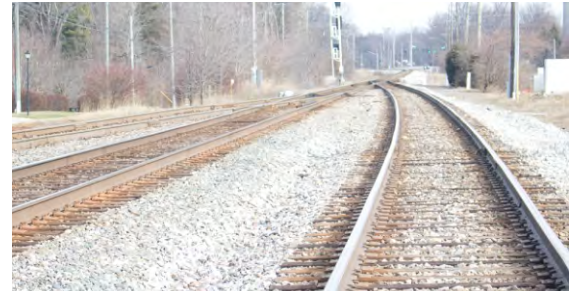


# Track Circuit Systems Products



**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

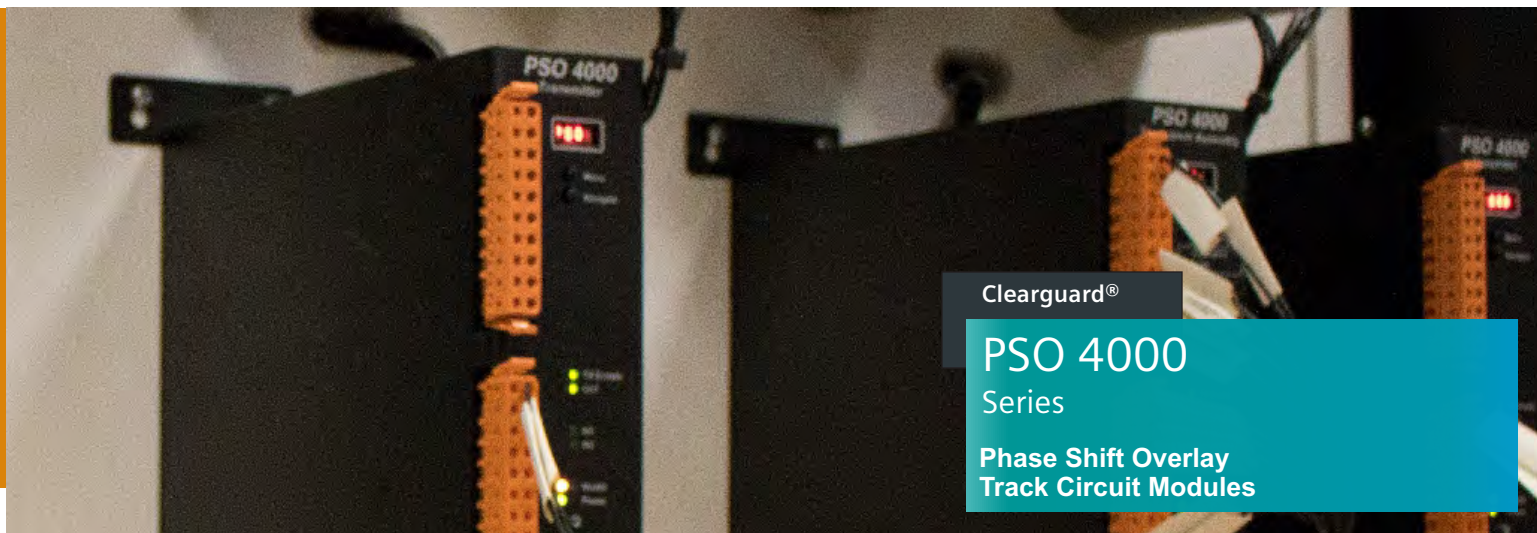
C13 - C16



**SOTC Series**  
Series Overlay  
Track Circuit Modules

C17 - C20





Clearguard®

## PSO 4000 Series

Phase Shift Overlay  
Track Circuit Modules

### Overview



### 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

*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.

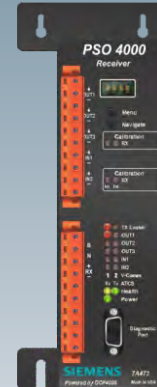
NYK:70007A4710001



#### Transmitter Module

- Weight is approx. 6.1 lbs. (2.77 kgs.) including connectors.
- Quiescent power consumption is approx. 0.85 A @ 9 V
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 90% Non-Condensing Relative Humidity
- Frequency stability is  $\pm 0.01\%$  (Hz) of the selected frequency
- Frequency modulation with 8 bit serial address
- Track transmitter load 25  $\Omega$
- Track receiver load 250  $\Omega$
- Relay coil resistance 400  $\Omega$  - 1,000  $\Omega$
- Input power supply can be 9VDC, 12VDC (nominal) or 16.5VDC
- Power supply ripple is 1.0VDC Peak to Peak maximum
- (2) Vital inputs

