

BRITISH RAILWAYS BOARD

SPECIFICATION 1905A

FOR

FOR SOLID STATE INTERLOCKING MULTIPROCESSOR MODULE (MKII)

FOREWORD

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

British Railways Board,
Director of S. & T. Engineering,
Materials Management Group,
Room 1103,
Rail House,
CREWE,
Cheshire. CW2 6EA

from whom further copies may be obtained.

Technical queries shall be referred to the above address.
For telephone enquiries the numbers are:-

BT (STD) 0270-532494
BT (STD) 0270-532345 FAX
BR (ETD) 05-32494
BR (ETD) 05-32345 FAX

The information contained within this document is confidential and must not be used other than for the purpose for which this specification was released.

REFERENCES

Reference in this specification is made to :-

SSI 8004 Vol 2, Multiprocessor Module Handbook.

British Railways Specifications

967 Environmental conditions for Railway Signalling apparatus
1900 General Specification for Solid State Interlocking equipment
1904A SSI Data Link Module (Mk III)
1906 SSI Long Distance Terminal
1908A SSI Panel Processor Module (Mk II)
1911A SSI Processor Memory Module (Mk II).
1990 Procedures for Programming and Checking PROM devices for vital systems.

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

1. GENERAL

- 1.1 This specification states the specific engineering requirements for a Solid State Interlocking ("SSI") Multiprocessor Module ("MPM").
- 1.2 MPMs together form the interlocking part of SSI. They are triplicated for availability but will continue to work as a duplicated system automatically upon the failure of the first module. The MPM is versatile in that it can also be configured by software to act as a diagnostic processor or a simulator, by installing the appropriate Processor Memory Module ("MM") as specified by BR Specification 1911A.
- 1.3 (1) The MPM as its name implies has several functions which differ only by the software provided within the Memory Module, the hardware being identical for each. The MPMs when acting as an interlocking require information to be fed to them from both
- (a) Panel Processor Modules which interface the control panel side of the MPM.
 - and
 - (b) Data Link Modules or Long Distance Terminals which link the interlocking to the trackside equipment.
- An interlocking cubicle may be required to communicate to other interlocking cubicles within the same scheme (up to a set maximum), and an internal communications processor is provided within the MPM for this purpose.
- (2) The MPM when acting as a diagnostic module monitors the data flow on the data link and communicates with the technicians terminal.
- (3) The MPM when acting as a simulator accepts information from the test panel and then is connected to the data link where it receives and transmits data.
- The detailed structure, operation and possible connection configurations are obtained in the handbook for the SSI MPM SSI8004, Volume 2.
- 1.4 The module shall meet all the requirements of BR Specification 1900 unless otherwise stated.
- 1.5 A "SYSTEM" indication shall be provided on the front of the module and "POWER", "FUSED SUPPLY" and "SYSTEM" indications on the rear of the module.
- 1.6 The module shall be fitted with a Manufacturer's label at the rear of the module, containing at least the following information:-

Manufacturer's name
Manufacturer's part number
Module serial number
Date of Manufacture
Module type (typically "Multi Processor Module Mk II")
BR Specification number BR1905A
BR Modification state.

2. CONSTRUCTION

- 2.1 The modules shall be constructed to meet the requirements of BR Specification 1900.
- 2.2 The module shall meet the requirements of BR 967 Category 'B' with the exception that drip proofing is not required. (The cabinet in which the module is located shall be drip proof to BR specification 967 Category C).
- 2.3 The module shall be host to a MM which is specified in BR Specification 1911A.
- 2.4 The module shall be internally labelled in accordance with the following:-
 - 2.4.1 The p.c.b. assembly shall identify all component positions.
 - 2.4.2 The p.c.b. shall carry the manufacturer's identity, p.c.b. type, date and modification state.

3. ELECTRICAL REQUIREMENTS

- 3.1 The module shall contain all of the circuitry shown on the following WBS drawings:-
 - WS/E19050/150 sheet 1 (Central Processor and interface circuits)
 - WS/E19050/150 sheet 2 (Redundance Management circuit)
 - WS/E19067/1D Power Supply Unit circuit diagramor GEC drawings:-
 - OW 60577 & OW 60678 MPM main PCB
 - 2W 60583 Power Supply Circuit
 - 3W 60582 Suppression PCB
- 3.2 The component specifications (tolerances, ratings and so on) shall be as shown on the component schedules except as specifically authorised by the Engineer.
- 3.3 All proposals for input/output connections to and from PCB assembly shall be subject to the specific approval of the Engineer and incorporate the following design criteria.
- 3.4 The connections from the PCB to the rest of the module shall be such that there can be no practical misconnection.

All components on the PCB shall be soldered except that IC sockets shall be provided for the following components. Such sockets shall be subject to the approval of the Engineer.

