

ISO 9001: 2015	Effective from 17.02.2023	RDSO/SPN/196/2020	Version 4.0 Amdt-2
Document Title : Specification of Kavach (The Indian Railway ATP)- RFID Tag-TIN Layout Guidelines Annexure – H			

Annexure – H

KAVACH

RFID Tag-TIN Layout Guidelines

(Amdt-2)

Amdt	Date of issue	Amendment
1.d	29.12.2022	<p>Cl. 2.1-New clause added for version control.</p> <p>Cl.2.6 – Signal foot Tag to be provided at the Ends of berthing track (may be with shunt signal sometimes).</p> <p>Cl. 2.7- Deleted.</p> <p>Cl. 2.8- The clause modified as “Normal tag shall be provided at distance of 150-250 meter (Preferably 200 meter)”.</p> <p>Cl. 2.9 –Deleted.</p> <p>Cl.2.11-The clause modified as “To demarcate TIN sections, TIN discrimination Turnout tags”.</p> <p>Cl. 2.13 – The clause is modified as- “Location adjustment or Junction requirement are to be provided with Normal Tag where require”.</p> <p>Cl. 2.14- The following text is added in clause “Minimum 2 sets of Tags shall be provided as exit tag. The 1st Exit RFID shall be programmed with Communication in Direction of entry & no communication in direction of exit and 2nd exit Tag shall be programmed with no communication required in both directions”.</p> <p>Cl. 2.16- The clause is modified as “The duplicate RFID tag shall be installed minimum distance of 3 meter to 5 meter except turn out RFID tag. The turn out RFID tag shall be in same absolute location”.</p> <p>Cl. 2.17 - New clause regarding border RFID Tag is added.</p>

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		<p>Cl. 2.22 – The clause is modified to indicate notation for different types of Tag as per placement.</p> <p>Cl. 2.23, 2.25 and 2.26 are Deleted.</p> <p>Cl. 2.27:- clause modified to accommodate TIN range upto - 255.</p> <p>Cl. 2.31- Absolute location of Stop Board and BSLB to be mentioned in RFID Tag layout.</p> <p>Template for RFID layout is added after correction.</p>
2	14.02.2023	<p>Cl.2.8- modified as correction as “Normal or LC Gate tag shall be provided between 150-250 meters in approach to all Main Signals (Preferably 200 meter).</p> <p>Cl. 2.10 – Deleted.</p> <p>Cl. 2.13 –Deleted.</p> <p>Cl. 2.14- Modified with addition of “Exit Tag may be provided at a distance of 20m”.</p> <p>Cl. 2.15-modified as “The minimum distance between Tag set (Main & Duplicate) to Tag set (Main & Duplicate) shall be greater than 10 m.</p> <p>Cl. 2.13- New clause added with new numbering.</p> <p>Cl. 2.14- New clause added- Tag legend in RFID TIN Layout with new numbering.</p> <p>Cl. 2.17- modified with addition of definition.</p>

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1 Introduction

- 1.1 This document presents the guidelines for preparation of RFID Tag-TIN layouts for the purpose of KAVACH system.

2 Guidelines

Following guidelines shall be followed while preparing RFID Tag-TIN layouts for Station/IB/LC or block sections.

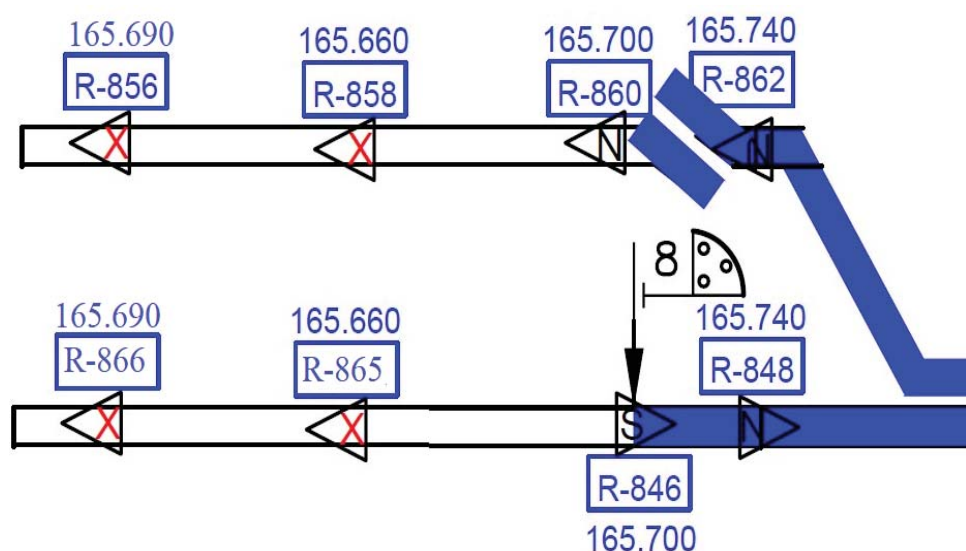
- 2.1 **Version Control:-** The version control for all documents submitted for approving authority shall have X.Y.Z format in which:-
- (i) X means KAVACH Version Control.
 - (ii) Y means SIP version control.
 - (iii) Z means Guidelines change or review comments control.
- 2.2 Reference SIP drawing numbers shall be mentioned on the layout.
- 2.3 RFID tag-TIN layout shall be prepared with Signal Interlocking Plan (SIP) as reference. However, the actual site considerations shall be taken into account prior to its preparation. A site survey shall be conducted to mark the locations where tags need to be placed.
- 2.4 The center of Station Master's panel shall be taken as station's Centre Line for reference purpose.
- 2.5 Normal tags shall be provided in the block section as well as in station section. The maximum distance between the two Normal tags shall not be more than 1000m.
- 2.6 Every Main signal, Subsidiary signal, Stop board, Ends of berthing track (may be with shunt signal sometimes) and BSLB shall be provided with Signal foot tag.
- 2.7 Normal or LC Gate tag shall be provided between 150-250 meters in approach to all Main Signals (Preferably 200 meter). The distance of Signal Approach (Normal Tag/LC Tag) from corresponding Signal Foot (S) Tag should be exact multiple of 1m. This should be invariably ensured during installation and verification at site. The minimum distance shall be reckoned as 120 m for Advanced Starter or Intermediate Starter.
- 2.8 To demarcate TIN sections, TIN discrimination Turnout tags i.e. TIN demarcation Tag, Normal tag, and Signal foot tag shall be placed as per the feasibility.

