



**SIEMENS**

*Ingenuity for life*



2018

# Rail Automation

Products Catalog

SIE-RA-CMP-001-18-EN

# Grade Crossing Control Systems Products



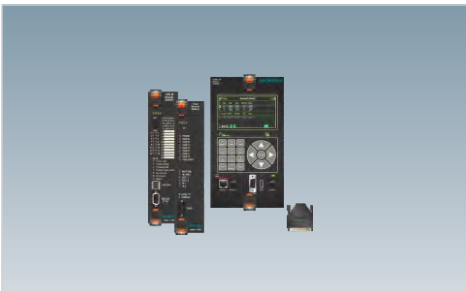
Wayguard® SGCP 4000 / MS 4000 Series  
Simple Grade Crossing Predictors /  
Motion Sensors **A1 - A4**



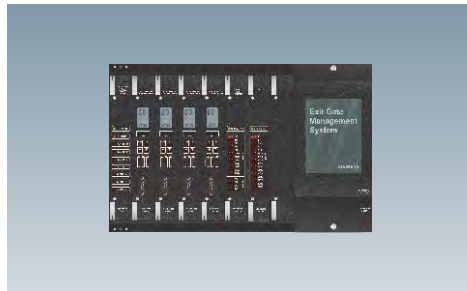
Wayguard® GCP 4000 Series  
Grade Crossing Predictors **A5 - A12**



Wayguard® GCP 5000 Series  
Grade Crossing Predictors **A13 - A18**



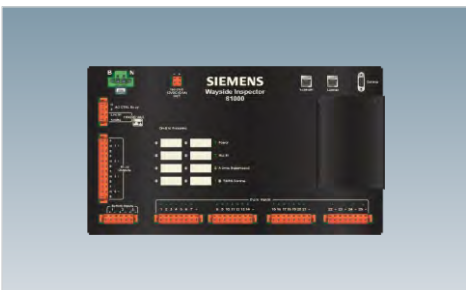
SGCP 4000 / MS 4000 /  
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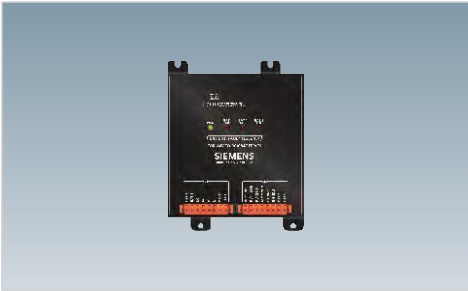
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**iLOD**  
Intelligent Lights Out Detector

A50



**GFT II Series**  
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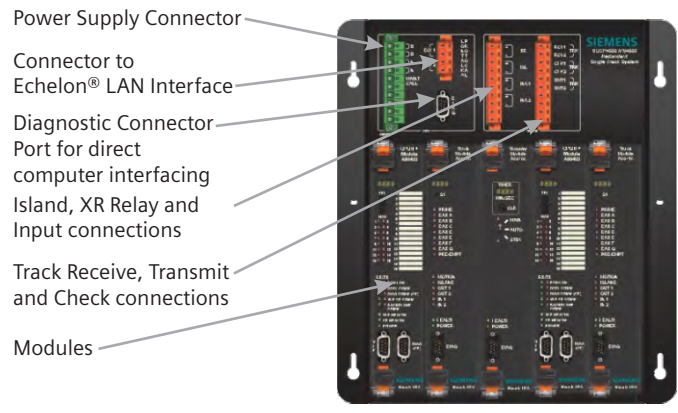
A51 - A52



Wayguard®  
SGCP 4000 / MS 4000 Series  
Simple Grade Crossing Predictor / Motion Sensor

[usa.siemens.com/rail-automation](http://usa.siemens.com/rail-automation)

Overview



- Power Supply Connector
- Connector to Echelon® LAN Interface
- Diagnostic Connector
- Port for direct computer interfacing
- Island, XR Relay and Input connections
- Track Receive, Transmit and Check connections
- Modules

Features

- Available in single track non-redundant and redundant models.
- Uses proven GCP 4000 / 5000 modules.  
*(All of which hot swappable and interchangeable with GCP systems)*
- Reduced system size for installation in a smaller equipment house.
- Provides a simple user interface in order to easily setup unit.
- Programming can be confirmed by an Office Configuration Check Number (OCCN) and the track calibration information can be confirmed by a Track Check Number (TCN).
- Provides a diagnostic history log and train move history log capable of interfacing to a SEAR II Event Recorder/ Analyzer for additional capability.
- Supports the use of an external island using a vital input.
- Transfer module can be removed and a strap can be used to force either main or standby operation without transfer module being present.  
*(On Redundant A80490 models only)*
- Can be configured as either a motion sensor or as a simple grade crossing predictor.

**SIEMENS SGCP 4000 / MS 4000** is an electronic, microprocessor based modular system designed to reliably detect the motion of an approaching train and start the crossing warning system.

Operation of the system is based on the maximum impedance of an unoccupied track circuit, which is determined by the location of termination shunts and rate of change in impedance resulting from physical location of a train as it moves within a track circuit.

System will apply a constant current AC signal to track and measures level of the resulting voltage. These levels vary with approach track impedance, which also varies due to distance of train from the crossing.

System detects inbound motion of train and activates crossing warning equipment.

When the train has cleared crossing, system no longer senses inbound motion and allows crossing warning signal system to recover.

When a train stops before reaching crossing, or reverses direction and backs away from the crossing, system will recover after a short (programmable) time-out as inbound motion is no longer detected.

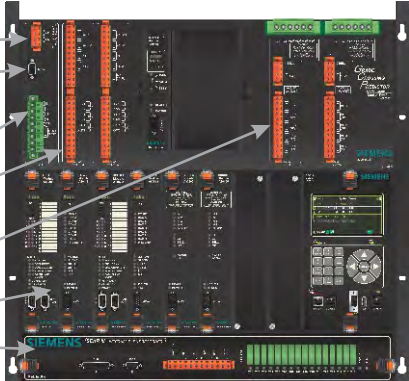


For additional optional modules, See this section, Pages A19 - A25



**Overview**

- Connector to Echelon® LAN Interface
- Diagnostic Connector
- Port for direct computer interfacing
- Power Supply Connector
- Track Receive, Transmit Check and Input / Output connections
- Solid State Crossing Controller connections
- Modules



**SIEMENS GCP 4000** is an electronic, microprocessor based modular system designed to reliably detect the motion of an approaching train and start the crossing warning system.

Utilizing up to (6) track circuits for train detection, with each track module having (9) track predictors that are configurable as motion sensors or predictors. Each track module has (2) vital inputs and (2) vital outputs. (2) track modules are required for each track circuit in redundant applications.

The Track Module Prime Predictor is generally used for control of local crossings. The Track Module DAX A through DAX G Predictors are generally used for control of remote crossings. The Track Module Preempt Predictor is generally used for interconnection with traffic signal systems. In addition to predictors, each track module is capable of providing a multifrequency island circuit.

Using internal SSCC IIIi crossing controller module(s), system is able to control the bells and gates of a crossing and up to (40) amps of light energy and each SSCC IIIi module contains (5) vital outputs. Providing up to (40) amps of lamp energy and controlling up to (4) gates.

Using internal PSO module(s) system is able to detect train direction on a bidirectional track circuit that allows the control of remote crossings (Bi-DAXing) and each PSO module contains (3) vital outputs and (2) vital inputs.

Using internal RIO modules system is able to extend I/O capability and each RIO modules contains (4) vital inputs and (4) vital outputs.

**Features**

- Capable of monitoring up to (6) track circuits including Intelligent Processor Island and Bi-DAXing.  
*(Number of maximum track modules dependent on chassis of GCP system selected.)  
(On redundant systems, (2) track modules needed for each track circuit.)*
- SEAR IIIi Event Analyzer / Recorder programmable via OCE and new display.
- Provides a diagnostic history log and train move history log utilizing a SEAR IIIi Event Recorder/ Analyzer.
- Internal logic utilizing vital AND gates and vital timers.
- Multiple ethernet ports available for interfacing with eSSR radio, vital communications as well as PTC applications.  
*(Depending on configuration, some ports may not be activated.)*
- Enhanced user interface tools including OCE, WebUI and new display.
  - Common menu structure between all user interfaces.
  - Generate office configuration check number (OCCN).
  - Simple, tailored dropdown menus for user friendly configuration, diagnostics and troubleshooting.

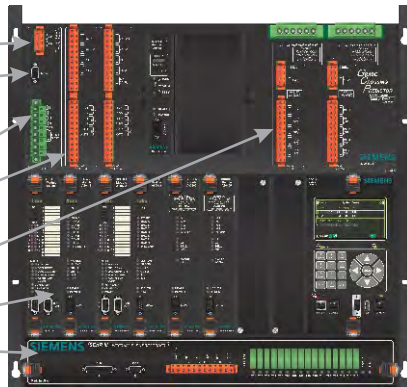


For additional optional modules, See this section, Pages A19 - A25



## Overview

- Connector to Echelon® LAN Interface
- Diagnostic Connector
- Port for direct computer interfacing
- Power Supply Connector
- Track Receive, Transmit Check and Input / Output connections
- Solid State Crossing Controller connections
- Modules



**SIEMENS GCP 5000** is an electronic, microprocessor based modular system designed to reliably detect the motion of an approaching train and start the crossing warning system.

Utilizing up to (6) track circuits for train detection, with each track module having (9) track predictors that are configurable as motion sensors or predictors. Each track module has (2) vital inputs and (2) vital outputs. (2) track modules are required for each track circuit in redundant applications.

The Track Module Prime Predictor is generally used for control of local crossings. The Track Module DAX A through DAX G Predictors are generally used for control of remote crossings. The Track Module Preempt Predictor is generally used for interconnection with traffic signal systems. In addition to predictors, each track module is capable of providing a multifrequency island circuit.

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Using internal PSO module(s) system is able to detect train direction on a bidirectional track circuit that allows the control of remote crossings (Bi-DAXing) and each PSO module contains (3) vital outputs and (2) vital inputs.

Using internal RIO modules system is able to extend I/O capability and each RIO modules contains (4) vital inputs and (4) vital outputs.

