

(भारत सरकार) GOVERNMENT OF INDIA
(रेल मंत्रालय) MINISTRY OF RAILWAYS
(रेलवे बोर्ड) RAILWAY BOARD

No. 2018/Sig/18/ EI/Gen.

New Delhi, dated 04.09.2024

PCSTEs ,
All Zonal Railways.

PED/S&T,
RDSO, LKO.

Sub: Provision of Kavach ready Interfaces in Electronic Interlocking.

Ref: (i) RDSO letter no. RDSO-SIG0MISC(GEN)/1/2021Part(1) Dtd17.08.2024
(ii) Rly Bd's letter nos.2020/Sig/TCAS Estimates dtd.18.05.2023 & 29.05.2024

RDSO vide letter under reference (i) on the subject has submitted the scheme for provision of dedicated port with allocation of Kavach bits required for Kavach interface. It is decided that the scheme to be made part of signalling work during the design stage itself for commissioning new EI or during modification in EI. This would facilitate Kavach ready EI installations without requiring design & testing of EI when Kavach is installed at later. A copy of the RDSO guidelines is enclosed herewith for ready reference.

2) Zonal Railways are advised to incorporate the provision based on RDSO guidelines in all the future EI tenders, whenever new works of EI or modifications in EI is undertaken.

3) RDSO may circulate the same among EI and Kavach OEM's/Vendors for necessary compliance.

DA: As above

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Verma
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File No.RDSO-SIG0MISC(GEN)/1/2021-SIGNAL DIRECTORATE/RDSO-Part(1)



भारत सरकार — रेल मंत्रालय
Government of India —
Ministry of Railways
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No: RDSO-SIG0MISC(GEN)/1/2021Part(1)

Date: 17.08.2024

Executive Director/Signal (Dev.)

Railway Board
New Delhi

Sub.: Provision of Kavach interfaces in Electronic Interlocking.**Ref.:** Rly Bd's letter No. 2020/Sig/18/EI/Gen dt. 28.05.2024

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To integrate the Stationary Kavach system with Electronic Interlocking using an OEM proprietary protocol converter, it was advised (vide reference letter mentioned above) to study the incorporation of a Kavach port into the Electronic Interlocking during the design and commissioning stages. After the study, the following is proposed:

- Redundant communication ports for Kavach bit allocation should be predetermined during the Electronic Interlocking design phase. These ports should initially be disabled when the Electronic Interlocking is commissioned and enabled once the Stationary Kavach is installed.
- The redundant communication interface for Kavach can include options such as RS232/RS485 serial or Ethernet connections, preferably over Optical Fiber Cable (OFC) or copper.
- A Bit Allocation Chart or Relay interface circuits should be provided to indicate the specific order for exchanging relay information between the Electronic Interlocking and Stationary Kavach systems. The preferred order should be all Track-proving relays, Lamp check relays (Main, Shunt, Auto, Block Signal), Point indicating relays, Gate proving relays, and Block proving relays. Data transfer should comply with Safety Integrity Level 4.
- Protocol converters supplied by the Stationary Kavach OEMs as part of the Stationary Kavach system should be capable of handling these logical bit inputs and should display an "error state" in case of any issues.
- The Electronic Interlocking should provide real-time communication of bit status to the Stationary Kavach at intervals not exceeding 500ms.
- Details of the configuration, including interface types, Electronic Interlocking identity, application logic version, endian types, baud rates, and IP addresses, should be included in the Station documentation.
- IP addresses and port numbers should be allocated according to the guidelines in Annexure A3 of the KAVACH Specification, with an extract provided below:

A3.4 : Configuration of IP address and port number of KAVACH entity:

A3.4.1 : The 1st octet of IP addresses of Stationary KAVACH to Electronic Interlocking shall be 192 .

A3.4.2 : All the vital entity shall be connected through redundant ring on Ethernet i.e. BLUE ring and RED ring. The 2nd octet of BLUE RING and RED RING shall be 254 & 255 respectively.

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A3.4.3 : Not applicable.

A3.4.4 : The 3rd and 4th octet shall be calculated based on the unique ID of KAVACH entity. Unique ID number shall be converted into hexadecimal number and most significant byte shall be used as 3rd octet after converting into decimal and least significant byte shall be used as 4th octet after converting into decimal.

Example

Conversion of unique ID 503 into Hex format = 0x01F7.

Conversion of most significant byte into decimal i.e. 01=1

Conversion of least significant byte into decimal i.e. F7=247

3rd and 4th octet station IP address derived from KAVACH entity ID = 1.247 [0x01 .0xF7]

BLUE Ring KAVACH entity IP address - 192.254.1.247

RED Ring KAVACH entity IP address - 192.255.1.247

A3.4.5 : Port number of KAVACH entity shall be as per below table

Primary partner	Secondary Partner	Port No start	Range
Stationary KAVACH	Electronic Interlocking	65001	65001-65534

Note: All numbers mentioned in the above clauses shall be configurable and shall not require FAT from EI side.