NYK:70007A4730001



#### Receiver Module

- Weight is approx. 6.1 lbs. (2.77 kgs.) including connectors.
- Quiescent power consumption is approx. 1.02 A @ 9 V
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 90% Non-Condensing Relative Humidity
- Frequency stability is  $\pm 0.01\%$  (Hz) of the selected frequency
- Frequency modulation with 8 bit serial address
- Track transmitter load 25  $\Omega$
- Track receiver load 250  $\Omega$
- Relay coil resistance 400  $\Omega$  - 1,000  $\Omega$
- Input power supply can be 9VDC, 12VDC (nominal) or 16.5VDC
- Power supply ripple is 1.0VDC Peak to Peak maximum
- (2) Vital inputs
- (3) Vital relay outputs

NYK:70007A4750001



#### Transceiver Module

- Weight is approx. 6.1 lbs. (2.77 kgs.) including connectors.
- Quiescent power consumption is approx. 1.12 A @ 9 V
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 90% Non-Condensing Relative Humidity
- Frequency stability is  $\pm 0.01\%$  (Hz) of the selected frequency
- Frequency modulation with 8 bit serial address
- Track transmitter load 25  $\Omega$
- Track receiver load 250  $\Omega$
- Relay coil resistance 400  $\Omega$  - 1,000  $\Omega$
- Input power supply can be 9VDC, 12VDC (nominal) or 16.5VDC
- Power supply ripple is 1.0VDC Peak to Peak maximum
- (2) Vital inputs
- (3) Vital relay outputs

