

Ref:	SSI 8150E
Issue:	11
Date:	02/06/2012
Compliance date:	01/09/2012

Module

Chapter E: Appendices 6, 7 & 9

Endorsement and Authorisation

For endorsement, authorisation and issue record of this document, please refer to the SSI Applications Manual Contents, NR/L2/SIG/17002

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User information

This Network Rail standard may contain requirements that are colour-coded according to the following Red–Amber–Green classification.

Red – Mandatory requirements

- **Requirements** that **will** be complied with, and achieved under all circumstances.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner.
- These requirements are monitored for compliance.
- Local non-compliances, discovered through engineering verification visits, will be reported and monitored through the quarterly Engineering Verification Report.
- Corrective actions will be enforced where local non-compliances remain open beyond the agreed mitigation plan dates.
- These are presented in a red box **and with the word “shall” or a direct instruction.**

Amber – Conditional requirements

- **Requirements** that **will** be complied with unless deviation has been approved.
- Accountability for the efficacy of these requirements lies with the Professional Head/ Standard Owner, or their nominated Delegated Authority.
- These requirements are monitored for compliance.
- Derogations **may** be permitted; which are to be approved by Standard Owner in advance.
- Derogations and Temporary Non-Compliances **may** be granted through the existing Delegated Authority arrangements.
- These are presented with an amber sidebar **and with the word “shall” or a direct instruction.**

Green – Guidance

- Guidance based on good practice; representing supporting information, based on good practice, to help achieve **RED** and **AMBER** requirements.
- This guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used, which do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence/documentation.
- This is presented with a dotted green sidebar **and with the word “should” (usually in notes).**

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Issue record

Issue	Date	Comments
11	01/09/2012	Appendix 8 transferred to NR/GN/SIG/17901

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 01/12/2012.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

Reference documentation

See Appendix 9.

Disclaimer

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1 Appendix 6: List Of Modification States

For explanatory text see Chapter B Sections 7.6 and 8.

1.1 Signal Module MkI & MkII

BR Spec 1902 for MkI and 1902A for MkII

MOD . ST.	MODIFICATION DETAILS	PRGRM. SSI4311-	MAIN EFFECT OF CHANGE FOR USER
1	MkI version as used on 1A or 1A(upgrade) schemes.	A	No longer used on Network Rail
2	Change to MkII. Cut and strap PCB modifications + program change.	B3	Extended addressing, double cut inputs added, and pin out changed. Cannot be used on 1A or 1A(upgrade) category schemes.
3	As 2 + program change.	B4	-
4	As 3 with modified earthing.		
5	As 4 with "piggyback" NVRAM arrangement.		
6	New PCB layout incorporating above changes.		
7	As 5 + program change.	C1	Message terminator changed to ease Trackside Data Link blip problem. Problem
8	As 6 + program change.		eliminated of Module going to sleep due to noisy Trackside Data Link. LDT compatible.
9	As 7 + program change.	C2	Improved Module performance in reading of address and modifier inputs lines in
10	As 8 + program change.		presence of interference.
11	As 9 + addition of exchange line decoupling capacitors.	C2	Improved Module performance in exchange of information between the Module's
12	As 10 + addition of exchange line decoupling capacitors.		Processors in the presence of interference.
13	As 11 + power interruption capacitor.	C2	Made Module immune to short power supply interruptions (approx. 40ms) during power
14	As 12 + power interruption capacitor.		supply changeovers.
15	As 13 or 14 but with program issue C3.	C3	C3 changes: Red retained aspects no longer blink due to power disable tests. Link select strategy improved when own message from I/L corrupted.
16	WRSL MkII as for 15 but with program issue D1, the corresponding WRSL modification state is W or later.	D1 #	WRSL MkII modified to improve the performance of the TPWS interface.
17	ALSTOM MkII as for 15 but with program issue C4.	C4	ALSTOM MkII modified to improve the performance of the TPWS interface.

Notes:

The modification state number is that number following the last number crossed out, and up to 14 indicates both hardware modifications and installed program issue. Separate software label introduced for modification state 15. See Appendix 5 (in Chapter D) for the effect of changes of program issues after SSI4311-C3.

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- An Example has been found of a WRSL MkII SM fitted with SSI4311-D1 but labelled modification state 15, however all WRSL MkII SMs fitted with SSI4311-D1 shall be considered to be fully interchangeable with WRSL MkII SMs to modification state 16.

