Standardisation of S&T Drawings V2.1

WORKSHOP

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Preface

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I

The Committee on 'Review of Electronic Interlocking (EI) Application Data Design for Achieving Uniformity Across Approved Vendors' has examined the design process adopted by the RDSO listed vendors and submitted the recommendations and the roadmap for achieving uniformity in data design across the vendors.

Recommendations 1.1 & 1.2 are

1.1 Standardisation has to be done for Signal Interlocking plan (SIP), Front Panel Display (FPD) diagram and Route Control Chart (RCC) or Table Of Control (TOC). Leaving any of these primary documents will not help in achieving the goal.

1.2 The nomenclature of (a) Signalling functions on Signal Interlocking Plan, (b) Interlocking Relays have not been standardised. SIP, FPD, RCC/ TOC, Interlocking Circuits have been standardised to a larger extent by earlier work groups

And, the Road map envisaged in 2.1 as

2.1 A Working Group preferably consisting of three members with Software Knowledge, Circuit Design knowledge and Construction Experience has to be constituted. The works carried out by the earlier workgroups[1] have to be reviewed to define the following:

- Station Layout
  - Nomenclature of signal functions
  - Standardisation of Pictorial Symbols
  - Standardisation of Notes, Aspect Control Chart, etc.,
- Table of Control
  - Standardisation of Columns and their Labels
  - Standardisation of Column Entries
  - Standardisation of Notes
- Circuits
  - Standardisation of Circuits
  - Nomenclature of Relay contacts
  - Symbols
- Application Logic

[1] (a) Working Group on Standardisation of Signalling Principles and Interlocking Practices have formulated Directive Principles and Typical Circuits for End Cabin Motor operated points (RB 2010/Sig/WG/Interlocking Principle dated 13/22-10-2010)

(b) RDSO Report on Standardisation of the typical circuits for Electronic Interlocking (Report no. SS/137/2013 Reference: RB 2010/Sig/WG/IP dated 02.05.2012)

- Standardisation of Boolean Operators
- Syntax and Semantics of Statements

- Typical Signalling Design

- Data Dictionary defining above standards

And, the reasons for achieving uniformity listed in 3.5 and 3.6 as

3.5 Standardisation in Design approach and Uniformity in Application Data Design is required to

- Expeditious Design Process - Quick Turnaround
- Expeditious Approval Process with dispensing of manual approval process
- Validation & Verification by formal methods
- Ease of Yard modifications
- Improved Understanding & Ease of Maintenance
- Conformance to RDSO Relay Logic standards
- Verification of Interlocking Logic with respect to Safety Principles
- Simulation & Visualization of Yard Working
- Test Plan Generation for Factory Acceptance Test (FAT) & Site Acceptance Test (SAT)
- Automation of Factory Acceptance Testing

3.6 Lack of Standardisation of Application Data Design may lead to

- Railway design staff have to be familiar with all 4 vendors tools & processes
- Significant design representation variations between and within zones - may lead to delays and errors
- Separate training needs for each vendor specific design process
- Unable to apply Generic Tools such as Model Checkers etc., in the absence of standardised representation
- Important steps - design & verification - are to be done fully manually or heavily dependent on vendors

II

1.0 The Working Group presented the report[2] on 'Standardisation of Signalling Drawing' in CSTEs (Planning) Conference, October 26, 2018 at WR, Churchgate and detailed the following

- Standardisation of nomenclature and numbering scheme of SIP, Panel Diagram and Video Graphics
- Standardisation of Table of Control
- Roadmap for development of compiler for converting TOC to Circuit/ Application software.

1.1 Further, the Working Group recommended in the roadmap to constitute separate committees on (i) SEM Chapters - 'Version Control' and 'Scheme Plan'; (ii) Manual On 'S&T Drawings Standards' and 'Typical Plans & Circuits' and (iii) permanent committee for Control of Drawings, Clarifications, Monitoring, Mentoring.

1.2 Railway Board constituted two separate committees for (i) Finalisation of the typical Electronic Interlocking circuits and (ii) Standardisation of drawings - Signalling Plans, Control Tables, Scheme Plan and Version Control concepts.

1.3 The committee constituted for 'Standardisation of Drawings' examined and deliberated the drawing practices of major railways. This report elaborates on the common standards to be adopted by all railways in preparation of signalling plans, associated tables, notes and symbols; standard interlocking table, VDU diagram and introduction of version control and scheme plans.

[2] Standardisation of S&T Drawings V1.0 dated 26.10.2018

III

1.0 The committee constituted for 'Standardisation of Drawings' presented the detailed report[3] in the PCSTEs Conference held on April 26-27, 2019 at Maligaon.

1.1 The booklet prepared on 'Standardisation of Drawings V2.0' is made available on Railnet at url http://10.195.2.19/iriweb/wiki/Learning Resources

1.2 The committee recommended further roadmap to achieve standardisation of drawings -

- Approval & acceptance of proposed standardisation
- Constituting permanent standing committee to resolve any issues in future
- Conducting workshops for S&T DO personnel

1.3 IRISET has been instructed to organise a 3-day workshop for zonal railways, metro, CORE, RDSO[4]

1.4 Zonal railways are requested to implement the above scheme for one station for standardisation on a pilot basis.[5]

[3] Standardisation of S&T Drawings V2.0 dated 26.04.2019
[4] Para 5.6(c) Minutes of PCSTEs Conference held on April 26-27, 2019 at Maligaon vide 2018/Sig/25-Conf/2 dated 04.06.2019
[5] Para 5.6(d) Minutes of PCSTEs Conference held on April 26-27, 2019 at Maligaon vide 2018/Sig/25-Conf/2 dated 04.06.2019

Introduction



This is an era of digitalisation. Indian Railways are becoming digital by bringing together systems and technology to manage and control the trains better for safety and comfort of rail user. Signalling systems on Indian Railways are witnessing rapid transformation from analog to digital systems.

Digital signalling requires standardisation. Standardisation of drawings will be the first step in bringing uniformity in signalling. Such standardisation will bring productivity, facilitates automation and improves project delivery times. Though certain guidelines have been provisioned in Signal Engineering Manual (SEM) for standardisation of S&T drawings, they are inadequate. Moreover, zonal railways have their own conventions for naming the signalling functions as per local preferences and practices.

This proposed standardisation is to streamline the drawings, their presentation and their version control. The process shall begin with the standardisation of Signalling Layouts, Interlocking Control Tables, VDU Panel Diagrams and Signalling Circuits, which requires standardising symbol representations and nomenclature of all signalling functions and relays.

Signal Design Life Cycle

1

1.0 Introduction

Resignalling works arising out of operational requirements, technological upgradation, section capacity enhancements, railway electrification etc., requires modifications to signal drawings. New signalling works require altogether new signal drawings. Signalling design and its modifications follow a definite and defined stages in its design life cycle from its conception to commissioning.

1.1 AIP Plan

Signal Scheme Plan represents the feasible signalling arrangement for a given geographical location (station/ section). It is prepared based on Project Specifications, Engineering Scale Plan; and/or Signal Interlocking Plan.

Signal Scheme Plan differs from Signal Interlocking Plan that Signal Interlocking Plan refers to the existing signalling arrangements at a geographical location, wherein Scheme Plan is proposed alterations to the existing signalling arrangements

Scheme Plan is produced duly deliberating upon project specifications including operational and maintenance requirement. It is approved initially by Contractors Responsible Engineer (technical approval) confirming that appropriate standards and specifications has been adhered to and competent persons have produced the plan. After submission of the plan to the railways, scheme plan will be verified and is issued as 'Approval In Principle' plan (provisional plan) for field and operating comments.

1.2 AFC Plan

Scheme Plan is further developed taking correlated details after undertaking slte survey, signal sighting and operating comments. Scheme Plan is issued as 'Approved For Construction' plan (approved plan).

Detailed signal designs will require existing source records; systems and equipment details. Source records will be correlated, before production of detailed designs. Designs, once verified and approved, will be released for construction, as 'Approved for Construction' designs.

1.3 Closure Plan

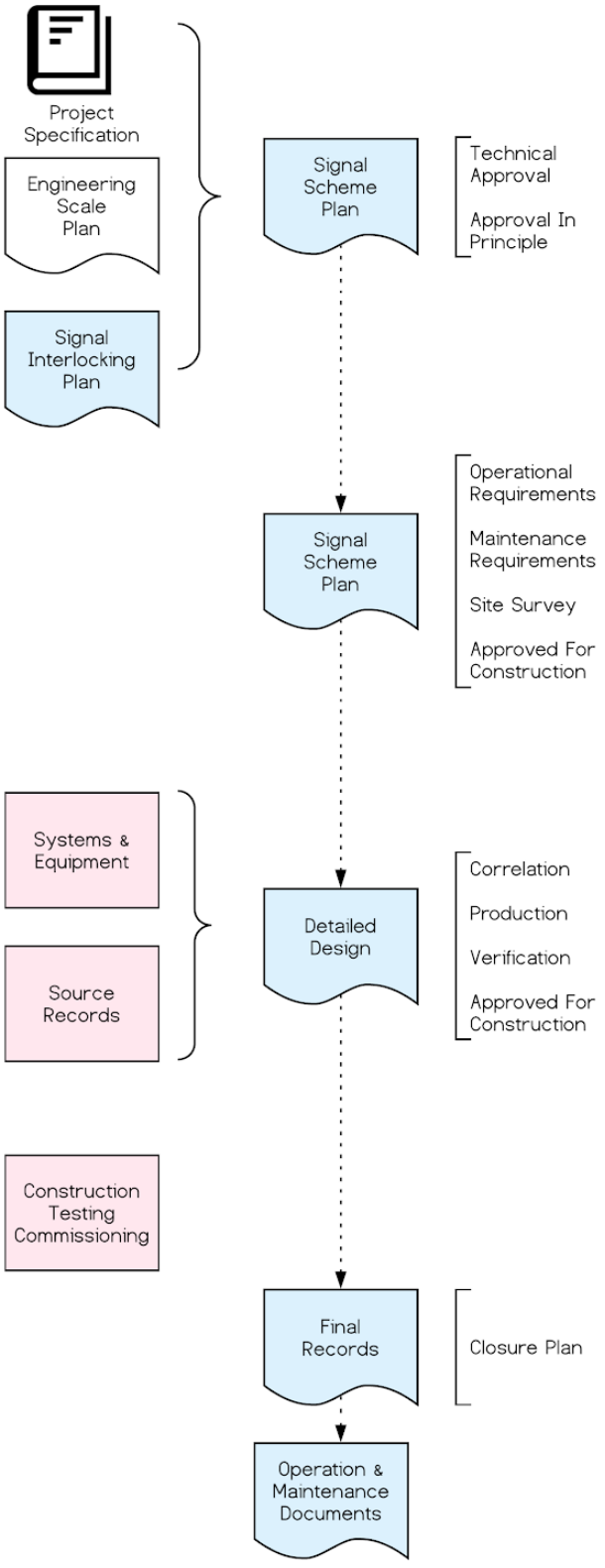
Final updates to plans and designs will be carried after commissioning of the work. After final updates, these plans and designs will become final records. Final records (completion drawings) are required for operations and maintenance of signalling assets.

Signal Scheme Plan will, after commissioning of indented signalling alterations at site, eventually replace base Signal Interlocking Plan with version update.

This cycle repeats for any signalling modifications.

This design life cycle is illustrated at next folio.

Signal Design Life Cycle



Signal Scheme Plan

2

2.0 Introduction

Signal Interlocking Plan (SIP) shall always reflect the existing station yard on the ground. Presently, alterations to the SIP are issued for carrying out certain modifications to signalling. There will be one or more such proposed modifications. Many a time, certain modifications will not take place in the intended sequence and some modifications may remain pending or cancelled. In such a scenario, SIP may not reflect the existing signalling on the ground. Moreover, many corrections will make SIP unreadable and incomprehensible.

Signal Scheme Plan (SSP) concept will help to tide over such a situation. If any modification is proposed for signalling, instead of altering the Signal Interlocking Plan (SIP), a Signal Scheme Plan (SSP) can be prepared.

SSP will be prepared based on a copy of current SIP and intended alterations can be made on the copy. Standard colour scheme needs to be adopted for depicting intended alterations in the Signal Scheme Plan. SSP is, therefore, a coloured plan or red/green plan.

More than one SSP can be prepared for different modifications as proposed by different executing agencies. In such a scenario, SIP remains unaltered.

After carrying out the modification work at site, particular SSP will replace existing SIP with version update. In scheme plan, alterations - 'red' and 'blue' are to be made 'black' and 'green' are to be removed. Earlier SIP will be stamped 'Superseded'.

Thereby, SIP will always reflect the signalling on the ground. Next SSP will be prepared based on the latest SIP.

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2.1 Outline

A Signal Scheme Plan or Scheme Plan (SSP) shall be developed from the scope of the sanctioned work or the project specification or any other requirement.

A signal scheme plan is a scaled layout plan which should be produced using the existing Signal Interlocking Plan (SIP) as a base plan, using an electronic copy of the existing CAD signal interlocking plan, if it exists, obtained from Document Controller.

A scheme plan shall be used as the basis to develop other signalling design details.

A scheme plan is a longitudinally scaled layout plan showing new and altered signalling and lineside arrangements.

A scheme plan is produced to express, in a form that is readily understood by signal engineering and operating personnel.

A scheme plan is updated with site survey and correlation.

Scheme plans shall be uniquely numbered.

2.2 Purpose

Scheme plans should fulfil the following purposes :

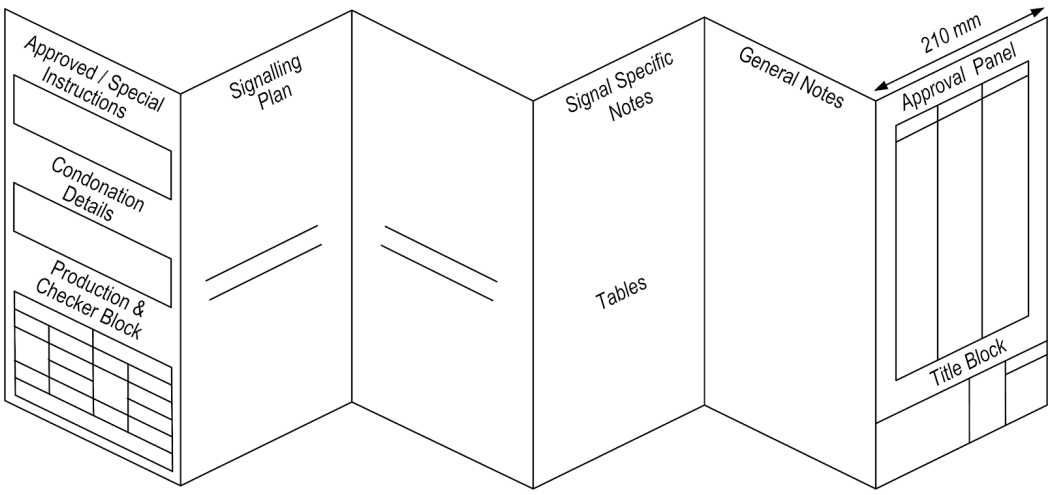
- Estimating and contract tendering, where applicable
- Preparation of interlocking control tables, and other design details;
- Providing a reference for VDU diagram
- Providing a reference for Station Working Order Diagram;
- Signal Sighting;
- Positioning new equipment on site
- Identifying signalling infrastructure removals on site;
- Compiling specifications of work for the adjacent stations areas;
- Producing a Signal Interlocking Plan for record purposes;
- Submission to support 'Approval in Principle' (as tentative or provisional plan)

- Submission for 'Approved for Construction' (approved plan) and
- Obtaining CRS Sanction
- Other purposes as necessary.

2.3 Layout

The Scheme Plan should be laid out in five parts

- Title block, approval and version panel
- General notes applicable to the signalling scheme as a whole
- Signal specific notes
- Single line plan of signalling infrastructure, drawn to scale longitudinally
- Special/ Approved Instructions and Condonation details and Production & Checker blocks



2.3.1 Orientation

- Plans should normally be arranged such that the Up direction is from right to left (i.e. Down line is at top) except for reasons of consistency
- Such reasons need to be given due consideration in the context of the scheme in question and may include:
    - Orientation of existing records and those for adjacent areas
    - Orientation of Engineering Scale Plan

2.3.2 Plan Height

- A3 size, 297mm high, most-referred: may be used if the layout is simple, such as a long stretch of plain line without junctions or complex layouts.
- A2 size, 420mm high, less-preferred: if the layout is simple, such as a long stretch of plain line with junctions or complex layouts
- A1 size, 594mm high, non-preferred: should not be used unless necessary to show multiple track complex layouts, such as major yards It will not conveniently fit on an office desk and is unwieldy when used on site.

2.3.3 Plan Length

- Before starting to draw the plan, the overall length of the drawing should be calculated to ensure it is not excessive.
- The maximum number of 210mm folds to 20, (however plans software allows up to a maximum of 30 folds).
- This must include folds for Title Block & Approval panel, General Notes, Signal Specific Notes, and Condonation Tables, Production & Checker panel.
- Another consideration to be taken into account is the maximum length of an Adobe pdf conversion which cannot exceed 5m or 24 folds.
- Scales chosen for use on the plan should be carefully planned as described below, so that the length of railway to be included does not exceed the available plan length.

2.3.4 Scales

2.3.4.1 The scales to be used for scheme plans shall be:

- 1:1000, for complex layouts, such as major stations.
- 1:2000, for most interlocking junction areas.
- 1:5000, for sections of plain line, with auto signals.
- 1:10000, for long sections of plain line where there is minimal signalling, like auto signalling sections etc., ; also, if short of space, sections of existing signalling at boundaries.
- 1:1250, 1:2500 are non-preferred scales and should not be used in new scheme plans. Not to scale can be used where appropriate.

2.3.4.2 Scales used on a scheme plan must be listed within or adjacent to the title block. A scale verification bar must be placed on the bottom right hand side of the plan so the accuracy of the print for measuring off can be confirmed.

Example:



2.4 Signalling Details

2.4.1 Signals, Indicators & Boards

- stop signals
- distant signals
- subsidiary or shunt signals
- route indicators
- repeating signals
- stop boards

- speed boards and warning boards
- signal post telephone (SPT), gate telephones
- gate lodges, ground frame,
- lifting barriers, sliding booms,
- inter signalling slots
- Insulation block joints
- overlaps
- loops or balises - ATP, TPWS
- aspect sequence charts
- Any special controls

2.4.2 Points

- electrical detectors for mechanically operated points and hand points

2.4.3 Train Detection or Block System

- type of block
- track circuit or axle counter sections
- fouling marks and track sections which require special controls
- limits of track sections

2.4.4 Level Crossings

- lifting barriers
- LC number
- classification of gate (based on TVUs)
- type of control
- telephones to the supervising or monitoring signal control centre
- warning boards, stop boards

2.4.5 Miscellaneous

- train activated warning systems, with the extent of the zones indicated;
- buffer stops;

2.5 Associated Information

The following ancillary information shall be provided in notes panel of the scheme plan

2.5.1 Signalling Features

- central panel / end panels
- centralised / distributed interlocking
- ground frame and level crossing notes
- numbering grid
- inter signal distances

2.5.2 Engineering Features

- gradient posts
- kilometerage changes
- the speed boards for signalling
- geographical names e.g. junctions;
- the position of points & crossings
- the trap points;
- viaducts and tunnels (with lengths);
- bridges that affect the positioning of signalling arrangements
- station and other platforms (numbered if relevant to signalling) plus platform length;
- level crossings
- buffer stops, sand humps, overrun lines
- location of building housing signal control, interlocking and ground frames; and
- reference at the extremities to any continuation sheet.

2.5.3 Electrification Features

- AC traction feeder stations
- Booster transformers
- Traction Substations in station limits
- Neutral sections in traction areas
- Limits of Electrification.

2.6 Plan Presentation

The layout presentation in the scheme plans shall have red and green work showing additions, removals or recoveries those required to be carried out at site.

2.6.1 Standard Colour Scheme

Standard Colour Scheme for depiction of proposed changes to the plans

RED: New Additions to the layout or signals

GREEN: Removals from layout or of signals (also dotted black)

BLUE: Additions not present on the source diagram but added from data sourced elsewhere.



Additions - layout or signals

Removals - layout or signals

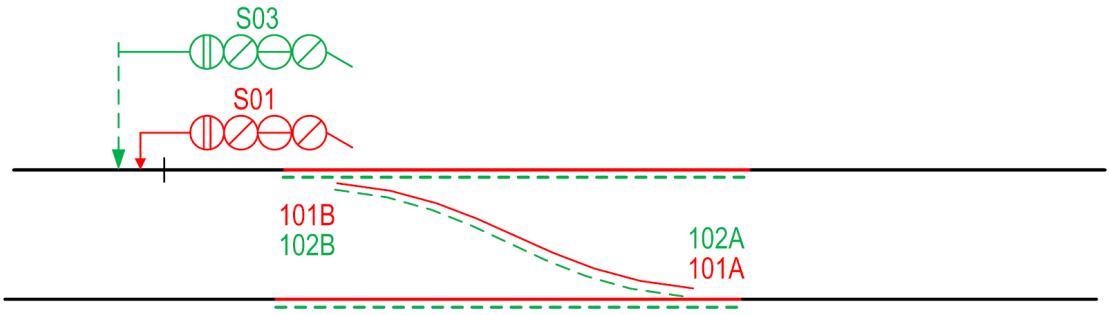
Additions - not from the source

2.6.2 Removals or Recoveries

2.6.2.1 All equipment to be removed or recovered should be shown on the scheme plan in green.

2.6.2.2 Where red and green items coincide on the plan, e.g. a new signal in the same position as a recovered one, or new and old point numbers, it is good practice for the red work to be placed in

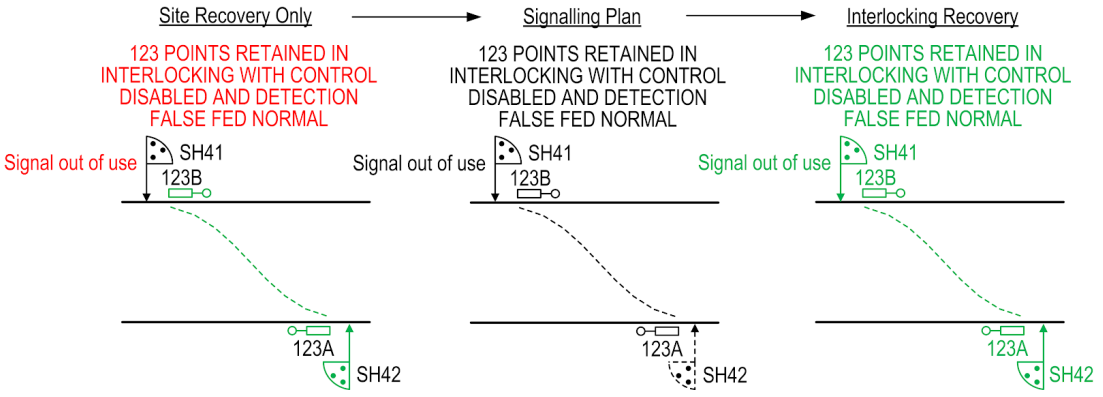
the final position closest to the track, with the green as close as practicable without being too cluttered, above or below. This will simplify the eventual conversion of the scheme plan into a signalling plan and also makes it easier to see the new signalling arrangements during meetings, Signal Sighting Committees etc.