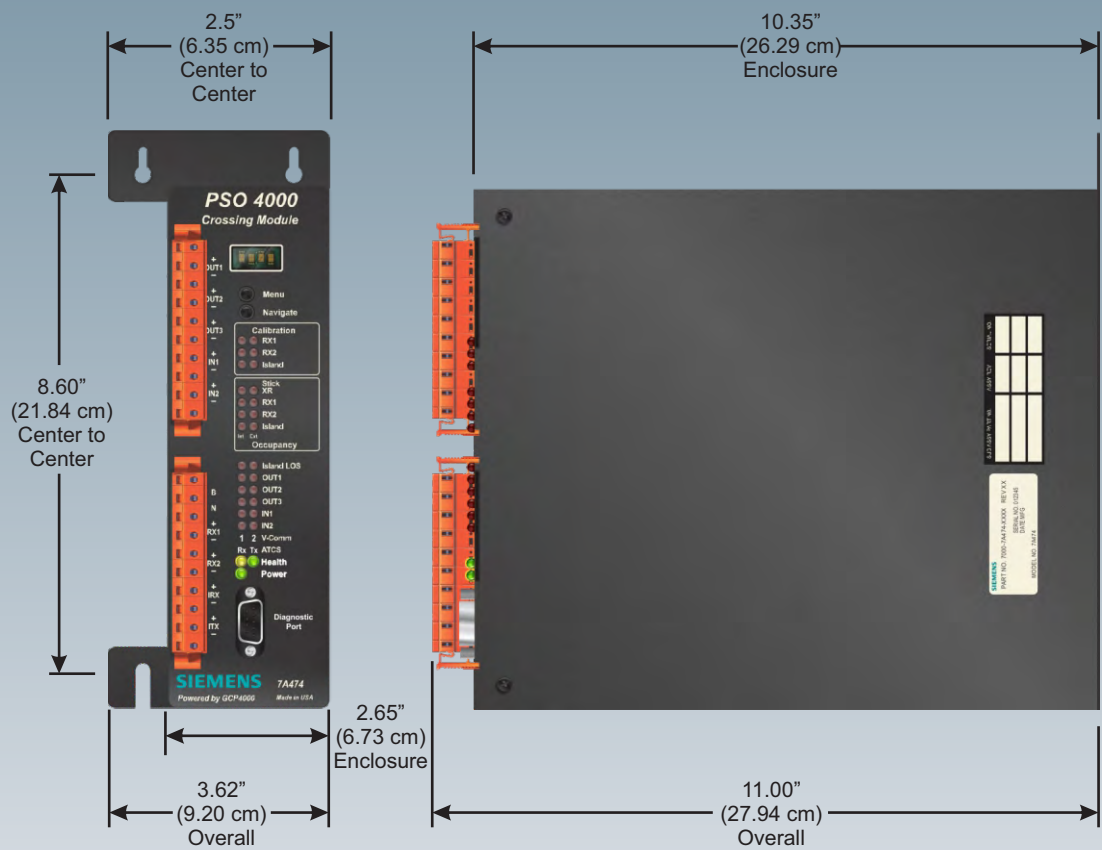
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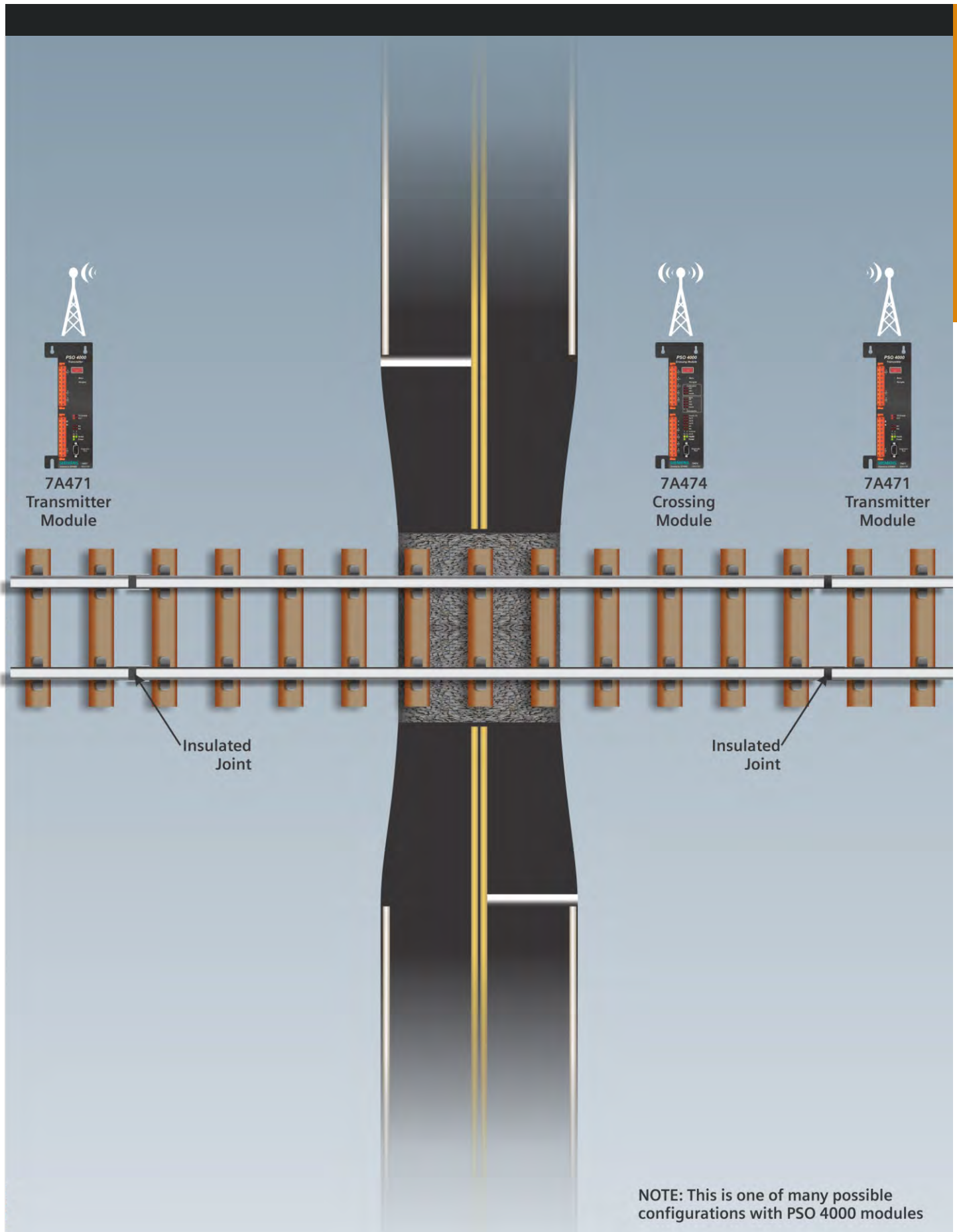


#### Crossing Module

- Weight is approx. 6.1 lbs. (2.77 kgs.) including connectors.
- Quiescent power consumption is approx. 0.87 A @ 9 V
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 90% Non-Condensing Relative Humidity
- Frequency stability is  $\pm 0.01\%$  (Hz) of the selected frequency
- Frequency modulation with 8 bit serial address
- Track transmitter load 25  $\Omega$
- Track receiver load 250  $\Omega$
- Relay coil resistance 400  $\Omega$  - 1,000  $\Omega$
- Input power supply can be 9VDC, 12VDC (nominal) or 16.5VDC
- Power supply ripple is 1.0VDC Peak to Peak maximum
- (2) Vital inputs
- (3) Vital relay outputs

Applicable for all Clearguard® PSO 4000 Series - Phase Shift Overlay Track Circuit Modules









