

Information for users

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Modular Signalling Handbook

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

The purpose of this document and its appendices is to provide information for those implementing Modular Signalling on Network Rail infrastructure.

The intended audience covers all potential users including project and programme developers, project managers, engineers, designers, third-party systems integrators and contractors.

1.3 Scope

This Modular Signalling Handbook document applies to all projects deemed to be Modular Signalling Schemes being implemented on Network Rail infrastructure.

The Handbook contains principles and derogations which may only be used in the context of a Modular Signalling Scheme.

This standard can also apply to schemes where Modular Signalling is suitable but has minor additional functionality or other variations from the Modular Signalling Handbook.

Projects other than those designated Modular Signalling Schemes may not make use of these principles, derogations and variations without obtaining separate, project specific authority to do so.

Any variances from Group or Network Rail standards in connection with Modular Signalling have been sought in accordance with normal practice.

Variations from this Handbook shall be referred to Network Rail Technical Services in their capacity as “System Authority” for Modular Signalling.

This standard applies to all persons involved in the development of Modular Signalling Schemes and systems including but not limited to: operators, infrastructure owners, clients, sponsors, project/programme managers, engineers, contractors and suppliers.

1.4 Definitions

Modular Signalling (system)

an economical signalling solution comprising processes and hardware to facilitate the use of modular design principles, off-site testing, modularised assembly/disassembly and “island” architecture

Modular Signalling Handbook

a Network Rail document (this) with appendices which describes Modular Signalling and constraints on its application and any applicable derogations to Network Rail’s standards suite

Modular Signalling Development Programme

a programme of activities established to introduce Modular Signalling onto Network Rail comprising development activities, trials and documentation including this Handbook

Modular Signalling Scheme

a signalling scheme which has been assessed as being within the constraints of the Modular Signalling Handbook and for which the contents of the handbook may be applied

Modular Signalling Island

a discrete, geographically-bounded area of Modular Signalling roughly equivalent to that which is traditionally controlled by a mechanical signal box

Modular Signalling System Authority

the technical authority for Modular Signalling; currently the authors and approvers of the Modular Signalling Handbook until further notice

2 Handbook Structure

The Modular Signalling Handbook consists of this document and a number of detailed appendices which may be read independently.

Users of the Handbook or its appendices are advised to read this document in order to gain an overall understanding of Modular Signalling. This section describes the contents of the Handbook.

2.1.1 Modular Signalling Handbook

This document provides a high-level introduction to the concepts of Modular Signalling and the processes that should be followed in order to deliver a compliant Modular Signalling Scheme in an efficient manner.

This document and its appendices also provide mandated rules for Modular Signalling and set out the restrictions on the use of this Handbook on Network Rail infrastructure in terms of its applicability and the allowable variations from Network Rail's standards suite.

This Handbook and its appendices contain a mixture of requirements, advisory information and explanatory text. Requirements for Modular Signalling Schemes and Modular Signalling systems are identified thus:

Requirement **[MSXX N.NX]**

The letters indicate the class of requirement and relate to the top-level acceptance requirements in clause 5.

The number represents the unique requirement sitting below. Thus, requirement MSAB 1.0 has sub-requirements MSAB 1.1A, MSAB 1.2A, etc.

The final letter refers to the Appendix in which the requirement appears.

The square brackets serve only to separate the requirement identity from the text.

2.2 Appendix descriptions

A: System Architecture: describes the permissible architectures for a Modular Signalling Scheme in general terms and provides details of those architectures from specific suppliers which have been approved for use.

Issue 3 | Publication date: 07 April 2014

B: System Components: describes the components required for Modular Signalling in order to realise a particular architecture. The document also details those components which have been approved for use in Modular Signalling Schemes but is not exclusive and may be added to.

Issue 3 | Publication date: 07 April 2014

B1: Approved System Components: describes a range of components which have been accepted for use on Network Rail infrastructure within a defined architecture.

Issue 3 | Publication date: 07 April 2014

C: System Functionality: describes the functionality and specifically the signalling principles to be used in Modular Signalling.

