सत्यमेव जयते

GOVERNMENT OF INDIA

(भारत सरकार)

MINISTRY OF RAILWAYS

(रेल मंत्रालय)

Annexure – A3

Stationary KAVACH Configurable Parameters

Amdt-3

Issued by

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Amendment History

Amdt	Date of Issue	Amendment
--	1st	• Annexure A is separated with Annexure A1, A2 and A3 with their requirement of configuration parameter.
1	02.04.2024	• A3.4 -Configuration of IP address and port number of KAVACH entity- New clause added by deleting item 19 of CL A3.4.6. • CL A3.4.6 a) SN 15.2: Onsight Signal Linking distance is modified to 200m from 100m. b) SN 18.3: IP address of KMS is added. c) SN 18.4: IP port number of KMS minimum range is changed to 54000 from 50000. d) SN 18.8: Number of associated LES is modified to 3 from 6. • CL A3.5 CRC related clause is added.
2	09.04.2024	CL A3.4.6 item 15 & 16 – new clause added for Tolerable error 'E' in odometry & SR Authorisation margin distance 'd'.
3	16.07.2024	CL A3.4.6 item 9: Rear End collision margin distance added as 100m for suburban section and EMUs. CL A3.26.9 Signal flickering timeout modified to 2s

A3.1 **Introduction**

This annexure describes the stationary KAVACH configuration parameter requirement that characterises its implementation.

A3.2 **Scope**

This document defines the stationary configuration parameter requirement data related with stationary sub system.

A3.3 **Stationary KAVACH Configurable Parameters**

The configuration parameters mentioned in this annexure are indicative only. Software-developer may consider these parameters.

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

A3.4.1 The 1st octet of IP addresses of Stationary KAVACH, TSRMS, SKAVACH – SKAVACH, SKAVACH to Electronic interlocking and NMS 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.

A3.4.3 The 2nd octet of Network monitoring system being a non-vital system shall be different and to be configured as 253.

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

S.No	Primary partner	Secondary Partner	Port No start	Range
1.	SKAVACH	TSRMS	40001	40001-49999
2.	SKAVACH	LTE	50001	50001-54999
3.	SKAVACH	NMS	55001	55001-59999
4.	SKAVACH	SKAVACH	60001	60001- 64999
5.	SKAVACH	Electronic Interlocking	65001	65001-65534

Note: All the numerical mentioned in above clauses shall be configurable.

A3.4.6 **Stationary KAVACH Configurable Parameters**

S.No	Parameter	Description	Default	Min	Max	Units
1.	Version No	Source version No of S-KAVACH, IBS, LC gate	1	0	7	Number
2.	Stationary KAVACH ID	Stationary KAVACH _ILC/_IBS/_ID	SD[1]	00001	65535	Number
3.	Number of directions		6	1	6	Number
4.	Station Name		SD			20 Char
5.	Station Traffic capacity	No of KAVACH equipped loco that can be handled by S-KAVACH	SD	1	44 (UHF)	Number
5.1.	**Stationary KAVACH 1 Parameter**					
5.1.1.	Station Boundary 1(UP Limit)	Station boundaries (in meters) should be configured based on the radio communication requirement.	SD	100	10000	meter
5.1.2.	Station Boundary 1 (DN Limit)	Station boundaries (in meters) should be configured based on the radio communication requirement.	SD	100	10000	meter
5.1.3.	Absolute Location	Center of station absolute location kilometre	SD	0000000	8388606	meter
5.1.4.	Type of block	Auto or Abs or Virtual				
5.1.5.	Shunt Direction 1	Shunt direction (Invalid, Nominal, Reverse)	SD			
5.1.6.	Shunt Limit TIN	Shunt limit point TIN number to be entered.	SD			
5.1.7.	Shunt Limit	Absolute Location (in meters) of Shunt Limit point.	SD	100	10000	meter
5.1.8.	IP address 1	IP address of Blue Ring	SD			
5.1.9.	IP address 2	IP address of RED Ring	SD			
5.2.	**Stationary KAVACH 2 Parameter**					
5.2.1.	Station Boundary-2(Up Limit)		SD	100	10000	meter
5.2.2.	Station Boundary-2(Dn Limit)		SD	100	10000	meter
5.2.3.	Absolute Location	Center of station absolute location kilometre	SD	0000000	8388606	meter