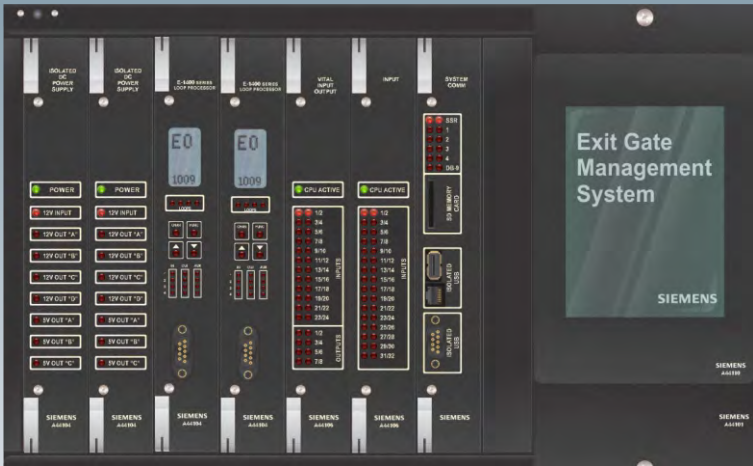
## Features

- Capable of monitoring up to (6) track circuits including Intelligent Processor Island and Bi-DAXing.  
*(Number of maximum track modules dependent on chassis of GCP system selected.)  
(On redundant systems, (2) track modules needed for each track circuit.)*
- SEAR Ili Event Analyzer / Recorder programmable via OCE and new display.
- Provides a diagnostic history log and train move history log utilizing a SEAR Ili Event Recorder/ Analyzer.
- Internal logic utilizing vital AND gates and vital timers.
- Multiple ethernet ports available for interfacing with eSSR radio (PoE) port, vital communications as well as PTC applications.
- Enhanced user interface tools including OCE, WebUI and new display.
  - Aligned menu structure between all user interfaces.
  - Generate office configuration check number (OCCN).
  - Simple, tailored dropdown menus for user friendly configuration, diagnostics and troubleshooting.
  - Improved diagnostics, track monitor saved to ECD and easily downloadable to USB flash drive.
- USB ECD storage of SEAR Ili Event Recorder/ Analyzer parameters.



For additional optional modules, See this section, Pages A19 - A25



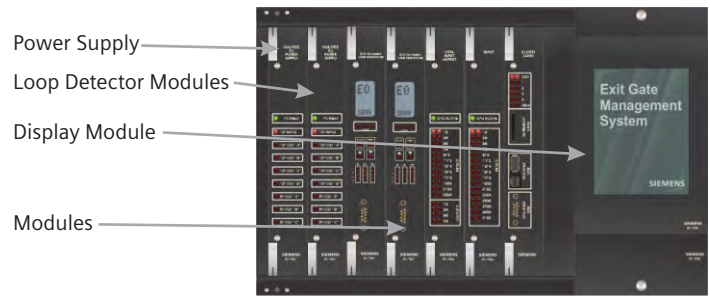


Wayguard®

**EGMS**  
Series

**Exit Gate Management System**

**Overview**



**Features**

- Inductive Loop Operation
- (2) Levels of systems health monitoring
- Dynamic Exit Gate Operation

**SIEMENS** Wayguard® Exit Gate Management System (EGMS) is designed to perform exit gate timing and control as a part of an overall (4) Quadrant Gate - Warning System (4QG). Utilizing self checking inductive loop detectors to determine the presence of vehicles within the area between the entrance gates and exit gates also known as the Minimum Track Clearance Distance (MTCD).

If a vehicle is detected within the MTCD, the exit gates will not be lowered until the vehicle clears the MTCD to avoid trapping vehicles within the crossing.

As a backup mode, automatic changeover to timed exit gate or exit gate fail-up mode in the event of inductive loop failure is available through front panel programming. Providing a touch-sensitive liquid crystal display (LCD) to allow data entry and access to all stored data.

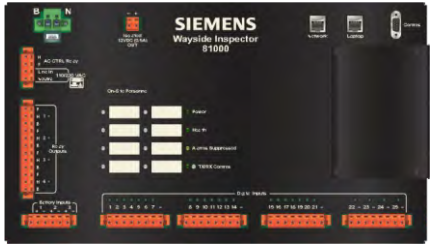


For additional optional modules, See this section, Pages A30 - A33



**Overview**

**Features**



**SIEMENS** Wayside Inspector Automated Grade Crossing Testing System automates periodic inspection of crossings such as monitoring the state of discrete I/O signals, battery voltages and AC power.

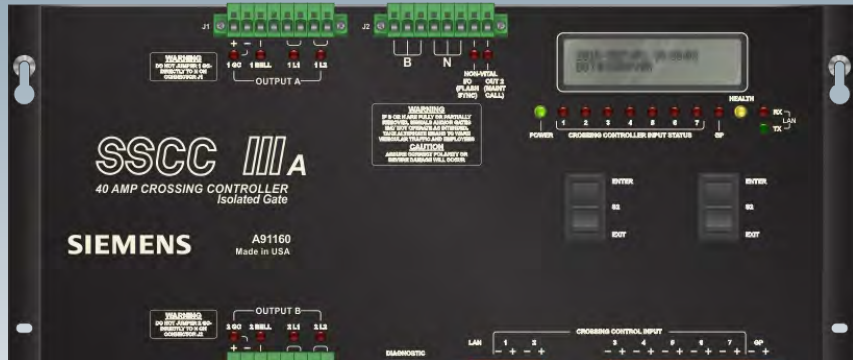
From that information, it analyzes the operation of the grade crossing's warning systems and provides a means for inspection of those systems.

It can send alarms and inspection report logs to a backoffice system or can interact thru a WebUI to allow field personnel to adjust system settings, view statuses etc.

- Scheduled Annual Warning Time inspection available for both main and standby equipment, and for every directional approach and route through associated crossing.  
*(When used in conjunction with optional WiMag® sensor and specific setup procedures)  
(Railroad personal must verify warning time)*
- Scheduled Monthly Standby Power inspection available.
- Scheduled Monthly Ground inspection available.  
*(When used in conjunction with optional Ground Fault Tester - GFT II and specific setup procedures)*
- All inspections can be tailored to meet individual railroad threshold requirements.

SIEMENS Part Number	Description
NYK:8000810000001	Wayside Inspector Unit
NYK:Z921004070000	WiMag VSN240-F Sensor
NYK:Z927004220000	WiMag Repeater Unit
NYK:Z927004210000	Access Point Base Station





Wayguard®  
SSCC  
Series  
Solid State Crossing Controller

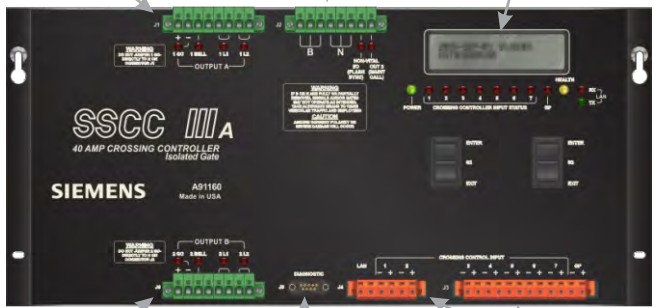
Overview

Features

OUTPUT A Connector Controls:  
(1) 20 A Flashing Light  
(1) GC Output  
(1) Electronic Bell

Power Supply Connector

Status and Program display and related indicators



OUTPUT B Connector Controls:  
(1) 20 A Flashing Light  
(2) GC Output  
(1) Electronic Bell  
(Available on 40 A SSCC Units ONLY!)

Diagnostic Connector Port for direct computer interfacing

Connector to Echelon® LAN Interface and Inputs from Crossing Controller

The **SIEMENS** Wayguard® Solid State Crossing Controller (SSCC) Series offers reliable and simple crossing control without breaking the bank.

All parameters are easily set using built in liquid crystal display (LCD) screen and pushbuttons as well as protected against unauthorized changes using available password protection. Alternatively, passwords can also be uploaded or downloaded via computer.

With built in logic you can control a crossing more reliably and more cost effectively with greater flexibility. Eliminate need for relays and related wiring using the built in standardized logic, which can be customized to accommodate a vast array of crossing configurations.

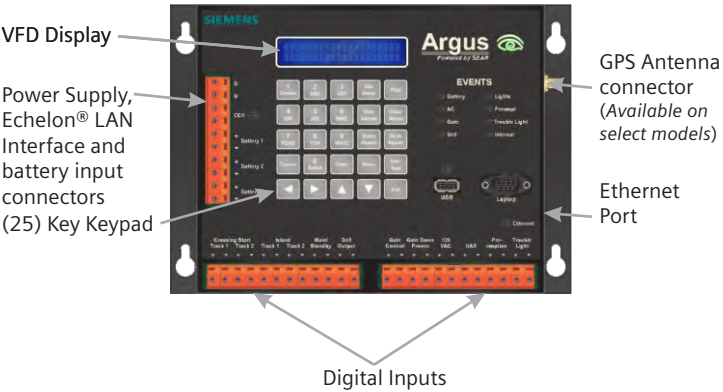
- Echelon® connectivity for communicating recorder and diagnostic information.
  - Programmable loss of shunt timers for each input.
  - Programmable vital control inputs. Up to (8) including (1) input for gate position.
  - Programmable low battery indication threshold.
  - Programmable lamp flash rate.
  - Optional synchronized lamp flashing of multiple units.
  - Optional loss of shunt selection with configurable timers.
  - Non Volatile Real-Time Clock.
  - Expanded menu system includes pre-emption output drive logic.
  - "SERVICE" menu option to program Out-of-Service timers. (Available on select models)
  - Communications via ATCS. (Available on select models)
- 5 built in test modes**
- Lamps Steady - Allows the maintainer to continuously light a lamp for alignment purposes.
  - Flash Lamps - Allows the maintainer to flash a lamp to ensure it is working.
  - Timed Lamps- Allows the maintainer to set a timing sequence that will flash a lamp for "X" seconds.
  - Timed Lamps Repeat - Allows the maintainer to set a timing sequence that will flash a lamp for "X" seconds after "Y" and "2Y" delay.
  - Activate Crossing - Allows the maintainer to activate a crossing in a controlled manner.



Wayguard®  
**ARGUS**  
 Series  
 Event Recorder

Overview

Features



The **SIEMENS** Wayguard® Argus Event Recorder Series offers reliable and simple comprehensive monitoring, recording, reporting and alarm generation in one compact simple to install, simple to use unit without breaking the bank.

Immediately reporting anomalies to the where the client's maintainers' specify in order to investigate and maintain.

- Provides full monitoring, recording and reporting functions for most standard crossing configurations without the need for any other modules, except for light-out detectors or other optional supported devices (*check with **SIEMENS** Technical Assistance for Rail Automation Team for which other devices are currently supported*).
- Allows the railroad to have recorded proof-of-crossing operation. The log from the recorder contains anti-tampering information. Any editing of this log will be obvious to an auditor.
- Provides a user-friendly platform for site configuration and log retrieval, without the need for special hardware or software, via a USB 2.0 flash drive.
- Provides notification of alarm conditions to the Wayside Alarm Management System (WAMS) over a variety of communication networks (*check with **SIEMENS** Technical Assistance for Rail Automation Team for the networks and protocols currently supported*).
- Available with either **SIEMENS** proprietary silkscreening of predetermined events or inputs or a non proprietary silkscreening offering generic descriptions instead.