2.6.2.3 When a scheme involves recovery of infrastructure from site but without undertaking interlocking recoveries, then the scheme plan needs to make clear features that still remain in the interlocking but 'out of use'.

2.6.2.4 These 'out of use' features should be shown in green as usual but with black numbers. To clearly identify any additional features, a red note should be used to supplement the diagrammatic information.

2.6.2.5 The green infrastructure will then become black dotted on the signalling plan. The final recovery from the interlocking will be shown green dotted.



2.6.2.6 Where recoveries or removals to signalling controls or other functions are shown by a green note it shall be accompanied with an associated red note to depict complete removal of the control in 'green' and the revised control in 'red'.

2.7 Main Signals

2.7.1 The following features associated with main running signals (and stop boards on running lines) should be added:

- Positioning with respect to datum point i.e., central line (CL) of the station
- signal identities;
- standard signal profiles - post, ground mounted
- overlaps, fouling marks, clearance points and clear standing room (CSR) lengths
- any warning system equipment such as AWS or TPWS

2.7.2 Signals should be drawn to show the number of aspects to be displayed

2.7.3 The normally-displayed aspect should be shown as a double line as determined by the aspect sequence.

2.7.4 Where a signal is automatic, A marker plate should be shown,

2.8 Train Detection

- Where train detection limits are being altered this must be highlighted with (ALT) in red next to the train detection section name
- All IRJs and axle counters detections shall be marked

2.9 Gradients

Gradient changes should always be shown on the scheme plan.

2.10 Symbols

Symbols for Signal Interlocking and Scheme Plans shall be adopted as mentioned in Chapter 06 - Symbols.

2.11 Numbering

2.11.1 In general, running lines shall be numbered from 01 starting from top to bottom when plan is positioned in ascending kilometres from left to right.

2.11.2 Signalling infrastructure shall have the following series for numbering various signal functions.

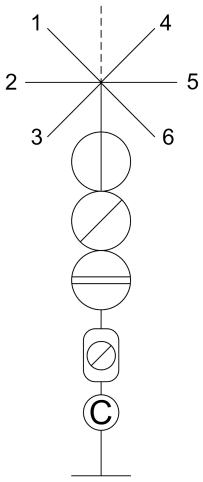
Function	Location or Direction	Range
Signal	Left to Right	01-39 (Odd numbers)
	Right to Left	02-40 (Even numbers)
Shunt Signal	Left to Right	41-99 (Odd numbers)
	Right to Left	42-98 (Even numbers)
Points	Left half	101-199 (Odd numbers)
	Right half	102-198 (Even numbers)
Siding Points	Left half	201-299 (Odd numbers)
	Right half	202-298 (Even numbers)
LC Gate	Left half	301-399 (Odd numbers)
	Right half	302-398 (Even numbers)

2.11.3 Signals and Shunt Signals shall be odd numbered in ascending order from left to right and even numbered in ascending order from right to left.

2.11.4 Point crossovers shall have one number for both the ends. The point number which is located nearest to the signal panel shall be suffixed 'A' and farther end 'B'.

2.11.5 Engineering non-interlocked points need not be numbered in SIPs and SSPs.

2.11.6 Junction type route indicator:

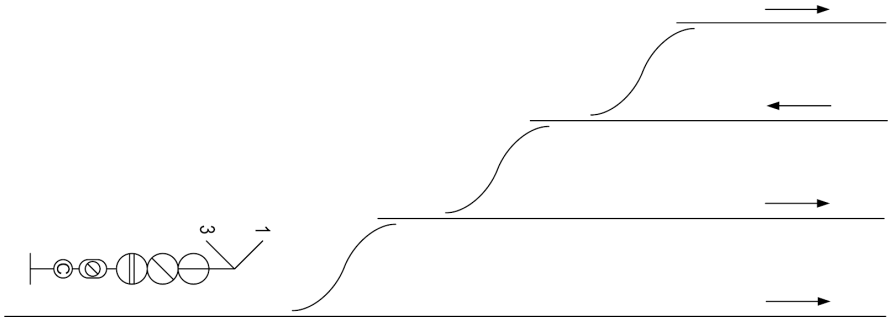


Route Indications have to follow the numbering depicted as shown above starting from 1, 2, 3 for left hand turnouts and 4, 5, 6 for right hand turnouts.

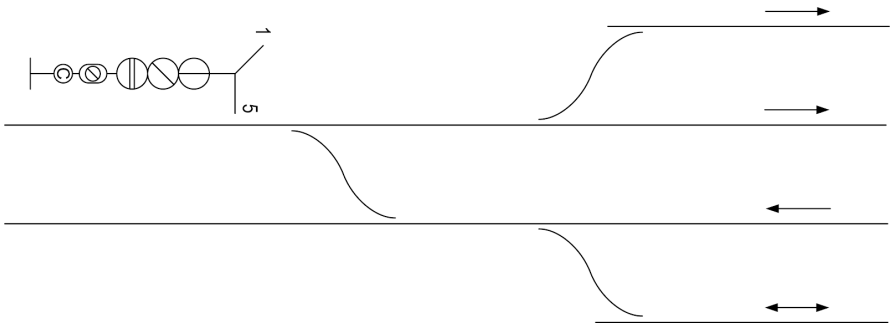
Position of route number shall not be changed from 3 to 2 if line pertaining to the route 2 does have a movement.

Routing arms will not indicate road number, but the number of turnouts train shall negotiate to reach the berthing track.

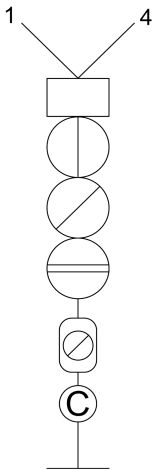
2.11.6.1 Illustartion 1



2.11.6.2 Illustartion 2



2.11.7 LED Matrix type (with junction type arms) route indicator: Route Indications have to follow the numbering depicted as shown 1 for left hand turnouts and 4 for right hand turnouts.



LED Matrix shall display road numbers.

Routing arms will not indicate road number, but indicates location of road whether it is on the left of the running line or right.

2.12 Scheme Plan Notes

Scheme plan notes is a list of the key features of signalling scheme that are not clear from the scheme plan.

2.12.1 General Notes

2.12.1.1 Notes for Installation as a whole

The following minimum information should be included in the general notes for the signalling system or installation as a whole

- reference to base Signal Interlocking Plan
- reference to base Engineering Scale Plan
- standard of interlocking
- whether new signal positions have been amended to sighting committee recommendations, or "subject to signal sighting";
- whether clearance points shown on the plan have been checked on site, or "subject to site survey";
- whether electrified section
- units of measurement
- longitudinal scale
- source information (signalling plan number and version and site survey date)
- other essential signalling information that is not evident from the plan.
- information regarding applications for technical non-compliances such as condonations etc.,

2.12.1.2 Notes for Electronic Signalling Systems

The following scheme plan information is typically required for an electronic signaling system:

- type of signalling control and display system provided (including number of electronic workstations, where applicable);
- type of block working;
- list any automatic signals
- statement if telephones are provided at all colour light stop signals with the appropriate prefix (two illuminated telephones for tunnel signals, where applicable) and at all ground frames;
- method of power operating points, where applicable, or list of points operated by each method;
- list any mechanically operated points, e.g. at ground frames;
- location of point handle and/or crank handle for the use of operating personnel in emergency;
- list any lifting barriers and state whether emergency local control is provided;
- conditions incorporated into train approaching warnings, where applicable;
- statement if all relay rooms are fitted with double locking arrangement
- units of measurement and datum point (normally the centre of station building) and;
- other essential signalling information that is not evident from the plan.

2.12.1.3 Notes for Ground Frame

The following scheme plan information is typically required for ground frames:

- whether elevated, platform, or ground mounted frame;
- whether lever frame or switch panel;
- whether diagram provided (statement if illuminated);
- list of track sections indicated (only with non-illuminated diagram);
- list of mechanically detected points;
- list of electrically detected points (unless power operated);
- method of power operating points, where applicable;
- whether FPL/HPLs stand normally in or out (usually in);

2.12.1.4 Typical General Notes

- This scheme plan is derived from the following signalling records: . . . . .
- A site survey was carried out to correlate the base record. The results of the survey are recorded in . . . . .
- The following documents support this plan and should be referred to as required:
  Example: Aspect sequence charts, signal spacing charts
- This scheme has been carried out in accordance with the relevant railway standards and specifications at the date of AIP approval.
- All dimensions are in metres unless otherwise stated
- All kilometer posts are annotated with their distance from the scheme plan datum point.
- Position of new equipment is subject to site survey.
- Record of design decisions are detailed in scheme plan design log: .....
- All symbols on this plan are in accordance with standard symbols.
- Fouling points are required to be measured on site.

2.12.2 Signal Specific Notes

Signal specific notes is a list of the key features of signalling scheme that are not clear from the scheme plan.

2.12.2.1 Typical Signal Specific Notes

2.12.2.1.1 Signal Notes

- All new main signals, subsidiary signals, position light ground signals, repeater signals, standard and miniature indicators, position light junction indicators to be LED type.
- All colour light signals capable of displaying a stop aspect, including position light ground signals, are fitted with SPTs with 2-way ringing facility.
- Signal and signs are in accordance with sighting survey report or signal and sign sighting has not been completed at the time of issue of this plan.
- Signal overlaps to be 120m and Block overlaps to be 180m unless otherwise stated.

2.12.2.1.2 Train detection notes

- Generally, axle counter detection points at a turnout or fixed diamond shall be within 3m of the fouling point, and within 3m of the toes of the points in the parallel line at the crossover.
- Method of axle counter reset to be . . . . .

2.12.2.1.3 Point notes

- All points are electrically operated
- Sequential operation or parallel operation of a crossover points
- Relevant crank handles to be provided at all junctions in a position of safety.
- Point ends to be indicated separately to the signaller.
- Point zone telephones (PTZ) are provided.

2.12.2.1.4 Plan specific notes

- Non-standard symbols used on this plan. . . . .

2.12.2.1.5 Assumptions

- List any assumptions being made while scheme plan was in production

2.12.2.1.6 Deviations

- List all deviations

2.12.2.1.7 Outstanding Issues

- Detail any scheme plan specific issues which are still to be resolved.

2.12.3 Tables

- Number grid with spares
- Block Working
- Details of Track Circuits

- Details of Axle Counters
- Details of Motor Operated Points & Crank handles grouping
- Details of Siding points & detection
- Interlocked LC gate details & Instructions
- Communication Details - SPT, PZT and LC Gate telephones
- Details of Signal routes having alternate overlaps
- Axle counters & resetting instructions
- Points and detection details

2.13 Supporting documents

2.13.1 Signal Sighting Report

Signal sighting needs to be given full consideration throughout the development of a scheme plan, to ensure that each signal or sign is designed and located in the optimum position for visibility by the train driver, affords the correct protection, is compliant, maintainable, minimises the environmental impact and is the most cost effective solution.

2.13.2 Scheme Plan Design Log

A log shall be produced during the whole lifecycle of the scheme plan design phase. This log is intended to be a record the design decisions and subsequent changes made during that scheme plan design phase.

2.13.3 Compliance & Deviations

2.13.3.1 Where it is not possible to design a compliant scheme plan and it is found necessary to raise a deviations.

2.13.3.2 The type of deviations have to be limited to those relating to the signalling principles.

2.14 Modification Process

2.14.1 Production of scheme plan modification sheets is permitted but not preferred.

2.14.2 The preferred method is to update the scheme plan using a standard configuration control process.

2.14.3 Where this is not possible, maybe due to late project changes leading up to a commissioning, then using the modification sheet process is acceptable.

2.14.4 Care must be taken to ensure all changes are easy to identify, possible methods are:

- Using a list of changes
- Coloured boxing around changes
- Bold highlighting of changes

2.15 Updates

2.15.1 As design process is repetitive in nature, scheme plan will undergo updates. There will be a point at which version increment must be applied, examples of this are:

- When design is undertaken across different projects
- During the production and checking process
- On completion of signal sighting and yard survey
- Once issued outside the drawing office

2.15.2 Where a scheme plan is divided into a number of parts, all parts shall have the same version number.

2.15.3 Prior to the production of a scheme plan, a Project Specification should have already been produced to detail the scope of the project and set out the design parameters for the scheme plan. Within these signalling specifications, an overview of both additions and removals of signalling infrastructure and system functionality should be clearly defined.

2.15.4 The geographical area of alterations to be shown on a scheme plan should be surveyed to confirm the existence, position, orientation, configuration and critical dimensions of the signalling infrastructure being modified.

2.16 Approval Panel

2.16.1 Technical Approval

2.16.1.1 Prior to submitting to Railways for approval, the scheme plan and supporting information should be initially approved by the Contractor's Responsible Engineer (CRE) in confirmation that the following items are complete:

- the appropriate standards and specifications have been used or adopted and been referenced on the plan or other supporting documents;
- the scheme plan has been designed and signed by a competent person;
- the scheme plan has been checked and signed by a competent person who is sufficiently independent
- the electronic systems has been verified for their configuration, as mandated, by RDSO and/ or Railways and
- where required an interdisciplinary review/check has been undertaken

2.16.1.2 The submitted copy shall then be signed by the Contractor's Responsible Engineer (CRE) in Production & Checker block of the signalling plan

2.16.2 Approval In Principle

2.16.2.1 Once signed off by the Contractor's Responsible Engineer, the documentation shall be submitted to Railways.

2.16.2.2 Railways shall review the scheme plan to confirm that:

- the proposed scheme is feasible, meets the requirements of the project specification or equivalent, and is fit for purpose; and
- the safety of railway operations and safe interworking are in place, having reviewed the proposed signalling facilities and operational arrangements.

2.16.2.3 The Approval In Principle copy (Tentative or Provisional copy) shall then be signed by:

- Operating Manager
- Signal Engineer (Design) of appropriate level

2.16.2.4 The Approval In Principle copy shall be updated after site survey and correlation, operating comments.

2.16.3 Approval for Construction

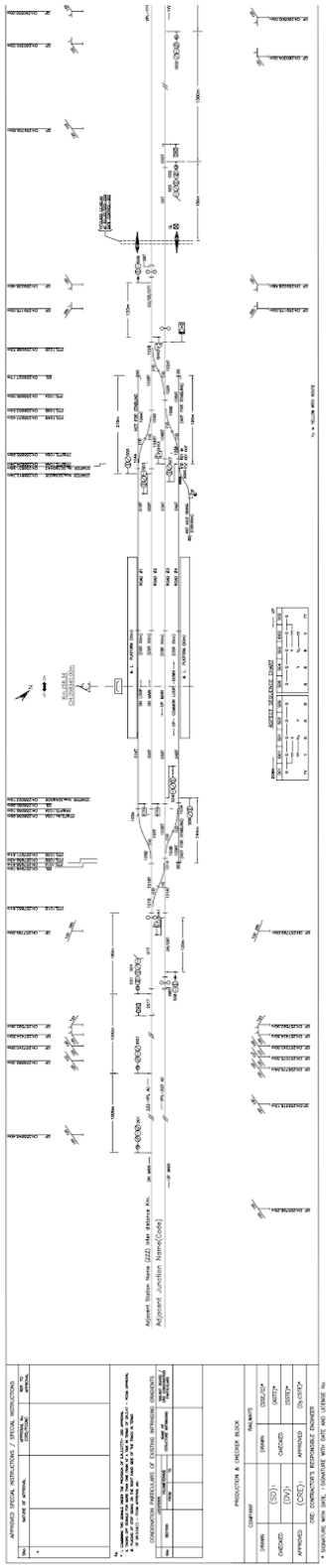
2.16.3.1 Where a Scheme Plan is issued as Approved (for Construction) Plan, it shall be signed and issued. The Approved and Amendment Panel shall be signed by;

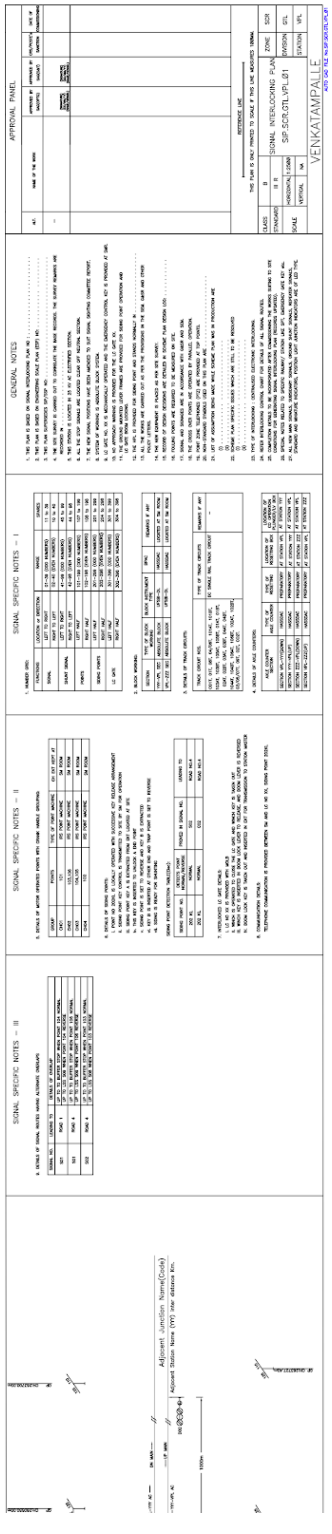
- Operating Manager of appropriate level
- Signal Engineer of appropriate level

2.16.3.2 Where there are significant amendments to the scheme plan, subsequent to AFC, the plan shall require re-approval, if this occurs another Production & Checker Block shall be added.

2.17 Typical SIgnal Interlocking/ Scheme Plan

A typical U-size Signal Scheme Plan is placed at the end of the book.





Interlocking Control Table

3

3.0 Standard Columns

Standard Interlocking Control Table (ICT) [Selection Table/ Table of Control/ Route Control Chart] shall have the following columns

- Serial no
- Signal no
- To Destination
- Select Route
  - Signal Button/Knob
  - Route Button/ Knob
- In Route
  - Points Normal
  - Points Reverse
  - Track Circuits
- Overlap
  - Points Normal
  - Points Reverse
  - Track Circuits
- Isolation
  - Points Normal
  - Points Reverse
- Crank Handle Normal
- Fouling Track Circuits
- Approach Lock By Track Circuits
- Back Locked By Track Circuit

- Signal Replaced by Track Circuit
- Overlap Release After 120"
  - By Occupation of Track Circuit
  - By Clearance of Track Circuit
- Slotted By Gate
- Released By Other Controls & Siding Point detection
- Lock Routes
- Signal Aspect Controlled By
  - Yellow With Route, Yellow, Double Yellow, Green
- Remarks - Typical
  - Controlled by Up/ Dn Line Block Line Clear
  - Controlled by Up/Dn BPAC clear
  - Time Release 120"
  - DG Controlled by DG/HHG with Points xxx Normal, xxx Normal
  - HG Clears after 30"
  - Siding Point Key A In
  - Complied GR 5.16

3.1 Interlocking Control Table For Typical Scheme Plan

3.1.1 Numbering of Routes

3.1.2 Route numbers, for berthing tracks, are to be the same as the road numbers of the yard. For a 4-road station, if the roads are designated as 01, 02, 03, 04; the routes are also will have the same number.

If a road has more than 1 overlap, then routes shall be designated as 01_1, 01_2. . . . .

3.1.3 Route numbers, for other than berthing tracks, shall take the number of the preceding signal(s). For example, route after Last Stop signal (S09) shall take the number that of signal as 09. For a route (common) after starter signals S03, S05, S07; shall take the number 03-07.

3.1.4 Interlocking Control Table is a multiple sheet drawing set and shall have version control and indexing as envisaged in Chapter 04 - Version Control

The Interlocking Control Table (ICT) is placed at the next folio.

