

Catalog of Wayside Information Systems Products and Applications Software



EQUIPMENT

A P P L I C A T I O N S





Wayside Condition Talker System

Next Generation Defect Detector



Real Time Defect Information Sent to a Central Location



Automated Yard Inventory – SmartScan AEI



Real Time Yard Inventory Tracking



Manual Yard Inventory – Hand Held AEI Reader



Manually Transfer Track Consists to a PC



Next Generation



The Smart Scan Next Generation Defect Detector builds on the proven concepts of the Sentry System developed by Southern Technologies Corporation in 1986.

The Smart Scan NG offers expanded data processing capability, non-volatile memory, non-volatile time and date, reduced board count, simplified packaging, improved diagnostic capabilities and economical AEI integration.

Smart Scan NG offers a complete out of the box solution for wayside defect detection. The system is readily expand-able from its basic hot box detector configuration. Simply plug in the modules for the additional functions you want, and the NG will function in its new expanded role.

Additional expansion functions include:

- · Dragging equipment detection
- High and wide load detection
- Hot wheel detection
- AEI integration
- Central office reporting

The basic Smart Scan NG software is already configured for each of the expansion functions.





A fully integrated HBD/HW/AEI

Smart Scan AEI integration provides a valuable tool for reporting defects. The AEI integration module is based on industry standard components from Transcore.

- AI 1200 Reader logic board
- AR2200 RF module

The AEI integration module is packaged in a NEMA enclosure suitable for direct wall mounting. A single RS 232 cable is connected between the module and the NG processor. The NG, with AEI will automatically generate voice messages and reports that associate bearing and wheel data with specific cars.

Defect Detection



SmartScan NG Electronics

The SmartScan NG electronics package is complete; including all necessary equipment for standalone automated defect detection and reporting.

Standard equipment includes:

- Dual processor controller board
- 19.2 K modem
- Series overlay track circuit for presence detection
- Internal 5 watt 8 channel radio with surge protection
- Internal DTMF decoder to enable rebroadcast of last message
- Internal Universal Transit Barrier (UTB) surge protection
- Built in Faraday cage for surge components
- Heavy duty solid state relays for wheel and bearing scanners
- Military connectors for bearing and wheel scanners

The electronics package is designed for ease of expansion as requirements change.



Type II – Bearing Scanner

The type II bearing scanner provides a very compact and rugged system for recording the heat from railcar bearings as they move through a wayside location.

The scanner clamps directly to the base of the rail. Shock and electrical isolation from the rail is provided. The system is small enough to fit between two ties and low enough to avoid being struck by hi-rail equipment.

The scanners have 10° of lateral adjustment built into the patented alignment system. Type II scanners can reliably scan bearings at speeds to 100 MPH.



Type II – Wheel Scanner

The Type II wheel scanner mounts in the same manner as the bearing scanner, but the field of view is turned 90° in order to scan a point approximately 3 inches above the rail.

Bearing and wheel scanner modules are interchangeable. Only the mounting hardware is different. Both scanners use the same alignment and calibration equipment.



Two magnetic transducers provide all of the timing signals required for calculation of train presence, speed, length, direction, axle count, and synchronization of data capture from wheel and bearing scanners.

The transducers mount directly to the web of the rail with vibration resistant grade 8 hardware. The transducers are vertically adjustable.

SmartScan transducers have been tested for reliable operation over a speed range of 7- 100 MPH



Next Generation Defect Detection

Central Office Reporting

The value of data recorded by SmartScan wayside information systems can be enhanced through the use of a central office computer system offered by Southern Technologies Corporation.

All SmartScan defect detection systems can be connected to the central office computer by a dedicated phone line, fiber optic cable or a data radio network.

Each system is polled for new information at regular intervals. The systems respond with new train data or system health information.

Defects detected by the way side systems are immediately alarmed both visually and audibly at the central office computer.

All reports that can be generated at the way side systems can also be generated at the central office.



All train data from the way side systems is recorded in a data base at the central office. If the train data is integrated with AEI data, it becomes an invaluable tool for planning proactive maintenance of failing bearings and braking systems. The central office software can export data base information to other applications.