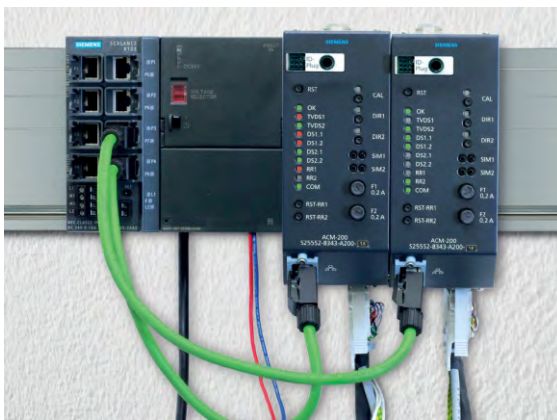
Wayguard®

## ACM 200 Series

Axle Count Management System

### Overview

### Features



- Connection to electronic and relay interlockings
- HTML communication for attribute configuration, logging and diagnostics
- Modular, compact hardware
- Deployment of Clearguard ZP D 43 and Clearguard ZP 43 E/V counting heads

**SIEMENS** Clearguard ACM 200 electronic wheel detection equipment is a wheel detection component for use in track vacancy detection systems using the axle counting method.

It is preferentially used in the outdoor equipment of the Clearguard Az S 350 U and Clearguard ACM 200 counting systems and comprises a double wheel detector and a trackside connection box. Clearguard ZP D 43 is the successor model to ZP 43 E and ZP 43 V.

#### DEK 43 double wheel detector

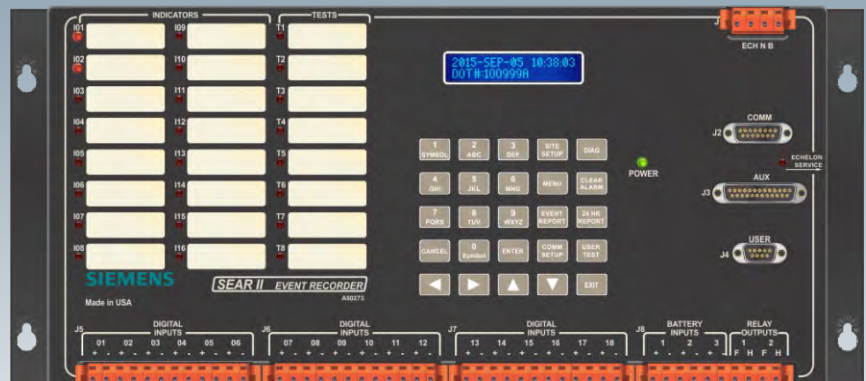
The DEK 43 double wheel detector is made up of a transmitter and a receiver in separate housings, each mounted with a reducing plate against the rail web.

#### Trackside connection box

The trackside connection box of the Clearguard ZP D 43 consists of a base plate and a cover which is made of either plastic or aluminum (selectable). The base plate supports a board module which in turn comprises a base plate, the application-specific printed circuit board and a protective cover.

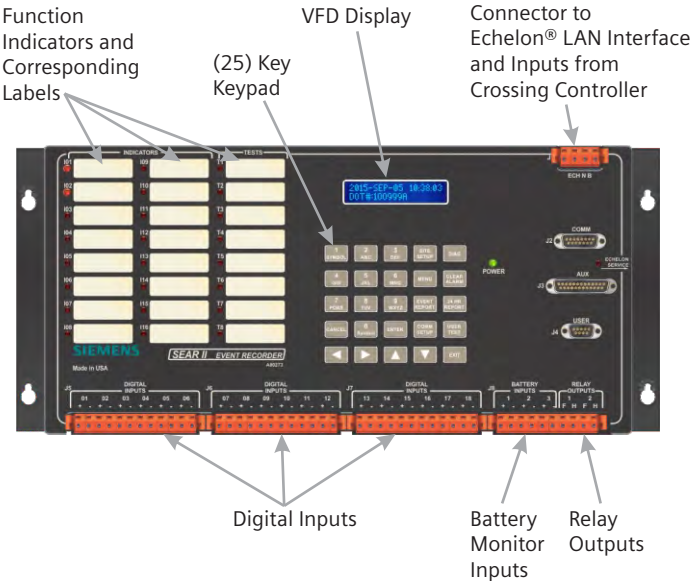
SIEMENS Part Number	Description
NYK:680001-0040	ZP D 43 Wheel Detector
NYK:680001-0019	ACM 200 ID Plug Module
NYK:680001-0083	SIPLUS SCALANCE X208 Ethernet Switch
NYK:6ES57108MA31	SIMATIC S7-300 Controller





Wayguard®  
SEAR II  
Series  
Event Analyzers / Recorders

Overview



SIEMENS SEAR II Event Analyzer / Recorder model A80273 shown for reference purposes only! Actual unit selected may vary in mounting and features.

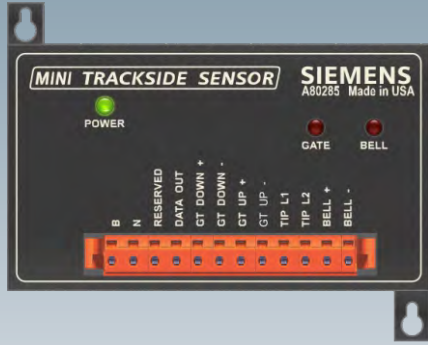
Railroads have a duty of care to ensure that grade crossings operate safely. SIEMENS Wayguard® SEAR II Series Event Analyzer / Recorders immediately report anomalies to the where the client's maintainers' specify in order to investigate and maintain.

Offering reliable and simple comprehensive monitoring, recording, reporting and alarm generation in one compact simple to install, simple to use unit without breaking the bank.

Microprocessor controlled non-vital, stand alone alarm management system designed to provide continuous real-time general purpose status monitoring and event recording for a wide range of functions associated with grade crossings.

Features

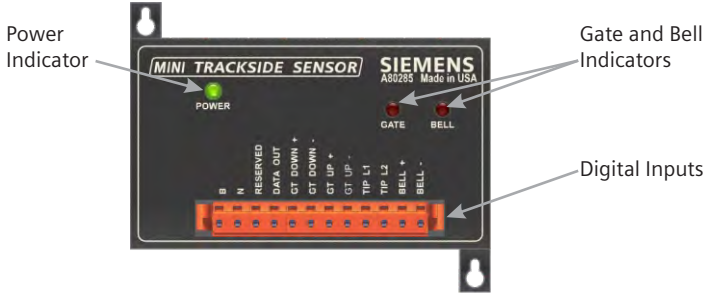
- 24 x 7 monitoring and fault reporting.
- Echelon® connectivity for communicating recorder and diagnostic information.
- Non-contact detection of flashing lamps.  
*(Can detect a single failure within a lamp bank when SIEMENS Intelligent Lights Out Detector (iLOD) is installed)*
- Isolated monitoring of up to 18 separate digital points.
- Isolated monitoring of 3 analog points.  
*(such as a battery)*
- Configurable dry contact outputs for remote testing.
- Configurable internal logic to discriminate faults from normal operation.
- Configurable maintainer call on real alarms.
- Can be remotely interrogated.
- Direct interface to Grade Crossing Predictors  
*(such as a SIEMENS Wayguard® GCP 4000 Series model)*
- Connects to analogue and digital expansion modules for even larger systems.
- Stores up to 150,000 events  
*(Up to 400,000 with extended memory module)*
- Intranet or internet access.
- Push alarms to nominated staff.
- Shelf or rack mountable.



# MTSS

## Mini Track Side Sensor

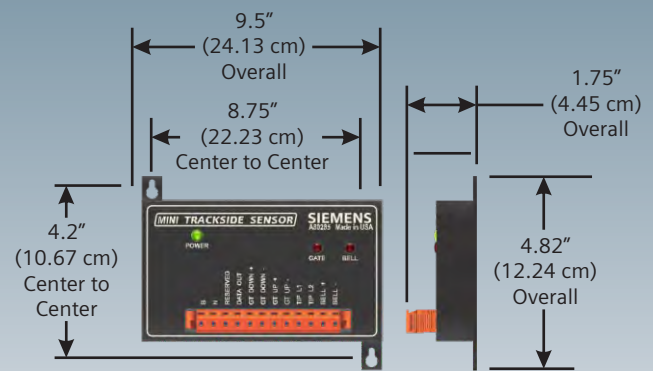
### Overview



**Model A80285**  
*shown for reference purposes only!*  
*Actual unit selected may vary in mounting and features.*

**SIEMENS** Mini Track Side Sensor (MTSS) interfaces with the various monitored signals via connector J1, a 12-pin, mass-terminated Eurostyle terminal block (board header and wiring plug), and provides LED indicators for power, when the gate is horizontal and the bell is ringing.

### NYK:8000802850001

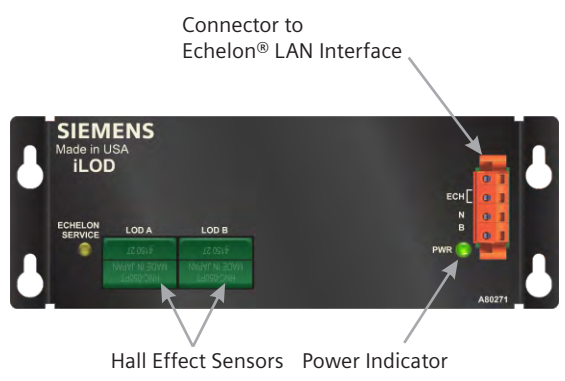


- Easily mountable on instrument house backboards.
- Weight is approx. 1.11 lbs. (0.50 kgs.) including connectors
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity

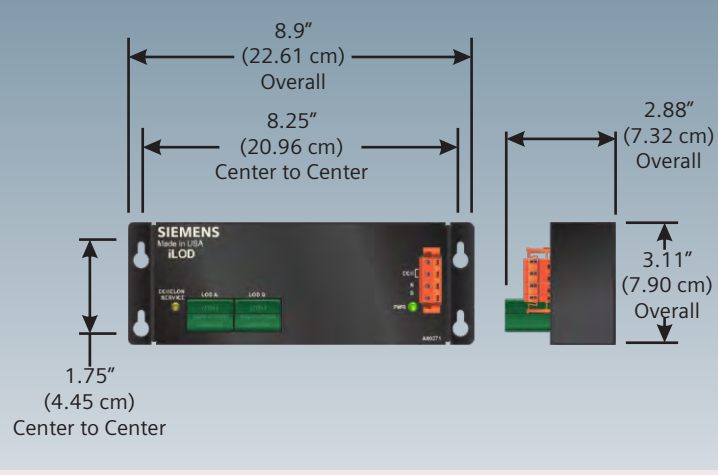


**iLOD**  
Intelligent Lights Out Detector

**Overview**



**NYK:800802710001**



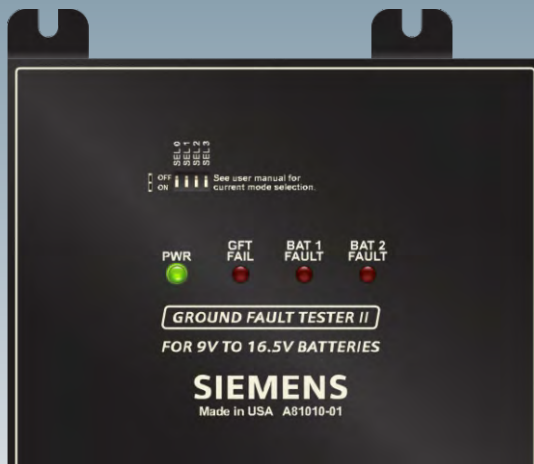
**Model A80271**  
*shown for reference purposes only!*  
*Actual unit selected may vary in mounting and features.*

**SIEMENS** Intelligent Lights Out Detector (iLOD) adds programmable current sensing functionality to **SIEMENS** SEAR II/SEAR III Event Analyzer / Recorders.