VENKATAMPALLE

INTERLOCKING CONTROL TABLE

SIGNAL SCHEME PLAN VERSION No: SSP.SCR.GTL.VPL.Ø1

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

CONTROL TABLE	COVER SHEET	
ICT.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØØ	Ø1

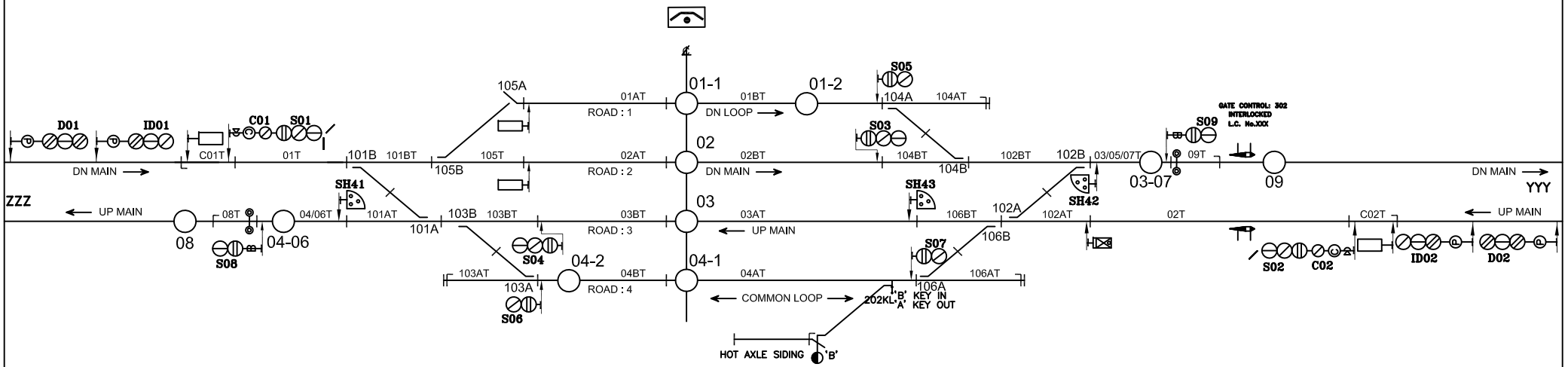
SHEET NO	VERSION	DESCRIPTION	STATUS ***	MODIFICATION SHEET SERIAL NUMBERS	TESTED	REMARKS
000	01	COVER SHEET				
X1	01	INDEX				
001	01	STATION LAYOUT				
002	01	INTERLOCKING CONTROL TABLE PART I				
003	01	INTERLOCKING CONTROL TABLE PART II				
004	01	INTERLOCKING CONTROL TABLE PART III				

*** NEW OR (R) RED OR (G) GREEN OR (R/G) RED AND GREEN

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

INTERLOCKING CONTROL TABLE	INDEX	
ICT.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	X1	Ø1

VENKATAMPALLE



PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

INTERLOCKING CONTROL TABLE	STATION LAYOUT	
ICT.SCR.GTL.VPL.Ø2	SHEET No:	VERSION
VENKATAMPALLE	ØØ1	Ø1

SNo.	SIGNAL No.	TO DESTINATION	SELECT ROUTE		IN ROUTE			OVERLAP			ISOLATION		CRANK HANDLE NORMAL	FOULING TRACK CIRCUITS	APPROACK LOCK BY TRACK CIRCUITS	BACK LOCK BY TRACK CIRCUITS	SIGNAL REPLACED BY TRACK CIRCUITS	OVERLAP RELEASES AFTER 120 SEC BY		SLOTTED BY GATE	RELEASED BY OTHER CONTROLS &SIDING POINT DETECTION	LOCKS ROUTES	SIGNAL ASPECT CONTROLLED BY				REMARKS
			SIGNAL BUTTON	ROUTE BUTTON	POINT		TRACK CIRCUIT	POINT		TRACK CIRCUIT	POINT							OCCUPIED BY TRACK CIRCUITS	CLEARENCE OF TRACK CIRCUIT				YELLOW WITH ROUTE	YELLOW	DOUBLE YELLOW	GREEN	
					NOR.	REV.		NOR.	REV.		NOR.	REV.																
1.	D01	ID01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	ID01 HHG/ DG	DG CONTROLLED BY ID01 DG/HHG WITH POINTS No. 101N. 105N
2.	ID01	S01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S01 HG	S01 DG	DG CONTROLLED BY S01 DG WITH POINTS No. 101N.105N
3.	S01	DN MAIN	S01	02	101. 105	—	01T. 101BT. 105T. 02AT. 02BT	104. 102	—	104BT. 102BT. 03/05/07T	—	—	CH01. CH03. CH04	—	DEAD APPROACH	01T. 101BT. 105T	01T	02AT. 02BT	105T	—	—	C01–02. SH42–02	—	S03 RG/ HG/ DG	—	S03 DG	TIME RELEASE 120 SEC
4.	S01	DN LOOP SET TO BS	S01	01–2	101	105	01T. 101BT. 105T. 01AT. 01BT	104	—	104AT	—	—	CH01. CH03	—	DEAD APPROACH	01T. 101BT. 105T	01T	01AT. 01BT	105T	—	—	C01–01–1. SH42–02	S05 RG	—	—	—	TIME RELEASE 120 SEC.
5.	S01	DN LOOP SET TO MAIN	S01	01–1	101	105	01T. 101BT. 105T. 01AT. 01BT	102	104	104AT. 104BT. 102BT. 03/05/07T	—	—	CH01. CH03. CH04	—	DEAD APPROACH	01T. 101BT. 105T	01T	01AT. 01BT	105T	—	—	C01–01–1. SH42–01–1	S05 RG/ HG	—	—	—	TIME RELEASE 120 SEC.
6.	S01	COMMON LOOP SET TO BS	S01	04–2	—	101. 103	01T. 101BT. 101AT. 103BT. 103AT. 04BT. 04AT	106	—	106AT	105	—	CH01. CH02. CH03	—	DEAD APPROACH	01T. 101BT. 101AT. 103BT. 103AT	01T	04BT. 04AT	103AT	—	—	C01–04–1. C02–03. SH42–02. SH42–03	S07 RG	—	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
7.	S01	COMMON LOOP SET TO MAIN	S01	04–1	—	101. 103	01T. 101BT. 101AT. 103BT. 103AT. 04BT. 04AT	—	**106. 102**	106AT. 106BT. 102AT. 102BT. 03/05/07T	105	—	CH01. CH02. CH04. CH03	—	DEAD APPROACH	01T. 101BT. 101AT. 103BT. 103AT	01T	04BT. 04AT	103AT	—	—	C01–04–1. SH42–04–1	S07 RG/ HG	—	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
8.	C01	DN MAIN	C01	02	101. 105	—	C01T OCCUPIED.	—	—	—	—	—	CH01. CH03	—	DEAD APPROACH	01T. 101BT. 105T	—	—	—	—	—	S01–02. S03–03–07. S05–03–07. S07–03–07. SH42–01–1. SH42–02. SH42–03. SH42–04–1. SH43–03–07	—	—	—	—	TIME RELESE 120 SEC. HG CLEARS AFTER 60 SEC.
9.	C01	DN LOOP	C01	01–1	101	105	C01T OCCUPIED.	—	—	—	(104W SH42–03 SH42–04–1 SH43–03–07)	—	CH01. CH03	—	DEAD APPROACH	01T. 101BT. 105T	—	—	—	—	—	S01–01–1. S05–03–07. SH42–01–1. SH42–02.	—	—	—	—	TIME RELESE 120 SEC. HG CLEARS AFTER 60 SEC.
10.	C01	COMMON LOOP	C01	04–1	—	101. 103	C01T OCCUPIED.	—	—	—	105	—	CH01. CH02. CH03.	—	DEAD APPROACH	01T. 101BT. 101AT. 103BT. 103AT	—	—	—	—	—	C02–03. C02–04–1. S01–04–1. S07–03–07. SH42–02. SH42–03. SH42–04–1	—	—	—	—	TIME RELESE 120 SEC. HG CLEARS AFTER 60 SEC. 'A' KEY IN.

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

INTERLOCKING CONTROL TABLE	PART I	
ICT.SCR.GTL.VPL.Ø2	SHEET No:	VERSION
VENKATAMPALLE	ØØ2	Ø1

SNo.	SIGNAL No.	TO DESTINATION	SELECT ROUTE		IN ROUTE			OVERLAP			ISOLATION		CRANK HANDLE NORMAL	FOULING TRACK CIRCUITS	APPROACK LOCK BY TRACK CIRCUITS	BACK LOCK BY TRACK CIRCUITS	SIGNAL REPLACED BY TRACK CIRCUITS	OVERLAP RELEASES AFTER 120 SEC BY		SLOTTED BY GATE	RELEASED BY OTHER CONTROLS &SIDING POINT DETECTION	LOCKS ROUTES	SIGNAL ASPECT CONTROLLED BY				REMARKS
			SIGNAL BUTTON	ROUTE BUTTON	POINT		TRACK CIRCUIT	POINT		TRACK CIRCUIT	POINT							OCCUPIED BY TRACK CIRCUITS	CLEARENCE OF TRACK CIRCUIT				YELLOW WITH ROUTE	YELLOW	DOUBLE YELLOW	GREEN	
					NOR.	REV.		NOR.	REV.		NOR.	REV.																
11.	D02	ID02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	ID02 HHG/ DG	DG CONTROLLED BY ID02 DG/HHG WITH POINTS No. 106N
12.	ID02	S02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—	—	—	—	—	S02 HG	S02 DG	DG CONTROLLED BY S02 DG WITH POINTS No. 106N
13.	S02	UP MAIN	S02	03	102. 106	—	02T. 102AT. 106BT. 03AT. 03BT	103. 101	—	103BT. 101AT. 04/06T	—	—	CH04. CH02. CH01	—	DEAD APPROACH	02T. 102AT. 106BT	02T	03AT. 03BT	106BT	302	—	C02–03. SH41–03	—	S04 RG/ HG/ DG	—	S04 DG	TIME RELEASE 120 SEC
14.	S02	COMMON LOOP SET TO BS	S02	04–2	102	106	02T. 102AT. 106BT. 106AT. 04AT. 04BT	103	—	103AT	—	—	CH04. CH02	—	DEAD APPROACH	02T. 102AT. 106BT. 106AT	02T	04AT. 04BT	106AT	302	202N	C02–04–1. SH41–03	S06 RG	—	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
15.	S02	COMMON LOOP SET TO MAIN	S02	04–1	102	106	02T. 102AT. 106BT. 106AT. 04AT. 04BT	101	103	103AT.103BT. 101AT. 04/06T	—	—	CH04. CH02. CH01	—	DEAD APPROACH	02T. 102AT. 106BT. 106AT	02T	04AT. 04BT	106AT	302	202N	C02–04–1. SH41–04–1	S06 RG/ HG	—	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
16.	C02	DN MAIN	C02	03	102. 106	—	C02T OCCUPIED.	—	—	—	—	—	CH04. CH02	—	DEAD APPROACH	02T. 102AT. 106BT	—	—	—	302	—	S01–04–2. C01–04–1. S02–03. S04–04–06. S06–04–06. SH41–03. SH41–04–1	—	—	—	—	TIME RELESE 120 SEC. HG CLEARS AFTER 60 SEC.
17.	C02	COMMON LOOP	C02	04–1	102	106	C02T OCCUPIED.	—	—	—	—	—	CH04. CH02	—	DEAD APPROACH	02T. 102AT. 106BT. 106AT	—	—	—	302	202N	C01–04–1. S02–04–1. S06–04–06. SH41–03. SH41–04–1	—	—	—	—	TIME RELESE 120 SEC. HG CLEARS AFTER 60 SEC. 'A' KEY IN.
18.	S03	DN MAIN	S03	03–07	104. 102	—	104BT. 102BT. 03/05/07T	—	—	—	—	—	CH03. CH04	—	02AT. 02BT, S01–02	104BT. 102BT	104BT	—	—	—	—	C01–02. SH42–02	—	S09 RG/ DG	—	S09 DG	TIME RELEASE 120 SEC
19.	S04	UP MAIN	S04	04–06	103. 101	—	103BT. 101AT. 04/06T	—	—	—	—	—	CH02. CH01	—	03AT. 03BT, S02–03	103BT. 101AT	103BT	—	—	—	—	C02–03. SH41–03. SH42–03.	—	S08 RG/ DG	—	S08 DG	TIME RELEASE 120 SEC
20.	S05	DN MAIN	S05	03–07	102	104	104AT. 104BT. 102BT. 03/05/07T	—	—	—	—	—	CH03. CH04	—	01AT. 01BT	104AT. 104BT. 102BT	104AT	—	—	—	—	C01–01–1. C01–02. SH42–01–1	—	S09 RG/ DG	—	S09 DG	TIME RELEASE 120 SEC

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*

CRE: CONTRACTOR'S RESPONSIBLE ENGINEER
*SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No

INTERLOCKING CONTROL TABLE	PART II	
ICT.SCR.GTL.VPL.Ø2	SHEET No:	VERSION
VENKATAMPALLE	ØØ3	Ø1

SNo.	SIGNAL No.	TO DESTINATION	SELECT ROUTE		IN ROUTE			OVERLAP			ISOLATION		CRANK HANDLE NORMAL	FOULING TRACK CIRCUITS	APPROACK LOCK BY TRACK CIRCUITS	BACK LOCK BY TRACK CIRCUITS	SIGNAL REPLACED BY TRACK CIRCUITS	OVERLAP RELEASES AFTER 120 SEC BY		SLOTTED BY GATE	RELEASED BY OTHER CONTROLS &SIDING POINT DETECTION	LOCKS ROUTES	SIGNAL ASPECT CONTROLLED BY				REMARKS
			SIGNAL BUTTON	ROUTE BUTTON	POINT NOR.	POINT REV.	TRACK CIRCUIT	POINT NOR.	POINT REV.	TRACK CIRCUIT	POINT NOR.	POINT REV.						OCCUPIED BY TRACK CIRCUITS	CLEARENCE OF TRACK CIRCUIT				YELLOW WITH ROUTE	YELLOW	DOUBLE YELLOW	GREEN	
21.	S06	UP MAIN	S06	04–06	101	103	103AT. 103BT. 101AT. 04/06T	—	—	—	—	—	CH02. CH01	—	04BT. 04AT	103AT. 103BT. 101AT	103AT	—	—	—	—	C02–03. C02–04–1. SH42–03. SH42–04–1. SH41–04–1	—	S08 RG/ DG	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
22.	S07	DN MAIN	S07	03–07	—	106. 102	106AT. 106BT. 102AT. 102BT. 03/05/07T	—	—	—	104	—	CH02. CH04. CH03	—	04BT. 04AT	106AT. 106BT. 102AT. 102BT	106AT	—	—	—	—	C01–02. C01–04–1. SH42–04–1. SH41–03. SH41–04–1.	—	S09 RG/ DG	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
23.	S08	UP MAIN	S08	08	101	—	08T	—	—	—	—	—	CH01	—	—	—	08T	—	—	—	—	SH41–03. SH41–04–1	—	—	—	—	CONTROLLED BY UP LINE BLOCK INSTRUMENT 'LINE CLEAR' CONDITION. UP LINE BPAC CLEAR.
24.	S09	DN MAIN	S09	09	—	—	09T	—	—	—	—	—	—	—	—	—	09T	—	—	302	—	SH42–01–1. SH42–02. SH42–03. SH42–04–1. SH43–03–07	—	—	—	—	CONTROLLED BY DN LINE BLOCK INSTRUMENT 'LINE CLEAR' CONDITION. DN LINE BPAC CLEAR.
25.	SH41	UP MAIN	SH41	03	101. 103	—	101AT. 103BT	—	—	—	—	—	CH01. CH02	—	04/06T	101AT. 103BT	101AT	—	—	—	—	S02–03. S02–04–2. C02–03. C02–04–1. S04–04–06. S07–03–07. S08–08. SH42–03	—	—	—	—	TIME RELEASE 120 SEC
26.	SH41	COMMON LOOP	SH41	04–1	101	103	101AT. 103BT. 103AT	—	—	—	—	—	CH01. CH02	—	04/06T	101AT. 103BT. 103AT	101AT	—	—	—	—	S02–04–1. C02–03. C02–04–1. S06–04–06. S07–03–07. S08–08. SH42–04–1	—	—	—	—	TIME RELEASE 120 SEC
27.	SH42	DN LOOP	SH42	01–1	102	104	102BT. 104BT. 104AT	—	—	—	—	—	CH04. CH03	—	03/05/07T	102BT. 104BT. 104AT	102BT	—	—	—	—	S01–01–1. C01–01–1.C01–02. S05–03–07.S09–09	—	—	—	—	TIME RELEASE 120 SEC
28.	SH42	DN MAIN	SH42	02	102. 104	—	102BT. 104BT	—	—	—	—	—	CH04. CH03	—	03/05/07T	102BT. 104BT	102BT	—	—	—	—	S01–01–2. S01–02. S01–04–2. C01–01–1. C01–02. C01–04–1. S03–03–07. S09–09	—	—	—	—	TIME RELEASE 120 SEC
29.	SH42	UP MAIN	SH42	03	106	102	102BT. 102AT. 106BT	—	—	—	104 W C01–01–1	—	CH04. CH02.	—	03/05/07T	102BT. 102AT. 106BT	102BT	—	—	—	—	S01–04–2. C01–02. C01–04–1. S04–04–06. S06–04–06. S09–09. SH41–03. SH43–03–07.	—	—	—	—	TIME RELEASE 120 SEC
30.	SH42	COMMON LOOP	SH42	04–1	—	102. 106	102BT. 102AT. 106BT. 106AT	—	—	—	104 W C01–01–1	—	CH04. CH02.	—	03/05/07T	102BT. 102AT. 106BT. 106AT	102BT	—	—	—	—	S01–04–1. C01–02. C01–04–1. S06–04–06. S07–03–07. S09–09. SH41–04–1	—	—	—	—	TIME RELEASE 120 SEC. 'A' KEY IN.
31.	SH43	DN MAIN	SH43	03–07	106	102	106BT. 102AT. 102BT	—	—	—	104 W C01–01–1	—	CH02. CH04.	—	03BT. 03AT	106BT. 102AT. 102BT	106BT	—		—	—	C01–02. S09–09. SH42–03	—	—	—	—	TIME RELEASE 120 SEC

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

INTERLOCKING CONTROL TABLE	PART III	
ICT.SCR.GTL.VPL.Ø2	SHEET No:	VERSION
VENKATAMPALLE	Ø04	Ø1

Version Control

4

4.0 Introduction

Version control helps in tracking changes in the design process in a controlled manner. Version control, also referred to as revision control, exists to manage changes in a structured, efficient manner through the collocation and management of the information either as a physical or digital document.

4.1 Document Controller

4.1.1 Document controller is a custodian of all signal drawings, documents and data files.

4.1.2 He is responsible for issue and receipt of all signal drawings, documents and data files

4.1.3 He shall control the naming, version numbering, filing, sorting and retrieval of signalling drawings or documents or data files in the format - hard copy or electronically stored copy, produced by drawing office in a timely, accurate and efficient manner.

4.1.4 He shall coordinate with Open Line, Construction and Project Organisations for implementation of the version control of the drawings, documents and data files.

4.1.5 He ensures the approved documents are with proper authorisation and version of the documents are accurate.

4.1.6 He maintains the latest version of all related signalling drawings, documents and data files.

4.1.7 He allocates the next version number for superseding drawing or document or data. If the drawing or document or data is a base for other drawings or documents or data (dependent), he shall ensure all dependent documents are received and their versions are updated.

4.1.8 He maintains hard copy and/ or electronic record copy of drawings, documents or data - division and station wise.

4.1.9 He stores drawings, documents and data and takes backups from time to time as per storage and retention policies issued by PCSTEs Office.

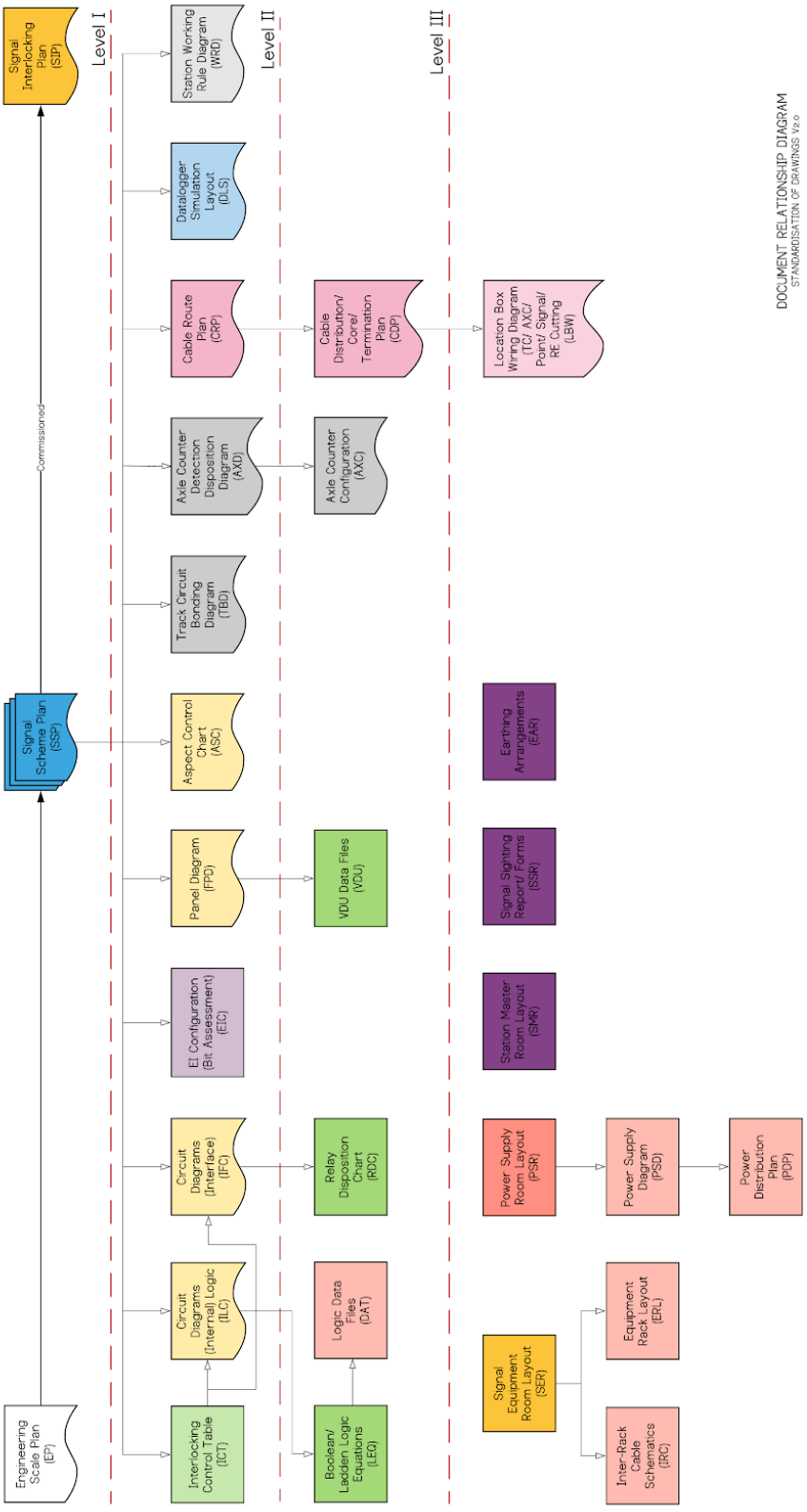
4.1.10 He maintains the Index for the drawings or documents or data.

