



AUSTRALIAN RAIL TRACK CORPORATION

INFRASTRUCTURE, STRATEGY AND PERFORMANCE

Engineering Standards and Documents

The following recommendation, together with the attached supporting documentation, has been considered at the ARTC Risk & Safety Committee Meeting held on 10th April 2007.

Documents:

Ref No:	08-08-10-059 - Equipment Type Approval
Subject:	'SIEMENS' SIMATIC (SICAS S7) Interlocking System
Dated:	27 th February 2007.

Prepared By: Arthur Haberlin, Signal Engineer - Equipment

Endorsed by: Trevor Moore, Signal Standards Engineer

Items Considered for Approval:

Manufacturer:	SIEMENS Transportation Systems
Product:	Computer Based Interlocking System (SIMATIC).
Item Identification:	See item list Ref No: 01-0610-031a

The items in the form presented at the review date were approved for System & Equipment Approval to be used on all ARTC jurisdictions in accordance with the manufacturers published performance criteria and subject to the following.

Relevant ARTC Specifications:

Ref. No.	Title	Status	Date
SPS 02	Environmental Conditions	Issue 1 Revision 2	May '05
SPS 05	Electrical & Electronic Components (Ratings & Construction Requirements)	Issue 1 Revision 3	May '05
SCP 17	Computer Based Interlocking Requirements	Issue 1 Revision 3	Oct '06

Specific Conditions of Approval:

- i.** For use in accordance with ARTC specification SDS 25 and standard typical circuits developed and approved specifically for the SIMATIC interlocking system only. Standard typical circuit designs shall be extended to include interlocking equations and PROFIsafe network addressing processes and documentation before the first interlocking is offered for commissioning.
- ii.** For the application of this interlocking to ARTC infrastructure a waiver will be required for requirements in ARTC standard SPS 17 – ‘Computer-Based Interlocking Requirements’ clause 3.7.3.
 - The configuration of field modules forms part of the field module. It is not possible to swap common field modules without altering the configuration settings by altering the addressing DIP switches on each module.

The waiver request shall detail the means of mitigating the risk of incorrect addressing of field modules for any installation site.
- iii.** A register of network addresses, administered by ARTC, shall be established to ensure maintenance of unique addressing within any single connected SIMATIC (PROFIsafe) network for before any interlocking is certified as checked for design safety.
- iv.** All vital serial communications links shall use only closed communication paths reserved by ARTC specifically for signalling purposes.
- v.** In ARTC high traffic density areas any serial data link, which runs external to equipment housings, shall be configured in a ring. The link shall maintain continuous communication between all nodes if a single break occurs at any point on the ring.
- vi.** In ARTC high traffic density areas a maximum of 19 Signalling Objects may be controlled from a single (non redundant) SIMATIC Interlocking Processor.
- vii.** Full interlocking testing must be carried out with the compiled interlocking equations installed on safety hardware equivalent to the final commissioned interlocking.
- viii.** The DESIMO interface module to the signal light unit shall be demonstrated and achieve acceptance of the lamp proving feature for ARTC accepted LED lamp units at least four months prior to the first scheduled commissioning.
- ix.** The DEWEMO interface module may be used to drive single phase 110V AC motor point machines with a current requirement not exceeding 7A. Where point motors of higher current are proposed an alternative interface shall be demonstrated and achieve acceptance at least four months prior to the first scheduled commissioning.
- x.** The functioning of the Field PG device as a maintainers terminal shall be demonstrated and achieve acceptance at least four months prior to the first scheduled commissioning.
- xi.** Only the latest approved version of the power supplies, CPU, serial communications, functional and interface modules together with any integrated software and the associated development system software, may be used in new works installations.
- xii.** Arrangements shall be made to ensure that the temperature at which SCALANCE serial data link equipment items are operated does not exceed 60°C.
- xiii.** Only components from the list **01-0610-031a** may be utilised.
- xiv.** All SIMATIC components at a site (included in the same circuit book) shall use power supplies, functional modules and executive software referenced on the same ARTC acceptance certificate.
- xv.** For use as trial installations only within the Sydney – Melbourne Passing Lanes project.

Certificate Issued to:

SIEMENS Transportation Systems
885 Mountain Highway,
Bayswater
Victoria 3153

A general condition of approval is that 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 19011:2003.

Any subsequent change to the design, materials or manufacturing process is not covered by this approval.

Approved for use in the ARTC.



John Cowie

APPROVAL No: 08-08-10-059

Manager Standards & Systems

This certificate is approval for a trial installation. Performance of the equipment approved on this certificate shall be reviewed within 12 months from the date of the first commissioning. Unless renewed this certificate shall lapse absolutely 18 months after approval date.