Including (2) current sensing Hall-effect sensors with analog-digital conversion circuitry and it communicates with the **SIEMENS** SEAR II / SEAR III over the Echelon® network.

- Easily mountable on instrument house backboards.
- Quiescent power consumption is approx. 0.3 A @ 13.2 V, 0.4 A @ 9.0 V
- Weight is approx. 1.50 lbs. (0.68 kgs.) including connectors
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity

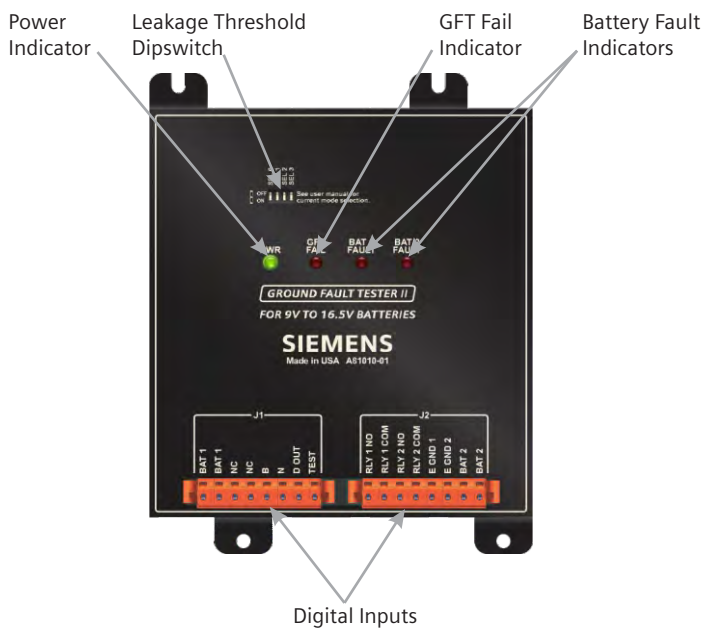




## GFT II Series

### Ground Fault Tester

#### Layout



- Monitors leakage resistance between battery terminals and earth ground.
- Can be used as a stand alone monitor or in conjunction with **SIEMENS** Wayguard® SEAR II Series Event Analyzer / Recorders for recording ground fault events.
- (10) Second fault debounce circuitry.
- (2) dry relay contacts to 3<sup>rd</sup> party inputs .
- Up to (8) leakage current mode detection settings.
- Dipswitch configurable leakage thresholds.

**SIEMENS** GFT II Model A81010 shown for reference purposes only!  
Actual unit selected may vary in mounting and features.

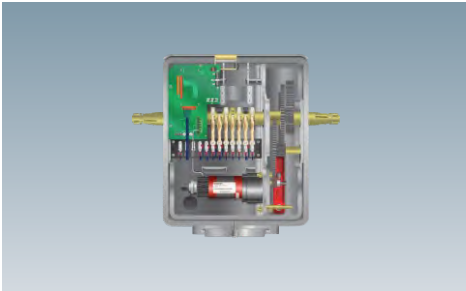
**SIEMENS** Ground Fault Tester (2<sup>nd</sup> Generation) GFT II Series can operate in two modes. In normal mode, the GFT II constantly monitors up to two batteries for ground faults and indicates battery fault status to the **SIEMENS** Wayguard® SEAR II Series Event Analyzer / Recorder if connected.

Information is provided to the SEAR II as a pulsed data signal via any unused digital input. The unit can also be placed in test mode where a simulated ground fault is placed internally on an isolated battery input to verify that the unit is properly detecting faults.

A separate internal circuit is used to verify the GFT II's health, as indicated by the status of the GFT FAIL LED on the front panel.

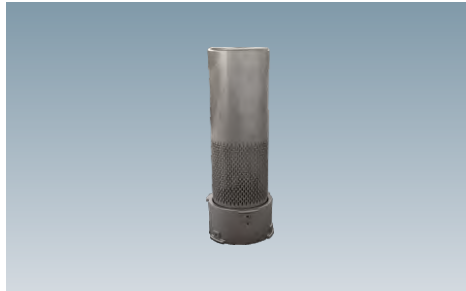
The GFT II can be powered by a 9-30 VDC (12 VDC nominal) operating battery, or independently powered from a battery being monitored.

# Grade Crossing Signaling Systems Products



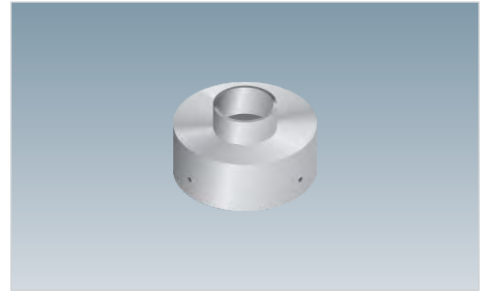
Wayguard® S60 Series  
Grade Crossing Gate Mechanisms

A77 - A84



Wayguard® EBell Series  
Electronic Bells

A85 - A86



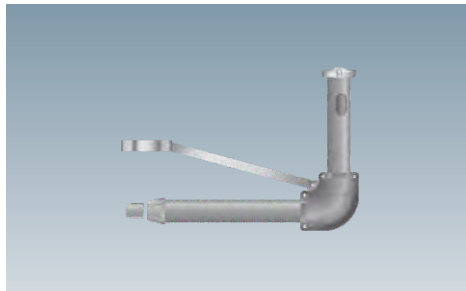
Mast Adapter Mounts

A87 - A88



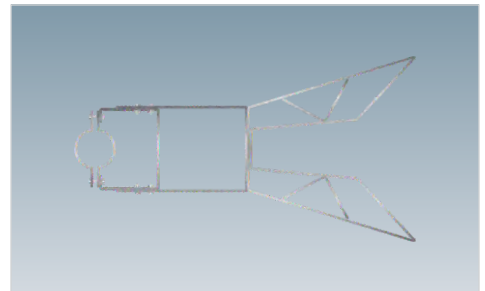
Pinnacles

A89 - A92



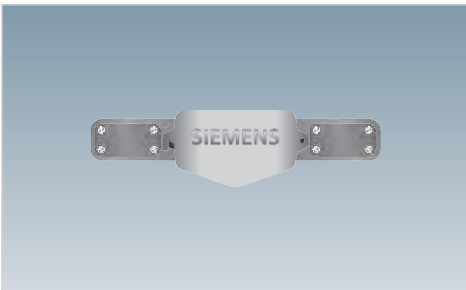
Sidelight Cantilevered Mounts

A93 - A96



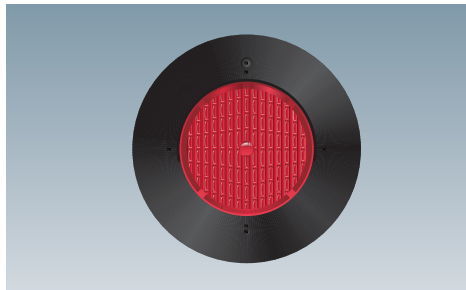
High Wind Brackets

A97 - A100



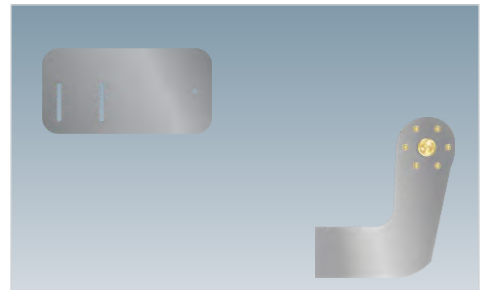
Cross Arms and Junction Boxes

A101 - A106



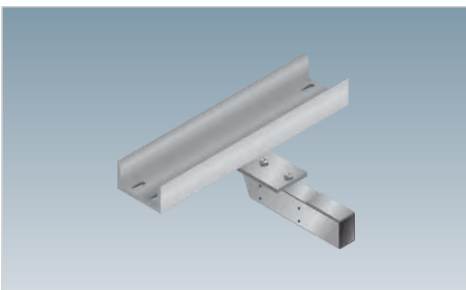
Wayguard® FLX Series  
Flashing Light Signals

A107 - A110



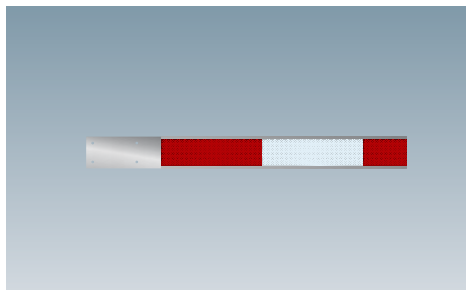
Barrier Arm Components

A111 - A114



Conversion Brackets

A115 - A117



Barrier Arms

A118



Barrier Arm Sensors and Lights

A119 - A120

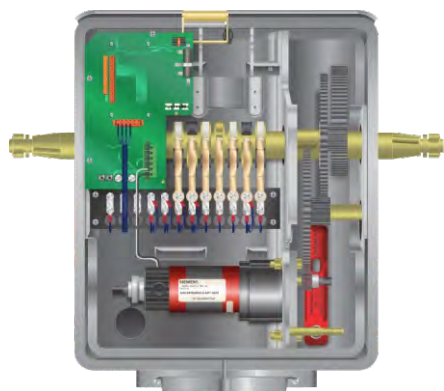


Wayguard®

S60  
Series

Grade Crossing Gate Mechanisms

## Overview



*Model A074007 Entrance Gate Mechanism shown for reference purposes only!  
Actual unit selected may vary in mounting and features.*

**SIEMENS** Wayguard® S-60 Series Grade Crossing Gate Mechanisms are ideal for operating grade crossing entrance and exit barrier arms up to 40' (12 m) in length.