4.2 Signalling Drawings & Documents

4.2.1 The diagram below will depict the relationship between various standard drawings or documents.

4.2.2 Changes to drawings placed on higher level in hierarchy will affect the drawings placed in lower level in hierarchy. However, changes to drawings placed on lower level may not affect the drawings placed in higher level.

4.2.3 Document Relationship diagram is placed at next folio.


DOCUMENT RELATIONSHIP DIAGRAM
STANDARDISATION OF DRAWINGS V2.0
Level I
Level II
Level III
Commissioned
Signal Interlocking Plan (SIP)
Signal Schematic Plan (SSP)
Engineering Scale Plan (EP)
Station Working Rule Diagram (WRD)
Datalogger Simulation Layout (DLS)
Cable Route Plan (CRP)
Axle Counter Detection Disposition Diagram (AXD)
Track Circuit Bonding Diagram (TBD)
Aspect Control Chart (ASC)
Panel Diagram (FPD)
EI Configuration (Bit Assessment) (EIC)
Circuit Diagrams (Interface) (IFC)
Circuit Diagrams (Internal) Logic (ILC)
Interlocking Control Table (ICT)
Cable Distribution/ Core/ Termination Plan (CDP)
Axle Counter Configuration (AXC)
VDU Data Files (VDU)
Relay Disposition Chart (RDC)
Logic Data Files (DAT)
Boolean/ Ladden Logic Equations (LEQ)
Location Box Wiring Diagram (TC/ AXC/ Point/ Signal/ RE Cutting (LBW)
Earthing Arrangements (EAR)
Signal Sighting Report/ Forms (SSR)
Station Master Room Layout (SMR)
Power Supply Room Layout (PSR)
Power Supply Diagram (PSD)
Power Distribution Plan (PDP)
Signal Equipment Room Layout (SER)
Equipment Rack Layout (ERL)
Inter-Rack Cable Schematics (IRC)

4.3 Version number

4.3.1 Any controlled drawing or document needs to be identified uniquely and unambiguously.

4.3.2 Version number shall indicate document type, zone, division, station and its revision number.

4.3.3 Unique codes are to be assigned for zone, division and station and document type.

4.34 Revision number may take two digit number XX which can cater for 99 versions.

4.3.5 Electronic record copies shall have the file names same as Version number.

4.3.6 Structure of the Version number

DocType.ZoneCode.DivCode.StationCode.Version

For example, SIP of Venkatampalli (VPL) Station, Guntakal (GTL) division of South Central Railway (SCR) may have a version number -

SIP.SCR.GTL.VPL.Ø1

4.3.7 When drawings are having multiple sheets such as Interlocking Logic Circuits, Interface Circuits etc., shall have an index sheet, as deliberated at para titled Indexing.

4.3.8 Structure of the Version code where multiple drawing sheets are involved -

Index Sheet - **DocType.ZoneCode.DivCode.StationCode.Version**

Sheet - **Sheet#nnn.Version**

For example, Internal Circuit diagrams of Venkatampalli (VPL) Station may have a version number -

ILC.SCR.GTL..VPL.Ø1

Sheet#ØØ1.Ø1

4.3.9 Version number for Part drawing or document

Sometimes, only part of the drawing may be required for illustration or planning purpose. In such cases, drawing may have suffix '.Part'.

SIP.SCR.GTL..VPL.Ø1.Part

4.4 Version Update

4.4.1 Whenever changes have been made in the drawing, versioning needs to be revised upwards. If drawing contains more than one sheet, all sheets are required to be updated to the latest version.

4.4.2 For example, if changes are made in some of the sheets in signal interlocking circuit drawings, rest of the sheets are not required to be versioned upwards. How ever, version of modified sheets and associated index sheet will versioned upwards.

4.4.3 It is not necessary to change version of other document/ drawing types when one document type undergoes changes and version update.

For example, if changes are made to track bonding diagrams, version will be upgraded only to track bonding diagrams.

4.4.4 A registry shall be maintained to keep track of versions for all document types for a signalling installation.

4.4.5 Each version of production copies viz., copies of drawings and documents when printed for issue, shall be given a change number; starting at "01" for the original version. Subsequent numbers shall be allocated to modified or amended versions.

4.4.6 Each source record shall bear the current version in the bottom right hand corner. It may be coloured on production copies.

4.5 Document Types

4.5.1 Document or Drawing type can have standard abbreviations as listed below -

Document Type	Description	Group
SIP	Signal Interlocking Plan	Signalling System Overview
SSP	Signal Scheme Plan	Signalling System Overview
WRD	Working Rule Diagram	Signalling System Overview
ICT	Interlocking Control Table/ Selection Table	Interlocking
DAT	Logic Data Files	Circuits
IFC	Signal Interlocking Circuit Diagrams - Interface	Circuits
ILC	Signal Interlocking Circuit Diagrams - Logic	Circuits
LBW	Location Box Wiring Diagram	Circuits
LEQ	Logic Equation Boolean/ Ladder	Circuits
FPD	Front Panel Diagram/VDU Layout	Signalling Control & Display System
VDU	VDU Data Files	Signalling Control & Display System
ASC	Aspect Sequence Chart	Lineside Signals
BPC	Balise/Loop Positioning Chart	Lineside Signals
SSR	Signal Sighting Report/ Forms	Lineside Signals
AXC	Axle Counter Configuration Diagram	Track Detection
TBD	Track Circuit Bonding Diagram	Track Detection
CDP	Cable Distribution/ Core/ Termination Plan	Transmission System & Cabling
CRP	Cable Route Plan	Transmission System & Cabling
PDP	Power Distribution Plan	Power Supplies
PLC	Power Load Calculation Sheet	Power Supplies
DLS	Datalogger Simulation Layout	Diagnostics
INX	Master Index Sheet	Documentation
MOD	Modification Sheets	Construction, Testing & Commissioning

4.5.2 EI Configuration Diagram (EIC), Relay Disposition Chart (RDC), Inter-Rack Cable Schematic (IRC), Earthing Arrangements (EAR), Equipment Rack Layout (EQP), Signal Equipment Room Layout (SER), Station Master Room Layout, Power Supply Room Layout (PSR) shall be part of Interlocking Circuit Diagrams - Interface (IFC).

4.6 Zone Codes

Zonal Railway codes are as

Zone	Description	Zone	Description
CR	Central Railway	NR	Northern Railway
ECR	East Central Railway	SCR	South Central Railway
ECoR	East Coast Railway	SCoR	South Coast Railway
ER	Eastern Railway	SECR	South East Central Railway
NCR	North Central Railway	SER	South Eastern Railway
NER	North Eastern Railway	SWR	South Western Railway
NWR	North Western Railway	SR	Southern Railway
NFR	Northeast Frontier Railway	WCR	West Central Railway
MRK	Metro Rail Kolkata	WR	Western Railway

4.7 Scaling & Sizing

4.7.1 Scale

Layouts are to be prepared with a longitudinal scale. They may not have transverse scaling. The scales to be used for signal scheme or interlocking plans shall be:

- 1:1000, for complex layouts, such as major stations.
- 1:2000, for most interlocking junction areas.
- 1:5000, for sections of plain line, with auto signals.
- 1:10000, for long sections of plain line where there is minimal signalling, like auto signalling sections etc.,; also, if short of space, sections of existing signalling at boundaries.
- 1:1250, 1:2500 are non-preferred scales and should not be used in new scheme plans. Not to scale can be used where appropriate.

4.7.2 Size

4.7.2.1 The preferred size of plans shall be:

Types of Drawings	Size	Measurement	Border
Signal Interlocking Plan	U	297 mm X any length 420 mm X any length	10 mm
Signal Scheme Plan	U	297 mm X any length 420 mm X any length 594 mm X any length	10 mm
Sketches	A-4	210 mm X 297 mm	10 mm
Interlocking Control/ Selection/ Locking Table	A-3	297 mm X 420 mm	10 mm
Interlocking Logic Circuit Diagram	A-3	297 mm X 420 mm	10 mm
Interlocking Interface Circuit Diagram	A-3	297 mm X 420 mm	10 mm
Power Supply Diagram	A-3	297 mm X 420 mm	10 mm
Track Circuit Bonding Plan	A-3	297 mm X 420 mm	10 mm
Cable Termination Plan	A-3	297 mm X 420 mm	10 mm
VDU Panel Diagram	A-3	297 mm X 420 mm	10 mm
Location Box Diagram	A-3	297 mm X 420 mm	10 mm
Locking Diagram	U	297 mm X any length	10 mm
Cable Core Chart	U	297 mm X any length	10 mm
Cable Route Plan	U	297 mm X any length	10 mm

4.7.2.2 A margin of 30mm should be allowed for the purpose of binding.

4.8 Electronic Data

Drives or disks carrying the soft copies of Logic Data Files, VDU Data Files shall be labelled. These shall be accompanied by Status Record Index sheets (Refer Index for Data Systems)

Logic Data Or VDU Data			
DAT.SCR.GTL.TPTY.Ø1 Or VDU.SCR.GTL.TPTY.Ø1		Drive or Disk number	
Status Record Index			
EI Make		Model	
Logic/VDU Editor Version			
Executive Software Version			
Compiler Version			
CRC Checksum(s)			
Produced by		Date	
Checked by		Date	
Design Authority			

4.9 Erasable Programmable Read Only Memory (EPROM)

EPROMs shall bear the label containing the following information:

- Geographical Location (Station/ Section)
- Data type (System/Subsystem)
- Version number

These shall be accompanied by Status Record Index sheets (Refer Index for Data Systems).

4.10 Indexing

A system of indexing all signalling design details shall be provided. It shall incorporate the current version of each document. Indicies shall be provided for each group of design details, grouped both by geographical area and, where appropriate, by type. Geographical grouping shall be to interlocking areas.

4.10.1 Master Index

4.10.1.1 Version numbers of all signalling drawings and documents pertaining to a given geographical location such as station, automatic section, intermediate block section or level crossing gate shall be provided in a master index sheet.

4.10.1.2 Master Index sheet shall contain a complete list of signalling drawings and documents and their current versions, and shall contain the following information for each geographical location:

- Zone, Division, Geographical Location (Station/ Auto-Section/IBS/LC etc.,)
- Master Index Version
- Drawing & Document Details
- Serial number, Document/Drawing, Version number & Date, Superseding Document/ Drawing Version & . Date, Base Document/Drawing Version & Date, Remarks

4.10.1.3 Any details if updated in Master Index, version of Master Index shall be up versioned.

A typical Master Index is placed at next folio.

DRAWING & DOCUMENT DETAILS								
SNo	DRAWING	VERSION No	DATE	SUPERSEDING DRAWING VERSION No	DATE	BASE DRAWING No	DATE	REMARKS
1	SIP	SIP.SCR.GTL.VPL.V02	12/03/18	SIP.SCR.GTL.VPL.V01	08/04/15	E.20891/4	01/02/18	YARD MODIFICATION
2	ICT	ICT.SCR.GTL.VPL.V03	15/03/18	ICT.SCR.GTL.VPL.V02	12/04/15	SIP.SCR.GTL.VPL.V02	12/03/18	SIP CHANGE
3	TBD	TBD.SCR.GTL.VPL.V03	16/03/18	TBD.SCR.GTL.VPL.V02	13/04/15	SIP.SCR.GTL.VPL.V02	12/03/18	SIP CHANGE
4	ILC	ILC.SCR.GTL.VPL.V03	21/05/18	ILC.SCR.GTL.VPL.V02	01/06/15	ILC.SCR.GTL.VPL.V02	12/03/18	SIP CHANGE

* GEOGRAPHICAL LOCATION (STATION / AUTO–SECTION / IBS / LC)

DOCUMENT CONTROLLER			
PREPARED	DATE	VARIFIED	DATE

MASTER INDEX

INX.SCR.GTL.VPL.Ø1	SHEET No:
VENKATAMPALLE *	ØØ1

4.10.2 Index for Multiple Sheet Drawing Sets

4.10.2.1 A set of Multiple Sheet Drawings like Interface circuits, logic circuits etc. shall have (i) Cover sheet and (ii) Index sheet(s).

4.10.2.2 Cover sheet shall specify the base documents or drawings on which the detailed designs are prepared.

4.10.2.3 Index sheet shall have index of all drawing sheets numbers and their version numbers present in the drawing set.

4.10.2.4 Cover sheet, each of Index sheets and Drawing sheets shall have individual version number.

4.10.2.5 Version number shall be two-digit number starting from 01 to 99.

4.10.2.6 Version number of Drawing sheets will be up versioned when the drawing undergoes modification for any reason.

4.10.2.7 Version number of Cover sheet will be up versioned when any of the base documents mentioned on the sheet is changed.

4.10.2.8 If version number of cover sheet or drawing sheet up-versioned, Index sheet will be updated and version of the Index sheet will be up versioned.

4.10.2.9 Index sheets shall be placed after the cover sheet in the set to enable the contents to be audited.

4.10.2.10 Index sheets shall contain a complete list of sheet numbers, preferably including any spare numbers, and shall contain the following information for each sheet:

- Sheet number
- Current version
- Title of Description of Drawing
- Status - New or Red or Green or Red & Green
- Serial numbers of any modification sheets issued

4.10.2.11 Typical Cover, Index and Drawing Sheets are placed next folio.

VENKATAMPALLE

INTERLOCKING INTERFACE CIRCUITS

SIGNAL SCHEME PLAN VERSION No: SSP.SCR.GTL.VPL.Ø1

SIGNAL INTERLOCKING PLAN VERSION No: SIP.SCR.GTL.VPL.Ø4

INTERLOCKING CONTROL TABLE VERSION No: ICT.SCR.GTL.VPL.Ø1

DATA FILES VERSION No: DAT.SCR.GTL.VPL.Ø3

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

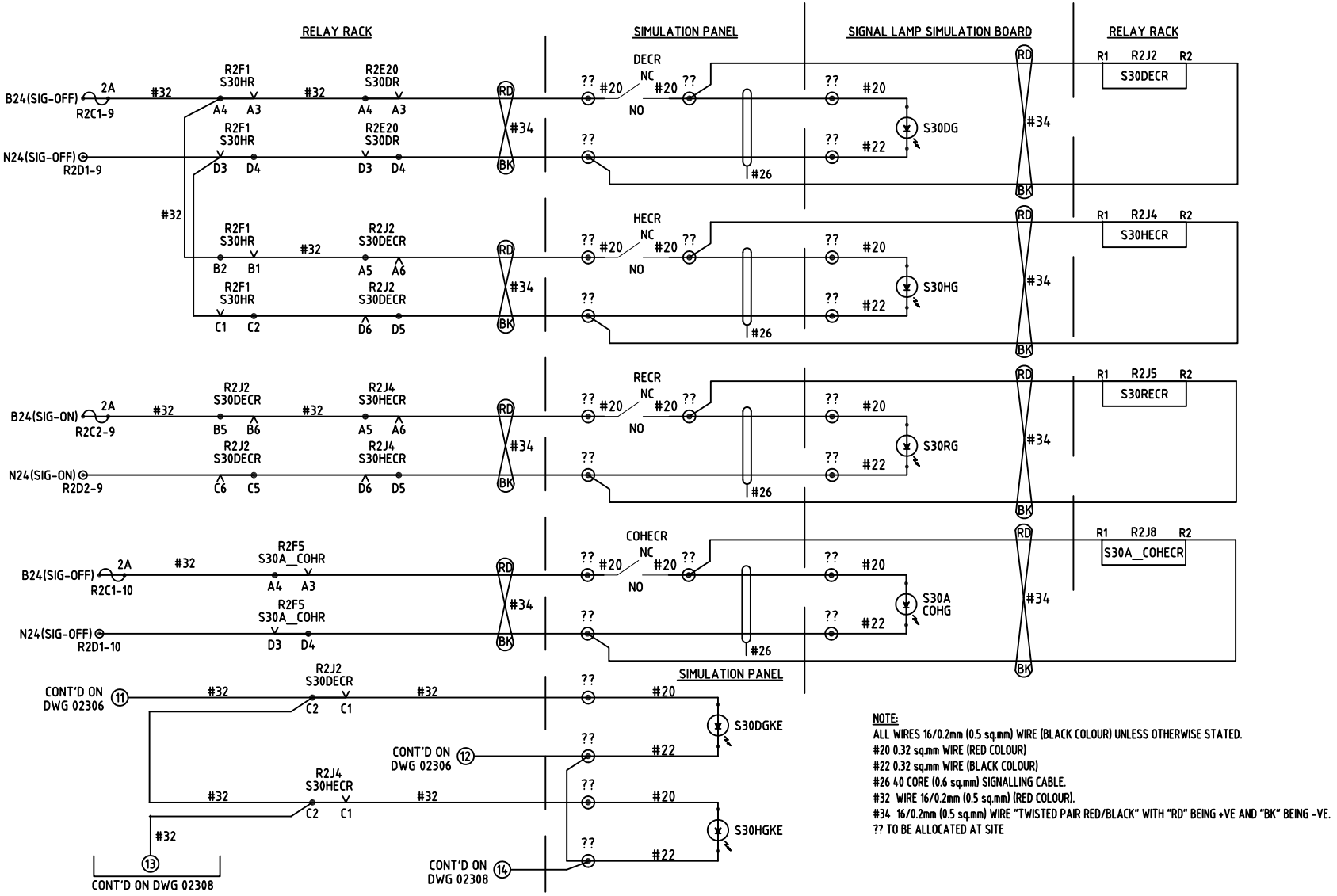
INTERLOCKING INTERFACE CIRCUITS	COVER SHEET	
IFC.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØØ	Ø3

SHEET NO:	VERSION	DESCRIPTION	STATUS ***	MODIFICATION SHEET SERIAL NUMBERS	TESTED	REMARKS
000	03	COVER SHEET				
X1	03	INDEX (1)				
X2	02	INDEX (2)				
001	01	SER FLOOR PLAN				
002	01	EI RELAY RACK LAYOUT				
003	02	EI SYSTEM CONFIGURATION				
004	01	EARTHING ARRANGEMENT				
005	01	INTER RACK CABLE SCHEMATIC				
006	01	FIBRE COMMUNICATION – INTER RACK				
007	03	FIBRE COMMUNICATION – SUBSYSTEMS				
008	01	INPUT / OUTPUT BIT CHART I				
009	01	INPUT / OUTPUT BIT CHART II				
010	02	SIGNAL LIGHTING CIRCUITS–S30				

*** NEW OR (R) RED OR (G) GREEN OR (R/G) RED AND GREEN

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

INTERLOCKING INTERFACE CIRCUITS	INDEX (1)	
IFC.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	X1	Ø3



NOTE:
ALL WIRES 16/0.2mm (0.5 sq.mm) WIRE (BLACK COLOUR) UNLESS OTHERWISE STATED.
#20 0.32 sq.mm WIRE (RED COLOUR)
#22 0.32 sq.mm WIRE (BLACK COLOUR)
#26 40 CORE (0.6 sq.mm) SIGNALLING CABLE.
#32 WIRE 16/0.2mm (0.5 sq.mm) (RED COLOUR).
#34 16/0.2mm (0.5 sq.mm) WIRE "TWISTED PAIR RED/BLACK" WITH "RD" BEING +VE AND "BK" BEING -VE.
?? TO BE ALLOCATED AT SITE

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

INTERLOCKING INTERFACE CIRCUITS	SIGNAL LIGHTING CIRCUITS–S30	
IFC.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	Ø1Ø	Ø2

4.10.2.12 Notes:

- Cover sheet shall take the serial number 000.
- Index sheets shall take serial numbers X1, X2, X3.....etc.,
- Diagram sheets shall take serial numbers 001, 002, 003.....etc.,
- Cover sheet, each of Index sheet or Diagram sheet shall carry version number 01, 02...as the case may be
- Status shall show whether drawing sheet is New or Modified (Red or Green or Red & Green). For an entirely new work, all sheets will have status 'New'. For modifications/ alterations to existing work, status of sheet can be Red (R) if only additions are made to in the existing drawing ; status of sheet can be Green (G) if only removals/ recoveries are made to in the existing drawing; status of sheet can be Red/Green (R/G) if both additions and removals/ recoveries are made to in the existing drawing;
- After issuance of drawing sheets for construction, modifications may arise to drawings out of site requirements or installation logs or test logs.
- These modifications are to be issued in separate Modification sheets serially numbered.
- Modification sheets column shall be posted with Modification sheets serial numbers if any such modifications are issued for construction.

4.10.3 Index for Data Systems

4.10.3.1 Status record index sheets or other system specific documentation giving the current software version of each data file shall be provided for each master data disk or equivalent belonging to each electronic system or sub-system.

4.10.3.2 EPROMs shall also be identified by means of status record indexes. Status record indexes shall be treated as design details in the same way as index sheets, complete with a standard title block bearing a drawing number and version with alteration letters.

Typical Cover, Index and Data File sheets are placed next folio.