Wheel scanning, when combined with AEI integration and bearing scanning can provide very meaningful data for proactive car maintenance. The SmartScan NG system has the capability to detect the following faulty brake conditions through the use of wheel scanners.

- Sticking brakes: represented as hot wheels
- · Poor braking: represented as cold wheels
- Sliding wheels: represented as radical differences between wheel heat on the same truck or car when combined with the absence of bearing heat.

Wheel scanning can be a valuable asset on long grades and around yard exit points. When combined with AEI, wheel scanning pinpoints defective rolling stock.

Wheel and Bearing Scanning with Integrated AEI

Southern Technologies Corporation Integrated Detector System TRAIN DETAIL												
Train # Date: Time:	: 10 09/22/03 14:16	3			D	Speed Axles irection	: 50 : 52 : Noi				Milepost: 1234.5 Track: Single Temperature: +51 Battery: 14.0v	
==== Rail	==== Max	===== Avg	Resisto	=== pr 7	axdr Co	==== unts		= = = Alarm	=== 1	= = = Limit	:===	Carside Parms
East West	38 263	37 77	190 184		TO1 5 TO2 5	2 Absolute 2 Differential Hot Wheel			Tomore	150 80 652		Slope: 1.31 Minimum: 155
Wheel	Max	Avg	Resist	or			Cold v	vneei	iemp	15		
East West	420 432	55 56	620 614									
AEI System Data												
Tags Read Tags Stored: 12												
Antenna 1: 12 Antenna 2: 12 ====================================												
Firmware Versions												
Analyzer: D.0.06 09/18/2003 Talker: 0.01 03/19/2003 Comm: E.0.10 08/22/2003												
Integrity Failures Alarms identified by car number												
None												
Axle Alarm Summary Alarms pinpointed on each car												
14 20 20	14West Rail AbsoluteTTWX 920Cold AxleWC 3020Sliding WheelWC 36					72780L3,A End Leading105R4,B End Leading05R4,B End Leading				ading ading ading		
===:	====:	===== Brg	====== Brg	Whl	==== Wh	==== 	====	===	===	===	===	
Car ====		East	West	East)FF ===	PW ===	1===	PW2 ====	
1	1 2	26 34	23 35	4	4	2	(7	0 72	10 7		11 7	CSX 4378 A End Leading
	3	32 26	30 24	5	7	2	7 6	64 684	7		7	Car ID & orientation —
	5 6	30 25	29 22	6 8	6	21 21	7 7	64 64	7 7		7 7	
2	7	25	22	9	8	27	7 1	93	7		7	CSX 7710 A End Leading
	8 9	30 26	29 24	6 7	e e	27	7 7	74 64	6 7		7 7	
	10	32	33	4	5	2	7 6	684	7		7	
	11 12	34 26	30 26	8 11	9 8	27	(7	64 64	7 7		/ 7	
3	13	37	34	12	10	27	7 1	93	7		7	TTWX 972780 A End Leading
	14	41	263	9	8	27	7	74	7		7	West Rail Absolute
	15 16	44 36	40 37	7 5	9 8	27	(6 7	64 64	6 7		7 7	Alarm Identificatio
4	17	63	66	340	368	2	7 1	193	7		7	WC 36105 B End Leading
	18 19	62 68	56 63	420 398	432 406	27	1 7 6	74 684	7		7 7	
	20	1	7	9	8	27	7	64	7		7	Cold Axle Sliding Wheel





SmartScan wayside condition reporting systems offer very cost effective alternatives to the installation of full wayside defect detection systems.

Typical applications for wayside condition reporting include:

- Dragging equipment detection to protect concrete ties
- High water detection
- Bridge misalignment
- Slide fence activation
- Weather monitoring

 wind and
 temperature
- Rail stress monitoring

Typically, wayside condition reporting systems function as standalone talkers that communicate via voice radio, directly to train crews.

The SmartScan wayside condition reporting system can also report through a data radio network to the SmartScan Central Office software system.



The central office reporting system provides near real time notification of dangerous conditions that may develop

along the right of way, plus notification of any rolling stock defects detected by the SmartScan NG defect detection system.

Because the power requirement of the SmartScan wayside condition reporting system is so modest, it can be

installed almost anywhere using an engineered solar power system from Southern Technologies Corporation.