Built on proven robust reputation of the legacy S-20 and S-40 iterations, it retains a high strength cast aluminum housing, maintenance free bearings, reliable gear train and rotary circuit controller.

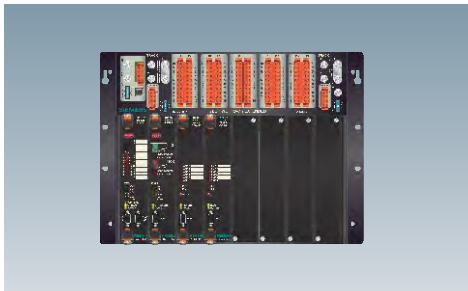
Optional Mini Trackside Sensor (MTSS) consolidate the monitoring of barrier position, electronic bell and tip lights to the Wayguard® SEAR II Series Event Recorder.

## Features

- Maintenance free, weatherproof design
- Safely lock gate in any position with the patented locking bar
- On board diagnostic LEDs simplify troubleshooting
- Optional module for Bell and Gate monitoring
- A 90% spare part compatibility between the entrance and exit gate mechanism, reduces your cost of ownership
- Integrated PC board with over-speed control
- Adjustable circuit to set descend times
- Electronic auto-reset overload for motor protection
- Standard gate mechanism is equipped with (4) arrangements. With configurations up to (7) cam arrangements.
- Maintenance operation to power down counterweights when the gate arm is broken
- Single and two-wire gate control capability
- Horizontal and vertical buffers adjusted from outside of mechanism
- Lifting eyebolt for ease of installation



# Wayside Control Systems Products



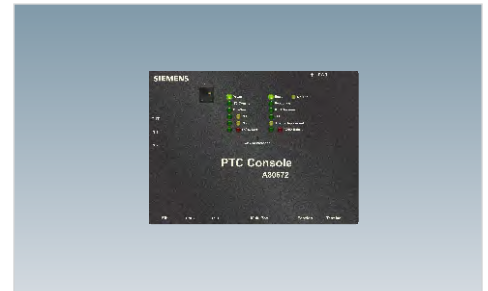
**Trackguard® GEO®**  
Geographic Signaling Systems

**B1 - B8**



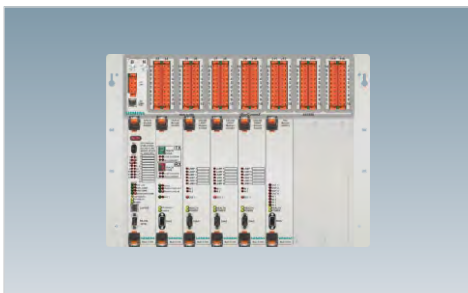
**Trackguard® VIU Series**  
Vital Interface Units

**B9 - B20**



**Trackguard® PTC Series**  
Positive Train Control Console Units

**B21 - B23**



**Trackguard® WayConneX Series**  
Wayside Signaling System

**B24**



## Overview



*Model A53510 Trackguard® GEO® Geographic Signaling System shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** Trackguard® GEO® Geographic Signaling System is a vital microprocessor-controlled system that generates an electronic DC coded track circuit and operates intermediate signal locations and single or multiple switch interlocking.

It is available as a color-light system and will operate in cab signal territory. Compatible with Electro Code 4, Electro Code 4/4 Plus, Electro Code 2, Genrakode™, and E-Code™.

With the addition of a **SIEMENS** Wayguard® SEAR II Series Event analyzer / Recorder and a Wayside Communications Package (WCP) module, it will interface with all of the major codeline protocols including ATCS.

Supporting coded track applications, coded line applications, and vital radio based signaling. Vital network applications are supported via spread-spectrum radio, Echelon®, RS-232, and RS-422.

## Features

- Using Standard Boolean Logic with the GEO® Configuration Suite (GCS) which has been enhanced to provide users with the option to write their own signaling logic equations in boolean format. Users may also produce a relay diagram plot of the boolean logic and print this as a PDF file.

Users no longer need to use the existing GEO® GOL libraries and geographic signaling logic; they can write their own logic in traditional boolean format and print the relay equivalent circuits. The resulting MCF will run with the existing GEO® CPU2+ MEFs.

- Object based logic with the GEO® Configuration Suite (GCS)

The GEO® Configuration Suite is a Windows® based design tool used to program the GEO® unit for specific applications. In the GCS, each signal function (signal head, turnout, etc.) is represented by a unique icon or Geographic Signaling "Object".

Each object represents the rules of signaling for that object. The complete signal system is assembled by the CPU based on which "objects" are used and how they are interconnected.

GCS is available on CD-ROM. System design can be performed by the user or can be supplied by **SIEMENS**.

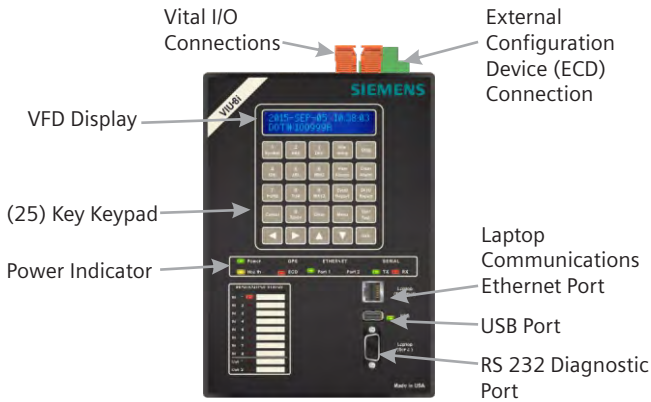


Trackguard®

VIU  
Series

Vital Interface Units

### Overview



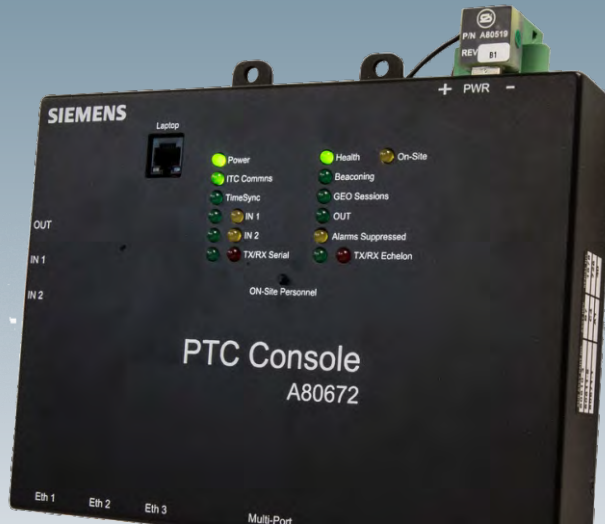
*Model A80540 Trackguard® VIU Series Vital Interface Unit shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** Trackguard® VIU Series Vital Interface Unit is a general purpose programmable logic controller. The VIU can monitor the state of its inputs, control vital outputs, perform logic functions and generate vital communications messages to report its status or the status of devices connected to it. The primary purpose of the VIU- 16i/8i is to control wayside signal lamps by using current sensors or by controlling the lamp voltage (AC or DC).

### Features

- Radio frequency rate of up to 2.7 Mbps.
- Integrated IP Connectivity.
- Built-in keypad and display for configuration, troubleshooting and diagnostics.
- Standard USB interface allows download of event logs and configuration information or upload of executive and application software.
- Access from a laptop using standard web browser.
- Consolidated event logging for distributed / networked units.
- User programmable (Boolean Logic), generic lamp/ switch monitoring application for all locations.
- Use to interface locomotive-based equipment to wayside equipment to allow for display of signal aspects in-cab.



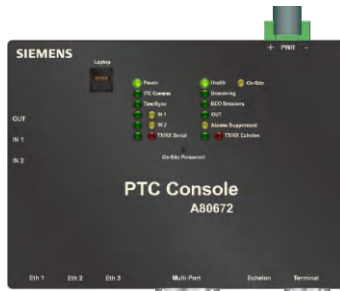


Trackguard®

PTC  
Series

Positive Train Control Console Units

## Overview



## Features

- Provides Network Time Protocol (NTP) functionality.
- Provides consolidated logging for PTC enabled Trackguard® GEO® units.
- Ability to run vital logic, non-vital logic as well as customizable CDL functionality thus supporting Simple Network Management Protocol (SNMP) message trapping.
- Contains dual 400 MHz processors, with up to (8) GB of onboard flash memory per processor.
- Allows for remote monitoring, even in Dark Territory locations.
- Optional internal A80611 GPS I/O wifi adapter card available.

**SIEMENS** Trainguard® PTC Console Positive Train Control console unit is an electronic wayside monitoring unit which can be configured for a variety of applications including Positive Train Control (PTC) enabled equipment.

Inputs include:

- (1) ethernet laptop port
- (3) ethernet network ports
- (2) RS-232 serial ports
- (1) Echelon® network port

LEDs provide status of unit at a glance. An optional Vital I/O module is available within the console with (2) vital input channels and (1) vital output channel.

Unit is well suited for “Dark Territory Switch Monitoring” and can be used as a low cost monitor for a switch point or other wayside hazard that PTC monitoring.

Allows for remote monitoring, consolidated logging, log access as well as maintainer interface of Positive Train Control (PTC) equipment when used in conjunction with a PTC Enabled Trackguard® GEO® unit.



Trackguard®  
**WayConneX™**  
Series  
**Wayside Signaling System**

## Overview



**SIEMENS** Trackguard® WayConneX™ Wayside Control System is a vital microprocessor controlled system that generates an electronic DC coded track circuit and operates intermediate signal locations and single or multiple switch interlockings.

It is available as a color-light or search-light system and will operate in cab signal territory. It provides built-in PTC compatibility and systems management as well as compatibility with Genrakode™, ECode™ and MicroTrax®. All modules are interchangeable between units and all modules are designed to be “hot-swappable”.

With the addition of a **SIEMENS** Wayguard® SEAR II Series Event Analyzer / Recorder and a **SIEMENS** Wayside Communications Package (WCP) module, system will interface with all of the major codeline protocols including Advanced Train Control System (ATCS).

Vital network applications are supported using **SIEMENS** Ethernet Spread Spectrum Radio (ESSR) or Echelon®.