## 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.

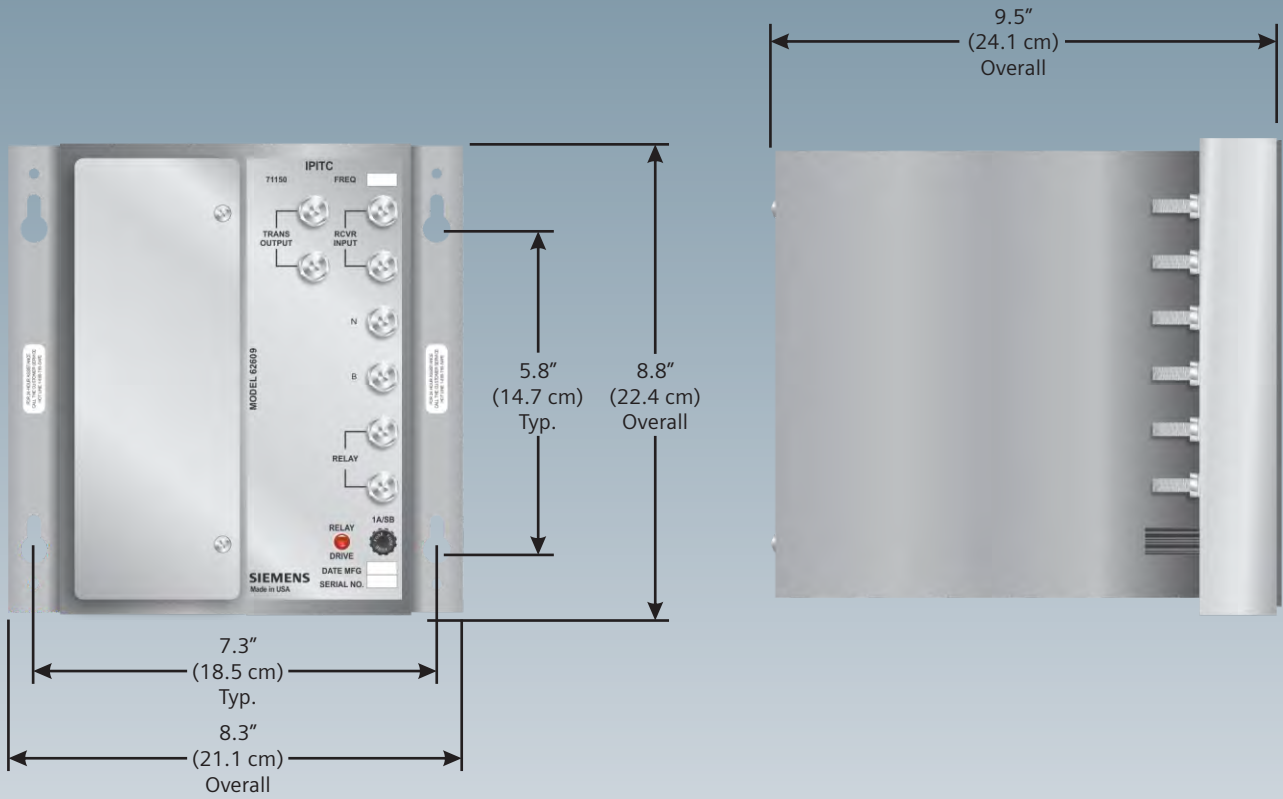
Direct replacement for legacy Short Modulated Track Circuit (SMTC) series.