[1] SD means station dependent

S.No	Parameter	Description	Default	Min	Max	Units
5.2.4.	Type of Block	Auto or ABS	SD			
5.2.5.	Shunt Direction 2	Shunt Direction (Invalid, Nominal, Reverse)	SD			
5.2.6.	Shunt Limit TIN	Shunt Limit point TIN number to be entered	SD			
5.2.7.	Shunt Limit	Absolute Location(in meters) of Shunt Limit point	SD	100	10000	meter
5.2.8.	IP address 1	IP address of Blue Ring	SD			
5.2.9.	IP address 2	IP address of RED Ring	SD			
5.3.	**Stationary KAVACH 3 Parameter**					
5.3.1.	Station Boundary-3(Up Limit)		SD	100	10000	meter
5.3.2.	Station Boundary-3(Dn Limit)		SD	100	10000	meter
5.3.3.	Absolute Location	Center of station absolute location kilometre	SD	0000000	8388606	meter
5.3.4.	Type of Block	Auto or ABS	SD			
5.3.5.	Shunt Direction 3	Shunt Direction (Invalid, Nominal, Reverse)	SD			
5.3.6.	Shunt Limit TIN	Shunt Limit point TIN number to be entered	SD			
5.3.7.	Shunt Limit	Absolute Location (in meters) of Shunt Limit point	SD	100	10000	meter
5.3.8.	IP address 1	IP address of Blue Ring	SD			
5.3.9.	IP address 2	IP address of RED Ring	SD			
5.4.	**Stationary KAVACH 4 Parameter**					
5.4.1.	Station Boundary-4(Up Limit)		SD	100	10000	meter
5.4.2.	Station Boundary-4(Dn Limit)		SD	100	10000	meter
5.4.3.	Absolute Location	Center of station absolute location kilometre	SD	0000000	8388606	meter
5.4.4.	Type of block	Auto or Abs	SD			
5.4.5.	Shunt Direction 4	Shunt direction (Invalid, Nominal, Reverse)	SD			
5.4.6.	Shunt Limit TIN	Shunt limit point TIN number to be entered.	SD			
5.4.7.	Shunt Limit	Absolute Location (in meters) of Shunt Limit point.	SD	100	10000	meter
5.4.8.	IP address 1	IP address of Blue Ring	SD			
5.4.9.	IP address 2	IP address of RED Ring	SD			

S.No	Parameter	Description	Default	Min	Max	Units
5.5.	**Stationary KAVACH 5 Parameter**					
5.5.1.	Station Boundary-5(Up Limit)		SD	100	10000	meter
5.5.2.	Station Boundary-5(Dn Limit)		SD	100	10000	meter
5.5.3.	Absolute Location	Center of station absolute location kilometre	SD	0000000	8388606	meter
5.5.4.	Type of block	Auto or Abs	SD			
5.5.5.	Shunt Direction 5	Shunt direction (Invalid, Nominal, Reverse)	SD			
5.5.6.	Shunt Limit TIN	Shunt limit point TIN number to be entered.	SD			
5.5.7.	Shunt Limit	Absolute Location (in meters) of Shunt Limit point.	SD	100	10000	meter
5.5.8.	IP address 1	IP address of Blue Ring	SD			
5.5.9.	IP address 2	IP address of RED Ring	SD			
5.6.	**Stationary KAVACH 6 Parameter**					
5.6.1.	Station Boundary-6(Up Limit)		SD	100	10000	meter
5.6.2.	Station Boundary-6(Dn Limit)		SD	100	10000	meter
5.6.3.	Absolute Location	Center of station absolute location kilometre	SD	0000000	8388606	meter
5.6.4.	Type of block	Auto or Abs	SD			
5.6.5.	Shunt Direction6	Shunt direction (Invalid, Nominal, Reverse)	SD			
5.6.6.	Shunt Limit TIN	Shunt limit point TIN number to be entered.	SD			
5.6.7.	Shunt Limit	Absolute Location (in meters) of Shunt Limit point.	SD	100	10000	meter
5.6.8.	IP address 1	IP address of Blue Ring	SD			
5.6.9.	IP address 2	IP address of RED Ring	SD			
6.	**Time period for data logging**					
6.1.	Event logger logging time	Detail Data logging	72	24	240	hours
6.2.	Event logger logging time	Maintenance data logging	15	5	90	days
6.3.	Event logger logging time	Critical data	90	10	180	days
7.	**Radio MODEM transmission switching from Radio MODEM 1 to Radio MODEM 2 & Vice versa**					
7.1.	Movement	Alternate cycle	Alternat	1	5	cycle