A new configuration tool known as the WayConneX™ Configuration Tool (WCCT) has been created to allow users to create their own Boolean signaling logic. The tool allows the user to see the relay equivalent circuits of the Boolean logic as it is being developed and also provides a logic simulation capability which allows the user to animate the relay contacts and coils as the change state.

## Features

WayConneX™ Wayside Control System (3) track extended chassis includes new modules, such as;

- CPU III module
- WayTraX™ module
- PSO-E module.

WayConneX™ Configuration Tool (WCCT) provides a simple graphical user interface which allows users:

- To specify which modules are in the system and how they are configured, and as well as which I/O points on the modules will be used.
- To define the PTC messages generated by the WCX.
- To create vital communications channels between WCX's.
- To specify interface to non-vital controller system (SEAR II).

The tool allows the user to add field configurable timers and Boolean properties, and to specify which ones are included in the systems Unique Check Number (UCN).



# Wayside Communications Systems Products



**Communications Modules**

**B25 - B27**



**WAMS**

Wayside Alarm Management System

**B29**



**OCG**

Office Communications Gateway

**B30**



**WCM Series**

Wayside Communications Manager

**B31 - B32**



**WCP Series**

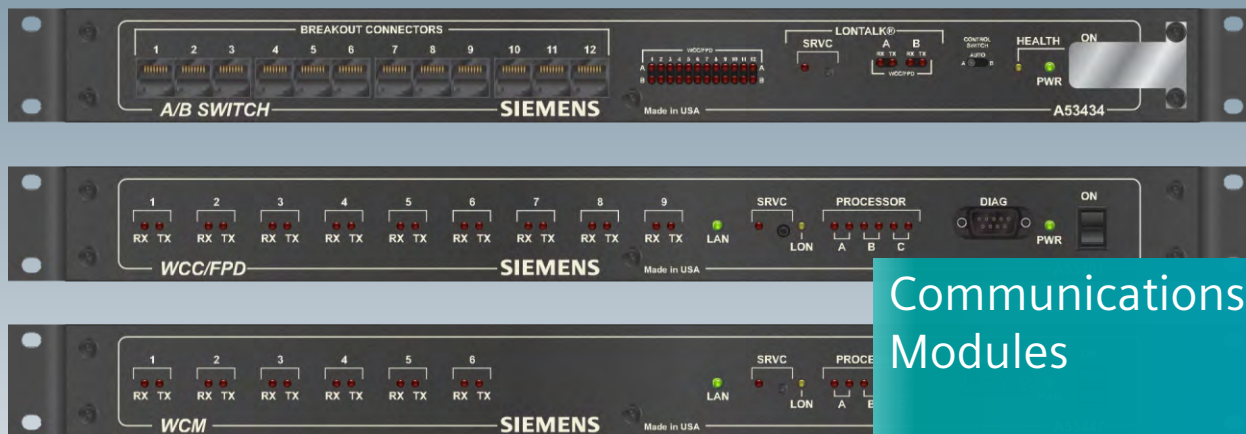
Wayside Communications Package

**B33 - B40**



**I/O Modules**

**B41 - B42**



# Communications Modules

## Overview



*Model A53434 AB Switch shown for reference purposes only!  
Actual unit selected may vary in mounting and features.*

**SIEMENS** AB Switch, (53434 Series) is a general purpose device used to provide RS-232 redundant switching for office and field applications. It is normally used in conjunction with two of **SIEMENS** 9-port Wayside Communications Controller / Field Protocol Device, WCC/FPD's (53401 Series) to provide redundant communication with code lines.

**SIEMENS** AB Switch and the two connected **SIEMENS** WCC/FPD units communicate via an Echelon® (LonTalk®) LAN. The AB Switch is constantly checking the health of the the WCC/FPD's and if any problem is detected with the primary unit, the AB Switch automatically switches all lines to the backup unit.

The AB Switch utilizes magnetically-latched relays for line control. In the unlikely event that the AB Switch should fail, the relays will remain latched in the current state and the on-line WCC/FPD unit will continue to operate without interruption. Once the relays are latched in the failed state, a switchover is not possible until the AB Switch is once again operational.

**SIEMENS** Wayside Communications Controller/Field Protocol Devices, WCC/FPD's (53401 Series) is a general purpose communications controller and protocol converter for use in communications systems. It is configured for use through the local diagnostic port and/or remotely via dial-up or LAN/WAN connections. The unit is fully compatible with **SIEMENS** ASERVER & WCC MAINT. Utilities, and can be diagnosed and monitored remotely. Multiple units can be clustered together to perform front end processing and Cluster Controller functionally.





# WAMS

Wayside Alarm Management System

## Overview

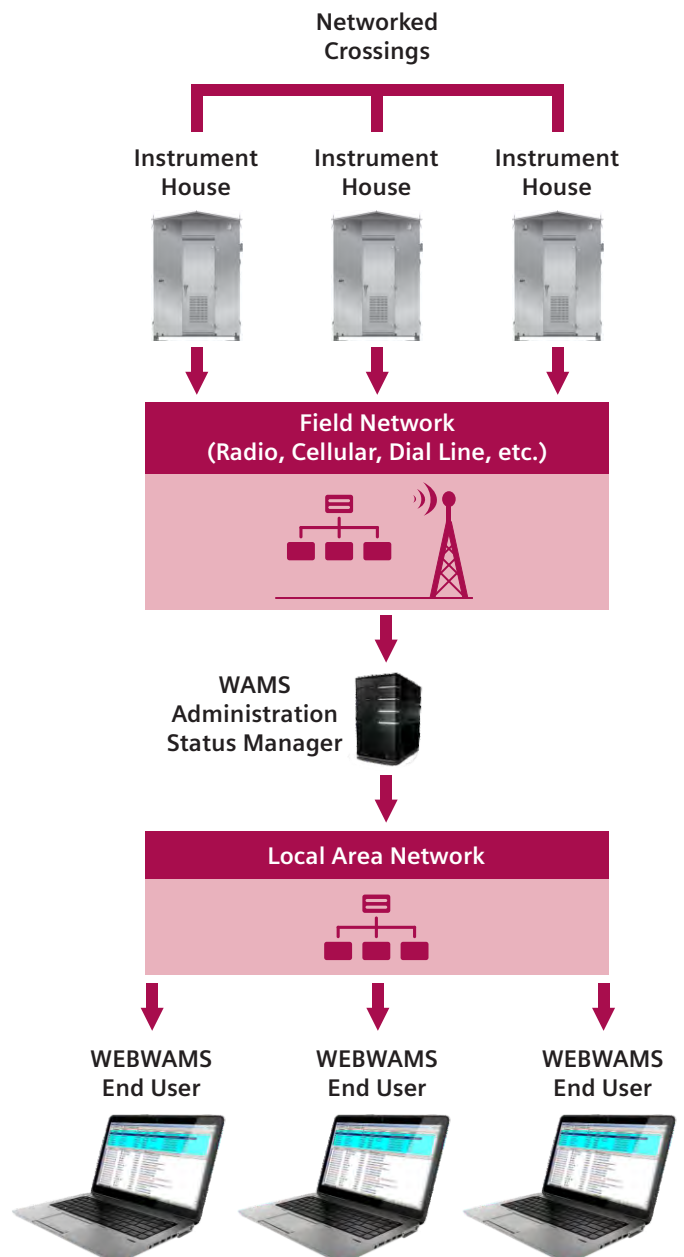
SIEMENS Wayside Alarm Management System (WAMS) manages data collected from event recorders supporting railroad operations.

WAMS Status Manager application collects data from the network and notifies users with e-mail, cell phone text messages, and FAX. Users can use WebWAMS to log into WAMS system remotely and check the status of railroad wayside locations.

WAMS supports federally-mandated inspection of railroad wayside equipment by automating many inspection steps and by providing a secure, on-line process for handling inspection reports.

Real time monitoring and complete status documenting at your finger tips. WAMS is an invaluable operations and maintenance tool and a cost effective management resource.

## System





OCG

Office Communications Gateway

## Overview

**SIEMENS** Office Communications Gateway (OCG) is a standalone executable program that runs on the Windows® operating system.

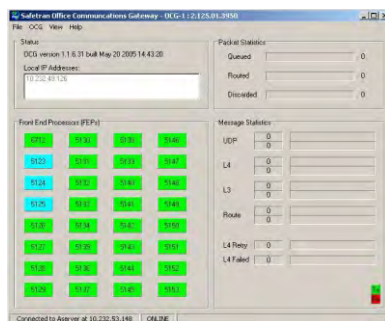
It was designed to bring the ATCS over IP and NMS functionality of the Siemens Wayside Cluster Controller (WCC) to the PC platform. OCG adds diversity and scalability to Advanced Train Control System (ATCS) networks, providing an open-ended means to control large systems with no investment in hardware other than the PC Workstation/Server.

OCG provides the interface between the Office Dispatch System and the Field Code Line Network for ATCS networks. OCG is functionally identical to the Siemens Wayside Communications Controller (WCC), with the exception of the serial interface protocols, as OCG is an IP based system.

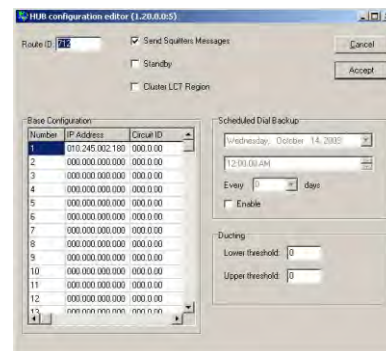
OCG is capable of controlling more Front End Processor (FEP) (HUB/LCT) processes than the WCC. In its current release, OCG supports up to (32) simultaneous FEP processes while the WCC supports up to (3) FEP processes. OCG is backward compatible with WCC clusters, and may be freely integrated into existing systems, intermixing with conventional WCCs as part of a migration strategy.

Appropriately configured individual codelines are quickly and easily transferred from the WCC to OCG (and back) using the **SIEMENS** suite of network management utilities (Aserver/WCCMaint). OCG will run HUB and Line Control Task (LCT) processes in any combination .