- h) Stationary Kavach identity shall be assigned by the Zonal Railway's planning section as follows:

The **first two digits** are allotted to each zonal railway as shown in the table below and Zonal railways may decide the **last three digits** for the stations. A proper record shall be maintained by the Zonal Railways to avoid repetition of number as station ID should be unique number.

Sl. No	Name of the Railway Zone	Allotted code	Sl. No	Name of the Railway Zone	Allotted code
1.	South Central Railway	00-02	11.	North Western Railway	30-32
2.	Northern Railway	03-05	12.	West Central Railway	33-35
3.	North Eastern Railway	06-08	13.	North Central Railway	36-38
4.	Northeast Frontier Railway	09-11	14.	South East Central Railway	39-41
5.	Eastern Railway	12-14	15.	East Coast Railway	42-44
6.	South Eastern Railway	15-17	16.	East Central railway	45-47
7.	Southern railway	18-20	17.	Metro Railway Kolkata	48
8.	Central railway	21-23	18.	Konkan Railway	49
9.	Western Railway	24-26	19.	RDSO, Lucknow	50
10.	South Western Railway	27-29	20.	South Cost Railway	51-53
			21.	IRISET SC	54

This letter is issued with the recommendation of ED/Sig-1/RDSO and approval of PED/S&T/RDSO.

Digitally Signed by Pavan Kumar Gudavalleti

Date: 17-08-2024 13:02:27

(G. Pavan Kumar)

Executive Director/Tele-II
For Director General/S&T

C/- ED/Sig-1/RDSO for information please.

भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS
रेलवे बोर्ड (RAILWAY BOARD)

No.2020/Sig/TCAS/Estimates

New Delhi, Dated:29.05.2024

PCSTEs,
All Indian Railways.

PED/S&T,
RDSO/LKO.

Sub: Signalling Alteration/Modification works in existing/proposed Kavach territory.

Ref:(i) Railway Board letter of even no. dated 18.05.2023

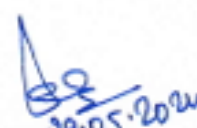
(ii)OSD/COE letter no. IRISSET/CoE/Kavach/Misc dated 31.01.23

A number of infrastructure works are ongoing in sections where Kavach works are being undertaken. In order to ensure that Kavach functions properly in such sections, it is necessary that Kavach and the Signalling system are in sync at all times.

For this purpose, for any works related to change in Signalling, guidelines as below shall be followed for Kavach territory:

- 1) Provision required for alterations due to Kavach works, should be kept in the estimates of all future works, as already conveyed vide Boards letter under Ref.(i).
- 2) All signalling changes shall be carried out with corresponding change in the Kavach component in existing/proposed Kavach territory.
- 3) Train operations in Kavach territory shall be clearly defined in Station working Rules / Pre-NI/NI instructions.
- 4)On these sections safety certificate at the time of commissioning should incorporate commissioning of Kavach also.
- 5) RDSO shall suitably include execution of Kavach related works in Pre-commissioning check list for EI (New/Alteration/Modification) wherever required.

This is for information and necessary action please.


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भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड (Railway Board)



No. 2020/Sig/TCAS/Estimates (e3316629)

New Delhi, Dated: 18.05.2023

The General Managers,
Indian Railways


Sub: Components of Kavach/CTC inclusion in yard remodeling /ABS/ LC gate/signalling works.

Works of IR-ATP system "Kavach" and CTC are being implemented on IR. It has been noticed that while commissioning of various signalling works due to Yard Remodelling, Multi-tracking, Automatic Block Signalling, Track works (affecting gradients/ speed restrictions /detouring /layout), LC Gates (Elimination/ Introduction/ Interlocking), other Signal works etc., corresponding changes in the commissioned Kavach & CTC are not being carried out. As a result Kavach & CTC for that section becomes inoperative.

The matter has been examined in Board's office and the following has been decided:

- 1) In section where Kavach works have already been commissioned, the component required for Kavach/CTC on the section should be included in detailed/revised estimate as the case may be.
- 2) Similarly for non Kavach Territory also where Kavach/CTC works have already been sanctioned, the component required for Kavach/CTC shall be included in estimates of works.

This is issued with the concurrence of Finance Directorate of Ministry of Railways and approval of Board (M/Infra).


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Executive Director/Signal (Dev.)

No. 2020/Sig/TCAS/Estimates

New Delhi, Dated: 18.05.2023

1. The Principle Director of Audit, All Indian Railways
2. The PFAs, All Indian Railways
3. Dy. Comptroller and Auditor General of India (Railways), Room No.224, Rail Bhavan, New Delhi.



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Copy to:

1. PCSTEs, All Indian Railways
2. F(x)-II & Budget Branch