NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

Certificate No.	NESA-S099	Version No. 1.1

Approval date	19 July 2024
Approved by	Manager Engineering Services

This certificate is issued to

Supplier	Siemens

In respect of

Manufacturer	Siemens Level 7 / 380 Docklands Drive DOCKLANDS VIC 3008
Product description	Siemens – Grade Crossing Predictor (GCP) 4000
Item identification	See approved item list
Application	Network Wide
Relevant Standards	SPS 02 Environmental Conditions SCP 05 Electrical & Electronic Components (Ratings & Construction Requirements) SCP 17 Computer-Based Interlocking Requirements ESC-03-01 Level Crossing Construction ESD-03-01 Level Crossings Design ESD-03-02 Level Crossing Design Certification and Test

Conditions of Approval	• For use in accordance with ARTC signalling standards.
	
	• Only items listed as approved shall be utilised.
	
	• Designer shall follow the manufacturer's documents and consider the local site-specific situation within the design and configuration of the system.
	
	• .A special design analysis shall be undertaken, and the results shall be submitted for Standards Section approval in each instance before GCP4000 track circuits are applied to dual gauge track (one track circuit equipment detecting trains on either gauge).
	
	• A GCP 4000 approach frequency must be separated from another use of the same frequency from any version GCP by one of
	
	   ○ A pair of insulated rail joints without wide band joint couplers, or narrow band joint couplers of the same frequency, where the predictor track functions are driven out of the one box
	   ○ One insulated rail joint in each rail without wideband joint couplers or narrow band joint couplers of the same frequency
	   ○ Two shunts of the same frequency and a distance of > 1.75 km for frequencies above 211 Hz
	   ○ Two shunts of the same frequency and a distance of > 5 km for frequencies of 211 Hz and below

A GCP4000 Island track circuit frequency shall be separated from another use of the same frequency by one insulated rail joint in each rail without wide band joint couplers, or narrow band joint couplers of the same frequency

- Separation of > 3km and one insulated rail joint, without bypass coupler, in each rail OR > 1km and two insulated rail joints, without bypass coupler, in each rail is required from an Siemens PSO-II, PSO-III or PSO-4000 track circuit installation using frequencies (f): - 2140, 2630, 3240 or 4000 Hz.

- Siemens GCP4000 Grade Crossing Predictor track circuits may be used to overlay immune and non-immune DC feed track circuits, electronic coded track circuits and 50Hz AC feed track circuits (not including remote rectifier DC relay track circuits), PSO-II, PSO-III or PSO-4000 track circuits with frequencies separated by > 15% and other GCP approaches of a different frequency.

- Siemens GCP4000 Grade Crossing Predictor track circuits may be used only in areas where there is no electric traction current conducted in the rails.

- Output relay for vital circuits shall be Siemens type QS2. The output relay and GCP4000 equipment shall be housed in the same equipment enclosure. Outputs from any part of the GCP 4000 system equipment may only be used to directly control Level Crossing protection (including adjacent GCP 4000 systems) or provide non-vital information to any other system.

- Vital track clear information for a signal interlocking shall be derived independently from GCP4000 equipment.

- Design documentation shall record track related dimensions in both metric (meters) and imperial (feet) with the imperial dimensions always shown in parenthesis following the metric.

- Only components from the list in Attachment A may be utilised.

- Any modification to an existing location or installation of new locations shall use the latest approved version of module hardware and executive software, together with the associated maintenance & development system (DT) software.

- Unless otherwise specified items with approvals for earlier versions still valid may be retained and re-installed in existing installations or upgraded to any later version with the relevant updating of site installation records.

- All DT modules shall be updated to the latest executive software version before being used as a maintenance spare replacement.

- All modules at a site (included in the same circuit book) shall use versions of executive software shown on the same ARTC acceptance certificate.

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.

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Any subsequent change to the design, materials or manufacturing process is not covered by this approval. The manufacturer should notify ARTC of any modification or changes in order to obtain a valid certificate.

Note/Comments

Issue date	19/07/2024	**Expiry date**	N/A
Issued by			**Manager Engineering Services**

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Approved Item list

Certificate No. NESA-S099

Manufacturer	Siemens
Product Description	Siemens – Grade Crossing Predictor (GCP) 4000

The following lists the individual types (by catalogue number) of Grade Crossing Predictor (Level Crossing) Equipment manufactured by Siemens which are submitted for type approved for use in signalling circuits on ARTC infrastructure under Type Approval Certificate TAS-01-09-05-IR082 subject only to any conditions shown on that Certificates and the Conditions of Use shown against individual types.

Catalogue No.	Revis'n	Item Type	Conditions of Use	
		Equipment Assemblies		
8110-80445	B2, C 😣 D	NGCP Single Track Crossing Chassis	Frequencies of approach circuits, for adjacent level crossings, overlaid on the same line or on adjacent independent tracks (with < 0.5km longitudinal separation of terminations) shall be differentiated by not less than one standard frequency increment. Separation of ≥ 1km along track alignment (on same or adjacent track) is required from a PSO III installation using frequencies: - 2140, 2630, 3240 or 4000Hz.	Frequency from the list ¶ of frequencies approved for general use. @
8110-80455	C3, D 😣 E	NGCP Basic Crossing Chassis & Eqp.		Frequency from the list ¶ of frequencies approved for general use. @
8110-80440	C4, D 😣 E	NGCP Complex Crossing & Control Equipment with event recorder.		If more than one crossing controller module is used at a crossing the lamp and gate loads shall be divided approximately equally between the modules.
8110-80465	B5, C 😣 D	NGCP Dual 2 Track Crossing Predict & Control Equipment with event recorder.		
8110-80400	C3, D 😣 D1	NGCP Dual CPU Complex Crossing Predict & Control Equipment with event recorder.		
8000-80049-0001	-	DC Shunt Enhancer Panel with Power Supply	May be used to assist shunting of one or more GCP4000 equipment used in a stand alone configuration (NOT overlaid on another track circuit). Δ	
8000-80049-0005	-	DC Shunt Enhancer Panel w/o Power Supply	Δ	
9000-91195-0101	-	SSSC III + Isolated Crossing Controller (20A)	Where more than one SSCC III + module used at a crossing divide lamp and gate loads approximately equally between modules.	

