SSI Central Interlocking

GENERAL

Includes:	SSI Central Interlocking Cubicle
Excludes:	SSI Technicians Terminal and SSI Datalinks.
Related Test Specifications:	NR/L2/SIG/30014/D120/TS12-02 SSI Datalinks, TS12-04 SSI Technicians Terminal.
Related Standards:	NR/GN/SIG/19054 SSI Technicians Manual, SSI 8500
	Note: All relevant Technical Instructions and Notice Boards are to be checked for new instructions.
Related Design details:	Control Centre Drawings, Installed SSI Software Record (ISSR)
Recording of Testing:	Completion of tests shall be by application of check marks and recording of values on Test Copy diagrams; by recording of values on the appropriate Record Card and by signing the appropriate Test Certificate. This specification is formatted to provide a tick box or results entry field next to each item so that a full auditable record of tests is produced. Differently coloured checkmarks shall be utilised where more than one tester is involved and at the end of each section, the tester(s) shall sign for completed tests.
Pre-requisites:	Cubicle C of C, Processor and Memory Modules C of C, DLM and LDT C of C

General

This test specification comprises of the following sections, which correlate with the competency levels identified in NR/L2/SIG/30014/B410 for this type of equipment or testing

1. Verification
2. Hardware Tests
3. Function Tests
4. Data Change

General definitions of terms are given in NR/L2/SIG/30014. Terms specific to this specification are defined in the last section of this specification.

This specification contains the testing requirements for current standard designs / installations of Alstom and Invensys SSI cubicles. Where alterations are made to existing installations, which may have alternative arrangements / equipment, some sections of this specification may not apply and a supplementary testing specification shall be produced, approved and appended to this specification.

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PLACE / PROJECT: _____

MASTER TEST CERTIFICATE NUMBER: _____

SSI IDENTITY: _____

CHECKLIST IDENTITY: *e.g. MTC number/TS12-01/SSI identity/nn*

1. VERIFICATION

1.1 STATIC TESTING CUBICLE

1.1.1 Record the CI Cubicle Type:

a) Using MkII MPMs: ☐
- Type A: 2 x DLMs (EXT) or
- Type B: 4 x DLMs or
- Type C: 2 x LDTs or
- Type D: 2 x LDTs + 2 x DLMs

b) Using MkALIII MPMs: ☐
- Type A2: 2 x DLMs (EXT) or
- Type B2: 4 x DLMs or
- Type C2: 2 x LDTs or
- Type D2: 2 x LDTs + 2 x DLMs.

c) Using MkWSIII MPMs: ☐
- Type A: 2 x DLMs (EXT) or
- Type B: 4 x DLMs or
- Type C: 2 x LDTs or
- Type D: 2 x LDTs + 2 x DLMs.

1.1.2 Record the following CI Details:-

a) Manufacturer (Alstom or Invensys) ☐

b) Serial Number ☐

c) Certification Details (C of C number or TC 2/2 number) ☐

1.1.3 Plug Coupler & Peripheral Port Pin/Socket Test

a) Examine and record the grip and seating of all the pins and sockets within each of the CI plug couplers, using a ‘Qikmate’ pin and socket as required. ☐

b) Examine and record the grip and seating of all the pins and sockets within each of the CI peripheral ports, using a ‘Qikmate’ pin and socket as required. ☐

c) Examine the seating of each of the ‘Qikmate’ coupler in the chassis: all couplers shall be mounted the correct way up. ☐

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1.1.4 CI Earthing

a) *Check* the CI cubicle earth stud is connected to the earth bar by 4mm^2 GNYE cable. ☐

b) *Check* all removable panels are connected to earth by 4mm^2 GNYE cable. ☐

c) *Test* pins CC and FF of each DLM are connected separately to the earth bar (fail if >0.2Ω):

(i) DLM A (EXT). ☐

(ii) DLM B (EXT). ☐

(iii) DLM A (INT). ☐

(iv) DLM B (INT). ☐

d) *Test* pins 79 and 58 of each LDT are connected separately to the earth bar (fail if >0.2Ω)

. (i) LDT A. ☐

(ii) LDT B. ☐

e) *Test* that the 'E' socket of the IEC mains connector of each PPM and MPM is connected to the earth bar (fail if >0.2Ω):

(i) PPM 1. ☐

(ii) PPM 2. ☐

(iii) MPM 1. ☐

(iv) MPM 2. ☐

(v) MPM 3. ☐

(vi) MPM 4 (Diagnostic). ☐

f) *Test* each Qikmate connector fitted, is connected to the earth bar (fail if >0.2Ω):

Note: Where cubicles are fitted with separate connectors for each channel, the pinout will be different from that detailed

(i) Connector A (Pin 10) ☐

(ii) Connector B (Pin 10). ☐

(iii) Connector D (Pin 10). ☐

(iv) Connector E (Pin 10). ☐

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(v) Connector F (Pin 11). ☐

(vi) Connector G (Pin 10). ☐

(vii) Connector H (Pin 10). ☐

1.1.5 BX & NX110 Connections.

Disconnect all couplers to DLMs and LDTs and break all BX110 MCBs / fuses before starting this test.