1.2 Signal Module MkIII, MkIIIA & MkIV

BR Spec 1902B

MOD . ST.	MODIFICATION DETAILS	PRGRM. SSI4311-	MAIN EFFECT OF CHANGE FOR USER
1	MkIII developed from MkII, using improved internal layout. Labelled MkIII. ALSTOM Mod States 2, 3 and 4 have been issued, Mod 3 introduced program issue C4 and Mod 4 had O/P and I/P improvements.	C3 or later #	More robust to electrical environment at the trackside. Fully interchangeable with MkII. ALSTOM MkIII Mod 4 improves EMC robustness, but has a lamp proving problem if certain external strapping is omitted, requiring a lamp proving test at installation.

Spec WS1902B

MOD . ST.	MODIFICATION DETAILS	PRGRM. SSI4311-	MAIN EFFECT OF CHANGE FOR USER
15	MkIIIA developed from MkII, using improved internal layout. Labelled MkIIIA, dark grey finish. Mod D introduced, O/P improvements over Mod C.	D1 or later	More robust to electrical environment at the trackside. Fully interchangeable with MkII & MkIII. Mod D has improved EMC robustness, reduced tendency to OID.

Spec AL1902C

MOD . ST.	MODIFICATION DETAILS	PRGRM. SSI4311-	MAIN EFFECT OF CHANGE FOR USER
AL1	MkIV developed from MkIII to overcome lamp proving problems with missing plug coupler strapping and other improvements.	C4 or later	Improved version of ALSTOM MkIII including enhanced EMC performance. Fully interchangeable with MkII, MkIII and MkIIIA.

Notes:

GEC/ALSTOM Modules shall use C4 or later.

The modification state number is that number following the last number crossed out, and indicates hardware modifications only. A separate software modification box indicates installed program issue.

1.3 Link Module

BR Spec 1904 for MkII, 1904A for MkIII and WS1904B for MkIIIA

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MOD . ST.	MODIFICATION DETAILS	EFFECT OF CHANGE FOR USER
-	MkII as used on 1A or 1A(upgrade) category schemes.	Developed from MkI (MkI never entered service).
-	MkIIa as used on 1A or 1A(upgrade) category schemes	Ability added to use in repeater pairs.
1 #G	MkIII as used on all other category schemes. Second Data Link connection added.	Electrically separate Data Link outputs.
2 #G	MkIII voltage clamping diodes and additional resistor added	Reduction in susceptibility to "blips", i.e. reflected signals on Trackside Data Links.
2	MkIIIA developed from MkIII using revised internal layout. Label marked MkIIIA and identifiable by dark grey finish.	More readily produced. Increased surge protection. Interchangeable with MkIII.

Notes:

#G For GEC DLMs, modification state 1 equates to GEC SS2003 modification state 1, and modification state 2 equates to both SS2003 modification state 2 and SS2004 modification state 2.

This Module has no program, thus the modification state for this Module only indicates hardware modifications. The modification state number is that number following the last number crossed out.

It should be noted that the label on some GEC MkIII DLMs wrongly states BR specification 1904 instead of 1904A. These labels are being rectified by ALSTOM when the DLMs are returned to them for repair.

1.4 Points Module MkI & MkII

BR Spec 1901 for MkI and 1901A for MkII

MOD . ST.	MODIFICATION DETAILS	PRGRM. SSI4312-	MAIN EFFECT OF CHANGE FOR USER
1	MkI version as used on 1A or 1A(upgrade) schemes.	A	No longer used on Railtrack
2	Change to MkII. Cut and strap PCB modifications + program change.	B3	Extended addressing double cut inputs added and pin out changed. Cannot be used on 1A or 1A(upgrade) category schemes.
3	As 2 + program change.	B4	-
4	As 3 with modified earthing + program change.	B5	Elimination of spurious I/P interface failures and reduced sensitivity to O/P interface failures due to impulsive noise.
5	As 4 with "piggyback" NVRAM arrangement.	B5	-
6	New PCB layout incorporating above changes. -		
7	As 5 + program change.	B7	Elimination of Module failures due to Processor divergence after point detection contact bounce.
8	As 6 + program change.		
9	As 7 + program change.	C1	Message terminator changed to ease Trackside Data Link blip problem. Problem