

1904A

BRITISH RAILWAYS BOARD

SPECIFICATION NO. 1904A

FOR

SOLID STATE INTERLOCKING DATA LINK MODULE MARK III

ISSUE C

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D OF S

FOREWORD

This specification supersedes all previous issues and is issued by:-

British Railways Board,
Director of S. & T. Engineering,
Materials Management Group,
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from whom further copies may be obtained.

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REFERENCES

British Railways Drawings

ELS - AI - 3534 Data Link Module Mk III Circuit Diagram
ELS - A4 - 3565 Data Link Module Mk III Coil Data
ELS - A4 - 3566 Data Link Module Mk III Parts List

British Railways Specification

967 Environmental Conditions for Railway Signalling Apparatus
1900 General Specification for Solid State Interlocking Equipment

Reference is also made to the SSI Code of Practice for Design of Signalling Schemes SSI-8500,

Other Specification

BS 381c British Standard Paint Colour

The latest issue of all specifications, drawings, and British standards shall apply unless otherwise stated.

2009/2213r/1



Documents

Document Sharing Hub

Manufacturers Drawings

Westinghouse Signals :- E 19050/107 Issue XX

GEC General Signals :- OW 60407 Issue XX

1. GENERAL

- 1.1 Data link modules (DLMs) part of the serial data distribution system between the solid state interlocking and the trackside functional module (TFM) which it controls. The modules perform the two main functions of transmitting data from the solid state interlocking to the TFM and then returning data from the TFM to the solid state interlocking.

The module shall be capable of connection to up to six trackside functional modules at the lineside or four multiprocessor modules at the interlocking. The module shall also be capable of driving two electrically isolated data link systems.

The module may also be configured as a repeater in order to extend the transmission line by working two modules "back to back". In this mode the module may be connected to a maximum of five TFMs. The detailed operation and connection configuration are contained in the SSI Code of Practice SSI 8500.

- 1.2 This specification states the Engineering requirements for a solid state interlocking module for data transmission.
- 1.3 The module shall meet all the requirements of BR Specification 1900 unless otherwise stated.

2. CONSTRUCTION

- 2.1 The module shall be constructed to meet the requirement of BR Specification 1900 Section 4.
- 2.2 The module shall meet the requirements of BR Specification 967 category D.
- 2.3 The module shall contain a printed circuit board assembly which shall be mounted in the small type trackside functional module.
- 2.4 The module shall be internally labelled in accordance with the following: -
- (a) The PCB assembly shall have all the component numbers and positions marked.
 - (b) The PCB assembly shall carry the manufacturers name, module type, BR specification number, date of manufacture and modification state.

- 2.5 A nameplate with natural lettering on a blue ground to BR Specification 1900, Section 4. shall be attached to the outside of the module. The label shall be generally in accordance with drawing 1904-A4-1 and mounted on the module front panel (plug side).
- 2.6 The materials used and finish shall comply with BR Specification 1900 Clause 5. The modules shall be painted Light aircraft Grey BS specification 381c colour number 627.

3. ELECTRICAL REQUIREMENTS

- 3.1 The module shall contain all the circuitry shown in the following drawings.

GEC Dwg No. OW 60407 issue XX
or
WS Dwg No. E 19050/107 issue XX

These drawings include those components introduced to remove the tendency of the DLM to produce spurious "blips" when used in repeater mode.

- 3.2 The module shall be provided with a mains input filter; and the option of linking externally the modules chassis earth, filter earth and 0 Volts shall also be afforded, by means of pins allocated in the 50-way connector.
- 3.3 Plug in components shall not be used.
- 3.4 An external indication shall be provided indicating that the 5V dc power is available within the module.

4. CONNECTORS

The module shall be connected via a multiway connector. The standard connector shall be a 50 way rectangular form, details of which, including pin allocation to be used, are shown in Appendix one of this Specification.

5. RELIABILITY

The module shall be designed to achieve a nominal predicted MTBF of 10 years. The Contractor shall send details of the method of calculation used.

6. MODULE AND INPUT/OUTPUT RATINGS

The module power supply shall be from one of two sources: -

- a) 110V a.c., 50 Hz
- b) 12V d.c.

In case a), the module shall operate reliably from a supply of amplitude range 94 to 122 V rms, at a frequency of 50 Hz $\pm 10\%$. The maximum current drawn shall be 100 mA.

In case b), the module shall operate reliably from a supply of amplitude range 9 to 15 V. The maximum current drawn shall be 500 mA.

Each transmitter input shall be capable of sinking up to 25mA without damage.

The receiver shall be capable of supplying 20mA on all of its outputs simultaneously. It must be capable of sustaining a short circuit on one output indefinitely without incurring any damage.

The transmitter output shall be capable of supplying a signal of 4.75 ± 0.25 V pk-pk into a 50 Ohm load at the data link terminals. The receiver input shall have a cut off threshold of 500 ± 100 mV pk-pk on a 10 kHz sine wave. The above parameters should be measured at $20 \pm 2^\circ\text{C}$.

7. TYPE APPROVAL TESTS

The type approval testing shall be carried out as detailed in BR Specification 1900 Section 8. The following type tests shall be applied to an example of the data link module.

- Visual Inspection (1)
- Performance Test (1)
- Dry Heat Test
- Damp Heat Test
- Low Temperature Test
- Drip Test
- Drop Test
- Vibration Test
- Humidity Test
- Insulation Test
- Condensation Test
- Visual Inspection (2)
- Performance Test (2)