Catalogue No.	Revis'n	Item Type	Conditions of Use
	Auxiliary Equipment		
62780-8621	-	Multi-band termination shunt.	For frequencies: 86, 114, 156 and 211Hz (#).
62780-1543	-	Multi-band termination shunt.	For frequencies: 156, 211, 285, 348 and 430Hz (#).
62780-2152	-	Multi-band termination shunt.	For frequencies: 211, 285, 348, 430 and 525Hz (**#**).
62780-5297	-	Multi-band termination shunt.	**@**
8V617 -xx00	-	Simulated track inductor	Use with 62780-8621, -1543, -2152 or -5297 multi-band shunt to simulate track length for bidirectional approaches within 10% if needed
62664-Mf		Bidirectional Simulation Coupler	Frequency (*f*) may be from the list ¶ approved for general use. **@**
62780-f		Narrow band termination shunt.	
62775-f	-	Narrow band shunt	
8A076-0011		Wideband Shunt	Use only to terminate approach overlaid on a DC track circuit. Maximum 20V DC track voltage.
8A398-6		Adjustable inductor	Must be used with 62780-*f* narrow band shunt if needed to simulate track length for bidirectional approaches to within 15%.
62785-f		Tunable IRJ bypass coupler	Frequencies (*f*): 156, 211, 285, 348, 430 and 525Hz only may be used.
Z803-00052-0001	-	Equalizer	For use as maintenance spares of surge suppression incorporated into IRJ bypass coupler part no 62785-*f* only.
Z803-00053-0001	-	Gas Tube Arrestor	
8A065A		DC track feed isolation choke	Use to isolate any D.C. feed to the track circuit on which GCP4000 is overlaid (within 300m).
6A342-1		Relay Pulse Code track feed isolation Choke	Use to isolate any D.C. relay pulse coded track circuit feed on which GCP4000 is overlaid.
8000-26654	A1	Premade cable	Use to connect SEAR Iii event recorder to CPU II + processor module.
8000-80435	A2	ECD Unit	External Configuration Device. Only circuit board revision B2 ☺**§** & D approved.

Catalogue No.	Revis'n	Item Type	Conditions of Use

<List ¶>   Frequencies: - 86, 114, 156, 211, 285, 348, 430 and 525Hz are approved for general use.
Offset and "other" frequencies: - between 44 and 560Hz may be used in complex multiple

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track / crossing installations subject to acceptance by ARTC of the conclusions from a specific risk analysis of the proposed design. </List ¶>

\#   Together with associated "Offset" and "Other" frequencies.

@   For track circuits which do not require any IRJ to be bypassed frequencies 645, 790 and 970Hz (#) may be used.

-f   Insert required GCP4000 frequency.

Δ   Insulated Rail Joints shall be inserted in each rail not more than 30m beyond the extremities of track area connected to DC shunt enhancer(s).

§   Module no longer supported by manufacturer, may be replaced by Display II module revision C8 with software version 5.2.1.

☺   Previous version type approval remains valid for existing installations and like for like maintenance replacement, see earlier type approvals.

Assembly Description	Part No.	MEF Version	CRC	Release On	GCP-T6X-02-0.MCF	GCP-T6X-02-5.MCF
A80403 CPU MODULE (CP) – CPU II+	9V792-A02Y	NCG05_30.MEF	959A	31-Oct-11	Compatible	Compatible
A80403 CPU MODULE (VLP) CPU II+	9V689-A02AE	VPH05_20.MEF	5A05	31-Oct-11	Compatible	Compatible
A80903 CPU MODULE (CP) – CPU III	9VC93-A01F	GCPNCP3_MEF_1.1.61R.TGZ	N/A	26-Feb-20	Compatible	Compatible
A80903 CPU MODULE (VLP) – CPU III	9VC72-A01E	9VC72-V3H01_00.MEF	EB6F	26-Feb-20	Compatible	Compatible
A80418 TRACK MODULE	9V788-A01BA	GCP04_90.01.MEF			Compatible	Compatible
		GCP04_91.01.MEF (Trial only)	E610	16-Aug-23		
A80413 RIO MODULE	9V453-A01E	RiO01_07.MEF	FEF6	20-Mar-07	Compatible	Compatible
A80405 SSCC IIIi MODULE	9V686-A01M	XNG04_10.MEF	A6D9	7-Apr-11	Compatible	Compatible
A80410 SEAR Iii MODULE	9V725-A010AA	9V725-a01aj.bin	31F37D3A	18-Jun-10	Compatible	Compatible

A80407 Display Module	9V794-A01V	DT 5.2.3	none	21-May-10	Compatible	Compatible
A80485 Display Module	9VC15-A01AF	Ng5k_mef_1.5.64r.tgz	none	10-July-23	Compatible	Compatible

MCF Filename:	MCF Part Number:	MCF Software CRC:	MCF Release Date:
GCP-T6X-02-0.MCF	9V713-A002AA	D297F650	2-Jan-08
GCP-T6X-02-5.MCF	9V713-A002AG	D1A8IB68	21 Oct 11
GCP-T6X-02-9.MCF	9V713-A002AM	8BDDA85D	14-Feb-18
GCP-T6X-02-11.MCF	9V713-A02AP	F1A9A71B	16-08-23

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