## Screenshots



## Main Menu



## Hub Editor

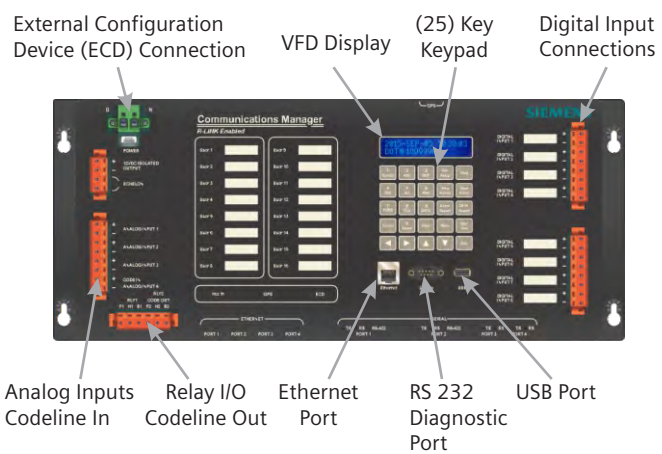


## Configuration Editor



**WCM Series**  
**Wayside Communications Manager**

**Overview**



*Model A53475 WCM Series Wayside Communication Manager shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**Features**

- Communication protocols suite for both Positive Train Control (PTC) and Advanced Train Control System (ATCS) based radios for interoperability
- Supports multiple ethernet and serial interfaces to interconnect to wayside devices
- Integrates seamlessly with existing Centralized Traffic Control (CTC) systems, Network Management System (NMS) tools and Simple Network Management Protocol (SNMP) based architecture.
- Provides a complete migration path to PTC while leveraging existing assets
- Unmatched connectivity options to data radios

**SIEMENS** Wayside Communications Manager (WCM) allows end users to consolidate multiple communication and signaling devices operating on public and private communications networks into a centralized communications system.

Providing simple user interfaces for monitoring and configuration. For control point applications, the WCM provides a minimal signal input capability with built-in logic execution which can be communicated over the user's network.

As a communication protocol converter the WCM supports a wide range of modern and legacy communication protocols and provides inter-message protocol conversion communications. As a message router, the WCM provides configurable and automatic routing capabilities within many different kinds of networks as well as provides network redundancy support.



WCP Series  
Wayside Communications Package

Overview



WCP Series Wayside Communications shown for reference purposes only! Actual unit selected may vary in mounting and features.

Features

- Separate CPU II, DC / DC Converter and Radio modules provided to simplify system maintenance issues and provide for more flexible installation options
- RS-232 / RS422 connection option on two client ports
- High-speed (1.2Mb/s) client LAN port allows WCP CPU II to directly connect to other vital and non-vital I/O modules concurrently
- Front-panel push-button configuration no laptop needed during routine maintenance
- Outbound RSSI reading provides additional system information of signal strength at WCP location
- Optional on-board ladder-logic processing for code system applications
- Protocol emulation and conversion of many industry standard code-line protocols
- Full non-volatile event log built in with hardware real-time clock
- Full duplexer operation at 4800 baud using GMSK direct FM signaling with extensive error detection and correction





## I / O Modules

### Overview



*Model A53101 I / O Module shown for reference purposes only!  
Actual unit selected may vary in mounting and features.*

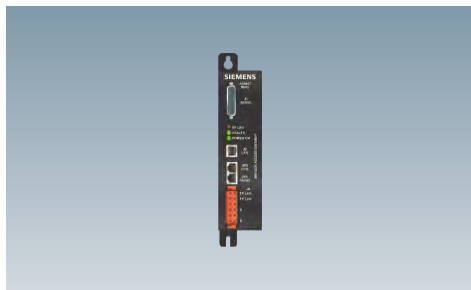
**SIEMENS** Bipolar I/O module supplies eight bipolar outputs to replace an LCS unit and to drive existing final stick relays. A total of 14 unipolar indication inputs are also available. The module is controlled by an on-board Echelon® Neuron™ LAN and delivered to the bipolar outputs either continuously or in pulsed format (configurable). Opto-isolated read-back circuits verify delivery of each input. All inputs and outputs are also fully optically isolated to prevent common-mode problems and to enhance their ability to withstand voltage surges.

Inputs are sensed at a configurable rate and the module generates an indication message via LonTalk™ each time a change of state occurs. A programmable indication hold-off time allows interlocking circuits to stabilize before the change-of-state message is generated. The module provides an indication battery output (KINDIS) that can be fed into the input circuits to allow the unit to sense input circuit relay contact states. Additional LonTalk™ messages supported include recheck, diagnostics, configuration control, and error status updates.

### Features

- Bipolar outputs for final stick relays
- Front panel LED status indicators are provided for each I/O circuit for ease of maintenance and troubleshooting.
- Input/Output termination points and interface to the module are accomplished via a top-mounted, removable plug connector. Configuration data for the module is retained in a user-programmable EEPROM device located in the connector. This allows the module to be replaced during maintenance without the need for reconfiguration.
- The module operates directly from the signal battery and 2,000 volts rms isolation is provided by the transformer-coupled LonTalk™ interface.
- Unipolar outputs for interface or vital relay drive. It essentially identical to the Bipolar I/O module except that a total of (30) unipolar circuits are supplied. The circuits can be allocated for any combination of inputs and outputs.
- Relay outputs, while sharing roughly the same physical characteristics as the bipolar and unipolar I/O modules, the relay output module contains 15 individually controllable, nonvital relays that provide contact options that can be jumpered to provide a combination of Form A and Form C outputs.
- The module is available with either latched or non-latched relays. Latched relays remain in the previously-set state position and are unaffected by equipment restarts or power failure.
- A latched relay module is typically used to drive vital signal control relays.

# Wayside Wireless Pole Line Products



**WAG Series**  
Wireless Access Gateways

**B51 - B52**



**ESSR Series**  
Ethernet Spread Spectrum Radios

**B53 - B54**



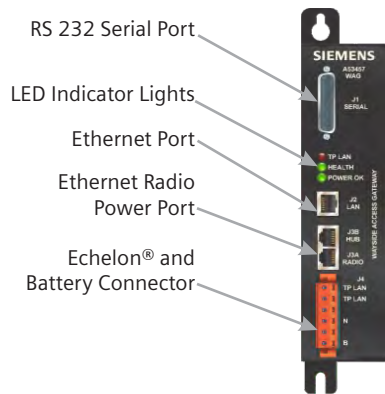
**HD Link Modules**

**B55 - B56**



**WAG**  
Series  
Wireless Access Gateways

**Overview**



*Model A53355 ESSR Series Ethernet Spread Spectrum Radio shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** WAG Series Wireless Access Gateway offers a reliable and simple method of attaching legacy field devices to your corporate WAN without breaking the bank.

WAG Series converts Echelon® messages to industry standard ethernet messages. This connectivity allows the WAG to communicate to ethernet networks through other wireless pole line products such as the HD / Link module and the Ethernet Spread Spectrum Radio (ESSR).

WAG Series connects vital and non-vital field equipment using industry standard protocols and off the shelf IT hardware.

**Features**

- Echelon®, ethernet and serial communications media converter
- Isolated from battery supply
- Advanced Train Control Systems (ATCS) Specification 200, Version 4.0 Communications Systems Architecture addressable for intelligent message routing
- Connects communications between various Grade Crossing Control Systems Products such as Grade Crossing Predictor (GCP) series, Intelligent Lights Out Detectors (iLod) and Analyzer / Event Recorders (SEAR II) series to Wayside Wireless Pole Line Products such as HD / Link Module and Ethernet Spread Spectrum Radios (ESSR)

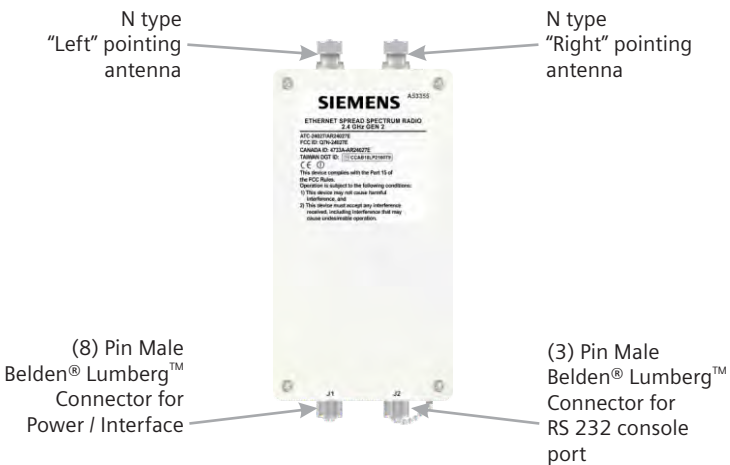
WAG Series units can be configured individually utilizing Microsoft® HyperTerminal, or can be configured globally over network utilizing Telnet software.

Embedded configuration tools and simple to use menu selections make it easy to set up, run diagnostics and create detailed operational logs either locally or remotely.



**ESSR**  
Series  
**Ethernet Spread Spectrum Radios**

**Overview**



*Model A53355 ESSR Series Ethernet Spread Spectrum Radio shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** ESSR Series Ethernet Spread Spectrum Radio Series offers the ability to establish point to point, point to multipoint, linear, tree and roaming networks without the expense, labor and time involved in installing cables.

ESSR Series connects vital and non-vital field equipment using industry standard protocols and off the shelf IT hardware. Can be used as a stand alone direct connection through ethernet protocols or as a bridge to serial or Echelon® connections when used in conjunction with a **SIEMENS** WAG Series Wireless Access Gateway unit.

Able to join multiple segment networks across multiple channels without the concern of interfering with each other.

Able to access data logs as well as configure networks easily either through a laptop connected to any node or monitor locations with SNMP based systems.

**Features**

- Radio frequency rate of up to 2.7 Mbps
- Secure RF protocols for vital train control systems
- Intelligent routing for vital, high and normal priority level messages
- Low latency messaging for critical point to point applications
- Intelligent tools for spectrum and network analysis
- Single hop ranges of up to 80 km with clear line of sight

ESSR Series units can be configured individually for data rate and minimum received signal level to suit application requirements. Can also be configured to accommodate the time division duplex cycle time to optimize network throughput and latency.

ESSR Series units can be deployed one node at a time and can be extended at any time by adding additional nodes. Encased in a weather resistant housing that allows the ESSR Series unit to be mounted in close proximity to transmission antenna without the concern of RF loss due to long, expensive cabling.





## HD Link Modules

### Overview

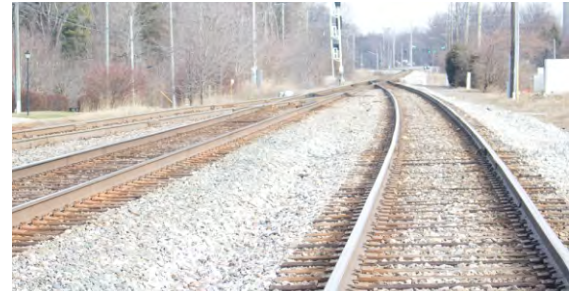


*Model A53201 HD Link Module shown for reference purposes only!  
Actual unit selected may vary in mounting and features.*

**SIEMENS** HD Link™ is designed to be used in conjunction with an Ethernet Spread Spectrum Radio (ESSR), in order to function in a communications network system as a vital I/O unit.

