

## EQUIPMENT AND SYSTEM LEGACY APPROVAL CERTIFICATE

**Certificate No. S 02-1705-030A**

**Approval date** 25/05/2017  
**Approved by** GM Technical Standards  
**Report no.** N/A  
**Report date** N/A

*This certificate is issued to*

**Supplier** Siemens  
 Level 7, 380 Docklands Drive  
 Docklands, Victoria 3008

*In respect of*

**Manufacturer** Siemens  
**Product description** PSO III  
**Item identification** Overlay Track Circuit

**Application** ARTC Network Wide  
**Relevant Standards** SPS 02 Environmental Conditions  
 SCP 05 Electrical & Electronic Components (Ratings & Construction Requirements)  
 SPS 21 Audio Frequency Jointless Track Circuits for Main Line Applications  
 SDS 17 Track Circuits  
 ESC 03 01 Level Crossing Equipment

### Conditions of Approval

<b>Conditions of Legacy Approval</b>	1. May continue to be used in current installations
	2. Can be replaced with the same item of equipment during maintenance activities
	3. Current installations shall not be renewed
	4. Shall not be used in new installations
<b>Conditions of continued Use</b>	5. For use in accordance with ARTC specification SDS 25 and standard typical circuits developed and/or approved specifically for PSO III equipment.
	6. Only components from the attached list of approved components may be used.
<b>Supplier</b>	7. All documentation from the supplier supporting this system shall be in English. All diagnostic systems and support systems associated with the Product shall display all information in English.

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<b>Signal Designers</b>	8. The Supplier remains accredited to ISO 9001 specifically for these products and ARTC is advised on a 12 monthly basis that accreditation is current. ARTC reserves the right to conduct its own audit of the manufacture and supply of these components to AS 19011.
	9. Any subsequent change to the design, materials or manufacturing process is not covered by this approval. The Supplier shall notify ARTC of any modification or changes in order to obtain a valid updated certificate.
	10. All design for track circuit operation shall assume a minimum train shunt and ballast resistance in accordance with ARTC specification SPS 21 'Specification – Audio Frequency Jointless Track Circuits for Main Line Applications'.
	11. A special design analysis shall be undertaken and the results shall be submitted for Standards Section approval in each instance before PSO III track circuits are applied to dual gauge track (one track circuit equipment detecting trains on either gauge).
	12. Repeated use of any PSO III track frequency (with the same address) or IPI track circuit on a single track shall require each usage to be separated by at least one insulated rail joint, without bypass coupler, in each rail and a distance > 3.0km OR by two insulated rail joints, without bypass coupler, in each rail and a distance > 1.0km. Repeated use of any PSO III track frequency with different addresses on a single track separated by at least one insulated rail joint, without bypass coupler, in each rail is permitted.
	13. PSO III or IPI track circuit frequencies shall be different when used on adjacent independent tracks (terminations separated by < 0.5km along track alignment).
	14. Where a PSO III equipment signal is transmitted over a line circuit (overlaid on another circuit or stand alone) no other circuit using the same frequency, irrespective of address code, shall be used in the same cable or any equipment case in which the circuit is terminated.
	15. PSO III equipment may be used to implement a stand alone track circuit or overlaying an existing track circuit however vital track clear information shall be derived independently from any PSO III island track (IPI) output.
	16. Output relay for vital circuits shall be WRSA type QS2 housed in the same equipment enclosure as the PSO III receiver.
	17. PSO III equipment may be used to overlay 50v DC vital signalling line circuits, immune and non-immune DC feed track circuits, DC relay pulse coded track circuits, electronic coded track circuits and 50Hz AC feed track circuits (not including remote rectifier DC relay track circuits).
	18. Surge protection shall be provided in accordance with ARTC specification ESAC-09-02 and SCP 04 'Lightning and Surge Protection Requirements' for Electronic equipment subject to Category C exposure.
	19. Design documentation shall record the jumper settings (frequency and pickup delay) and software version number for each IPI track circuit module installed.
	20. Design documentation shall record track related dimensions in both metric (meters) and imperial (feet) with imperial dimensions always shown in parenthesis following metric.

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Issue date

Expiry date

Issued by 25 May 2017



John Furness

ARTC Manager Standards

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### *Type Approval Status*

Issue 1 – 08-08-10-030 – Safetran Phase Shift Overlay (PSO III) - superseded

Issue 2– S-02-1705-030A Siemens – PSO III - Current

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### Approved Item List – PSO III (Phase Shift Overlay track circuit)

Catalogue No.	Address	Item Type	Conditions of Use	
Equipment Assemblies			<p>&lt;List ¶&gt; Frequencies (f):- 0645, 0790, 0970, 1180, 1450 and 1770Hz are approved for general use, frequencies (f):- 2140, 2630, 3240 and 4000Hz may be used where separation exists along track alignment of <math>\geq 1</math>km from any IPI track circuit. &lt;/List ¶&gt;</p> <p>Adjacent frequencies on the same track shall be differentiated by more than one increment in the above list ¶ of approved frequencies.</p> <p>PSO III or IPI track circuit frequencies shall be different when used on adjacent independent tracks (terminations separated by &lt; 0.5km along track alignment).</p> <p>Frequencies (f):- 0156, 0211, 0285, 0348, 0430 and 0525Hz in addition to the above list ¶ may be used for DC line circuit overlay.</p>	
7000-7A439-f	A	Transmitter		
7000-7A451-f	C			
7000-7A438-f	A	Receiver		
7000-7A453-f	C			
7000-7A448-f-f-IPI	A	Crossing Package		
7000-7A455-f-f-IPI	C			
Auxiliary Equipment				
7000-8A065A		Battery Choke	Must be used to isolate any D.C. feed to the circuit on which PSO III signal is overlaid.	
7000-7A418		Power Line Filter	Must be used to isolate the power supply busbar from individual PSO III equipments.	
7000-7A403		Line Overlay Coupler		
7000-7A388		Equipment / Line Coupler		
7000-7A355A-f		Tuned Receiver Coupler	Frequency (f) may be from the above list of approved frequencies only.	Use where one transmitter feeds multiple receivers.
7000-7A366-f				
7000-7A377-1-f		Rx end Line / Rail Coupler		
7000-7A399-f		Tx end Line / Rail Coupler		
7000-7A422-f		IRJ Bypass Coupler		Use only in areas where no rails conduct electric traction current.
Component Modules				
7000-62609		Intelligent Island Processor	May be used where a separation exists along track alignment of $\geq 1$ km from a PSO III installation using frequencies (f):- 2140, 2630, 3240 or 4000.	

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Catalogue No.	Address	Item Type	Conditions of Use
7000-7A437-f		Transmitter Module	Frequency (f) may be from the above list ¶ of approved frequencies; in addition frequencies (f):- 0156, 0211, 0285, 0348, 0430 and 0525Hz may be used for DC line circuit overlay.
7000-7A437-2-f			
7000-7A436-f		Receiver Module	
7000-7A436-2-f			

-f :- insert required PSO III frequency from list.