NYK:7000711500001

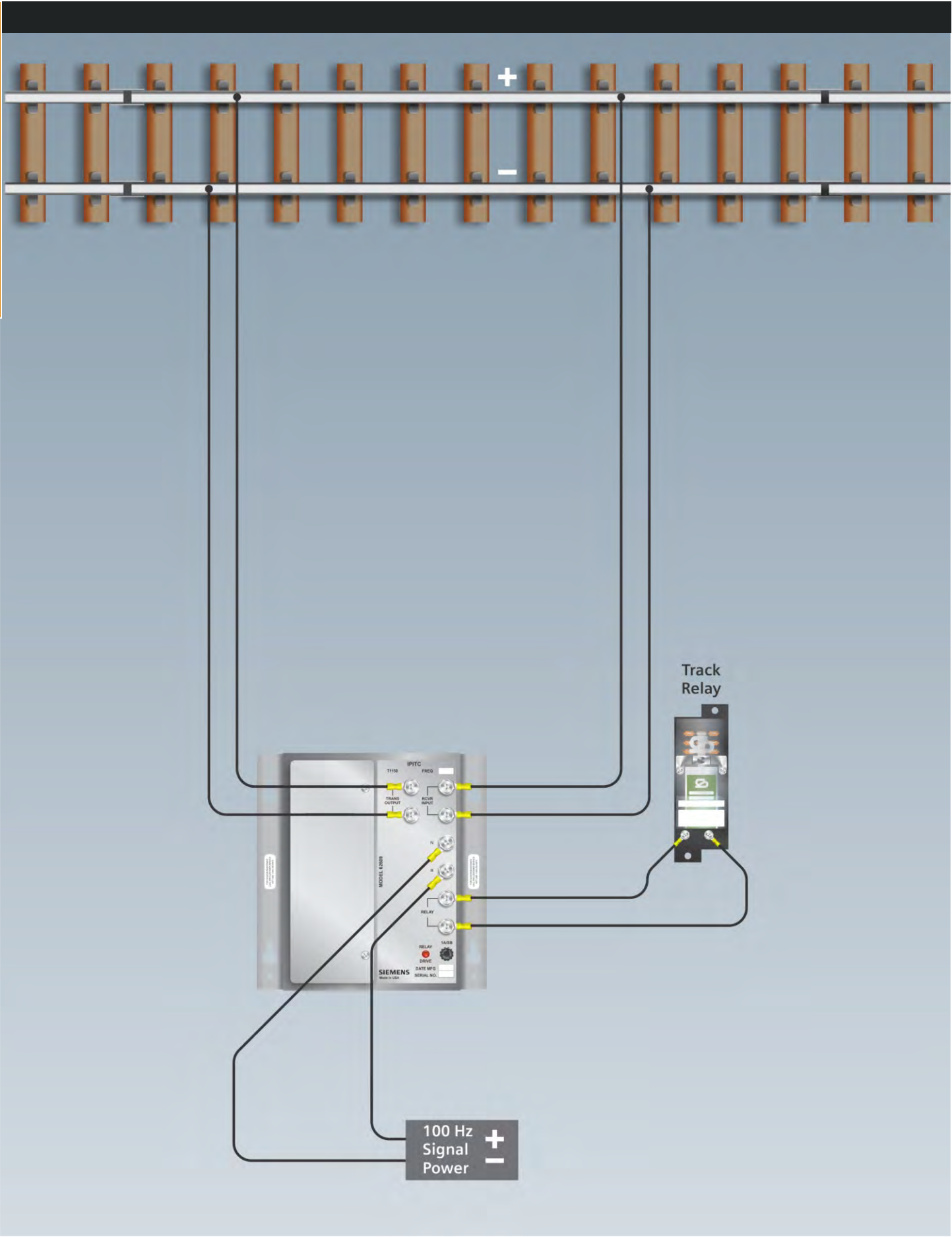


- Microprocessor based
- Weight is approx. 5.0 lbs. (2.27 kgs.)
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 9 - 16.5 VDC Input voltage
- 550mA VDC Input current (nominal)
- 0.1 Amp Transmitter output current (maximum)
- Field selectable frequencies: 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

Applicable for all Clearguard® IPITC Series - Intelligent Processor Island Track Circuit Module



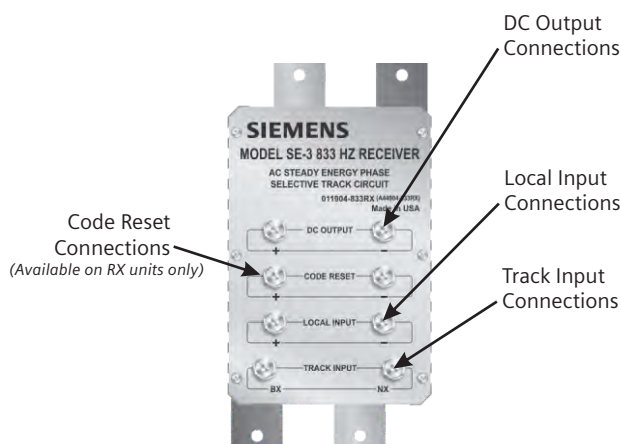








## Overview



*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.

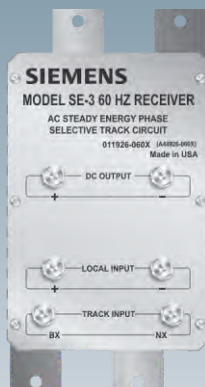
They can be used in conjunction with impedance bonds for traction current return or with either balanced or unbalanced (single rail) track circuits using insulated joints without impedance bonds.

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.