VENKATAMPALLE

LOGIC AND VDU DATA FILES

SIGNAL SCHEME PLAN VERSION No: SSP.SCR.GTL.VPL.Ø1

SIGNAL INTERLOCKING PLAN VERSION No: SIP.SCR.GTL.VPL.Ø4

INTERLOCKING CONTROL TABLE VERSION No: ICT.SCR.GTL.VPL.Ø1

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
PRODUCED		PRODUCED	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

DATA SYSTEMS	COVER SHEET	
DAT.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØØ	Ø2

SHEET NO:	VERSION	DESCRIPTION	STATUS ***	MODIFICATION SHEET SERIAL NUMBERS	TESTED	REMARKS
000	02	COVER SHEET				
X1	01	INDEX				
001	03	LOGIC DATA FILES				
002	03	VDU DATA FILES				

*** NEW OR (R) RED OR (G) GREEN OR (R/G) RED AND GREEN

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
PRODUCED		PRODUCED	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

DATA SYSTEMS	INDEX	
DAT.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	X1	Ø1

SUBSYSTEM OR MODULE	CHEKSUM	PC SERIAL NUMBER	VERSION	FILE NAME OR EPROM REFERENCE	PRODUCED	CHECKED
SYSTEM A	8c27	P56781	3.0	DAT.SCR.GTL.VPL.Ø1.P56781		
SYSTEM B	8c27	P56782	3.0	DAT.SCR.GTL.VPL.Ø1.P56782		

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
PRODUCED		PRODUCED	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

DATA SYSTEMS	LOGIC DATA FILES	
DAT.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ1	Ø3

SUBSYSTEM OR MODULE	CHEKSUM	PC SERIAL NUMBER	VERSION	FILE NAME OR EPROM REFERENCE	PRODUCED	CHECKED
VDU A	1f6bc	PC501	3.0	DAT.SCR.GTL.VPL.Ø1.PC501		
VDU B	1f6bc	PC502	3.0	DAT.SCR.GTL.VPL.Ø1.PC502		

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
PRODUCED			(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

DATA SYSTEMS	VDU DATA FILES	
DAT.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ2	Ø3

4.11 Version Control of SIP and SSP

4.11.1 Signal Interlocking Plan (SIP) shall always reflect the signaling on the ground.

4.11.2 Signal Scheme Plan (SSP) shall be prepared for the proposed signalling project for a station based on Signal Interlocking Plan and/ or approved Engineering Scale Plan.

4.11.3 On commission of the project, Scheme Plan which was prepared for the project will replace the Signal Interlocking Plan with version update.

4.11.4 Version updates of SIP and SSPs are illustrated as below:

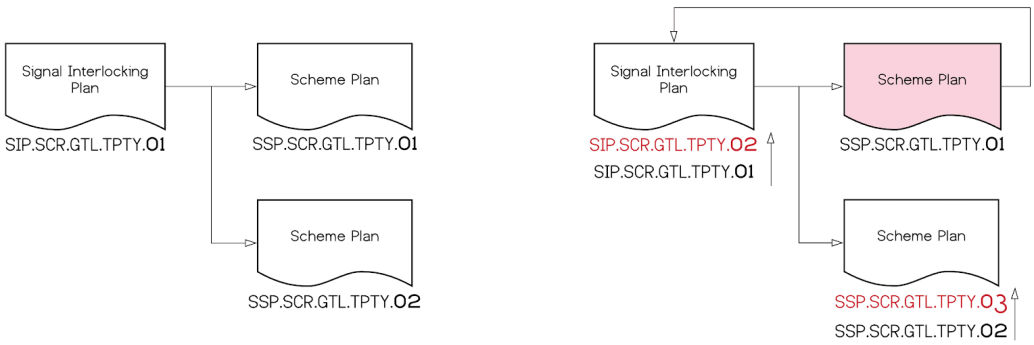
4.11.4.1 SSP is prepared from SIP for a project. When the project is commissioned, SSP will replace SIP with version update. It is illustrated below.

Scheme Plan is prepared based on Signal Interlocking Plan version no: SIP.SCR.GTL.TPTY.01. Scheme Plan is versioned as SSP.SCR.GTL.TPTY.01.

When project is commissioned, Scheme Plan will replace Signal Interlocking Plan with upward revision of version from SIP.SCR.GTL.TPTY.01 to SIP.SCR.GTL.TPTY.02.

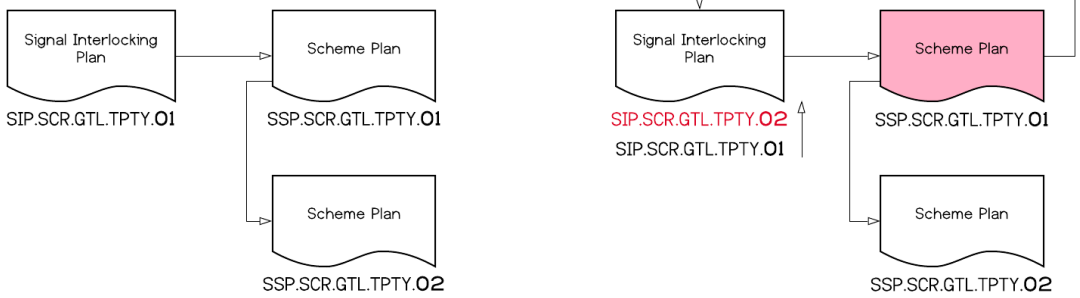


4.11.4.2 Two SSPs are prepared from SIP for 2 different works which are independent. When one of the work is commissioned, the concerned SSP will replace SIP with version update. Other SSP will also undergo version update. This is illustrated below.

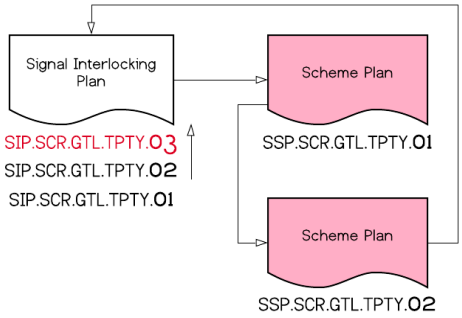


4.11.4.3 Two SSPs are prepared from SIP for 2 different works but works are not independent. Let's assume that that work associated with SSP (version 02) requires the work associated with SSP (version 01).

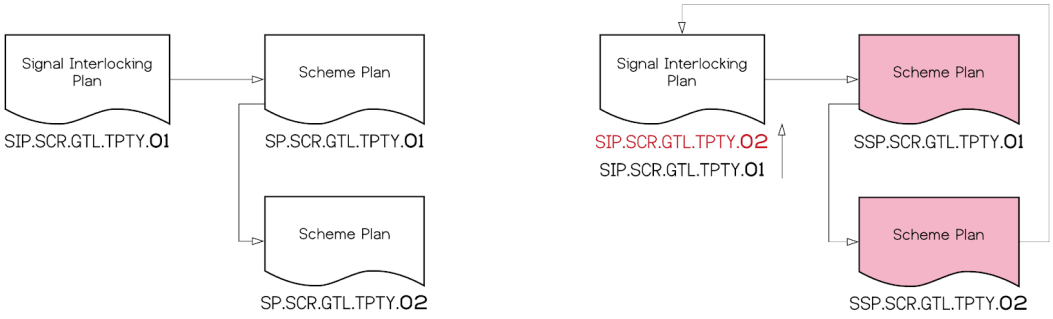
4.11.4.3.1 When the work associated with SSP (version 01) is commissioned, SSP (version 01) will replace SIP with version update.



4.11.4.3.2 When the work associated with SSP (version 02) is commissioned subsequently, SSP (version 02) will replace SIP with further version update.



4.11.4.4 When the work associated with SSP (version 02) is commissioned, SSP (version 02) will replace SIP with version update. It is apparent that when the work associated with SSP (version 02) is commissioned, the work associated with SSP (version 01) is also executed.



4.11.5 Scheme Plan, along with Signal Interlocking Plan (base plan), will be submitted to Commissioner of Railway Safety or Principal Chief Signal & Telecom Engineer for obtaining his sanction for commissioning of the project work.

4.12 Detailed Design Modifications

4.12.1 After issuance of detailed design for construction, modifications may arise during the construction, testing and commissioning phases of the project.

4.12.2 Modification sheets have to be prepared for carrying modifications.

4.12.3 The process shall have

- unique identification of each modification
- full traceability and configuration control
- accurate and complete maintenance records on site at all times
- expeditious updating of final records

4.12.4 Where work has not yet commenced, it is advisable to recall the design details and issue a suitably corrected up-versioned drawing.

4.12.5 Modifications shall be approved for construction.

4.12.6 Modification Sheets and Drawings

- Uniquely identified modification sheets shall be issued by the design authority.
- Modification sheets may be produced in response to a test log, a construction log, or other change request.
- Modification sheets may either take the form of an extract, as shown in next folio , or may reproduce a whole sheet, e.g. using the original CAD file, but identified with a modification sheet border or suitable 'stamp' which can either be applied by hand or electronically.
- A modification sheet or drawing shall only show the wiring alterations affecting one original wiring diagram.
- Where modifications cover more than one sheet they shall be labelled sheet.....of .....sheets

4.12.7 Method

Modifications shall be produced and independently checked by a suitably qualified designer.

- Using Hand Drawn Modification Sheets
- Using CAD or electronic files

- When modification sheets are issued from the design office, they shall be sent with:
    - an issue document; and
    - a new version of the index showing:
        - the affected sheets; and
        - the serial number of the modification sheet.

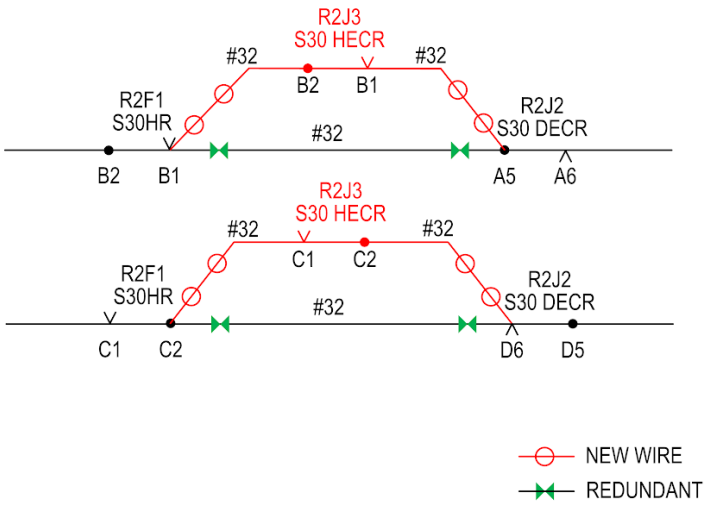
4.12.8 General

- Any 'subsequent modifications' shall assume all previous modifications have been installed with the 'subsequent modification' drawings showing previous modification changes.
- When issuing 'subsequent modifications' such modifications shall be suitably endorsed so as not get confused with previously issued modifications.

Example: by the use of different coloured borders or modification stamps.

A typical Modification Sheet is placed at next folio.

MODIFICATION SHEET				Modification Serial no.	001
Modification to	IFC.SCR.GTL.VPL.01	Sheet no.	010	Version no.	02
Construction Log no. / Test Log no.		Con/VPL/0028		Issued	05/05/2019



PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
PREPARED		PREPARED	(SSE/D)*
CHECKED	(SD)▲	CHECKED	(ASTE)*
	(DV)▲		(SSTE)*
APPROVED	(CRE)▲	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, ▲SIGNATURE WITH DATE AND LICENCE No.			

Nomenclature

5

5.0 Introduction

5.1 Naming of Signal Functions for Signalling Plans

On SIPs/SSPs and ICT, signalling functions /gears shall have following standard nomenclature.

Function/Gear	Nomenclature	Example	Circuit - Prefix	Example	Remarks
Signal	SXX	S01	SXX_	S01_HR	Not S1 or S 1
Distant	DXX	D01	DXX_	D01_HECR	XX - Stop Signal no ahead
Inner Distant	IDXX	ID01	IDXX_	ID01_HHECR	XX - Stop Signal no ahead
Calling-On	CXX	C01	CXX_	C01_HR	XX - Stop Signal no
Shunt	SHXX	SH41	SHXX_	SH41_HECR	XX - Shunt Signal no
Track Circuit	(signal no)T	23T	(signal no)_	23_TPR	
	(point no)*T	101AT	(point no)*_	101A_TPR	* A or B or C or D
	(berthing line no)T	01T 01_*T	(berthing line no)_	01_TPR 01_ATPR	Berthing tracks - 01, 02...01 as per ESP; * A/B/C/D
Block	StbCd_StnCd		StnCd_StnCd_	SC_MLY_LCPR	

Function/Gear	Nomenclature	Example	Circuit - Prefix	Example	Remarks
Axle Counter	(berthing line no)X	01_AC	(berthing line no)_	01_VPR	Berthing line axle counter
	(point no)*X	102A_AC	(point no)*_	102A_VPR	* A or B or C or D
	(signal no)X	08_AC	(signal no)_	08_VPR	Plain section
	StnCd_StnCd_X	SC_MLY_AC	StnCd_StnCd_	SC_ML Y_VPR	X - Relay of BPAC
Point	XXX	101	XXX_	101_WKR	Single End
Point	XXX*	101A	XXX_	101_WKR	Cross Over * Nearest End of the Point - A Other - B
Crank Handle	CHXX	CH01	CHXX_	CH01_NR	XX - Crank Handle Group no.
LC Gate	LXXXX	LX302	XXX_	LX302_PR	XXX - LC Gate number
Slot	(slot no)Y	40Y	XX_AAYR XX_AAPR	KL40_YR KL40_PR	AA - KL etc., Y for Transmit, P for Lock Proving
Slot	SXXY	S01Y	SXX_YR	S01_YR	Y for Transmit P for Lock Proving

5.2 Naming of Signal Functions for VDU Panel

VDU signalling functions such as buttons, indications, buzzers, keys and counters shall follow standard nomenclature.

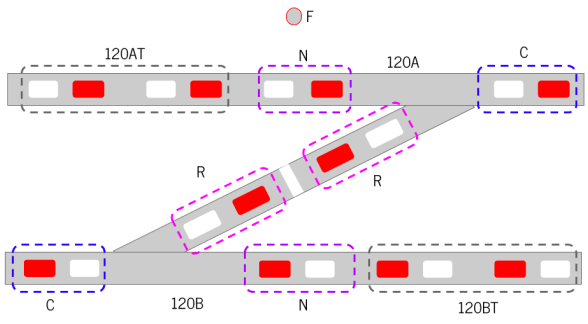
Function	Nomenclature	Circuits - Sufix	Example	Remarks
Route Button, Main	XX_UN		01_UN	XX - Line
Route Button, Overlap	XX_*_UN		01_1_UN	* - Overlap = 1, 2, 3 . .
Common Cancellation Button, Signal	EGGN		EGGN	
Acknowledge Button	*_ACKN		GF_ACKN WF_ACKN PF_ACKN SYS_ACKN	* GF or WF or PF or SYS
Point Indication	XXX_*WKE	_W, _R	101_NWKE_W	* N, R for Normal, Reverse; W, R for White, Red
Signal Indication	SXX_*KE		S01_HKE	* R, H, HH, D for Red, Yellow, Double Yellow, Green aspects
Calling On Indication	CXX_HKE		C01_HKE	
Shunt Signal Indication	SHXX_**KE		SH41_OFFKE SH41_ONKE	** ON/OFF
Route Indication	XX_UKE		01_UKE	XX: Route Indicator Position
Timer Indication	*XX_JKE		S10_JKE C01_JKE CH02_JKE	* S - Signal C - Calling On CH - Crank Handle
Track Circuit Indication	(signal no)TKE	_KE_*	23T_KE_W 23T_KE_R	*W or R
Track Circuit Indication	(point no)**TKE	_KE_*	101AT_KE_W 101AT_KE_R	*W or R ** A/ B/C/ D

Function	Nomenclature	Circuits - Sufix	Example	Remarks
Axle Counter Indication	(berthing line)AC	_KE_*	01AC_KE_W 01AC_KE_R	*W or R
LC Gate Indication	LCXXX_KE	_*	LX301_KE_W LX301_KE_R LX301_KE_F	XXX: LC Gate no *W or R or F
System On Indication	*_SYS_KE		A_SYS_KE B_SYS_KE	* A or B
VDU Selection Indication	*_VDU_KE		A_VDU_KE B_VDU_KE	* A or B
Key	*_KEY_KE	*_KEY_KE_**	SM_KEY_KE_W SM_KEY_KE_R PC_KEY_KE_W PC_KEY_KE_R	* SM or PC ** W- White R - Red
Buzzers, Failure	*_BUZ		GF_BUZ WF_BUZ PF_BUZ SYSF_BUZ	* GF or WF or PF or SYSF
Cancellation Counter	*_Z	(function)_Z	C_Z G_Z W_Z	* function: Calling-on (C) Signal (G) Point (W)

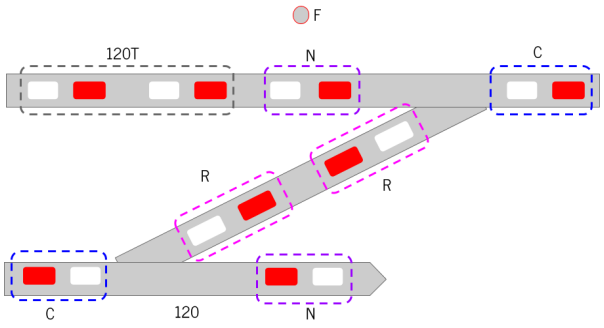
Function	Nomenclature	Circuits - Sufix	Example	Remarks
Point Indication (XOver A, B)	XXX*_*WKE XXX*T_*WKE XXX_WLKE	_*	120A_NWKE_W 120B_NWKE_W 120A_NWKE_R 120B_NWKE_R 120A_RWKE_W 120B_RWKE_W 120A_RWKE_R 120B_RWKE_R 120A_CWKE_W 120B_CWKE_W 120A_CWKE_R 120B_CWKE_R 120BT_NKE_W 120BT_NKE_R 120AT_NKE_W 120AT_NKE_R 120_WLKE_W	In order of appearance Prefix * A or B * N or R or C Suffix * W or R L: Lock (Please see the illustrations at the end of the table)
Point Indication (XOver)	XXX*_*WKE XXX*T_*WKE XXX_WLKE	_*	120_NWKE_W 120_NWKE_R 120_RWK_W 120_RWKE_R 120A_CWKE_W 120A_CWKE_R 120B_CWKE_W 120B_CWKE_R 120T_NKE_W 120T_NKE_R 120_WLKE_W	In order of appearance Prefix * A or B * N or R or C Suffix * W or R L: Lock (Please see the illustrations at the end of the table)

5.2.1 Illustration of Point Indications

Cross Over 120A, 120B



Cross Over 120



5.3 Relay Nomenclature

Signalling Relays can be grouped based on their importance of safety as Vital or Non Vital; based on their location and usage in interlocking as External or Internal; based on information the relays provide to the interlocking system or information the relays receive from the interlocking system as Input or Output.

For example, Track detections (TPRs, VRs), Point positions (WKRs), Signal aspects (ECRs), Interlocked gate, Siding and Crank handle controls (LRs) and Block line clear controls are considered as Vital Inputs.

Signal controls (HRs, DRs, URs), Point controls (NWRs/ RWRs), Slot controls (YRs/ CHYRs/LXYRs/KLYRs) are considered as Vital Outputs.

Panel buttons, knobs, key controls or VDU commands are considered as Non-Vital Inputs.

All panel or VDU indications, alarms/ buzzers, counters are considered as Non-Vital Outputs.

Standard naming of the relays are required to understand their role uniformly across the railways. The table contains the list of relays, naming, description and purpose.