An HD Link™ system provides the capability to read the state of a vital input at one location, typically a relay contact, and use this input state to drive a vital output, typically a relay coil, at the same or another location.

# Track Circuit Systems Products



**Clearguard® PSO Series**  
Phase Shift Overlay  
Track Circuit Modules

C1 - C4



**IPITC Series**  
Intelligent Processor Island  
Track Circuit Modules

C5 - C8



**Clearguard® SE-3 Series**  
Steady Energy Phase Selective  
Track Circuit Modules

C9 - C12



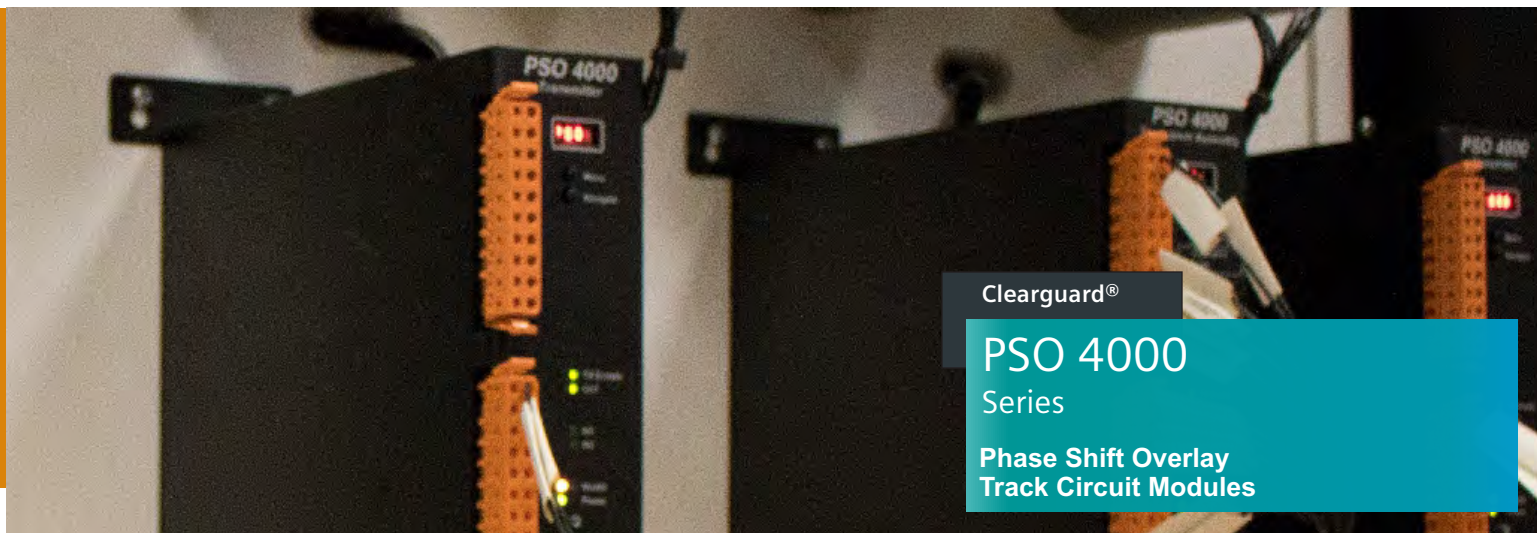
**ST Series**  
Track Feed Reactors

C13 - C16



**SOTC Series**  
Series Overlay  
Track Circuit Modules

C17 - C20



Clearguard®

PSO 4000  
SeriesPhase Shift Overlay  
Track Circuit Modules

## Overview



*PSO 4000 Series Phase Shift Overlay Track Circuit Modules shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** Clearguard® PSO 4000 Series Phase Shift Overlay Track Circuit Modules provides track occupancy information for a train detection system.

They offer a reliable and secure, microprocessor based, vital system for use in a variety of complex installations.

They are able to differentiate between its operation signal and all other signals present on the track is due to the non-symmetrical coded modulation and receiver decoding techniques which ensure that the systems is immune to random or foreign AM, FM and beat signals.

## Features

- Vital processor based
- Available in Transmitter, Receiver, Transceiver and Crossing Modules
- Programmable for all common PSO II and III, AFTAC and METRA carrier channels
- Internally programmable pick-up and drop delay times
- PSO channels compatible with existing PSO-II and PSO-III equipment
- Program selectable modulation codes "A," "C," (8 bit) "D" "E" and "F" (16 bit)
- Ability to dynamically select codes via vital inputs or ATCS interface



## Overview

Transmitter Output Connections → Receiver Input Connections



*Model A71150 Clearguard® IPITC Series Intelligent Processor Island Track Circuit Module shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** Clearguard® IPITC Series Intelligent Processor Island Track Circuit Module provides a stand alone island circuit solution at grade crossings.

Unit is a single board, microprocessor based, multi-frequency, modulated, short range (120' - 350' [37 - 107m]) track occupancy detector.

Designed to detect poor shunting conditions and provides a simple automated process for track circuit calibration.

Module is frequency programmable via an on board jumper and the operating program is contained in a flash memory device on board.

Direct replacement for legacy Short Modulated Track Circuit (SMTC) series.

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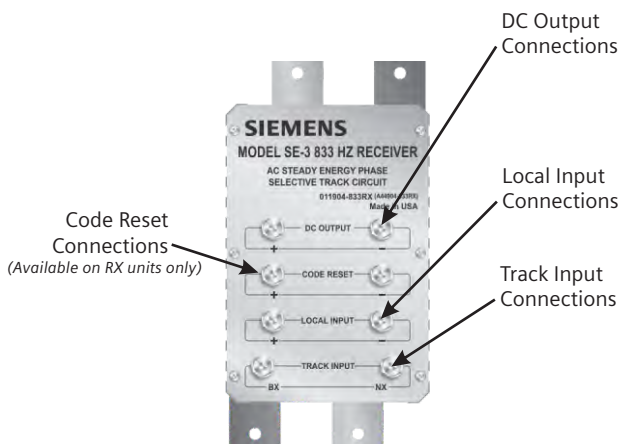


- Microprocessor based
- Weight is approx. 5.0 lbs. (2.27 kgs.)
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 9 - 16.5 VDC Input voltage
- 550mA VDC Input current (nominal)
- 0.1 Amp Transmitter output current (maximum)
- Field selectable frequencies: 2.14 kHz, 2.63 kHz, 3.24 kHz, 4.00 kHz, 4.90 kHz, 5.90 kHz, 7.10 kHz, 8.30 kHz, 10.0 kHz, 11.5 kHz, 13.2 kHz, 15.2 kHz, 17.5 kHz and 20.2 kHz





## Overview



*Model A44904 SE-3 Series Steady Energy Phase Selective Track Circuit Module shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** Clearguard® SE-3 Series Steady Energy Phase Selective Track Circuit Modules provides a solution where traction or other severe electromagnetic interference conditions could interfere with signaling circuits.

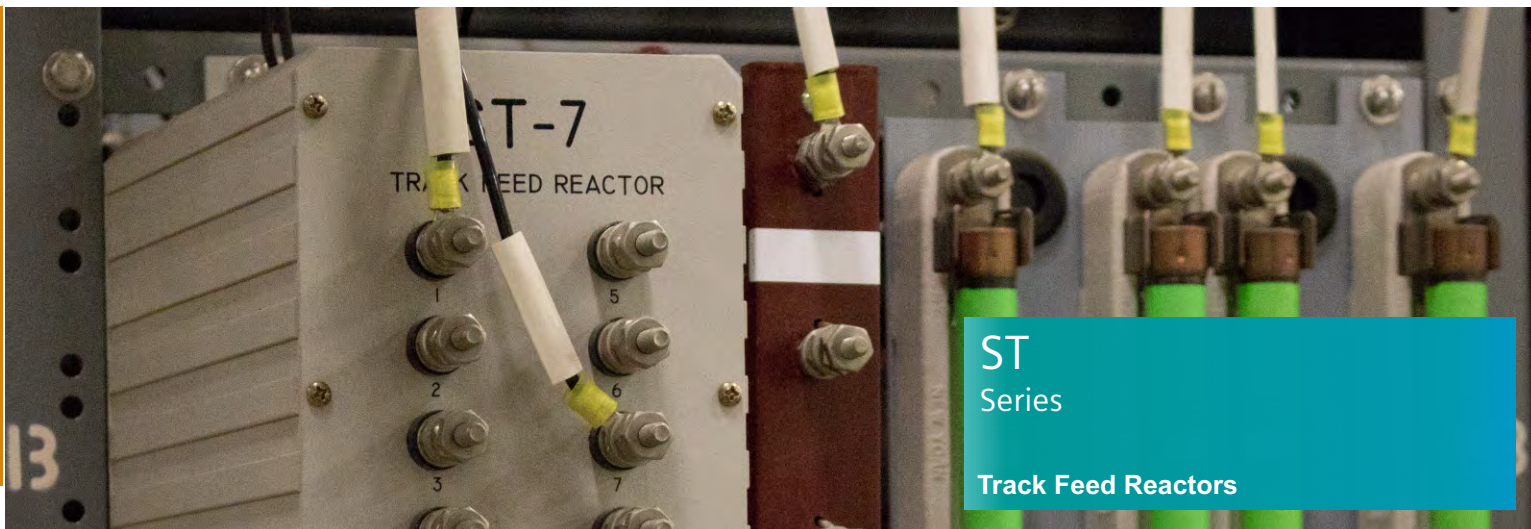
Designed to detect train presence and/or broken rail conditions in electric traction territory, or where high levels of induced AC interference occur.

They can be used in conjunction with impedance bonds for traction current return or with either balanced or unbalanced (single rail) track circuits using insulated joints without impedance bonds.

They are solid state and requires no regular maintenance. They are a passive component design, utilizing no active electronic circuits.

## Features

- Available in (8) configurations;
- Rejects all AC traction frequencies
- No active internal electronics
- Compatible with coded cab signal systems
- Mutually compatible with audio frequency track circuits
- Code reset option resets the track feed to steady energy after the block is cleared.



## Overview



*Model A44903 ST-7 Series Track Feed Reactors shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** ST Series Track Feed Reactors varies the amount of phase shift desired in the track circuit. Available in (3) models with varying inductance loads to accommodate wide variety of track design needs.



## Overview



*Model A7A190 SOTC Series Overlay Track Circuit Module shown for reference purposes only! Actual unit selected may vary in mounting and features.*

**SIEMENS** Clearguard® SOTC Series Overlay Track Circuit modules are an adjustable length audio frequency track circuit intended primarily for obtaining release of electrically locked switches (through a normally deenergized external relay) by occupying the main track immediately ahead of the switch points.

Compact design is available in (3) frequencies and except for primary arresters, no external surge protection devices are required.