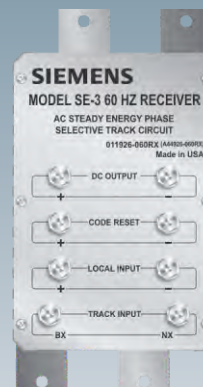
NYK:400044926060X



#### SE-3 60Hz Receiver Module

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 91.7 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

NYK:400044926060RX



#### SE-3 60 Hz Receiver Module with Code Reset

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 91.7 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- (1) pair code reset outputs (to code recognition system)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

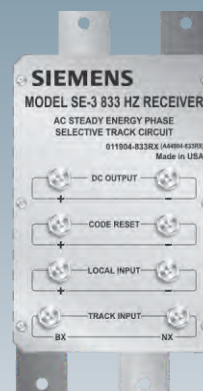
NYK:400044904833X



#### SE-3 83.3Hz Receiver Module

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 100 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

NYK:400044904833RX



#### SE-3 83.3Hz Receiver Module with Code Reset

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 100 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- (1) pair code reset outputs (to code recognition system)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

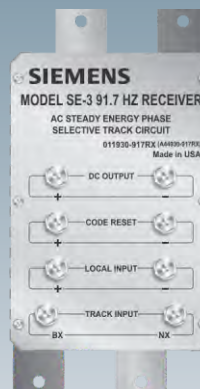
NYK:400044930917X



#### SE-3 91.7Hz Receiver Module

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 91.7 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

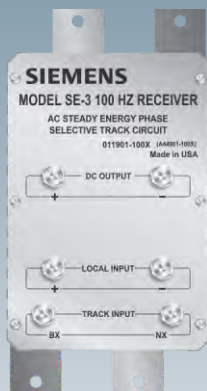
NYK:400044930917RX



#### SE-3 91.7Hz Receiver Module with Code Reset

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 91.7 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- (1) pair code reset outputs (to code recognition system)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

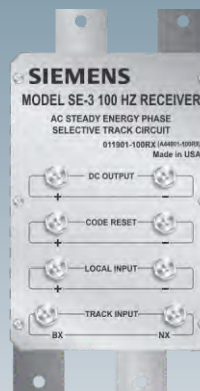
NYK:400044901100X



#### SE-3 100Hz Receiver Module

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 100 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