a) For each DLM, *Test* that pin AA is connected to the relevant BX110 MCB / fuse & pin BB is connected to the relevant NX110 busbar (fail if >0.2Ω):

(i) DLM A (EXT). ☐

(ii) DLM B (EXT). ☐

(iii) DLM A (INT). ☐

(iv) DLM B (INT). ☐

b) For each LDT, *Test* that pins 80 of each LDT is connected to the relevant BX110 MCB / fuse and pin 82 is connected to the relevant NX110 busbar (fail if >0.2Ω)

(i) LDT A. ☐

(ii) LDT B. ☐

c) *Test* that the 'L' socket of each IEC mains connector of each PPM and MPM is connected to the relevant BX110 MCB / fuse and each 'N' socket is connected to the NX110 busbar, (fail if >0.2Ω):

(i) PPM 1. ☐

(ii) PPM 2. ☐

(iii) MPM 1. ☐

(iv) MPM 2. ☐

(v) MPM 3. ☐

(vi) MPM 4 (Diagnostic). ☐

1.1.6 Miscellaneous

a) *Check* that the inserts are installed in the DLM WXYZ monitoring points. ☐

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1.2 IDENTITY & VERSION

1.2.1 MPM CI Identity Straps -

Consult SSI8500 Figure G2 for further information on strapping

a) Record the CI Identity Number as detailed on the latest issue of the ISSR. ☐

b) Record the CI Identity Number in Binary, and the corresponding strapping details. . ☐

c) Using the table below, *test* and record the installed CI Identity strapping of each 50-way Plug Coupler for compliance with (b) above. ☐

Alstom WIRE No.		W - Y	a - c	e - h	k - n	r - t
WRSL. WIRE No.		89	90	91	92	93
I/L	IN					
(MPM1)	OUT					
WRSL. WIRE No.		165	166	167	168	169
I/L	IN					
(MPM2)	OUT					
WRSL. WIRE No.		217	218	219	220	221
I/L	IN					
(MPM3)	OUT					
DIAG	IN					
(MPM4)	OUT					

Notes:

- The Diagnostic 50-way Plug Coupler and the PPM 50-way Plug Couplers do not have any CI Identity straps inserted.
- Incorrect strapping of the Identity Number will cause one or more security fuse(s) to be assassinated.

1.2.2 *Test* the PPM module identity strap in the 75-way Plug Couplers.

(i) PPM 1 - STRAP 76-79 **IN**. ☐

(ii) PPM 2 - STRAP 76-79 **OUT** ☐

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1.2.3 *Test* the MPM module identity strap in the 50w plug couplers

(i) MPM 1 - STRAP w-y **IN** & STRAP AA-CC **OUT**. ☐

(ii) MPM 2 - STRAP w-y **OUT** & STRAP AA-CC **IN**. ☐

(iii) MPM 3 - STRAP w-y **OUT** & STRAP AA-CC **OUT** ☐

(iv) MPM 4 - STRAP w-y **IN** & STRAP AA-CC **IN**. (Diagnostic) ☐

1.2.4 Interlocking (I/L) MPM's Geographic Data Version Number Straps

Consult SSI8500 Figure G2 for further information on strapping.

(i) Record the Interlocking Data Version/Sub-version number as detailed on the latest issue of the CISR. ☐

(ii) Using the table below, test and record the installed I/L Geographic Version Number strapping in the I/L MPM's 50-way Plug Couplers for compliance. ☐

Straps / Alstom WIRE No.	v - x	z - BB	DD - FF
Binary Units	4	2	1
(INSERT 1 or 0) BINARY No.			
Strapping required for Version No. INSERT IN for a Logic 0 OUT for a Logic 1			
WSL. WIRE No.	94	95	96
I/L IN			
(MPM1) OUT			
WSL. WIRE No.	170	171	172
I/L IN			
(MPM2) OUT			
WSL. WIRE No.	222	223	224
I/L IN			
(MPM3) OUT			

Notes:

- The Geographic Data version installed for pre-commissioning tests should be Version 0. Checks shall be made on site to confirm that the Version number is advanced by 1 when the final data is installed.
- The Diagnostic 50-way Plug Coupler and the PPM 50-way Plug Couplers do not have any CI Identity straps inserted.
- Incorrect strapping of the Version number does not cause any damage but will not allow the System to be brought on line.

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Example: How to calculate the I/L Version No.

The Version No. to be installed is 0.6. Ignore the value after the decimal point and divide the whole integer by 8 and carry any remainder. In this case 0/8=0 CARRY 0. The version No required is the CARRY No. 0, converted into a three digit binary No of 0 0 0. This requires all three version straps **v-x**, **z-BB** and **DD-FF** to be in.