5.3.1 Interface Relays

5.3.1.1 Interface Relays: Vital

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
1	Signal	ASCR	Advanced Starter Control Relay	A relay that picks up when Line Clear is obtained from Block instrument	Vital	Input	External
2	Signal	CO*HECR	Calling on Off aspect Lamp Proving Relay	A relay verifies Calling on Signal Off Aspect Lamp status	Vital	Input	External
3	Signal	DECR	Lamp Proving Relay – Green Aspect	A relay verifies Main Signal Off _Clear Aspect Lamp status	Vital	Input	External
4	Signal	HECR	Lamp Proving Relay – Yellow Aspect	A relay verifies Main Signal Off_caution Aspect Lamp status	Vital	Input	External
5	Signal	HHECR	Lamp Proving Relay – Double Yellow Aspect	A relay verifies Main Signal Off_Attention Aspect Lamp status	Vital	Input	External
6	Signal	RECR	Lamp Proving Relay – Red Aspect	A relay verifies Main Signal On Aspect Lamp status.	Vital	Input	External

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
7	Signal	UECR	Lamp Proving Relay – Route Indicator	A relay verifies Route indicator Lamps status.	Vital	Input	External
8	Signal	CO*HR	Calling on Off Aspect Control Relay	A relay controls Calling on Signal Off Aspect	Vital	Output	External
9	Signal	DR	Green Aspect Control Relay	A relay controls Main Signal Off_Clear Aspect	Vital	Output	External
10	Signal	HHR	Double Yellow Aspect Control Relay	A relay controls Main Signal Off_Attention Aspect	Vital	Output	External
11	Signal	HR	Yellow Aspect Control Relay	A relay controls Main Signal Off_Caution Aspect	Vital	Output	External
12	Signal	UR	Route Indicator Control Relay	It picks up when the route is set and locked for loop line	Vital	Output	External
13	Point	CHO*LR	Crank Handle Lock Relay	A relay verifies Crank handle key is IN and Locked	Vital	Input	External
14	Point	NWKR	Normal Point Detection Relay	A relay verifies Normal Point Detection	Vital	Input	External
15	Point	RWKR	Reverse Point Detection Relay	A relay verifies Reverse Point Detection	Vital	Input	External
16	Point	CHO*YR	Crank Handle slot Release Relay	A relay verifies Crank handle slot is granted for Key extraction	Vital	Output	External
17	Point	NWR	Normal Point Control Relay	A relay controls Normal Point operation	Vital	Output	External
18	Point	RWR	Reverse Point Control Relay	A relay controls Reverse Point operation	Vital	Output	External
19	Crank Handle	CHO*KEYINPR	Crank Handle Key In Proving Relay	It verifies that crank handle key is in and locked at EKT	Vital	Input	External
20	Siding Point	KL*KEYINPR	Siding Key In Proving Relay	It verifies that Siding I key is in and locked at EKT	Vital	Input	External
21	Siding Point	KL*PR	Siding control lock proving Relay	A relay verifies Siding control key is IN and Locked	Vital	Input	External
22	Siding Point	KL*YR	Siding control Slot Release Relay	A relay verifies Siding control slot is granted for Key extraction	Vital	Output	External
23	Track Circuit	TPR	Track Repeater Relay	A relay verifies track occupancy status.	Vital	Input	External
24	Axle Counter	AC*PR	Axle Counter Proving Relay	A relay that verifies axle counter section is free from wheels	Vital	Input	External
25	Axle Counter	PPR	Preparatory proving Relay	A relay used in Digital axle counter for verifying Axle counter preparatory resetting	Vital	Input	External
26	Axle Counter	VPR	Vital Track Proving Relay	A relay used in Digital axle counter for proving train detection	Vital	Input	External
27	Block	LCPR	Line clear proving relay	A relay verifies line clear granted status	Vital	Input	External

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
28	LC Gate	LX*KEYINPR	LC Gate Key In Proving Relay	It verifies that LC Gate key is in and locked at EKT	Vital	Input	External
29	LC Gate	LX*YR	Level Crossing Control slot Release Relay	A relay verifies Level crossing Gate slot is granted for key extraction	Vital	Output	External
30	Misc	SMCR	Station Master Control Relay	A relay verifies Station Master's control key is IN	Vital	Input	External

5.3.1.2 Interface Relays: Non-Vital

Sno	Group	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
1	Signal	Button	CO*GN	Calling on button	A push button used for calling on signal operation	Non-Vital	Input	External
2	Signal	Button	GN	Signal push button	A push button used for signal operation	Non-Vital	Input	External
3	Signal	Buzzer	GF_BUZ	Signal failure buzzer	Rings when any signal fails	Non-Vital	Output	External
4	Signal	Counter	CO*Z	Calling-On Cancellation counter	It counts Calling-On Cancellation activities	Non-Vital	Output	External
5	Signal	Counter	CO*IZ	Calling-On Initiation counter	It counts Calling-On Initiation activities	Non-Vital	Output	External
6	Signal	Indication	JKE	Cancellation timer indication	Flashes when route cancellation timer is in progress	Non-Vital	Output	External
7	Signal	Indication	CO*JKE	Calling - on Cancellation timer indication	Indicates Calling - on Cancellation timer is in Progress	Non-Vital	Output	External
8	Signal	Indication	CO*IJKE	Calling - on timer initiation indication	Indicates Calling - on timer is in Progress	Non-Vital	Output	External
9	Signal	Indication	CO*KE	Calling on Off indication	Indicates calling-on Off aspect status	Non-Vital	Output	External
10	Signal	Indication	DKE	Signal lamp indication – green aspect	Indicates green aspect is burning / lighting on signal at site	Non-Vital	Output	External
11	Signal	Indication	HKE	Signal lamp indication – yellow aspect	Indicates yellow aspect is burning / lighting on signal at site	Non-Vital	Output	External
12	Signal	Indication	RKE	Signal lamp indication - red aspect	Indicates red aspect is burning / lighting on signal at site	Non-Vital	Output	External
13	Signal	Indication	SH*_OFFKE	Shunt signal indication – off aspect	Indicates off aspect is burning / lighting on shunt signal at site	Non-Vital	Output	External
14	Signal	Indication	SH*_ONKE	Shunt signal indication – on aspect	Indicates on aspect is burning / lighting on shunt signal at site	Non-Vital	Output	External
15	Signal	Indication	SFKE	Signal failure indication	Lights up when any signal fails	Non-Vital	Output	External
16	Signal	Indication	UKE	Route indication	Indicates route aspect is burning / lighting on signal at site	Non-Vital	Output	External
17	Route	Button	UN	Route push button	A push button used for route selection	Non-Vital	Input	External
18	Route	Counter	EUUYZ	Emergency full route release counter	It counts emergency full route release operation activities	Non-Vital	Output	External

Sno	Group	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
19	Route	Indication	UNKE	Route button indication	Lights up when any route button pressed/stuck up	Non-Vital	Output	External
20	Route	Indication	*OVJKE	Overlap Cancellation Indication	Lights up to indicate whenever OV cancellation in progress	Non-Vital	Output	External
21	Point	Button	WN	Point push button	A push button used for point operation	Non-Vital	Input	External
22	Point	Buzzer	WF_BUZ	Point failure buzzer	Rings when any point fails	Non-Vital	Output	External
23	Point	Counter	EW_Z	Emergency point operation counter	It counts emergency point operation activities	Non-Vital	Output	External
24	Point	Indication	CKE_R	Common point track indication red	Lights up when route is set, locked and point is in normal or reverse and point zone track occupied	Non-Vital	Output	External
25	Point	Indication	CKE_W	Common point track indication white	Lights up when route is set, locked and point is in normal or reverse and point zone track clear	Non-Vital	Output	External
26	Point	Indication	EWNKEYINKE	Emergency point key turned on indication	Lights up when emergency point operation key is turned on.	Non-Vital	Output	External
27	Point	Indication	NKE_R	Normal point track indication red	Lights up when over that portion of track , the route is set, point is in normal and point zone track occupied	Non-Vital	Output	External
28	Point	Indication	NKE_W	Normal point track indication white	Lights up when over that portion of track , the route is set, point is in normal and point zone track clear	Non-Vital	Output	External
29	Point	Indication	NWKE_R	Normal point indication red	Lights up when point is detected in normal and point zone track occupied	Non-Vital	Output	External
30	Point	Indication	NWKE_W	Normal point indication white	Lights up when point is detected in normal and point zone track clear	Non-Vital	Output	External
31	Point	Indication	RWKE_R	Reverse point indication red	Lights up when point is detected in reverse and point zone track occupied	Non-Vital	Output	External
32	Point	Indication	RWKE_W	Reverse point indication white	Lights up when point is detected in reverse and point zone track clear	Non-Vital	Output	External
33	Point	Indication	WF_KE	Point failure indication	Lights up when any point fails	Non-Vital	Output	External
34	Point	Indication	WLKE	Point lock indication	Lights up when the point is locked in a route	Non-Vital	Output	External
35	Point	Indication	WNKE	Point button indication	Lights up when any point button pressed/stuck up	Non-Vital	Output	External

Sno	Group	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
36	Crank Handle	Button	CH0*N	Crank handle button	A push button used for crank handle release.	Non-Vital	Input	External
37	Crank Handle	Counter	CH0*YZ	Crank handle slot release counter	It counts emergency crank handle release activities	Non-Vital	Output	External
38	Crank Handle	Indication	CH0*FKE	Crank handle key free indication	Lights up when crank handle key is free to extract and extinguishes when ever the CH is locked in route	Non-Vital	Output	External
39	Crank Handle	Indication	CH0*KE_R	Crank handle key out indication- red	Lights up when crank handle key is out	Non-Vital	Output	External
40	Crank Handle	Indication	CH0*KE_W	Crank handle key in indication - white	Lights up when crank handle key is in	Non-Vital	Output	External
41	Siding Point	Indication	KL*FKE	Key free to extract in indication	Lights up when key is in and free to extract	Non-Vital	Output	External
42	Siding Point	Indication	KL*KEY_KE_W	Key In indication	Lights up when key is lock and not free to extract	Non-Vital	Output	External
43	Siding Point	Indication	KL*KEY_KE_R	Key Out indication	Lights up when key is out	Non-Vital	Output	External
44	Track	Indication	TKE_R	Track occupied (red) indication	Lights up when route is set, locked and track is occupied	Non-Vital	Output	External
45	Track	Indication	TKE_W	Track clear (white) indication	Lights up when route is set, locked and track is clear	Non-Vital	Output	External
46	LC Gate	Button	LX*N	Level crossing push button	A push button used for LC gate control	Non-Vital	Input	External
47	LC Gate	Counter	ELXY_Z	Emergency LC Gate release counter	It counts emergency LC Gate release operation activities	Non-Vital	Output	External
48	LC Gate	Indication	LX*F_KE	Level crossing Gate free indication	Lights up when Level crossing Gate key free to extract and extinguishes when ever the ch is locked in route	Non-Vital	Output	External
49	LC Gate	Indication	LX*KE_R	Level crossing red indication	Lights up when level crossing gate is opened after receiving the slot from sm	Non-Vital	Output	External
50	LC Gate	Indication	LX*KE_W	Level crossing white indication	Lights up when level crossing gate is closed and acknowledged by sm	Non-Vital	Output	External
51	System	Button	SYSF_ACKN	System failure acknowledge push button	A push button used for system failure buzzer acknowledgement.	Non-Vital	Input	External
52	System	Key	PC_KEY	PC Change over Key	A key used for Panel / PC Change over KEY	Non-Vital	Input	External
53	System	Key	SM_KEY	Station master key	A key used for station master control	Non-Vital	Input	External

Sno	Group	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	External/ Internal
54	System	Key	BLKR	Block Relay	It pickup when block command is given	Non-Vital	Input	External
55	System	Button	PF_ACKN	Power Failure Acknowledgement button	Pickup to mute the power failure buzzer	Non-Vital	Input	External
56	System	Indication	PC_KE	PC indication	When it is lit, indicates operations are authorised from vdu-ct	Non-Vital	Output	External
57	System	Indication	SMKEYIN_KE	Station Master Key In Indication	It lights up when sm key is inserted in the panel and panel is ready for operation	Non-Vital	Output	External
58	System	Indication	SMKEYOUT_ KE	Station master Key Out Indication	It lights up when sm key is out in the panel	Non-Vital	Output	External

5.3.2 Internal Relays

5.3.2.1 Internal Relays: VItal

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	Externa/ Internal
1	Signal	CO*CANR	Calling on Cancellation Relay	Pickup when calling on cancellation is ordered	Vital	-	Internal
2	Point	AS1WR	Autoset Point Relay 1	Point auto setting starting relay one – for chain operation initiation	Vital	-	Internal
3	Point	AS2WR	Autoset Point Relay 2	Point auto setting starting relay two – for chain operation to start	Vital	-	Internal
4	Point	ASWR	Autoset Point Relay	Point auto setting relay for individual point picks up when required to participate on chain operation	Vital	-	Internal
5	Point	EWWNCR	Emergency Point operation Control Relay – Normal Or Reverse	It picks up when emergency point operation button is pressed , to increment the emergency operation counter and drops with time delay, then only emergency point operation is initiated further.	Vital	-	Internal
6	Point	NCR	Normal Point Control Relay	It picks up and sticks (till the reverse operation command) when normal operation is ordered	Vital	-	Internal
7	Point	NLR	Normal point initiation Relay	It picks up to initiate normal automatic point operation when LR/NRR is picked up which requires that point in normal status	Vital	-	Internal
8	Point	NWLR	Normal Point Lock Relay	Normal point operation initiation relay / lock relay. These are normally pick up in some railways and normally drop in some railways.	Vital	-	Internal
9	Point	NWSR	Normal Point stick Relay	A relay ensures Point Normal detection and Crank Handle is IN	Vital	-	Internal
10	Point	RLR	Reverse point initiation Relay	It picks up to initiate reverse automatic point operation when LR/NRR is picked up which requires that point in reverse status	Vital	-	Internal
11	Point	RWLR	Reverse Point Lock Relay	Normal point operation initiation relay / lock relay. These are normally pick up in some railways and normally drop in some railways.	Vital	-	Internal
12	Point	RWSR	Reverse Point Stick Relay	A relay ensures Point Reverse detection and Crank Handle is IN	Vital	-	Internal
13	Point	NWCR	Normal Point Control Relay	It picks up and sticks (till the reverse operation command) when reverse operation is ordered	Vital	-	Internal
14	Point	RWCR	Reverel Point Control Relay	It picks up and sticks (till the normal operation command) when reverse operation is ordered	Vital	-	Internal

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	Externa/ Internal
15	Point	WJR	Point Time Control Relay	It allows the point feed for specific time.	Vital	-	Internal
16	Point	WWFR	Automatic Point Chain Operation Final relay	When picks up, confirms that the automatic chain operation initiation is completed and it drops when chain operation is completed.	Vital	-	Internal
17	Point	RCR	Point Reverse Control	Pickup and sticks when reverse operation is ordered	Vital	-	Internal
18	Point	WWR	Chain Operation Relay for Each Point	Pickup during automatic point operation to initiate each individual point	Vital	-	Internal
19	Crank Handle	CH0*FR	Crank Handle Free Relay	A relay verifies Crank Handle Key Free status	Vital	-	Internal
20	Siding Point	KLNR	Siding control Normal Relay	A relay that verifies siding control Normal status	Vital	-	Internal
21	Track Circuit	AR	Approach Relay	Picks up when approach track is occupied	Vital	-	Internal
22	Block	SNR	Signal Normal Relay	it verifies all Signals / controls, slides & signals Normal position pertaining to Block section.	Vital	-	Internal
23	Block	SR1, SR2	Stick Relays	To implement one train on one line clear feature	Vital		Internal
24	Block	ZR1, ZR2, ZR3	Block Clearance Relays	These Relays will pickup when train passes over set route to clear the block	Vital		Internal
25	LC Gate	LX*PR	Level Crossing Gate Close Proving Relay	A relay verifies Level Crossing Gate is Closed for road traffic	Vital	-	Internal
26	LC gate	LX*FR	LC Gate Free Relay	Normally pickup relay and drops when LC gate is proved in route set	Vital		Internal
27	Misc	ASR	Approach stick relay	A relay that ensures Route Locking on the Approach of a train. when ASR drops route gets locked.	Vital	-	Internal
28	Misc	EUUYR	Emergency Full route release Relay	A relay that verifies Full Route Cancellation activity is initiated.	Vital	-	Internal
29	Misc	FCOR	False cut off relay	FCOR relay picks up when any output relay is picked by the false feed. (EI)	Vital	-	Internal
30	Misc	JBPR	Route Cancellation Normal Proving Relay	A relay that verifies Route Cancellation is not in progress.	Vital	-	Internal
31	Misc	JSLR	Route Cancellation Stick Lock Relay	It gets picked up when route cancellation command is initiated or due to system bit (CPSJR) is set during start up and necessary conditions are satisfied like approach clear etc	Vital	-	Internal
32	Misc	NJPR	Route Cancellation Timer Relay	It gets supply/initiation, when JSLR is picked up for route cancellation. When predetermined time is elapsed, it gets picked up and release the route	Vital	-	Internal

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	Externa/ Internal
33	Misc	NNR	Route Initiation Normal Relay	It is normally picked up status to indicate that route is not initiated and it drops when NRR is picked up	Vital	-	Internal
34	Misc	NRR	Route Initiation Reverse Relay	It picks up when signal take off command is initiated from CCIP/VDU CT	Vital	-	Internal
36	Misc	OVNRR	Overlap Initiation Relay	A relay meant for Overlap Points initiation	Vital	-	Internal
37	Misc	OVSR	Overlap Stick Relay	It is a normally pick up relay. It drops when the route is set towards that overlap and locks the points in Overlap.	Vital	-	Internal
38	Misc	POR/ LVR	Power On relay	A relay checks whether power is on or not	Vital	-	Internal
39	Misc	TSR	Track Stick Relay	One Signal - One Train concept is achieved with this relay.	Vital	-	Internal
40	Misc	UCR	Route Checking Relay	It picks up after checking the Correct Route is Set	Vital	-	Internal
41	Misc	UYR1, UYR2, UYR3	Sequential Route Release Relays	They pick up to prove the directional arrival of a train in the set route and release the route when other conditions are satisfied.	Vital	-	Internal
42	Misc	OV*_NNR	Overlap Initiation Normal Relay	Normally pickup relay	Vital	-	Internal
43	Misc	OV*_JSLR	Overlap cancellation initiation Relay	Pickup whenever the train stops on berthing line after clearing last back lock track circuit automatically to initiate OV-cancellation	Vital	-	Internal
44	Misc	OV*_NJPR	Overlap cancellation timer Relay	It gets initiation through OV-JSLR and pickup after predetermined time delay 120 seconds	Vital	-	Internal
45	Misc	WXR	Point Special Relay	To help WJR to drop after time delay	Vital		Internal

5.3.2.2 Internal Relays: Non-Vital

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	Externa/ Internal
1	Signal	CO*GGNR	Calling On Signal Button Relay	A button relay meant for Calling on Signal initiation	Non-Vital	-	Internal
2	Signal	EGGNR	Emergency Signal Group cancellation Button Relay	It picks up when emergency signal cancellation button is pressed to throw a cleared signal to (On) danger	Non-Vital	-	Internal
3	Signal	GECR	Signal Aspect Checking Relay	Picks up when any one of the Signal aspects is litting. it proves that signal is not blank.	Non-Vital	-	Internal
4	Signal	GNCR	Signal Button Normal Checking Relay	It is normally pick up relay and drops when any signal button is pressed	Non-Vital	-	Internal
5	Signal	GNR	Signal Button Relay	Picks up when signal take off command is initiated from VDU-CT	Non-Vital	-	Internal
6	Point	EWWNR	Emergency Point operation Common Button Relay	It picks up when emergency point operation button is pressed and enables point operation under point zone track circuit in failure status	Non-Vital	-	Internal
7	Point	NWWNR	Common Point Button Relay – Normal Operation	Picks up when Common Point Button – Normal Operation is pressed	Non-Vital	-	Internal
8	Point	RWWNR	Common Point Button Relay – Reverse Operation	Picks up when Common Point Button – Reverse Operation is pressed	Non-Vital	-	Internal
9	Point	WF_ACKNR	Point Fail Buzzer Mute Relay	A relay that picks up when Point Failure buzzer is acknowledged.	Non-Vital	-	Internal
10	Point	WNCR	All Point Button Normal Checking Relay	It is normally pick up relay to indicate no point button is pressed and drops when any Point button is pressed	Non-Vital	-	Internal
11	Point	WNR	Point Button Relay	Picks up when Point Button is pressed	Non-Vital	-	Internal
12	Point	WFAILR	Point Fail Relay	A relay that verifies Point Fail status	Non-Vital	-	Internal
13	Siding Point	KL*NR	Siding Control Button Relay	A Button relay meant for Siding Control operations	Non-Vital	-	Internal
14	LC Gate	LX*NR	Level crossing button relay	It picks up when the LC gate control button is pressed	Non-Vital	-	Internal
15	Misc	BLKNR	Button Block Button Relay	A Button Relay for Block the Buttons	Non-Vital	-	Internal
16	Misc	CH*NR	Crank Handle Button Relay	A Button relay meant for Crank Handle Operation	Non-Vital	-	Internal
17	Misc	EUUYNR	Emergency Full route release Button Relay	Picks up when Emergency Full Route Cancellation button is pressed on panel or Route release command is initiated from VDU-CT	Non-Vital	-	Internal
19	Misc	GF_ACKNR	Signal failure Acknowledgement Button Relay	A Button relay meant for Signal Failure Acknowledgement	Non-Vital	-	Internal
20	Misc	YYNR	Group slot release button relay	A Button relay meant for Slot release/transmission	Non-Vital	-	Internal

Sno	Function	Nomenclature	Description	Purpose	Vital/ Non-Vital	Input/ Output	Externa/ Internal
21	Misc	YYRNR	Group slot return back button relay	A Button relay meant for Slot receive / return operation	Non-Vital	-	Internal
22	Misc	NNCR	All Button Normal Checking Relay	Drops when any panel button is struck-up in pressed condition	Non-Vital	-	Internal
24	Misc	ALL_UNBLKR	Unblock Relay	To unblock all the functions	Non-Vital	-	Internal
25	Misc	UNBLKR	Unblock Relay	To unblock a function	Non-Vital	-	Internal
26	Misc	UNCR	Route Button Normal Checking Relay	It is normally pick up relay and drops when any Route button is pressed	Non-Vital	-	Internal
27	Misc	UNR	Route Button Relay	A Button Relay verifies that concerned Route button is pressed	Non-Vital	-	Internal

5.3.3 VDU Menu Commands

List of typical menu commands and their bit nomenclature are as below:

Function	Menu Command	Command Bit	Associated Bits
Signal 01	S01_01_1	S01_01_1_UN	S01_GNR, 01_1_UNR
	S01_01_2	S01_01_2_UN	S01_GNR, 01_2_UNR
	S01_02	S01_02_UN	S01_GNR, 02_UNR
	Signal Cancel	S01_CANCEL	S01_GNR, EGGNR
	Emergency Route Release	S01_EU_RELEASE	S01_GNR, EUUYNR
	Emergency Route Release (Special)	S01_ESU_RELEASE	S01_GNR, ESUUYNR
	Block	S01_BLOCK	S01_BLKNR
	Unblock	S01_UNBLOCK	S01_UNBLKNR
Calling On 01	C01_01_1	C01_01_1_UN	C01_GNR, 01_1_UNR
	C01_02	C01_02_UN	C02_GNR, 02_UNR
	Signal Cancel	C01_CANCLE	C01_GNR, EGGNR
	Emergency Route Release	C01_EU_RELEASE	C01_GNR, EUUYNR
	Emergency Route Release (Special)	C01_ESU_RELEASE	C01_GNR, ESUUNYNR
	Block	C01_BLOCK	C01_BLKNR
	Unblock	C01_UNBLOCK	C01_UNBLKNR
Point 101	Normal	101_NORMAL	101_WNR, NWWNR
	Reverse	101_REVERSE	101_WNR, RWWNR
	Emergency Normal	101_NORMAL_EMERGENCY	101_WNR, NWWNR, EWWNR,
	Emergency Reverse	101_REVERSE_EMERGENCY	101_WNR, RWWNR, EWWNR,
	Block	101_BLOCK	101_BLKNR
	Unblock	101_UNBLOCK	101_UNBLKNR
Route 01	Block	01_1_BLOCK	01_1_BLKNR
		01_2_BLOCK	01_2_BLKNR
	Unblock	01_1_UNBLOCK	01_1_UNBLKNR
		01_2_UNBLOCK	01_2_UNBLKNR

Function	Menu Command	Command Bit	Associated Bits
Level Crossing Gate 302	Transmit	302_TRANSMIT	LX302_NR, YYNR
	Emergency Transmit	302_TRANSMIT_EMERGENCY	LX302_NR , EYYNR
	Receive	302_RECEIVE	LX302_NR, YYRNR
	Block	302_BLOCK	LX302_BLKNR
	Unblock	302_UNBLOCK	LX302_UNBLKNR
Siding Point 202	Transmit	202_TRANSMIT	KL202_NR, YYNR
	Receive	202_RECEIVE	KL202_NR, YYRNR
	Block	202_BLOCK	KL202_BLKNR
	Unblock	202_UNBLOCK	KL202_UNBLKNR
Crank Handle 01	Transmit	CH01_TRANSMIT	CH01_NR, YYNR
	Emergency Release	CH01_TRANSMIT_EMERGENCY	CH01_NR , EYYNR
	Receive	CH01_RECEIVE	CH01_NR, YYRNR
	Block	CH01_BLOCK	CH01_BLKNR
	Unblock	CH01_UNBLOCK	CH01_UNBLKNR
All Unblock	All Unblock	ALL_UNBLOCK	ALL_UNBLKR
PC Key	PC Key In	PC_KEY_IN	PC_KEYIN
	PC Key Out	PC_KEY_OUT	PC_KEYOUT
SM Key	SM Key In	SM_KEY_IN	SM_KEYIN
	SM Key Out	SM_KEY_OUT	SM_KEYOUT
System Failure Acknowledgement	SYSF_ACKN	SYSF_ACKN	SYSF_ACKNR
Signal Failure Acknowledgement	GF_ACKN	GF_ACKN	GF_ACKNR
Point Failure Acknowledgement	WF_ACKN	WF_ACKN	WF_ACKNR
Power Failure Acknowledgement	PF_ACKN	PF_ACKN	PF_ACKNR

NOTES	
Signal Cancel	To putback Signal to Danger
Emergency Route Release	To release route with time delay
Emergency Route Release (Special)	To release route with time delay with password protection (To work when one back lock track is down or any other reason)
Block	To make a function inoperative
Unblock	To release a function which is blocked earlier
All Unblock	To release all functions when system is powered on

5.3.4 VDU Menu Commands For Typical Scheme Plan

Menu Commands Sheets for the typical scheme plan are placed at next folio.