Supplementing SmartScan defect detection networks with wayside condition reporting systems provides the best and most cost effective rolling stock and infrastructure protection available

SmartScan wayside condition reporting systems are designed from the ground up to provide economical and flexible drop in packages for monitoring and reporting

> dangerous conditions along the right–of –way. Each system is shipped complete with an 8-channel transceiver, and a DC/DC converter to provide isolation at locations where power is shared with signaling equipment.

> Software support for all applications is incorporated in a single easy to configure package. All setup and data retrieval is performed through a RS232 serial interface.

The system can be configured to operate as a continuous scan device without advance start, or advance start can be provided by a railmounted transducer or a track circuit. If a transducer is used, wheel count information will be broadcast with defects.

One SmartScan wayside condition reporting system can service two tracks in many instances.



Condition Reporting





Portable AEI Reader

A revolutionary new product for reading Automatic Equipment Identification (AEI) tags.

The SmartScan Portable AEI reader is small, lightweight, inexpensive and compatible with all tag programming standards.

The hand-held reader enables users to read AEI tags anywhere, display and store information from tags it has read, and easily download the stored data to a personal computer.

Overview

The SmartScan portable reader provides an extremely simple and flexible method for collecting data from AEI tags programmed with AAR, ATA and ISO message formats.

With an accuracy rate of more than 99.99 percent, the portable reader is an excellent tool for verifying that tags are programmed properly and operating correctly.

The SmartScan portable reader helps improve margins by providing accurate data that can be interfaced electronically with planning, inventory and billing systems.

No more manual data collection, entries or corrections. SmartScan gets it right the first time, every time.

easy to locate in shop Rugged and durable high impact plastic construction Small (12 x 4 x 2 inches) and lightweight (less than 2 pounds) for easy handling 4-line, back-lighted LCD display Stores up to 1200 tag reads for SmartSCAN download to a PC Reads approximately 1500 tags per battery charge All tag reads are time and date stamped **Reads dynamic tags** Compatible with all tag programming standards, including AAR, ATA and ISO message formats

Vibrant safety yellow color makes it

20-key back lighted key pad for supplementary data input

Much less expensive than other portable tag readers

Applications

Coal companies, chemical refineries, automobile manufacturers and all other industries using rail transportation will benefit from extremely accurate, electronically formatted data from the SmartScan portable reader.

About 98 percent of all North American rail cars, as well as many trucking and intermodal vehicles are equipped with AEI tags that can be easily and accurately monitored using the portable reader. The SmartScan portable reader allows users to:

- Identify tagged equipment and store data in individual sessions.
- Identify tagged equipment and relate to a specific track or area by using tags to identify the location
- Identify tagged equipment and associate with preprogrammed vehicle status codes.
- Download all stored sessions to a host computer or serial printer.

PC Interface

The data stored in the SmartScan portable reader can be downloaded to a personal computer through a standard RS – 232 serial communications interface.

PC software required to retrieve and use tag data from the portable reader is included with the purchase of the reader.

The program, "Portable Reader Lite," runs under Windows 95, 98, 2000 & NT. It is a compact version of a larger product used for automated terminal and yard inventory management.

Designed specifically for SmartScan users, Portable Reader Lite configures PC's to accept data from the portable reader, downloads tag data and organizes it for vehicle management or export to other programs.

Portable Reader Lite's vehicle management functions include the graphical display of vehicles on a track with the capability to reposition by dragging and dropping where desired.



Users also can create, modify and add comments to car lists and search for specific vehicles or groups of vehicles.

Vehicle lists can be formatted and printed or exported to other applications.







Main Line and Yard Inventory

SmartScan main line and yard inventory AEI systems are proven products.

Systems can be assembled in different configurations that suit the site conditions where they will be located.

System configurations can include:

- Upgrade systems for existing locations with bungalows.
- Free standing systems for yard locations where clearances are minimal
- Solar powered systems for locations where commercial power is unavailable
- · Systems that use cellular communications

No matter what the final configuration, the systems are built from a group of modules that are designed to work together.

The modular construction of SmartScan AEI systems makes field maintenance simple and fast. The fact that standard modules make up each system reduces cost of ownership by reducing spare parts inventory.