 - (a) CPU
 - (b) FROM and EPROM
 - (c) VIA
 - (d) Security fuse (in suitable socket)
- 3.5 FROM devices shall be programmed and labelled in accordance with BR Specification 1990.

4. CONNECTORS

- 4.1 All external connections to the module shall be made via multiway connectors. The standard connectors shall be a 75 way and a 50 way of rectangular form. Further details of these connectors and their pin allocations are shown in Appendix 1 to this specification.
- 4.2 A connector for a MM shall be a 40 way IDC "male" header. A suitable ribbon cable shall be provided to plug into the header. Each end shall be terminated in a 40 way IDC "female" connector to satisfy BR Specification 1911A. See also Appendix 2. The connector shall have central polarising keying to ensure that there will be only one way to plug in the Memory Module.
- 4.3 The mains supply voltage, 110v a.c., shall be made by an IEC filtered connector.

5. RELIABILITY

The module shall be designed to have a nominal minimum predicted MTBF of 15,000 hours. The Contractor shall send details of the method of calculation and database used.

6. TYPE APPROVAL TESTS

The Type approval tests listed below shall be carried out as detailed in BR Specification 1900. A MM should not be installed except for electrical tests.

Visual Inspection 1
Performance Test 1
Dry Heat Test
Damp Heat Test
Low Temperature Test
Drop Test
Vibration Test
Insulation Test
Condensation Test
EMC Test
Visual Inspection 2
Performance Test 2

7. ACCEPTANCE

Details of the acceptance tests to be carried out on every module during/after manufacture are shown in Appendix 3 of this Specification. In order to be accepted, each module must pass the Acceptance Test and be supplied with all documentation specified herein on in BR Specification 1900.

Contractor's reports shall indicate which acceptance test number is referred to in their reports.

APPENDICES

1. Multiprocessor Module Connections.
2. Memory Module connections.
3. Acceptance test specification.

LSDS7023/4



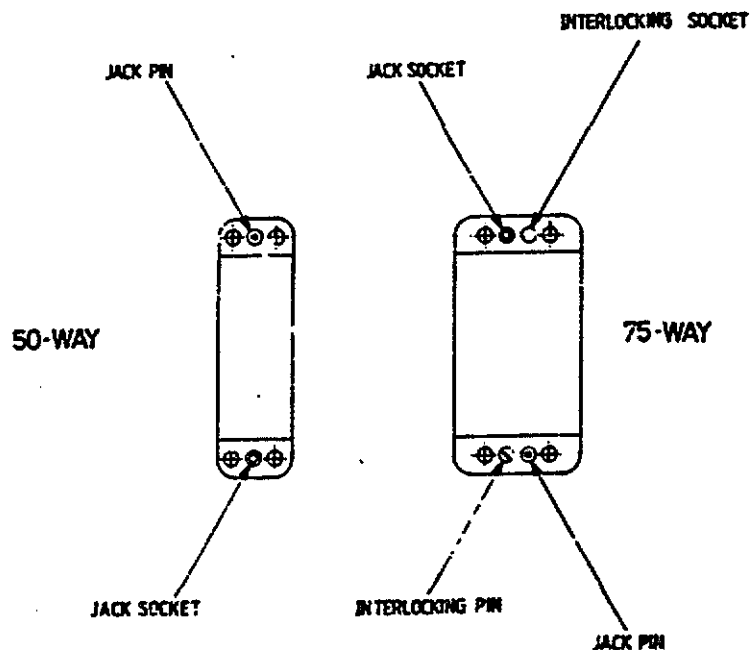
Documents
Document Sharing Hub

BR SPECIFICATION 1905A APPENDIX ONE

MULTIPROCESSOR MODULE CONNECTOR

The connectors shall be a 75 way and 50 way rectangular type from the BICC-Vero Trident range.

The connectors on the module shall be part Nos. 933-76222D and 933-76109G. Interlocking and jack pins and sockets shall be fitted as shown below. The free connector attached to the wiring loom within the equipment room shall be part Nos. 933-76182G and 933-76183D, fitted with female shrouds and extra large jack screws, and with interlocking and jack pins and sockets to mate with those on the module connectors.



INTERLOCKING DETAIL - VERO CONNECTORS

The connector pin outs shall be as listed below. The pins, to be fitted to the 75 way connector attached to the module shall be to part no. 229-90219G and those fitted to the 50 way connector attached to the module shall be 229-90226A. The sockets to be fitted to the 75 way free connector attached to the wiring loom shall be to part No. 229-90225D (previously T3P16FC1L-AU800). Those sockets to be fitted to the 50 way free connector shall be part No. 229-90218K (previously T3P16MC11-AU800).