The Version No. to be installed is 3.4. Ignore the value after the decimal point and divide the whole integer by 8 and carry any remainder. In this case 3/8=0 CARRY 3. The version No required is the CARRY No. 3, converted into a three digit binary No of 0 1 1. This requires strap **v-x** In, **z-BB** Out and **DD-FF** Out.

1.2.5 Interlocking LDTs Control Centre Identity Wiring

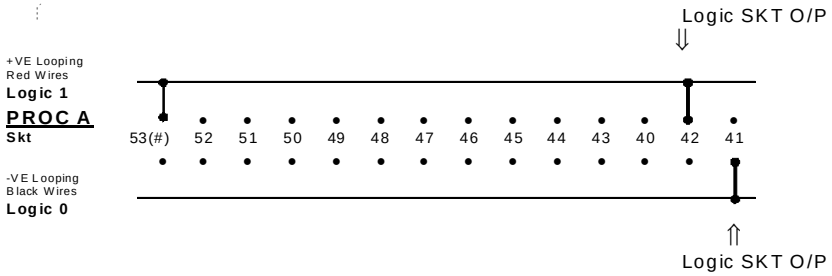
Consult SSI8500 Figure G16 for further information on strapping

(i) Record the Interlocking Control Centre Identity Number as detailed on the latest issue of the CISR. ☐

(ii) Using the table below, *test* and record the installed Control Centre Identity number for both LDT's. ☐

PROCESSOR A Socket Numbers.	52	51	50	49	48	47	46	45	44	43	40
PROCESSOR B Socket Numbers.	76	75	74	73	72	71	70	67	66	65	64
Binary Unit	1024	512	256	128	64	32	16	8	4	2	1
Insert 1 or 0											

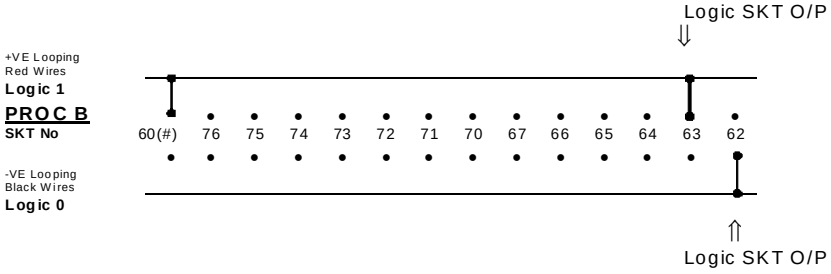
LDT A & B – Processor A



LDT A
Proc A ☐

LDT B
Proc A ☐

LDT A & B - Processor B



LDT A
Proc B ☐

LDT B
Proc B ☐

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1.3 CONFORMITY

1.3.1 Mod States of PPMs / MPMs / DLMs & LDTs

The BR Mod State is the first number NOT crossed out. (the one after).

GEC Mod State is also the first number NOT crossed out. (the one after).

Invensys Mod State is the last one crossed out.

a) Record the Mod states contracted to this installation in the table below:-.

MODULE	CONTRACTED MOD STATES									
	1	2	3	4	5	6	7	8	9	10
PPM										
I/L MPM										
DMPM										
DLM										
LDT										

1.3.2 Seals, C of C's, Manufacturer &Mod States.

a) *Check* each module in the CI cubicle and record its serial number, whether the seals are intact, the availability of C of C's, the Manufacturer and the Mod states.

INSTALLED / SPARE MODULES						
MODULE	**SERIAL No.**	**C of C No.**	**SEAL OK**	**Mod State**		
				NR	**WSL**	**Alstom**
PPM 1						
PPM 2						
I/L MPM 1						
I/L MPM 2						
I/L MPM 3						
DIAG MPM 4						
LDT A						
LDT B						
DLM A INT						
DLM B INT						
DLM A EXT						
DLM B EXT						

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INSTALLED / SPARE MODULES						
MODULE	SERIAL No.	C of C No.	SEAL OK	Mod State		
				NR	WSL	Alstom
Spare PPM						
Spare PPM						
Spare I/L MPM						
Spare I/L MPM						
Spare I/L MPM						
Spare DIAG MPM						
Spare LDT						
Spare DLM						

b) *Check* all three Interlocking MPMs within a Central Interlocking, all shall be of the same type and modification state, and running the same version of main, trackside communications and internal communications software

c) Both PPMs within a Central Interlocking shall be of the same type and modification state, and running the same version of software. The software shall be compatible with the version of Interlocking Software in use.

d) The Diagnostic MPM shall contain software of a version compatible with the interlocking and TT software. The TT software shall be of a version compatible with the diagnostic and panel processors.

Notes:

- Specific guidance on the compatibility of hardware and software is given in Section's 3 to 8 of the SSI Configuration Guide NR/GN/SIG/17901.
- It shall be noted that recent modifications to SSI hardware and software may not always be reflected in the mod state panel and careful attention shall be paid to any additional labelling on the equipment.

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