Out on the main line and at select set out locations. SmartScan AEI systems provide accurate consist updates to the host computer systems of the operating railroad and affiliates.

Each SmartScan main line AEI

system can report clean consist information in S-918A format to as many as 6 host computer systems.

Information from these reader systems can be used to automate processes that include.

- Train location
- Locomotive fuel status
- Car interchange
- · Car placement and pick up
- Billing

AEI Systems

In classification yards, SmartScan advanced AEI products provide automated inventory information on a track by track basis. Advanced AEI systems can reliably track the movement of cars into and out of tracks. Track list information provided by SmartScan AEI has been proven to be better than 99% accurate in sustained testing.





Information from advanced yard inventory AEI systems is transferred by wireless 802.11B communications to a centrally

located computer for further data integrity checking. Car locations are graphically displayed on the central computer as changes occur.

The central computer can provide switch list error reporting by comparing the actual track inventory with a pre-loaded switch list for each track. Error checking capability reduces the cost of handling cars and improves delivery time.

SmartScan advanced AEI systems provide accurate departure consist lists before the train departs the yard.

All main line and yard AEI systems operate with rail mounted zero speed transducers.

The transducers are installed in pairs on 9' – 6" centers to act as "truck traps".

The transducer arrangement of SmartScan AEI systems allows positive determination of wheel speed and direction during stop and reverse movements.

Proprietary algorithms in the SmartScan processor module develop clean consist list information regardless of the number of stop and reverse movements over a site.

Southern Technologies Corporation provides on site design and consulting services to create the optimum hardware and software configuration for a yard, assuring our customers the best value for their investment.





Southern Technologies Corporation

The company behind SmartScan.

Southern Technologies Corporation is a company with over 38 years of experience meeting the requirements of Class I railroads.

All of the company resources are dedicated to design, manufacture and support of the wayside information systems that are playing and increasingly important role in reducing operating costs for today's railroads.

Today, Southern Technologies Corporation provides products and services to major railroads in North America, South America, Australia, Africa and Europe.



Quality Assurance

Southern Technologies Corporation is a company committed to maintaining high quality standards.

STC is certified to the ISO 9001 – 2000 quality standard. The certification covers design, manufacture and support services provided by STC.

At Southern Technologies Corporation we are committed to the process of continuous improvement.



Customer Support

At Southern Technologies Corporation, customer support is provided at all levels.

STC engineers have an average tenure in excess of eight years. They are knowledgeable about the SmartScan product line, and available to discuss customer requirements.

Technical support can be accessed through a single contact with a trained support specialist.

Replacement parts, repair and warranty services are as near as your telephone.









Customer Training

Southern Technologies Corporation maintains a modern well equipped training facility at our headquarters.

Customer training for the our products is provided here at no charge to our established customers. When required, field training can be arranged.

Our goal is to establish personal working relationships with the people who purchase and maintain our products.

Product Availability

At Southern Technologies Corporation, system level components are maintained in finished goods inventory.

Finished goods inventory is maintained at levels that guarantee timely delivery of replacement parts.

Finished goods inventory also provides the system level components required to build complete systems configured to customer specifications.

Maintenance of finished goods inventory assures short lead times for systems and replacement parts.

Inventory in Depth

At STC our finished goods inventory is critical to maintaining our commitment to product availability.

To assure availability of finished system level components, large inventories of component parts are maintained in our warehouse.

Our depth of inventory assures prompt replenishment of finished goods.

STC is committed to continuous availability of parts and systems.

At Southern Technologies Corporation, helping our customers maximize their return on investment is of paramount importance.



Southern Technologies Corporation has the products and knowledge base to supply wayside information systems needs of most railroads.

Wayside information systems from STC will always be price competitive with any comparable product.

All SmartScan products are designed for the shortest possible installation time, reducing capital outlay. Systems are shipped complete and fully tested.

At STC, our quality management system requires that all systems returned for repair, are cycled back to the customer in 30 days or less.

STC equipment is designed for the environment in which it operates. A case study of one Class I railroad with an installed base of 188 defect detectors shows that over a four - year period the customer experienced:

- An average in service time of 99.98%
- A MTBF of 2.98 years
- An average annual repair cost of \$ 206.00 per system.
- Annualized repair cost as a percentage of equipment investment < 1.2%



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