Approval Date: **10th April 2007.**



AUSTRALIAN RAIL TRACK CORPORATION LTD

Ref No: 01-0610-031a

Date: 25th January 2007

Equipment Type Approval

Subject: 'Siemens' Computer Based Interlocking (SIMATIC)

The following lists the individual types (by catalogue number) of Computer Based Interlocking Equipment manufactured by Siemens which are type approved for use in signalling circuits on ARTC infrastructure under Type Approval Certificate **08-08-10-059** subject only to any conditions shown on that Certificate and the Conditions of Use shown against individual types.

Part No.	Item Type	Description	Conditions of Use
<i>Safety-related Functional Hardware.</i>			
Interlocking Processor units.			
6ES7 307-1EA00-0AA0	CPU power supply	PS 307	Maximum load 5A. Not required when CPU is fed from SITOP power supply.
6ES7 317-6FF00-0AB0	CPU module	317 F-2 DP processor - PROFibus interface.	May be used in interlockings controlling up to 120 signalling objects in Low and Medium or up to 19 signalling objects in High traffic density areas.
6ES7 317-2FJ10-0AB0	CPU module	317 F-2 PN/DP processor - PROFINet /PROFibus interface.	
6ES7 953-8LM11-0AA0	MMC card	4Mb memory for site specific data.	
Input / Output units.			
6ES7 138-4CA50-0AB0	ET200S Power supply.	PM-E DC24..48V	Module is interchangeable with other non-safety power modules which are not approved, check Part No. carefully.
6ES7 138-4FA02-0AB0	Vital input module	4/8 F-DI VDC24V ET200S unit.	Each vital input requires a vital relay (B.R.B. Spec. 930 equivalent) with 2 contacts feeding non-equivalent channels.
6ES7 138-4FB02-0AB0	Vital output module	4 F-DO DC24V/2A ET200S unit.	Each output channel drives a 24V DC relay to BRB Spec. 961 pin code 0097 or 0098 or Spec. 966 (F6) pin code 0054.
S25150-A64-A1	Signal interface	DESIMO	May be used to replace B.R.B. relay interface between vital output module and lineside signal using 110V AC light units.



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Part No.	Item Type	Description	Conditions of Use
S25150-A98-A1	Points interface	DEWEMO	May be used to replace B.R.B. relay interface between vital output module and 110V AC single phase point machine.
Serial data Interface Units			Communications link for vital data must be a closed system.
6EP1 336-3BA00	CPU power supply	SITOP	Maximum load 20A.
6ES7 151-1BA01-0AB0	PROFibus Interface CPU	IM 151 HF	May be used in interlockings controlling up to 120 signalling objects in Low and Medium or up to 19 signalling objects in High traffic density areas.
6ES7 151-3BA20-0AB0	PROFINet Interface CPU	IM 151 PN/HF	
6GK1 502-3CC10	F/O link module	OLM/G12-1300	Fiber Optic serial data link shall be configured as an open ring.
<i>Safety-related Non-functional Hardware</i>			
I/O Hardware			
6ES7 193-4CF40-0AA0	I/O module housing	TM-E30S46-A1 ET200S housing	Only a single conductor may be connected to each screw type cable connection.
6ES7 193-4CD20-0AA0	Power module housing	AUX1 P/S ET200S housing	Only a single conductor may be connected to each screw type cable connection.
Serial Data (PROFibus) Hardware			
6ES7 0BB50-0XA0	PROFibus	Connector	
6XV1 830-0ET10	PROFibus	Cable 100m	
<i>Non Safety-related Functional Hardware</i>			
Communications units			
6ES7 341-1HA01-0AE0	RS232C interface (V.24)	Communications processor	For use as non-vital control & indication and/or maintenance link.
6GK5 612-0BA00-2AA3	Security (VPN) module	SCALANCE S 612 Security module	Required where serial link carries multiple simultaneous communications sessions.



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Part No.	Item Type	Description	Conditions of Use
6GK5 204-2BB00-2AA3	F/O terminal unit.	SCALANCE X 204-2 Fiber optic to serial data link distributor.	Fiber Optic serial data link shall be configured as an open ring.
<i>Maintenance Terminal</i>			
6ES7 712-IBB10-0AF3	Field PG	Portable PC field maintenance terminal	
	GUI Software	Step 7	
A5E 000 47601	Backup Battery	Hardware clock battery.	Lithium battery, depleted battery to be disposed of as hazardous waste.
<i>Safety Software</i>			
6ES7 833-1FC02-0YA5	Distributed Safety package.	S7 V5.4 SP1	Includes system and application blocks listed on TÜV report 70013560 Revision 1.8 dated 17 August 2005