



## Appendices B and B1, *System components*

Network Rail specification

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## 1 Introduction

### 1.1 Background

The concept of Modular Signalling has been adopted and developed within Network Rail to introduce new products and changes in the implementation of signalling projects in order to bring about significant cost savings.

### 1.2 Purpose

Guidance on implementing Modular Signalling is contained in the Modular Signalling Handbook, and associated suite of Appendices. The purpose of this specification is to describe the system components, demonstrated as viable through trials, that support accepted Modular Signalling architectures.

This specification is primarily aimed at supporting the role of the Designated Project Engineer for a Modular Signalling scheme by providing a description of the system components which may be provided by suppliers to fulfil the requirements of the Modular concept.

It covers the Technical Detail that might otherwise be presented in an Initial and Outline Project Specification and replaces the need to carry out a Technical Option Definition and Feasibility study as only the components detailed in this document are acceptable for a Modular Signalling Scheme.

Descriptions of derogations applicable to modular signalling schemes can be found in Appendix F.

It provides technical descriptions that can be used to support technical activities during GRIP Stages 1 to 4 – *Requirements Analysis* and *Preliminary Scheme Design stages*.

Site-specific information for a particular scheme is detailed in the Scheme Plan and Signalling Equipment Plan.

This specification is subject to revision as the status of Modular Signalling products and system acceptance changes. Always consult the most recent version.

### 1.3 Scope

This specification applies to all projects deemed to be Modular Signalling schemes and being implemented on Network Rail infrastructure.

The Modular Signalling Handbook contains principles and derogations which may only be used in the context of a Modular Signalling scheme and use in any other context or project type is not supported by this Handbook.

## 1.4 Definitions

Common definitions are contained in the main section of the Modular Signalling Handbook.

## 1.5 Network Rail Product Acceptance

Standards already exist which specify the functional requirements for system components to be used on Network Rail controlled infrastructure. Suppliers of lineside equipment should demonstrate that they have met all requirements and have received Product Acceptance in compliance with the requirements of NR/L2/RSE/100/05.

Manufacturers of equipment seeking Product Acceptance are required to submit proposal forms for all products to be assessed and evidence demonstrating compliance with all identified specifications.

Network Rail product acceptance is granted to the manufacturer of the product as they have the responsibilities for quality control. The supply to Network Rail is subject to a standard company commercial process.

## 1.6 Documentation

Suppliers of a Modular Signalling system shall document their System Description and demonstrate how they have met the requirements and preferred practice identified in this Handbook Appendix. **[MSSC 1.1B]**

*NOTE Supplier System Description documents that have been reviewed and accepted by Network Rail are listed in Appendix B1.*

## 2 Interlocking

### 2.1 Application

A computer-based Interlocking shall be used for Modular Signalled routes with equipment distribution as required to support an approved Modular System architecture. **[MSAC 1.1B]**

The interlocking shall have defined, developed and tested standardised data structures that provide modularity and permit the re-use of data structures on other secondary routes utilising modular techniques and principles. **[MSAC 1.2B]**

The interlocking shall be capable of supporting migration of the route/scheme to future control using ERTMS. **[MSAC 7.1B]**

The interlocking shall be compatible with FTN as the data bearer. The interlocking hardware and data protocols shall be flexible to allow interfaces at existing FTN nodes and minimise the need for new nodes to be provided. Suppliers shall detail the FTN access node requirements for their interlocking design so that suitable provision can be made on the scheme. **[MSAC 2.1B]**

The interlocking and its associated scheme specific data, interfaces and duplicated fringe arrangements shall be tested in a factory or off-site environment prior to installation on site to reduce the amount of site testing. **[MSSC 5.1B]**

The standard interlocking interface to the Control and Indication System is specified in NR/SP/SIG/17503. Where an alternative protocol is proposed, this shall be subject to product acceptance and the supplier shall give consent to share the protocol for the sole purpose of disclosing it to third party suppliers of Traffic Management Systems to Network Rail. **[MSAC 1.3B]**

The interlocking shall provide a user interface for maintainers including graphic representations of equipment and lineside equipment. Monitoring and control of the interlocking shall be possible from a remote location as well as locally, though not all remote terminals shall be capable of applying controls. Any controls or restrictions applied by the maintainer shall be held on the interlocking and visible to any monitoring terminal, whether local or remote. **[MSME 3.1B]**

The interlocking shall include logging functions to record critical events for a minimum period of 30 days continuous recording. **[MSME 3.2B]**

Logged data shall be time-stamped to a minimum resolution of 1 second and suitable for assisting with the investigation of incidents. Secure local and remote access to the logged data shall be made available with the facility for graphical playback of recorded events. **[MSME 3.3B]**

Additional remote support terminals shall be available, restricted to prevent control of the interlocking. These remote support terminals can be located anywhere that suitable data connectivity is provided. **[MSME 3.4B]**

### 3 Control and indication system

A centralised VDU-based Control System shall be used for Modular Signalled routes with standardised screen and desk layout design with associated ergonomic study to support an approved Modular System architecture. **[MSAC 1.4B]**

The Control System shall be capable of being located remotely from the interlocking and to be transferable to a different control point. In addition to operating interlockings provided as part of a Modular Signalling scheme, it shall also be capable of operating other interlockings, accepted for use on Network Rail, by means of additional interface hardware or software. **[MSAC 3.1B]**

Automated route setting facilities (other than “Automatic” switches at signals) are not required for a Modular Signalling system but the control system should be capable of having these facilities added to it at a later date.

In addition to the signallers control equipment, the following functions and equipment shall be provided, either within the system or interfaced to it: **[MSAC 3.2B]**

- Alarm panel
- Emergency Alarms to any fringe signal control
- Control Panel for all MCB-CCTV crossings (plus CCTV monitors for any crossings operated by this method)
- Telephone Concentrator with keyboard and handset
- GSM-R terminal
- Fringe train describers

Provision shall be made for a Network Rail IM PC within the control location. **[MSAC 3.3B]**