VENKATAMPALLE

VDU LAYOUT &

MENU COMMANDS

SIGNAL SCHEME PLAN VERSION No: SSP.SCR.GTL.VPL.Ø1

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU LAYOUT	COVER SHEET	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØØ	Ø1

SHEET NO	VERSION	DESCRIPTION	STATUS ***	MODIFICATION SHEET SERIAL NUMBERS	TESTED	REMARKS
000	01	COVER SHEET				
X1	01	INDEX				
001	01	VDU LAYOUT				
002	01	VDU MENU COMMANDS – SIGNALS				
003	01	VDU MENU COMMANDS – SIGNALS				
004	01	VDU MENU COMMANDS – SIGNALS & POINTS				
005	01	VDU MENU COMMANDS – POINTS & MISC.				
006	01	VDU MENU COMMANDS – ROUTE & MISC.				

*** NEW OR (R) RED OR (G) GREEN OR (R/G) RED AND GREEN

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU LAYOUT	INDEX	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	X1	Ø1

INDICATIONS RELATED TO ROUTE, OVERLAP & CO-ON			
S01	○	04-OV	○
S04	○	06-OV1	○
S06	○	06-OV2	○
S08	○		
SH41	○		
C01	○		

SIG	PNT	PWR
○	○	○
●	●	●

VDU1	●
VDU2	○
VDU LINK	○

LINK STATUS
CH A
HEALTHY FAULTY
CH B
ACK

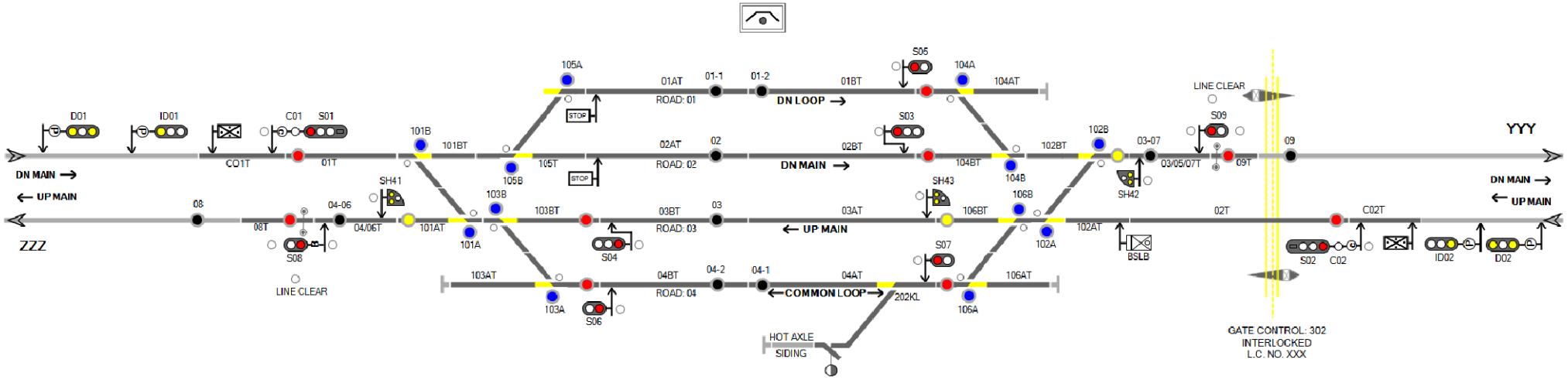
	ACT	STD	NA	ACK
VIC A HEALTH STATUS	●	○	○	●
VIC B HEALTH STATUS	○	●	○	●

DN KM : XXX UP
VENKATAMPALLE

SM KEY ○ ○
PC KEY ○ ○
ESU KEY ○ ○

CO-CAN	
C01	○
C02	○

INDICATIONS RELATED TO ROUTE, OVERLAP & CO-ON			
S02	○	C02	○
S03	○	03-OV	○
S05	○	05-OV1	○
S07	○	05-OV2	○
S09	○	07-0V1	○
SH42	○	07-OV2	○
SH43	○		



TFC_N

KEY IN	KEY OUT	KEY IN	KEY OUT	KEY IN	KEY OUT	KEY IN	KEY OUT
	●		●		●		●
CH01 : 101		CH02 : 103, 106		CH03 : 104,105		CH04 : 102	

KEY IN	KEY OUT
	●
202 POINT NO: 202	

IN	OUT
	●
302 L.C.NO. XXX	

TFC_S

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU LAYOUT	VDU LAYOUT	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ1	Ø1

Function	Signal	Route	Menu Command	Command Bit	Associated Bits
Signals	S01	01_1	S01_01_1	S01_01_1_UN	S01_GNR, 01_1_UNR
		01_2	S01_01_2	S01_01_2_UN	S01_GNR, 01_2_UNR
		02	S01_02	S01_02_UN	S01_GNR, 02_UNR
		04_1	S01_04_1	S01_04_1_UN	S01_GNR, 04_1_UNR
		04_2	S01_04_2	S01_04_2_UN	S01_GNR, 04_2_UNR
			Signal Cancel	S01_CANCEL	S01_GNR, EGGNR
			Emergency Route Release	S01_EU_RELEASE	S01_GNR, EUUYNR
			Emergency Route Release (Special)	S01_ESU_RELEASE	S01_GNR, ESUUYNR
			Block	S01_BLOCK	S01_BLKNR
			Unblock	S01_UNBLOCK	S01_UNBLKNR
	S03	03_07	S03_03_07	S03_03_07_UN	S03_GNR, 03_07_UNR
			Signal Cancel	S03_CANCEL	S03_GNR, EGGNR
			Emergency Route Release	S03_EU_RELEASE	S03_GNR, EUUYNR
			Emergency Route Release (Special)	S03_ESU_RELEASE	S03_GNR, ESUUYNR
			Block	S03_BLOCK	S03_BLKNR
			Unblock	S03_UNBLOCK	S03_UNBLKNR
	S05	03_07	S05_03_07	S05_03_07_UN	S05_GNR, 03_07_UNR
			Signal Cancel	S05_CANCEL	S05_GNR, EGGNR
			Emergency Route Release	S05_EU_RELEASE	S05_GNR, EUUYNR
			Emergency Route Release (Special)	S05_ESU_RELEASE	S05_GNR, ESUUYNR
			Block	S05_BLOCK	S05_BLKNR
			Unblock	S05_UNBLOCK	S05_UNBLKNR

Function	Signal	Route	Menu Command	Command Bit	Associated Bits
Signals	S07	03_07	S07_03_07	S07_03_07_UN	S07_GNR, 03_07_UNR
			Signal Cancel	S07_CANCEL	S07_GNR, EGGNR
			Emergency Route Release	S07_EU_RELEASE	S07_GNR, EUUYNR
			Emergency Route Release (Special)	S07_ESU_RELEASE	S07_GNR, ESUUYNR
			Block	S07_BLOCK	S07_BLKNR
			Unblock	S07_UNBLOCK	S07_UNBLKNR
	S09	09	S09_09	S09_09_UN	S09_GNR, 03_07_UNR
			Signal Cancel	S09_CANCEL	S09_GNR, EGGNR
			Emergency Route Release	S09_EU_RELEASE	S09_GNR, EUUYNR
			Block	S09_BLOCK	S09_BLKNR
			Unblock	S09_UNBLOCK	S05_UNBLKNR
	S02	03	S02_03	S02_03_UN	S02_GNR, 03_UNR
		04_1	S02_04_1	S02_04_1_UN	S02_GNR, 04_1_UNR
		04_2	S02_04_2	S02_04_2_UN	S02_GNR, 04_2_UNR
			Signal Cancel	S02_CANCEL	S02_GNR, EGGNR
			Emergency Route Release	S02_EU_RELEASE	S02_GNR, EUUYNR
			Emergency Route Release (Special)	S02_ESU_RELEASE	S02_GNR, ESUUYNR
			Block	S02_BLOCK	S02_BLKNR
			Unblock	S02_UNBLOCK	S02_UNBLKNR

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU MENU COMMANDS	SIGNALS	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ2	Ø1

Function	Signal	Route	Menu Command	Command Bit	Associated Bits
Signals	S04	04_06	S04_04_06	S04_04_06_UN	S04_GNR, 04_06_UNR
			Signal Cancel	S04_CANCEL	S04_GNR, EGGNR
			Emergency Route Release	S04_EU_RELEASE	S04_GNR, EUUYNR
			Emergency Route Release (Special)	S04_ESU_RELEASE	S04_GNR, ESUUYNR
			Block	S04_BLOCK	S04_BLKNR
			Unblock	S04_UNBLOCK	S04_UNBLKNR
	S06	04_06	S06_04_06	S06_04_06_UN	S06_GNR, 04_06_UNR
			Signal Cancel	S06_CANCEL	S06_GNR, EGGNR
			Emergency Route Release	S06_EU_RELEASE	S06_GNR, EUUYNR
			Emergency Route Release (Special)	S06_ESU_RELEASE	S06_GNR, ESUUYNR
			Block	S06_BLOCK	S06_BLKNR
			Unblock	S06_UNBLOCK	S06_UNBLKNR
	S08	08	S08_08	S08_08_UN	S08_GNR, 04_06_UNR
			Signal Cancel	S08_CANCEL	S08_GNR, EGGNR
			Emergency Route Release	S08_EU_RELEASE	S08_GNR, EUUYNR
			Block	S08_BLOCK	S08_BLKNR
			Unblock	S08_UNBLOCK	S08_UNBLKNR

Function	Signal	Route	Menu Command	Bit Nomenclature	Associated Bits
Calling-On Signals	C01	01_1	C01_01_1	C01_01_1_UN	C01_GNR, 01_1_UNR
		02	C01_02	C01_02_UN	C01_GNR, 02_UNR
		04_1	C01_04_1	C01_04_1_UN	C01_GNR, 04_1_UNR
			Signal Cancel	C01_CANCLE	C01_GNR, EGGNR
			Emergency Route Release	C01_EU_RELEASE	C01_GNR, EUUYNR
			Block	C01_BLOCK	C01_BLKNR
			Unblock	C01_BLOCK	C01_UNBLKNR
Calling-On Signals	C02	03	C02_03	C02_03_UN	C02_GNR, 03_UNR
		04_1	C02_04_1	C02_04_1_UN	C02_GNR, 04_1_UNR
			Signal Cancel	C02_CANCLE	C02_GNR, EGGNR
			Emergency Route Release	C02_EU_RELEASE	C02_GNR, EUUYNR
			Block	C02_BLOCK	C02_BLKNR
			Unblock	C02_UNBLOCK	C03_UNBLKNR

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU MENU COMMANDS	SIGNALS	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ3	Ø1

Function	Signal	Route	Menu Command	Bit Nomenclature	Associated Bits
Shunt Signals	SH41	03	SH41_03	SH41_03_UN	SH41_GN, 03_UNR
		04_1	SH41_04_1	SH41_04_1_UN	SH41_GN, 04_1_UNR
			Signal Cancel	SH41_CANCEL	SH41_GNR, EGGNR
			Emergency Route Release	SH41_EU_RELEASE	SH41_GNR, EUUYNR
			Emergency Route Release (Special)	SH41_SEU_RELEASE	SH41_GNR, SEUUYNR
			Block	SH41_BLOCK	SH41_BLKNR
			Unblock	SH41_UNBLOCK	SH41_UNBLKNR
	SH43	03_07	SH43_03_07	SH43_03_07_UN	SH43_GN, 03_07_UNR
			Signal Cancel	SH43_CANCEL	SH43_GNR, EGGNR
			Emergency Route Release	SH43_EU_RELEASE	SH43_GNR, EUUYNR
			Emergency Route Release (Special)	SH43_SEU_RELEASE	SH43_GNR, SEUUYNR
			Block	SH43_BLOCK	SH43_BLKNR
			Unblock	SH43_UNBLOCK	SH43_UNBLKNR
	SH42	01_1	SH42_01_1	SH42_01_UN	SH42_GN, 04_1_UNR
		02	SH42_02	SH42_02_UN	SH42_GN, 04_2_UNR
		03	SH42_03	SH42_03_UN	SH42_GN, 03_UNR
		04_1	SH42_04_1	SH42_04_1_UN	SH42_GN, 04_1_UNR
			Signal Cancel	SH42_CANCEL	SH42_GNR, EGGNR
			Emergency Route Release	SH42_EU_RELEASE	SH42_GNR, EUUYNR
			Emergency Route Release (Special)	SH42_SEU_RELEASE	SH42_GNR, SEUUYNR
			Block	SH42_BLOCK	SH42_BLKNR
			Unblock	SH42_UNBLOCK	SH42_UNBLKNR

Function	Point	Menu Command	Bit Nomenclature	Associated Bits
POINT	101	Normal	101_NORMAL	101_WNR, NWWNR
		Reverse	101_REVERSE	101_WNR, RWWNR
		Emergency Normal	101_NORMAL_EMERGENCY	101_WNR, NWWNR, EWWNR,
		Emergency Reverse	101_REVERSE_EMERGENCY	101_WNR, RWWNR, EWWNR,
		Block	101_BLOCK	101_BLKNR
		Unblock	103_UNBLOCK	101_UNBLKNR
	103	Normal	103_NORMAL	103_WNR, NWWNR
		Reverse	103_REVERSE	103_WNR, RWWNR
		Emergency Normal	103_NORMAL_EMERGENCY	103_WNR, NWWNR, EWWNR,
		Emergency Reverse	103_REVERSE_EMERGENCY	103_WNR, RWWNR, EWWNR,
		Block	103_BLOCK	103_BLKNR
		Unblock	103_UNBLOCK	103_UNBLKNR
	105	Normal	105_NORMAL	105_WNR, NWWNR
		Reverse	105_REVERSE	105_WNR, RWWNR
		Emergency Normal	105_NORMAL_EMERGENCY	105_WNR, NWWNR, EWWNR,
		Emergency Reverse	105_REVERSE_EMERGENCY	105_WNR, RWWNR, EWWNR,
		Block	105_BLOCK	105_BLKNR
		Unblock	105_UNBLOCK	105_UNBLKNR
	102	Normal	102_NORMAL	102_WNR, NWWNR
		Reverse	102_REVERSE	102_WNR, RWWNR
		Emergency Normal	102_NORMAL_EMERGENCY	102_WNR, NWWNR, EWWNR,
		Emergency Reverse	102_REVERSE_EMERGENCY	102_WNR, RWWNR, EWWNR,
		Block	102_BLOCK	102_BLKNR
		Unblock	102_UNBLOCK	102_UNBLKNR

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU MENU COMMANDS	SIGNALS & POINTS	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ4	Ø1

Function	Point	Menu Command	Bit Nomenclature	Associated Bits
Point	104	Normal	104_NORMAL	104_WNR, NWWNR
		Reverse	104_REVERSE	104_WNR, RWWNR
		Emergency Normal	104_NORMAL_EMERGENCY	104_WNR, NWWNR, EWWNR,
		Emergency Reverse	104_REVERSE_EMERGENCY	104_WNR, RWWNR, EWWNR,
		Block	104_BLOCK	104_BLKNR
		Unblock	104_UNBLOCK	104_UNBLKNR
	106	Normal	106_NORMAL	106_WNR, NWWNR
		Reverse	106_REVERSE	106_WNR, RWWNR
		Emergency Normal	106_NORMAL_EMERGENCY	106_WNR, NWWNR, EWWNR,
		Emergency Reverse	106_REVERSE_EMERGENCY	106_WNR, RWWNR, EWWNR,
		Block	106_BLOCK	106_BLKNR
		Unblock	106_UNBLOCK	106_UNBLKNR
Crank Handles	CH01	Transmit	CH01_TRANSMIT	CH01_NR, YYNR
		Emergency Release	CH01_TRANSMIT_EMERGENCY	CH01_NR , EYYNR
		Receive	CH01_RECEIVE	CH01_NR, YYRNR
		Block	CH01_BLOCK	CH01_BLKNR
		Unblock	CH01_UNBLOCK	CH01_UNBLKNR
	CH02	Transmit	CH02_TRANSMIT	CH02_NR, YYNR
		Emergency Release	CH02_TRANSMIT_EMERGENCY	CH02_NR , EYYNR
		Receive	CH02_RECEIVE	CH02_NR, YYRNR
		Block	CH02_BLOCK	CH02_BLKNR
		Unblock	CH02_UNBLOCK	CH02_UNBLKNR

Function	Point	Menu Command	Bit Nomenclature	Associated Bits
Crank Handles	CH03	Transmit	CH03_TRANSMIT	CH03_NR, YYNR
		Emergency Release	CH03_TRANSMIT_EMERGENCY	CH03_NR , EYYNR
		Receive	CH03_RECEIVE	CH03_NR, YYRNR
		Block	CH03_BLOCK	CH03_BLKNR
		Unblock	CH03_UNBLOCK	CH03_UNBLKNR
	CH04	Transmit	CH04_TRANSMIT	CH03_NR, YYNR
		Emergency Release	CH04_TRANSMIT_EMERGENCY	CH04_NR , EYYNR
		Receive	CH04_RECEIVE	CH04_NR, YYRNR
		Block	CH04_BLOCK	CH04_BLKNR
		Unblock	CH04_UNBLOCK	CH04_UNBLKNR
Level Crossing Gate	LX302	Transmit	302_TRANSMIT	LX302_LXNR, YYNR
		Emergency Transmit	302_TRANSMIT_EMERGENCY	LX302_NR , EYYNR
		Receive	302_RECEIVE	LX302_NR, YYRNR
		Block	302_BLOCK	LX302_BLKNR
		Unblock	302_UNBLOCK	LX302_UNBLKNR
Siding Point	202	Transmit	202_TRANSMIT	KL202_NR, YYNR
		Receive	202_RECEIVE	KL202_NR , EYYNR
		Block	202_BLOCK	KL202_BLKNR
		Unblock	202_UNBLOCK	KL202_UNBLKNR

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

VDU MENU COMMANDS	POINTS & MISC.	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ5	Ø1

Function	Function no.	Menu Command	Bit Nomenclature	Associated Bits
Route	01_1	Block	01_1_BLOCK	01_1_BLKNR
		Unblock	01_1_UNBLOCK	01_1_UNBLKNR
	01_2	Block	01_2_BLOCK	01_2_BLKNR
		Unblock	01_2_UNBLOCK	01_2_UNBLKNR
	02	Block	02_BLOCK	02_BLKNR
		Unblock	02_UNBLOCK	02_UNBLKNR
	03	Block	03_BLOCK	03_BLKNR
		Unblock	03_UNBLOCK	03_UNBLKNR
	04_1	Block	01_1_BLOCK	04_1_BLKNR
		Unblock	01_1_UNBLOCK	04_1_UNBLKNR
	04_2	Block	01_2_BLOCK	04_2_BLKNR
		Unblock	01_2_UNBLOCK	04_2_UNBLKNR

General	Menu Command	Bit Nomenclature	Associated Bits
All Unblock	All Unblock	ALL_UNBLOCK	ALL_UNBLKR
PC Key	PC Key In	PC_KEY_IN	PCKEYIN
	PC Key Out	PC_KEY_OUT	PCKEYOUT
System Failure Acknowledgement	SYSF_ACKN	SYSF_ACKN	SYSF_ACKNR
Signal Failure Acknowledgement	GF_ACKN	GF_ACKN	GF_ACKNR
Point Failure Acknowledgement	WF_ACKN	WF_ACKN	WF_ACKNR
Power Failure Acknowledgement	PF_ACKN	PF_ACKN	PF_ACKNR

NOTES	
Signal Cancel	To putback Signal to Danger
Emergency Route Release	To release route with time delay
Emergency Route Release (Special)	To release route with time delay with password protection (To work when one back lock track is down or any other reason)
Block	To make a function inoperative
Unblock	To release a function which is blocked earlier
All Unblock	To release all functions when system is powered on

PRODUCTION & CHECKER BLOCK			
COMPANY		RAILWAYS	
DRAWN		DRAWN	(SSE/D)*
CHECKED	(SD)†	CHECKED	(ASTE)*
	(DV)†		(SSTE)*
APPROVED	(CRE)†	APPROVED	(Dy.CSTE)*
CRE: CONTRACTOR'S RESPONSIBLE ENGINEER *SIGNATURE WITH DATE, † SIGNATURE WITH DATE AND LICENSE No			

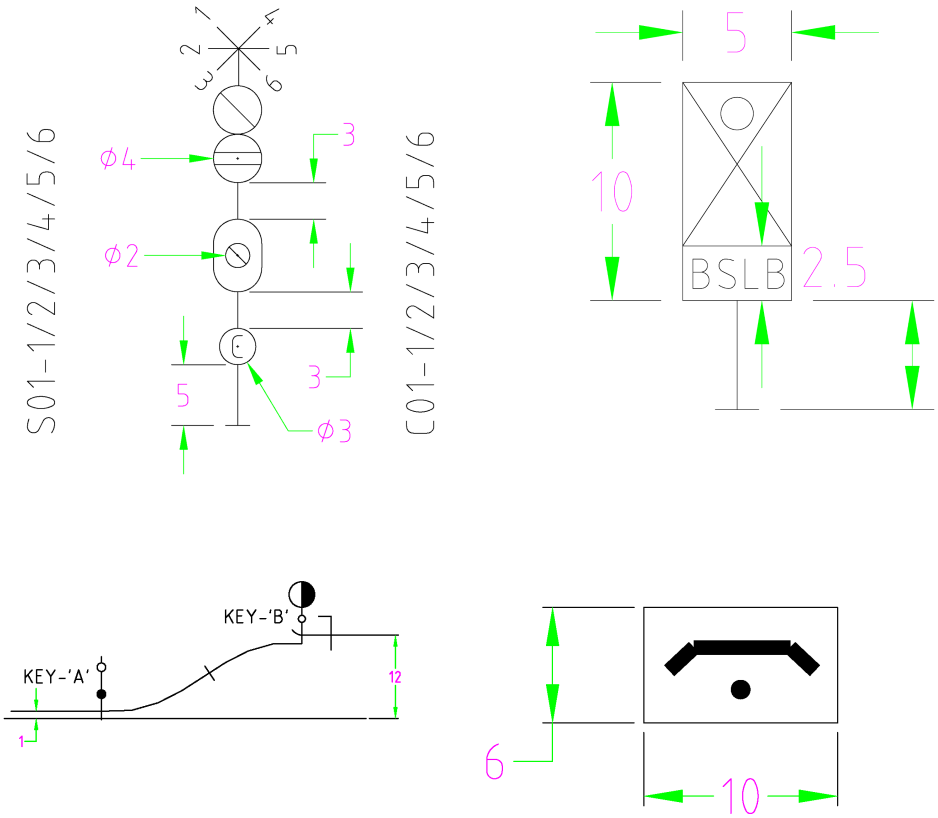
VDU MENU COMMANDS	ROUTES & MISC.	
FPD.SCR.GTL.VPL.Ø1	SHEET No:	VERSION
VENKATAMPALLE	ØØ6	Ø1

Symbols

6

6.0 Introduction

Symbols are required to represent signalling arrangement at a geographical location in signalling plans. How ever, these symbols are to be unique and unambiguous. A set of symbols is standarised for all signalling drwaings. All symbols have a set of dimensions those are to be followed while preparing with drafting software like autocad or microstation.