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- 2.9 Gate tags shall be placed at such a distance that Auto whistling for approaching LC gate can commence from at least 600m or W/L board on approach of LC gate.
- 2.10 While moving from KAVACH to non KAVACH territory, Exit tags shall be provided at the exit boundary of Stationary KAVACH in KAVACH territory. Minimum 2 sets of Tags shall be provided as exit tag.
- (i) The 1st Exit RFID shall be programmed with Communication in Direction of entry & no communication in direction of exit and 2nd exit Tag shall be programmed with no communication required in both directions.
- (ii) Exit Tag may be provided at a distance of 20m.

Example



- 2.11 The duplicate RFID tag shall be installed minimum distance of 3 meter to 5 meter except TIN discrimination/Turn out RFID tag. The TIN discrimination turn out RFID tag shall be in same absolute location.
- 2.12 The minimum distance between Tag set (Main & Duplicate) to Tag set (Main & Duplicate) shall be greater than 10 m.
- 2.13 Repeated Tag ID is not allowed within area of 25 Kilometer radius.
- 2.14 **Tag legend in RFID TIN Layout**

- (i) Legend in rectangle to be used when Main Tag and Duplicate Tags contain same location.

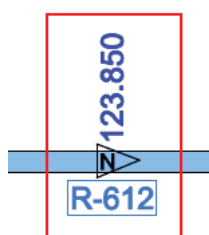
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- (ii) Legend in triangular to be used when Main Tag and Duplicate Tags contain different location. The duplicate tag shall be placed ahead of main tag in the direction of Tip of the Triangle.

- 2.15 Border RFID tag shall be indicated in RFID Tag layout with absolute location of station border line. Border RFID tag indicates the maximum distance from where the departed Loco will communicate with previous station SKAVACH. After crossing Border RFID tag, the loco shall communicate only from next stationary SKAVACH.

In RFID Layout, the border RFID tag shall be shown as below. -



- 2.16 A single TIN section shall be represented using a single color. The TINS in vicinity shall be represented in different colors.
- 2.17 Non-KAVACH territory shall be represented through white color.
- 2.18 The TIN layouts thus prepared, shall permit all the train movements allowed in a section as per Table of Control / Selection Table. For facilitating common loop reception when loco is standing between shunt signal and advance starter, TIN shall be bifurcated
- 2.19 At all places, where the train is likely to move outside KAVACH territory or remain stabilized for long duration for e.g., sidings, Exit tags shall be provided.
- 2.20 Following notations shall be used to denote different types of tags as per placement :

Type of Tag	Notation as per placement
Normal Tag	N
Signal Foot Tag	S
TIN Discrimination/Turn out Tag	T
Gate Tag	G
Exit Tag	X
Adjacent Line info tag	L
Adjustment/Junction Tag	A

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- 2.21 Block Section TIN should be extended up to BSLB on unidirectional lines (such as Double Line) and up to opposite direction Advanced Starter on Single Line. S-tag shall be provided at the Yard Exit Points not protected by Signals like BSLB etc.,
- 2.22 Tag numbers (values in the range of 1 – 1023) and TIN numbers (values in the range of 1-255) shall be allotted by the user Railways. Sufficient spares for future needs shall be taken into consideration while allotting the numbers. The allotted numbers shall also be mentioned on the RFID tag-TIN layout.
- 2.23 Signature Block and revision history blocks shall be prepared as per the practices of User Railways.
- 2.24 Legends mentioning the notation used for the purpose of preparation of layout shall be specifically mentioned on the layout.
- 2.25 RFID tag-TIN layout need not be up to scale. If the layout is not per scale, the same shall be mentioned on the layout.
- 2.26 Absolute locations of tags, LC gates, signals and turnout switches, BSLB, Stop board shall be mentioned on the RFID layout.
- 2.27 Absolute location of Station center line shall be mentioned on the layout.
- 2.28 A typical RFID tag-TIN layout for Indian Railways is shown below for reference purpose.

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