASCII text format.

MPRR Panel Assembly

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Train Presence Detection

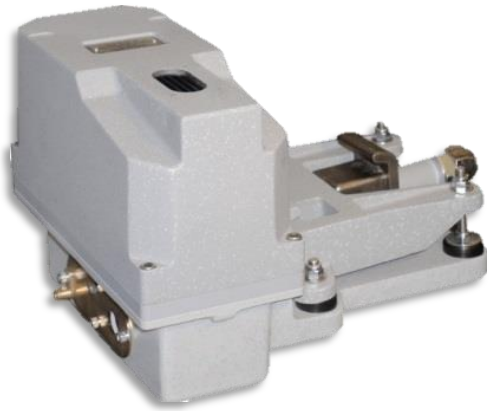
The standard chassis configuration features a 2-Wire Audio Overlay Track Circuit Module manufactured by Zukinut Enterprises, LLC with the following features.

- Customer Specified Operating Frequencies of 5.9KHz, 8.2KHz, 10KHz, 11.5KHz, 13.2 KHz, 15KHz, 17.5KHz, 20KHz, and 26KHz.
- Sinusoidal output independent of track load
- Digital Band Pass Filter receiver circuitry
- Provides consistent activation point independent of operating battery voltage
- Built-In LOS timer (non-vital)
- "Drop a shunt and push a button" Semi-Automated track circuit set-up feature
- Replaces the EPICIII and Safetran SOTC

Module Support

Bearing and Wheel Temperature: The Model 2300 NG system supports input from Type II and Type III infrared scanners manufactured by Southern Technologies Corporation. Both types of scanners are compatible with the same rail mounting hardware and can support either bearing or wheel scanning interchangeably. Each delivered system includes most of the tools required for system maintenance, including alignment and calibration.

Type III - Wheel Scanner



Type III - Bearing Scanner

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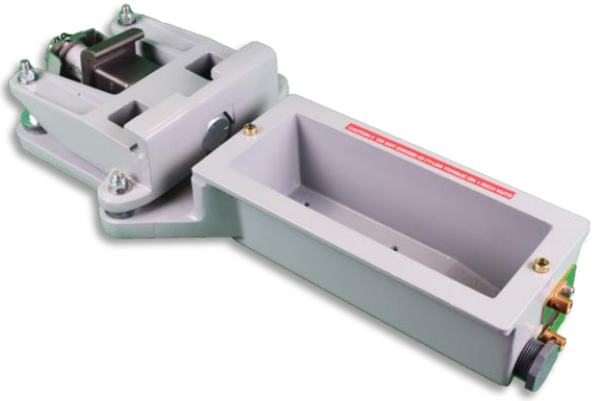
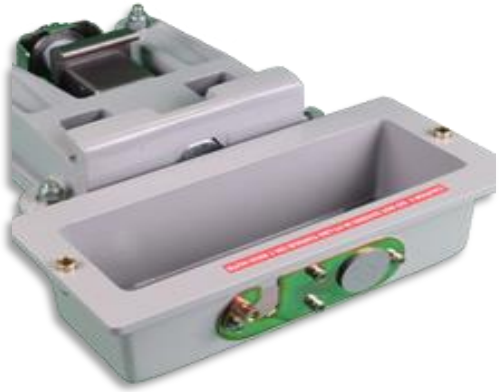
Scanner Mounting: The Model 2500-401 Wheel Scanner Mount and the Model 2100-501 Bearing Scanner Mount are a ruggedly built, shock resistant rail clamp bracket designed for use with Type III Scanners.



2500-401 Wheel Scanner Mount



2100-501 Bearing Scanner Mount

Scanner Cable: STC manufacturer's scanner cables in standard lengths of 65, 100 and 130-foot, designed to connect bearing and wheel scanners to an STC defect detector system.

Scanner Cable

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Calibration: The Model 2100-810NG Scanner Calibration Unit is the recommended heat source for calibrating STC bearing and wheel scanners. Place the 2100-810NG over the opening of the scanner cover to provide a precise value above ambient temperature for accurate calibration.

Scanner Calibration Unit

Ambient Temperature Measurement: The Model 2090-100 Temperature Probe is a plug-in module that provides an outside ambient temperature indication for an STC defect detector system.

Ambient Temperature Probe

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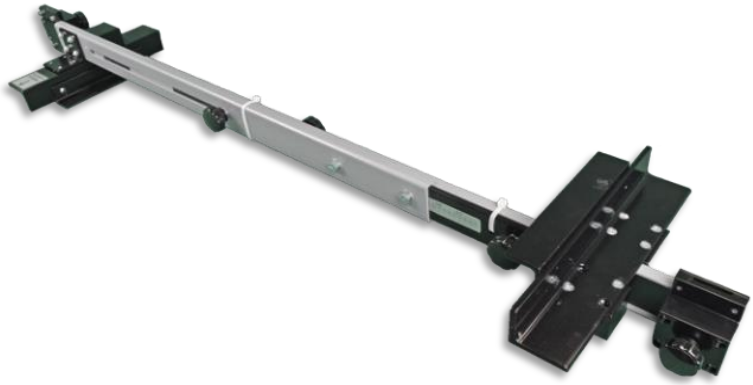
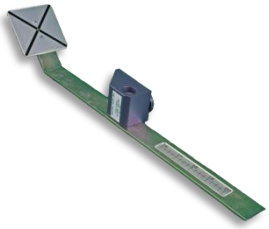
Alignment: Use the Model 2066-000 Scanner Alignment Fixture and Model 2066-200 Optical Alignment Accessory to aim the scanners to the proper point above the rail, and set the wheel sensing transducers to the correct elevation.