Issue 3 | Publication date: 07 April 2014

D: Non-Functional Requirements: sets out the requirements for non-functional requirements and attributes for a Modular Signalling system such as safety, reliability, availability, maintainability, environmental, EMC, etc.

Issue 3 | Publication date: 07 April 2014

D1: Ergonomic Requirements: states the Ergonomic requirements for Modular Signalling Schemes.

Issue 2 | Publication date: February 2012

E: Maintenance: describes the objectives for a highly maintainable system and the design requirements to achieve such objectives.

Issue 3 | Publication date: 07 April 2014

F: Statement of application and compliance: details the RSSB Group and Network Rail standards to be worked to and the scope of derogations/variations from them which have been agreed with the standard owners as being suitable for use in Modular Signalling Schemes.

Issue 2 | Publication date: 07 April 2014

G: Governance and Procurement: details the process for getting a Modular Signalling Scheme into Network Rail's workbank and the commercial and procurement activities that follow throughout the lifecycle.

Issue 2 | Publication date: February 2012

H: GRIP Stages 1 & 3: Feasibility Assessment and Requirements Analysis Processes: sets out the process and documentation requirements needed to complete the equivalent of GRIP Stages 1 and 3 for a Modular Signalling Scheme. There is no GRIP Stage 2.

Issue 3 | Publication date: 07 April 2014

H1: Implementation and Commissioning Planning: provides guidance for project developers, engineers, managers and others involved in the early stages of a Modular Signalling Scheme on the recommended means of implementing Modular Signalling.

Issue 3 | Publication date: 07 April 2014

H2: Implementation and Commissioning Outline Designs: provides guidance on the design principles for elements of Modular Signalling Schemes including point conversions, level crossings and fringe arrangements.

H3: Scheme Design Guidance: gives guidance on scheme specifics for Modular Signalling schemes.

Issue 3 | Publication date: 07 April 2014

H4: Equipment and Drawing Identification: specifies requirements on numbering conventions to be adopted for outside equipment including track sections, points and signals, and design items such as scheme plans and drawings.

Issue 3 | Publication date: 07 April 2014

I: GRIP Stage 4 – Preliminary Scheme Design Process: describes the activities and documentation required to complete Preliminary Scheme design which is the equivalent of GRIP Stage 4.

Issue 3 | Publication date: 07 April 2014

J: GRIP Stage 5 – Signalling Detailed Design: specifies how design should be carried out for a Modular Signalling scheme in the most efficient manner.

Issue 3 | Publication date: 07 April 2014

K: GRIP Stage 6 – Verification and validation (Testing): describes the principles that should be adopted for verification and validation across the whole project lifecycle in order to attain the efficiencies that Modular Signalling needs to deliver.

Issue 2 | Publication date: February 2012

L: GRIP Stage 6 – Installation and commissioning: describes the process for installation and commissioning but excludes testing which is described in the Verification & Validation (Testing) section.

Issue 2 | Publication date: February 2012

M: GRIP Stages 7 & 8 – Hand-back to operations and maintenance: describes the processes for handing back a Modular Signalling scheme to maintenance and operational functions. These processes are simplified from regular practice due to the simplifications afforded by Modular Signalling.

Issue 2 | Publication date: February 2012

N: Non-Signalling Design: covers the design processes to be followed for other non-signalling disciplines, i.e. Electrical Power, Civils, and Telecoms.

Issue 2 | Publication date: February 2012

O: Assurance Processes: describes the processes that need to be followed to demonstrate that a Modular Signalling Scheme has been adequately designed and implemented and covers areas such as ROGS and GRIP products, compliance, checklists and other assurance documentation requirements.

Issue 2 | Publication date: February 2012

Z: Templates: templates referred to in the appendices of the Handbook may be found here. Appendix Z is held on the Network Rail Collaboration website at address:

<http://oc.hiav.networkrail.co.uk/programmes/stamp/Pages%20Sig/Modular%20Signalling.aspx>