S.No	Parameter	Description	Default	Min	Max	Units
	Authority transmission		e			
7.2.	Track Profile	Alternate cycle	Alternate	1	5	cycle
8.	**Train Length Measurement**					
8.1.	Time Correction	Time correction offset for train length measurement	100	10	200	millisecond
8.2.	Track circuit failure declaration time	Typically, in case of failure of AT & BT track circuits declaration time	180	30	300	second
8.3.	Train length location logging resolution	Resolution to compensate for delay, if any, in clear / occupied status of track sections due to track repeater relays for train length measurement.	200	10	500	millisecond
8.4.	TLM detection fail time (in seconds)	This is the time to identify the AT & BT track failure to halt the Train Length measurement by station KAVACH	8	2	10	seconds
9.	Rear End Collision Margin	Min allowed separation between the two trains travelling in the same direction & on the same track.	300 for mainline and loco-hauled trains 100 for suburban section and EMUs	50	2000	meter
10.	Location Accuracy	The resolution with which the tags are placed accurately	1	1	10	meter
11.	L_DOUBTOVER in meter	This is the over-reading amount plus the 5 m location accuracy of RFID Tag	5	2	10	meter
12.	L_DOUBT UNDER in meter	This is the under -reading amount plus the 5 m location accuracy of RFID Tag	5	2	10	meter
13.	L_DOUBTOVER in reading	Odometery error	5	2	10	%
14.	L_DOUBTUNDER in reading	Odometery error	5	2	10	%
15.	Tolerable error ‘E’ in odometry	Tolerable error due to odometry error	50	10	100	meter
16.	SR Authorisation margin distance		800	500	5000	meter

S.No	Parameter	Description	Default	Min	Max	Units
	'd'					
17.	**Onsight Mode**					
17.1.	Onsight Speed limit	This speed limit will be sent by Stationary KAVACH based on Table of Control in case of entry to OS mode is due to selection of Override.	SD	5	200	kmph
17.2.	Onsight Signal Linking distance	Target distance for availing Signal info e.g. Signal aspect, marker, description in OS mode in case of entry to OS mode is due to selection of Override.	200	50	2500	meter
17.3.	Extended On Sight Movement Authority time out	Extended On Sight Movement Authority time permitted to cross signal at ON after override.	240	60	600	Second
18.	**Radio MODEM**					
18.1.	Power		10	1	20	watt
18.2.	Frequency Resolution		KHz	Hz	MHz	Hz
18.3.	Number of frequencies		2	3	16	number
18.4.	f0 freq	Centre frequency Tx & Rx	427.625	100	999	MHZ
18.5.	Base Frequency	Base Frequency	406	100	999	MHz
18.6.	Channel Bandwidth	Channel Bandwidth	25	25	100	KHz
18.7.	Channel No	Channel No for TX F1	SD	1	2560	Number
18.8.	Channel No	Channel No for RX F1	SD	1	2560	Number
18.9.	Channel No	Channel No for TX F2	SD	1	2560	Number
18.10.	Channel No	Channel No for RX F2	SD	1	2560	Number
19.	**Time slot Management**					
19.1.	Frame cycle		2	0.5	2	second
19.2.	Number of slots in centre Frequency	No of slot in f0 frequency	16	1	100	number
19.3.	Time slot for access authority packet	4 time slot are catered	P57, P58, P69 & P70	P53	P70	---
19.4.	Time slot for additional emergency Packet	4 time slot to cater	P53, P54, P65	P47	P70	