Scanner Alignment Fixture



Optical Alignment Accessory

Wheel Detection: The Model 2100-596 Dual Gating Transducer with Clamp Assembly is a rail-mounted device that generates wheel detection and timing signals for an STC defect detector.

Dual Gating Transducer Assembly

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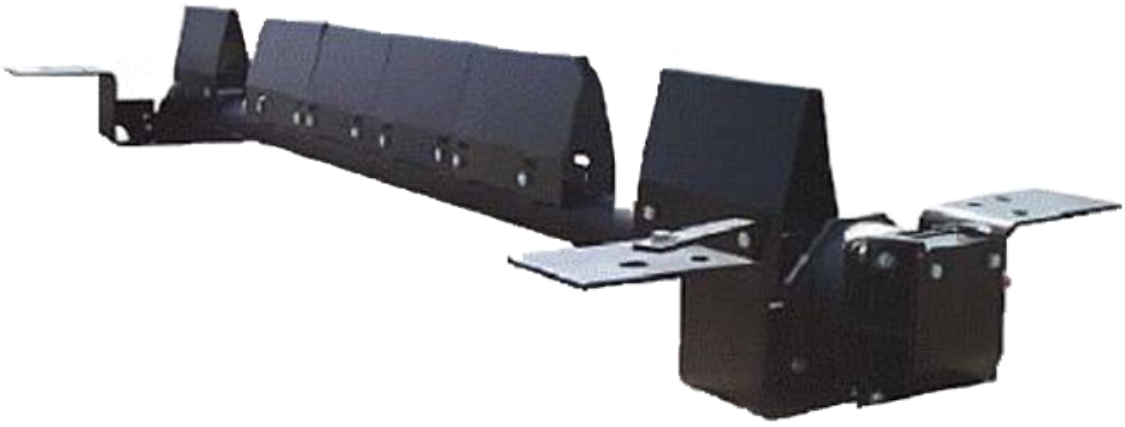
Wheel Detection: The Model 2100-550 Single Element Transducer is a rail-mounted device that senses passing wheels on a train. The timing signals generated by the transducers are critical for STC defect detector operation.

Single Element Transducer

Detection of Dragging Equipment: The Model 2300-044 Dragging Equipment Detector protects your rolling stock, cargo, concrete ties and track structures by detecting equipment that is dragging under a moving train.



Dragging Equipment Detector

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General Specifications

Maximum Train Length	1600 Axles
Input Voltage - DC	Controller Module and Chassis: 10 to 16 VDC. Maximum system current, including two bearing scanners and two wheel scanners, with train present and radio transmitting approximately: 11.6 amps. Idle current 770mA.
Input Voltage - AC	100 – 130 Volts @ 15 Amps, 50-60Hz
Input Voltage Protection	Circuit Breaker, Self-Restoring Fuses, Metal Oxide Varistors, Reverse Polarity Protected
Processors	Two Embedded Motorola 68HC11 Processors, each with the following features: 8-bit, 16MHz clock (4MHz bus), 480KB Flash Program Storage, non-volatile system configuration. One of the two processors has non-volatile time and date and 4MB of non-volatile memory for train storage.
Serial Communications Ports	Up to five RS-232 ports available, depending on internal options, and one RS-485 port — all with standard male D-Sub 9 connectors.
User Accessible Inputs	2 Bearing Scanner, 2 Wheel Scanner, 2 Wheel Gating Transducer, 2 Wheel Advanced Transducer, 8 Opto-Isolated Digital, 1 Precision Ambient Temperature Probe, 1 Train Presence Detection - Internal 2-Wire Audio Overlay Track Circuit
Network	One RJ45 connector for access to the optional internal Velocity Module.
Voice Communications	Internal VHF Radio Transceiver: Ritron DTX 160 – 8 channels, 6 watts, narrowband, 134MHz to 176MHz.
Dual-tone Multi-frequency Decoder	DTMF decoder recognizes all standard digits — 0 through 9, #, *, A, B, C, D. (Reception of a customer specified sequence of digits triggers a rebroadcast of the last voice announcement.)
Wi-Fi	N/A
Operating Temperature	–40°C to +70°C, Fanless Operation, Industrial Temperature Range
Size	15.5”W x 22”H x 3.75”D
Weight	30 lbs.
Finish	White powder coat over stainless steel.
Manufacturer	Southern Technologies Corporation, Chattanooga, Tennessee

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