NYK:400044901100RX

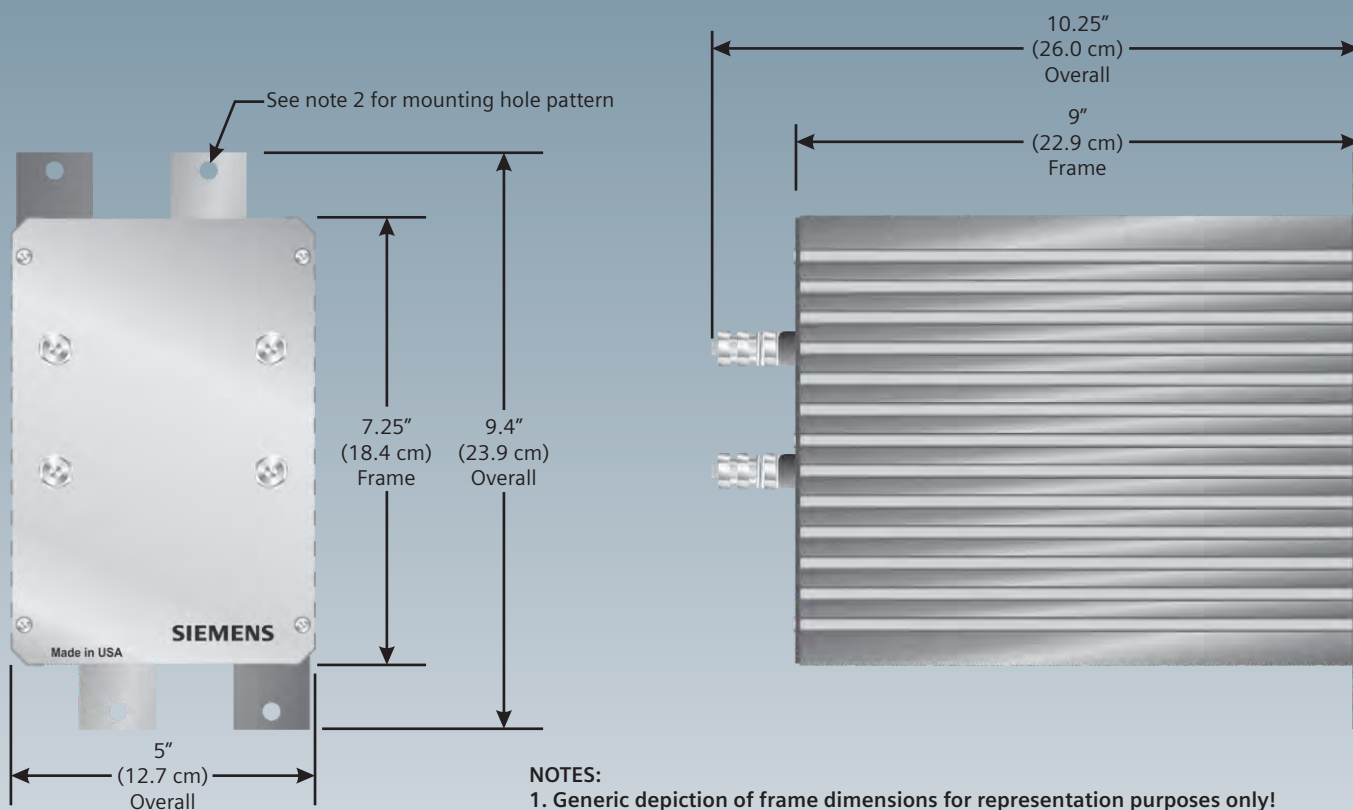


#### SE-3 100Hz Receiver Module with Code Reset

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 14.0 lbs. (6.35 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 100 Hz receiving frequency
- (1) pair DC outputs (to track relay)
- (1) pair local inputs (to inverter)
- (1) pair track inputs (to track transformer)
- (1) pair code reset outputs (to code recognition system)
- 40° ± 20° Phase angle relationship
- 200 - 500 mΩ shunting sensitivity

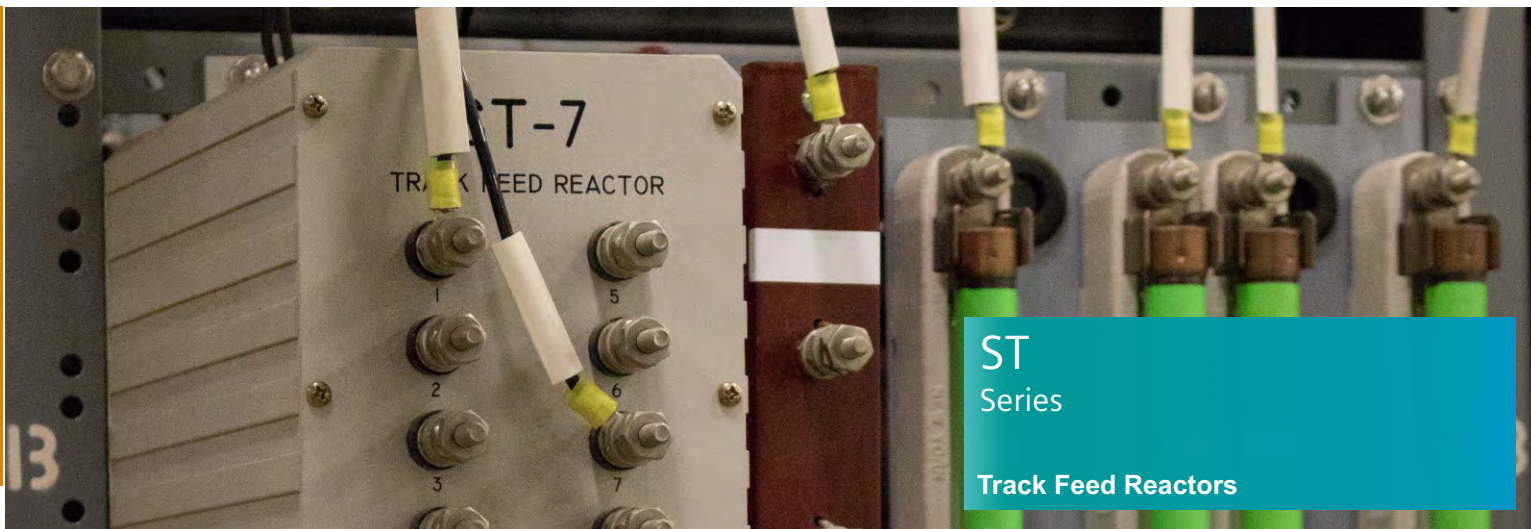


Applicable for all Clearguard® SE-3 Series - Steady Energy Phase Selective Track Circuit Modules



## NOTES:

1. Generic depiction of frame dimensions for representation purposes only!
2. Staggered mounting bracket hole pattern is 3" (7.6 cm) on center and matches relay bar mounting hole configuration for center to center dimensions.



ST  
Series

Track Feed Reactors

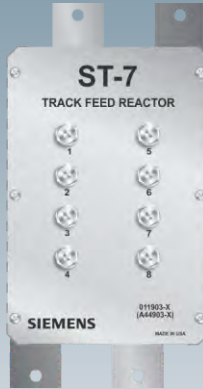
## Overview



*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.

