



Appendix H1, *Implementation and commissioning planning*

Network Rail guidance

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1 Scope

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.

Key to these efficiencies is the undertaking of the majority of construction and testing activities offsite.

Initial testing should be undertaken in the factory where the components and subsystems were manufactured and configured.

Subsequent integration testing should be carried out in the facility or “hangar” where the system is assembled and fully tested. “Hangaring” is the term used for the testing of the whole Modular Signalling System in the integration facility.

Testing offsite in a factory and a hangar has many safety and technical benefits including: protecting the equipment from poor weather, ease of staff access at times unconstrained by the operational railway, and allowing staff to work at times other than nights and weekends.

Once the hangaring has been carried out accordingly, the system should be disassembled, suitably packaged and transported to site for installation. Onsite testing may therefore be limited to a set of simplified tests.

1.2 Purpose

Early consideration of implementation and commissioning activities is a key part of developing a scheme. This document contains guidance on these issues for the Modular Signalling system. It is current best practice as identified by Network Rail operators and engineers. Alternative approaches from this guidance may be made but should be justified by specific site conditions and circumstances.

Outline design details illustrating methods of achieving the implementation processes described in this document are contained in Appendix H2.

1.3 Scope

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

The handbook contains guidance that 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 part of the Modular Signalling Handbook.

2 High level overview

2.1 Implementation and Commissioning High Level Objectives

The main objectives are to significantly reduce the cost of implementing and commissioning a signalling scheme, reduce the number of staff required to undertake the necessary work, reduce unproductive time and reduce the disruption to the operational railway.

One key method is to minimise the amount of enabling and temporary works. Where these are unavoidable, they should be carried out in a way which minimises the amount of work which is subsequently recovered at the final commissioning.

The targets for site activities requiring track possession are as follows (as specified in the Modular Signalling Handbook main module):

- Commissioning of signalling equipment in an 8 hour possession. (benchmarked as consisting of 4 islands with either 2 final or 1 final and 1 temporary fringe). **[MSPI 2.0]**
- Installation of equipment within 5 hour possessions. **[MSPI 3.0]**
- Changeover and commissioning of an MCB-OD level crossing in a 5 hour track possession (road closure or disruption may extend over a longer period; preparatory works will have been carried out prior to the changeover possession). **[MSPI 4.0]**

Typically, the following changes in working practices and principles may help to achieve these objectives:

1. Not carrying out wholesale correlation of existing equipment including that which is retained either permanently or for the purposes of stageworks;
2. Utilisation of degraded mode methods of working for short, temporary periods in place of temporary enabling work;
3. Carrying out site enabling works, e.g. the installation of foundations and ancillary equipment, as and when the appropriate design has been finalised and signed off in non-disruptive rules of the route possessions;
4. Installation of the modularised equipment on site in non-disruptive rules of the route possessions;
5. Utilisation of road and rail vehicle access to transport staff and equipment to site;
6. Where point machines are as yet unfitted, clipping the points in one position and carrying out the conversion at a later date (or prior to the commissioning if the mechanical points can be disconnected first);
7. Effective configuration management (including for example bar-coding of all equipment) as part of a full tracking system for the purposes of control of equipment and tracking of testing activities;
8. Down skilling of certain activities through modified ways of working.

2.2 Consultation and Planning

The key to successful implementation is to start planning for it as early as possible – in practical terms, this should be during GRIP Stage 3. Engagement with internal and external stakeholders is essential so that the implementation programme which is developed is robust and deliverable.

2.3 Types of Testing

Table 1 summarises the different types of testing that are likely to be undertaken during a Modular Signalling project as defined in NR/L2/SIG/30014/E110:

Type	Description
Functional Testing	Exercising of a component or system to confirm the correct outputs are generated with selected inputs.
Principles Testing	A test to confirm that the signalling system provided conforms to Railway Group Standards and statutory requirements and is fit for purpose including satisfying the scheme requirements and the operational needs of the layout
Validation Testing	Evaluation of a system to confirm it meets [its] requirements and is fit for purpose.
Verification Testing	Confirming a system or component is constructed to the initial design details.

Table 1 – Definitions of testing

Detailed information on the testing process for Modular Signalling is contained in Appendix K of this Handbook which, in turn, refers out to the agreed testing methodologies used by approved suppliers of Modular Signalling systems.

2.4 Applicable Group Standards and Network Rail standards

Any temporary enabling works or permanent fringe works on existing equipment should be carried out without endeavouring to bring the installation up to modern day standards.

Network Rail standards and Railway Group Standards apply to other works unless a derogation has been granted.

2.5 Correlation

Correlation is only required against the design details for any temporary or permanent alterations to retained equipment. Wholesale correlation of the existing signalling equipment is not necessary as it will largely become redundant when the new Modular Signalling system is commissioned.