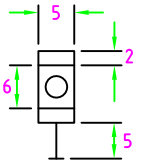
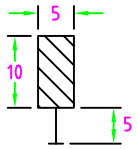
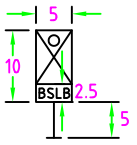
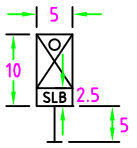
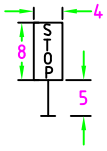
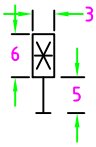
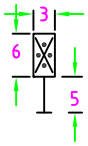
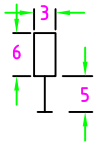
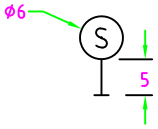
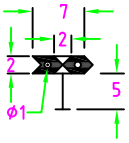


6.1 Symbols for Signalling Plans

List of Typical Symbols for use in signalling plans are placed next folios

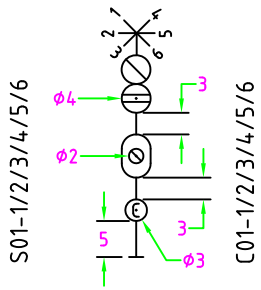
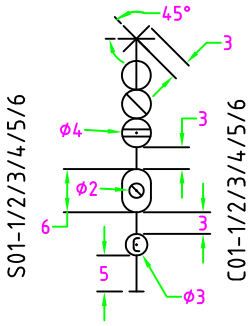
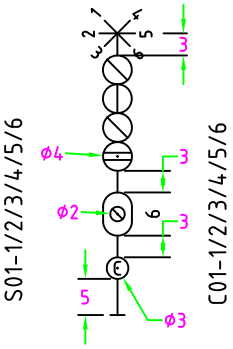
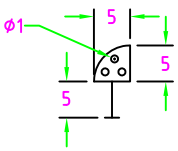
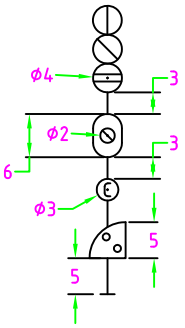
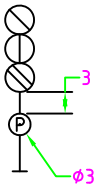
STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
1.	BOARD		WARNING BOARD (GOODS)
2.	BOARD		WARNING BOARD (PASSENGER)
3.	BOARD		BLOCK SECTION LIMIT BOARD (BSLB)
4.	BOARD		SHUNTING LIMIT BOARD (SLB)
5.	BOARD		STOP BOARD
6.	BOARD	 PLACED ON 13m. ADVANCE OF IB SIGNAL TRACK	LEGEND BOARD
7.	BOARD		CALLING ON LEGEND BOARD
8.	BOARD		GENERAL PURPOSE LEGEND BOARD
9.	BOARD		MID SECTION SIDING BOARD ('S' MARKER)
10.	BOARD		MID SECTION SIDING CAUTION INDICATOR
11.	BOARD		SPEED INDICATOR

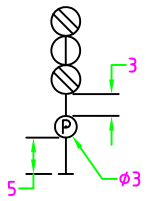
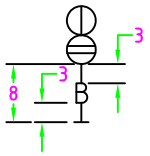
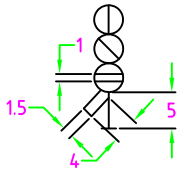
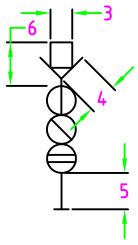
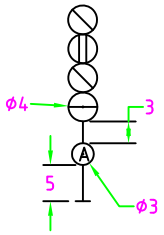
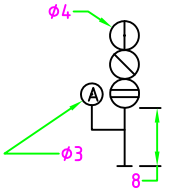
STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
12.	SIGNAL		2-ASPECT COLOUR LIGHT SIGNAL (HOME) WITH ROUTE INDICATOR/CALLING ON C MARKER BOARD
13.	SIGNAL		3-ASPECT COLOUR LIGHT SIGNAL (HOME) WITH ROUTE INDICATOR/CALLING ON 'C' MARKER BOARD
14.	SIGNAL		4-ASPECT COLOUR LIGHT SIGNAL (HOME) WITH ROUTE INDICATOR/CALLING ON C MARKER BOARD
15.	SIGNAL		COLOUR LIGHT SHUNT SIGNAL (INDEPENDENT)
16.	SIGNAL		MAIN WITH CALLING-ON & SHUNT SIGNAL (DEPENDENT)
17.	SIGNAL		INNER DISTANT SIGNAL

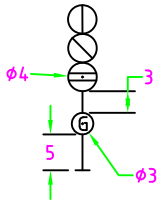
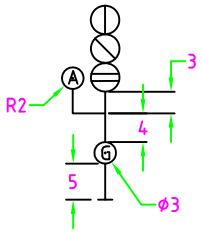
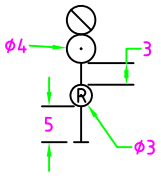
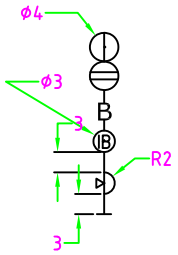
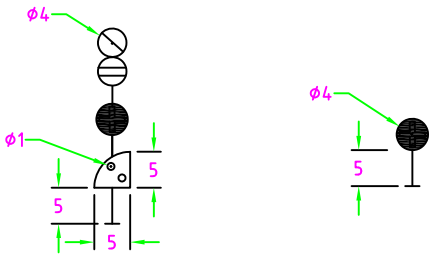
STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
18.	SIGNAL		DISTANT SIGNAL
19.	SIGNAL		ADV. STR. CONTROLLED BY BLOCK INSTRUMENT
20.	SIGNAL		SLOTTED SIGNAL (SLOT)
21.	SIGNAL		3-ASPECT CLS WITH LED MATRIX WITH DIRECTION TYPE ROUTE INDICATOR
22.	SIGNAL		4-ASPECT COLOUR LIGHT AUTO SIGNAL
23.	SIGNAL		3-ASPECT COLOUR LIGHT SEMI AUTO SIGNAL

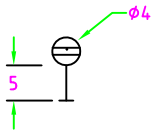
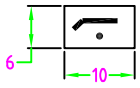
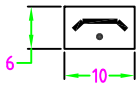
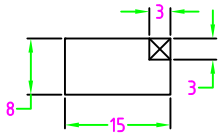
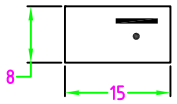
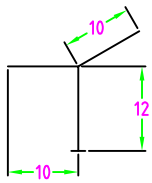
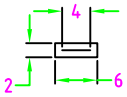
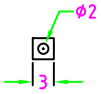
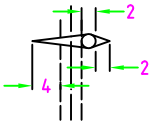
STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
24.	SIGNAL		3-ASPECT COLOUR LIGHT GATE SIGNAL
25.	SIGNAL		3-ASPECT COLOUR LIGH SEMI-AUTOMATIC GATE SIGNAL
26.	SIGNAL		COLOUR LIGHT REPEATER SIGNAL
27.	SIGNAL		COLOUR LIGHT STARTER INDICATOR SIGNAL
28.	SIGNAL		COLOUR LIGHT I.B. SIGNAL PROVIDED WITH SIGNAL POST TELEPHONE
29.	SIGNAL		SHUNT PERMITTING INDICATOR

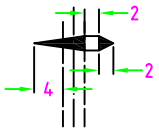
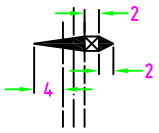
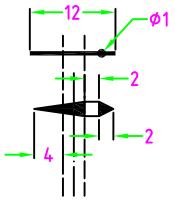
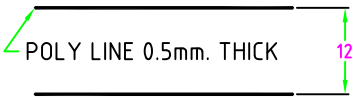
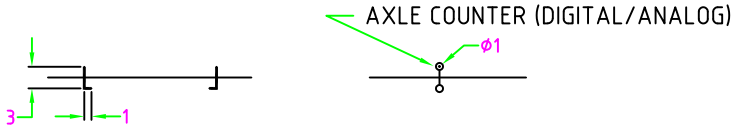
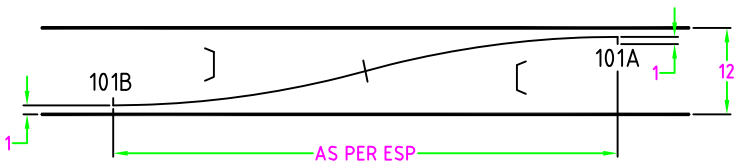
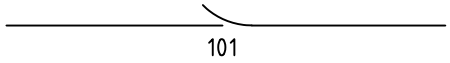
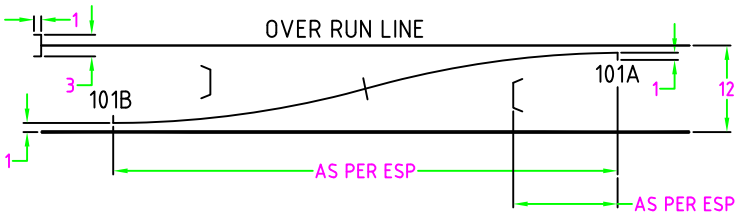
STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
30.	OPERATION PLACE		FIXED RED SIGNAL
31.	OPERATION PLACE		(S.M.) PANEL WITH VDU
32.	OPERATION PLACE		(S.M.) DUAL VDU
33.	OPERATION PLACE		GATE GOOMTY (WINCH OPERATION)
34.	OPERATION PLACE		GATE GOOMTY (PANEL OPERATION)
35.	GRADIENT		GRADIENT
36.	ARC LEVER FOR MECH. POINT OPERATION		GROUND LEVER FRAME WITH SINGLE LEVER
37.	INDICATOR		KEY LOCK
38.	INDICATOR		INDICATOR (POINT/TRAP)
39.	L.C. GATE		NON INTERLOCKED LC. GATE

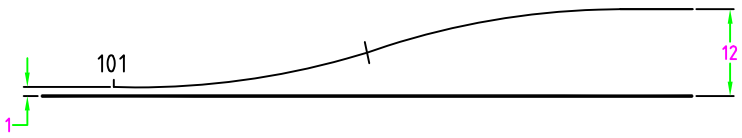
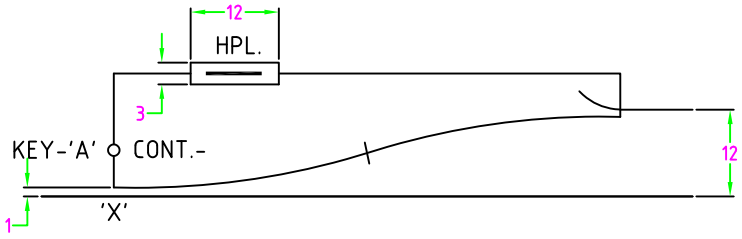
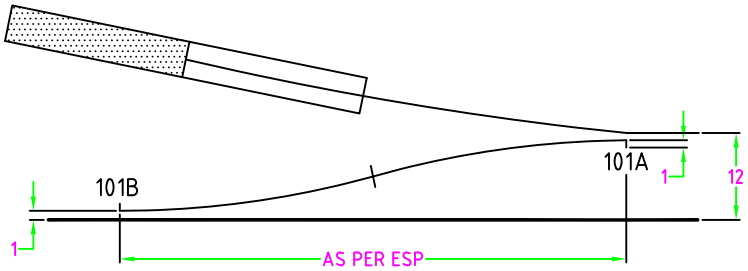
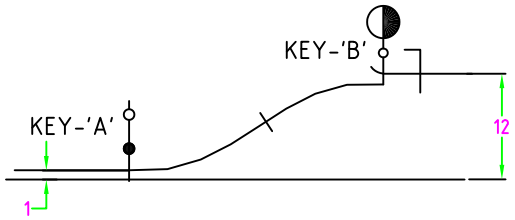
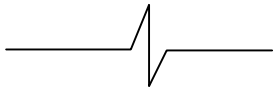
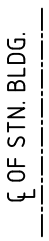
STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
40.	L.C. GATE		INTERLOCKED LC. GATE (MOTOR OPERATED)
41.	L.C. GATE		INTERLOCKED LC. GATE (MECHANICAL OPERATED)
42.	L.C. GATE AND SLIDING BOOM		INTERLOCKED LC. GATE WITH SLIDING BOOM ATTACHED WITH KEY
43.	DIRECTION OF SIDE		DIRECTION NORTH LINE
44.	DIRECTION OF SIDE		DIRECTION OF TRAFFIC (UP & DN)
45.	LINES		GAP BETWEEN ADJACENT LINE
46.	TRACK CIRCUIT/ AXLE COUNTER		TRACK CIRCUIT (DC/AXLE COUNTER)
47.	POINT		X-OVER POINT SHOWING FM.
48.	POINT		TRAP POINT (DERAILING SWITCH)
49.	POINT		X-OVER POINT SHOWING FM., OVER RUN LINE AND DEAD END

STANDARD SYMBOLS FOR SIGNAL INTERLOCKING AND SCHEME PLANS

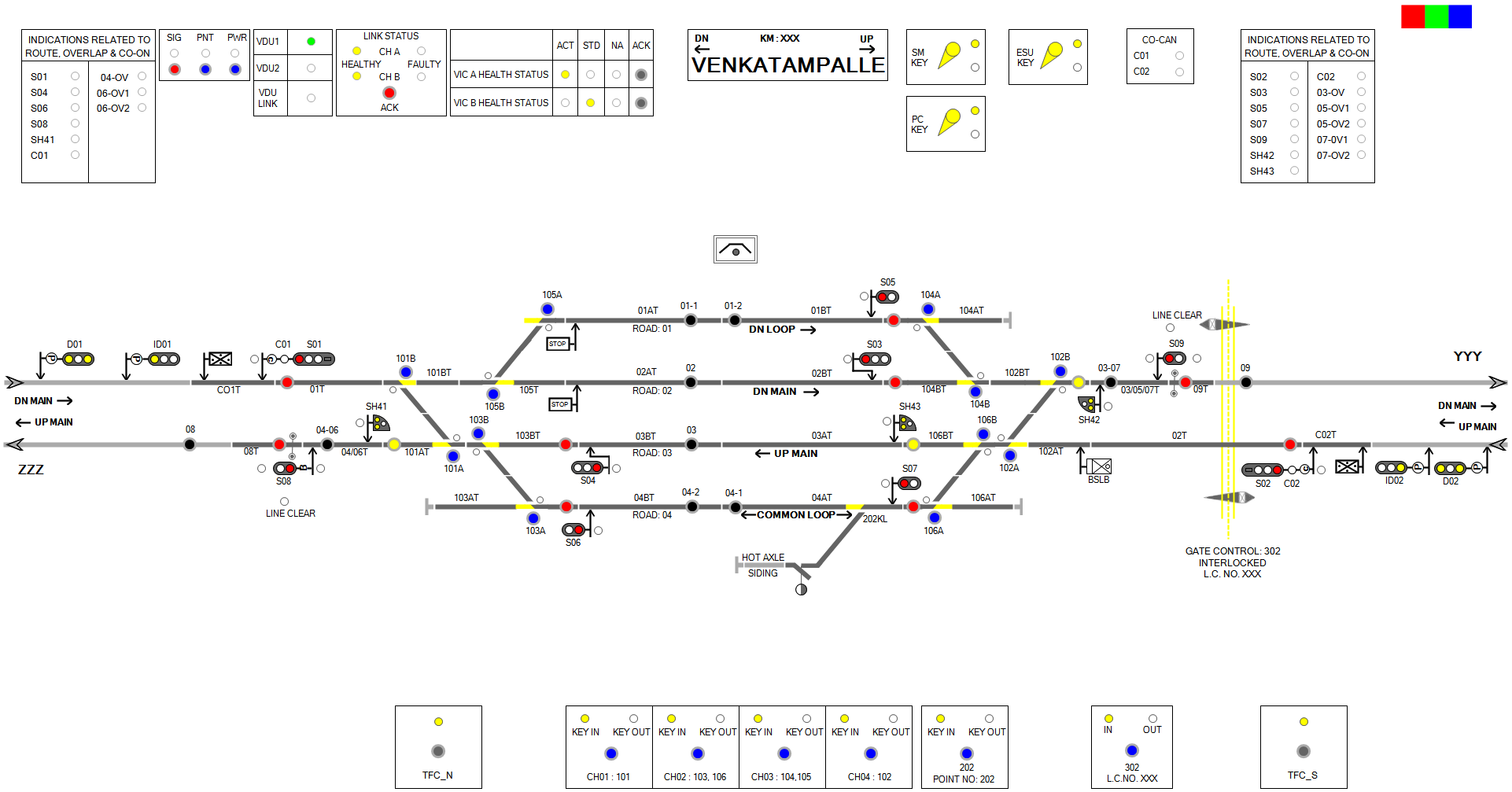
(ALL DIMENSIONS IN MM)

SNO.	FUNCTION	SYMBOL	DESCRIPTION
50.	POINT		POINT (SINGLE END)
51.	POINT		CONTROL POINT (ELECTRICALLY KEY CONTROL OPERATED BY HAND POINT LEVER)
52.	POINT		X-OVER POINT (SHOWING SAND HUMP)
53.	POINT		CONTROL POINT OPERATED BY HP LEVER WITH SUCCESSIVE ARRANGEMENT KEY CONT.
54.	LINE		BREAK LINE
55.	LINE		CENTRE LINE OF STATION BULDING
56.			ELECTRICAL KEY TRANSMITTER (EKT/RKT)

6.2 Symbols for VDU Panel

VDU symbols shown in the panel layout shall be adopted.

The typical VDU Panel layout is placed at next folio.


INDICATIONS RELATED TO ROUTE, OVERLAP & CO-ON
S01
S04
S06
S08
SH41
C01
04-OV
06-OV1
06-OV2
SIG
PNT
PWR
VDU1
VDU2
VDU LINK
LINK STATUS
CH A
HEALTHY
FAULTY
CH B
ACK
ACT
STD
NA
ACK
VIC A HEALTH STATUS
VIC B HEALTH STATUS
DN
KM : XXX
UP
VENKATAMPALLE
SM KEY
PC KEY
ESU KEY
CO-CAN
C01
C02
INDICATIONS RELATED TO ROUTE, OVERLAP & CO-ON
S02
S03
S05
S07
S09
SH42
SH43
C02
03-OV
05-OV1
05-OV2
07-0V1
07-OV2
D01
ID01
C01
S01
CO1T
01T
101B
101BT
105A
105B
105T
STOP
01AT
01-1
01-2
01BT
ROAD: 01
DN LOOP
S05
104A
104AT
S03
02AT
02
02BT
ROAD: 02
DN MAIN
104BT
104B
102BT
102B
03-07
03/05/07T
SH42
LINE CLEAR
S09
09T
09
YYY
DN MAIN
UP MAIN
ZZZ
08
08T
S08
LINE CLEAR
04-06
04/06T
SH41
101AT
103B
101A
103BT
03BT
ROAD: 03
03
03AT
UP MAIN
S04
SH43
106BT
106B
102AT
102A
BSLB
02T
C02T
S02
C02
ID02
D02
103AT
103A
S06
04BT
04-2
04-1
ROAD: 04
COMMON LOOP
202KL
S07
04AT
106AT
106A
HOT AXLE SIDING
GATE CONTROL: 302
INTERLOCKED
L.C. NO. XXX
TFC_N
KEY IN
KEY OUT
CH01 : 101
CH02 : 103, 106
CH03 : 104,105
CH04 : 102
202
POINT NO: 202
IN
OUT
302
L.C.NO. XXX
TFC_S