S.No	Parameter	Description	Default	Min	Max	Units
			,P66			
19.5.	Max no of slot in a frame		70	5	100	Number
19.6.	No of slot in pair freq		44	5	100	number
20.	**GSM APN and other IP address Parameter**					
20.1.	GSM 1 APN Name					
20.2.	GSM 2 APN Name					
20.3.	IP address of KMS					
20.4.	IP Port number of KMS		54143	54000	54999	Number
20.5.	IP address of NMS					
20.6.	IP address-1 of TSRMS	IP address of BLUE ring				
20.7.	IP address-2 of TSRMS	IP address of RED ring				
20.8.	Number of associated LES	Applicable for LTE only	1	0	6	Number
20.9.	IP address of LES 1	IP address of Blue Ring				
20.10.	IP address of LES 1	IP address of RED Ring				
20.11.	IP address of LES 2	IP address of Blue Ring				
20.12.	IP address of LES 2	IP address of RED Ring				
20.13.	IP address of LES 3	IP address of Blue Ring				
20.14.	IP address of LES 3	IP address of RED Ring				
21.	Length of station name	Number of character in station size				
22.	Max. Traffic Capacity	Loco Time Slot Number of Locos and Time Slots shall be as per RDSO or concerned railways approved document.				
23.	No of Profiles	Number of profiles depends on the station type.	SD	1	31	
24.	Shunt mode speed	Max Shunt mode speed to be configured	15	10	60	

S.No	Parameter	Description	Default	Min	Max	Units
25.	**Communication Parameter (RaSTA)**					
25.1.	Tmax	A message shall be received within T max after sending (Max Channel Delay).	1800	100	3000	milli-second
25.2.	**Th**	T h is the heartbeat interval.	300	100	1000	millisecond
25.3.	**Nsendmax**	A communication partner shall not send more than N sendmax messages without an acknowledgement received (Receive Buffer Size). This value is exchanged among communication partners during initialisation and can be interpreted as receive buffer minimum size.	20	10	100	millisecond
25.4.	**Tseq**	T seq defines the amount of time a message, received off the channels sequence, is stored (DeferTime).	100	10	500	ms
25.5.	**N Diagnose**	N Diagnose defines the Redundancy layers diagnose message window	200	100	500	number
25.6.	**Ndefer Queue Size**	N defer Queue Size defines the maximum number of entries in the defer Queue.	4	1	20	number
26.	**Time out**					
26.1.	Time for OS MA in day time	Time for OS MA from stationary KAVACH during day time.	1	0	7	Minute
26.2.	Time for OS MA in Night time	Time for OS MA from stationary KAVACH during Night time.	2	0	7	Minute
26.3.	Time out for terminating of Communication.	Time out for terminating of Communication by stationary KAVACH.	120	10	300	second
26.4.	Time out for Same state comparison in two input channel.	Time out for comparison of the two input channels	6	1	10	second
26.5.	Signal flickering time out (MA holding time)	The signal aspects read shall be held for this duration (Slow to release)	2000	2000	10000	msec
26.6.	Communication	The Radio communication				

S.No	Parameter	Description	Default	Min	Max	Units
	time out	failure time which is to be tolerated.				
		Absolute Block Section	30	6	120	second
		Automatic Block Section	10	6	120	second
26.7.	De- Registration Timeout	Absolute section	120	5	240	second
26.8.	De- Registration Timeout	Automatic section	30	10	180	second
26.9.	Random number time out	Resetting the secure communication after communication failure	30	6	120	second

A3.5 Checksum

Stationary KAVACH may at least maintain individual Checksums for Executive Software, Event logger software, Signalling TOC related, Track Profile related and Stationary KAVACH Configuration details related.