NYK:400044903000X



#### ST-7 Track Feed Reactor

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 6.5 lbs. (2.95 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 0.09 mH - 2.0 mH inductance

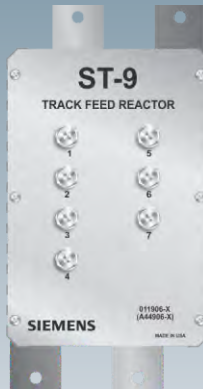
NYK:400044909000X



#### ST-8 Track Feed Reactor

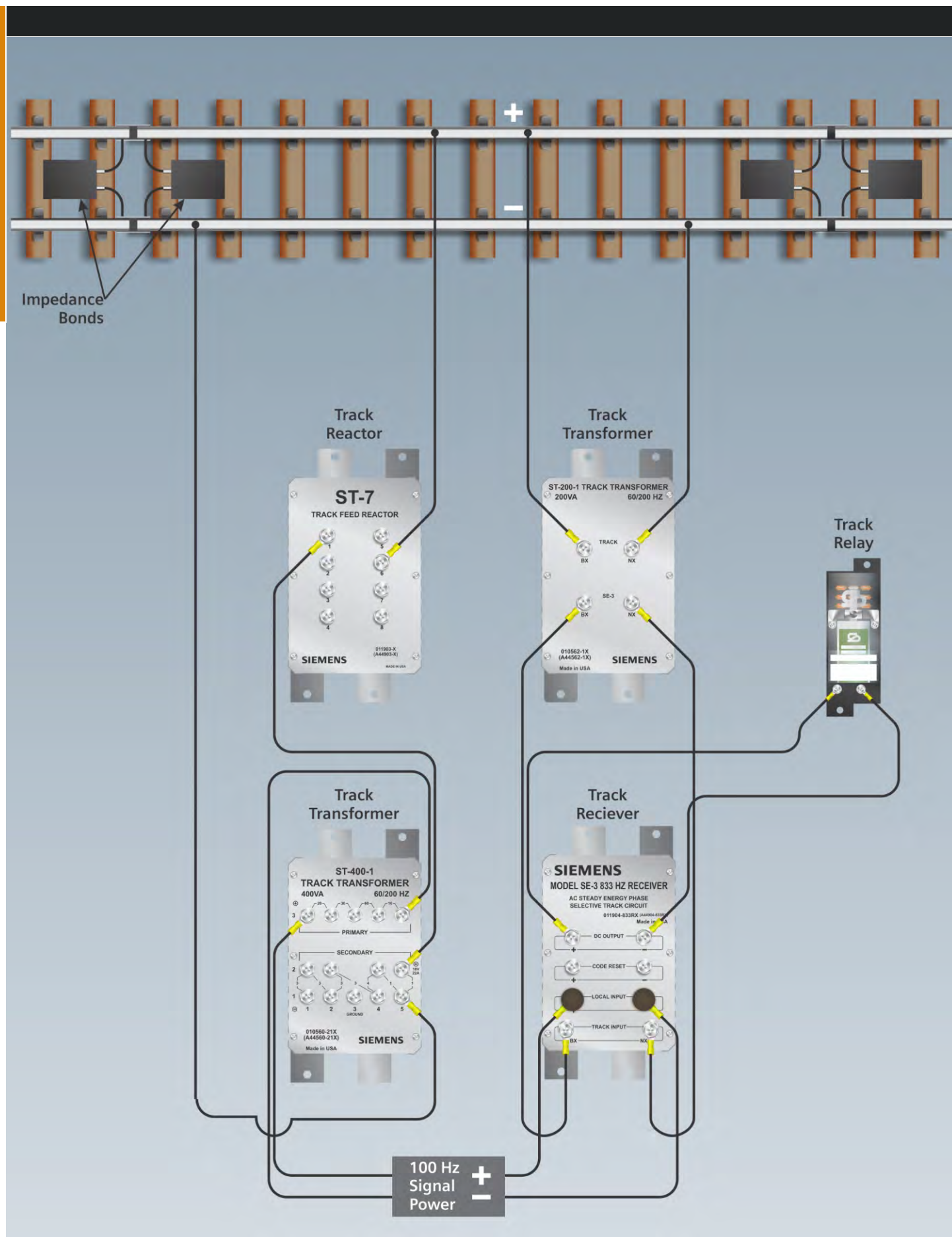
- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 6.5 lbs. (2.95 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 1.8 mH - 5.7 mH inductance

NYK:400044906000X



#### ST-9 Track Feed Reactor

- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 6.5 lbs. (2.95 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 4.4 mH - 14.1 mH inductance









## 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.

NYK:70007A1905900



- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 4.0 lbs. (1.81 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 5.9 KHz

NYK:70007A19010.0



- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 4.0 lbs. (1.81 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 10.0 KHz

NYK:70007A19026.0



- Meets or exceeds applicable AREMA® specifications
- Weight is approx. 4.0 lbs. (1.81 kgs.) including hardware
- Operates in -40° F to +160° F (-40°C to +70°C) @ up to 95% Non-Condensing Relative Humidity
- 26.0 KHz

Applicable for all Clearguard® SOTC Series - Series Overlay Track Circuit Modules

