SIEMENS

CONFIGURATION SUMMARY

SEAR IIi APPLICATION 9V864-A01

AUGUST 2009, REVISED JUNE 2014

DOCUMENT NO. SIG-00-05-02-001
VERSION P.1

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The equipment covered in this manual has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

DOCUMENT HISTORY

Version	Release Date	Details of Change
P	August 2009	• Section 4 – User Programmable LED Configuration table: o Page 6 – Added alarm # 90 to T02, and alarm #10 to T08. • Section 7.1 – Application Alarms table: o Page 14 – Added T02 Alarm Code # 90 (Gate Break Alarm). o Pages 14, 15 & 16 – Removed T03 Alarm Code #s 66, 67, 68 & 69 and deleted corresponding single asterisk footnote which denoted “Larger alarm codes will be sent when gates are not present.” o Page 21 – Changed Alarm Code # 233 to # 99, and re-worded “Transferred” to “Transferring”. • Section 7.2 – Application Alarm Clears table: o Page 23 – Added T01 Alarm Code # 147 (AC Power Back On). o Page 24 – Added T02 Alarm Code #s 144 (Vehicle Detector Health Normal) and 190 (Gate Break Alarm Clear). o Page 26 – Changed T08 Alarm Code # 24 to # 110, and added # 199 (GCP4K Transfer Complete).
P.1	June 2014	Rebranded for Siemens

NOTES, CAUTIONS, AND WARNINGS

Throughout this manual, notes, cautions, and warnings are frequently used to direct the reader's attention to specific information. Use of the three terms is defined as follows:

⚠ WARNING

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY. WARNINGS ALWAYS TAKE PRECEDENCE OVER NOTES, CAUTIONS, AND ALL OTHER INFORMATION.

⚠ CAUTION

CAUTION

REFERS TO PROPER PROCEDURES OR PRACTICES WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN A POTENTIALLY HAZARDOUS SITUATION AND/OR POSSIBLE DAMAGE TO EQUIPMENT. CAUTIONS TAKE PRECEDENCE OVER NOTES AND ALL OTHER INFORMATION, EXCEPT WARNINGS.

NOTE

NOTE

Generally used to highlight certain information relating to the topic under discussion.

If there are any questions, contact Siemens Industry Inc., Rail Automation Application Engineering.

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1.0 **INTRODUCTION**

This document supports installation and maintenance of SEAR IIi units configured with the 9V864-A01P user program stored in flash memory. This document:

- Explains LED indications
- Lists setup steps unique to 9V864-A01P
- Lists all messages generated by 9V864-A01P
- Links specific tests and alarm messages to specific FRA regulations
- Lists connector / wire tag assignments
- Describes test modes supported by 9V864-A01P

For further information on SEAR IIi, refer to the GRADE CROSSING PREDICTOR MODEL 4000 Reference Manual (Safetran document no. SIG-00-02-02).

2.0 **USER MENU ITEMS – SITE SETUP**

The table below lists configuration settings unique to 9V864-A01P. Each row presents an entry in the site setup sequence. The first column shows the text that appears in the SEAR IIi Interface function area on the 4000 GCP display unit. The three middle columns give the options or define the range of values that may be entered. The rightmost column summarizes conditions that determine if that row's step will appear, for example: 'GATE TIP SENSORS' entry appears only if the entry for 'ENTRANCE GATES' is one or greater.

Question	Minimum / Sel. 1	Maximum / Sel. 2	Sel. 3	Sel. 4	Sel. 5	Sel. 6	Sel. 7	Sel. 8	Condition For Menu Display
RAILROAD NUMBER?	1	999							
CROSSING CONFIGURATION?	NORMAL	SPLIT GATE		EXTERNAL ENTRANCE GATE CNTRLR(S)					
AND1 USED AS XR?	NO	YES							
AND2 USED AS XR?	NO	YES							
AND3 USED AS XR?	NO	YES							
AND4 USED AS XR?	NO	YES							
AND5 USED AS XR?	NO	YES							
AND6 USED AS XR?	NO	YES							
AND7 USED AS XR?	NO	YES							
AND8 USED AS XR?	NO	YES							
XR CONTROLLED BY FOREIGN RR?	AND1	AND2	AND3	AND4	AND5	AND6	AND7	AND8	CROSSING CONFIGURATION= SPLIT GATE
ENTRANCE GATES?	0	8							
GATE CONTROLLED BY FOREIGN RR?	NONE	TSS2	TSS3	TSS4					CROSSING CONFIGURATION= SPLIT GATE

Question	Minimum / Sel. 1	Maximum / Sel. 2	Sel. 3	Sel. 4	Sel. 5	Sel. 6	Sel. 7	Sel. 8	Condition For Menu Display
GATE POSITION FAIL TIME (SECONDS)?	10	60							GATES>0
GATES NOT STARTING TIME (SECONDS)?	10	20							RAILROAD=005
CROSSING ACTIVE TIME (MINUTES)?	20	30							RAILROAD=005
RING THRU TIME (SECONDS)?	10	15							RAILROAD=005
BATTERY BANKS?	1	3							
BATT MON USED?	NO	YES							
OB RESOLUTION?	0.2	0.5	1.0						RAILROAD=125
X-B RESOLUTION?	0.2	0.5	1.0						RAILROAD=125
X-B2 RESOLUTION?	0.2	0.5	1.0						RAILROAD=125
BATT MON RESOLUTION?	0.2	0.5	1.0						RAILROAD-125
INTERNAL CROSSING CONTROLLERS?	0	2							
EXTERNAL CROSSING CONTROLLERS?	0	2							
VHF COMMUNICATOR?	YES	NO							
DTMF ACTIVATION?	YES	NO							RAILROAD<>103
ALLOW DTMF CONTROL?	NO	YES							RAILROAD=103
DIGIT #1?	0	9							ALLOW DTMF CONTROL=YES
DIGIT #2?	0	9							ALLOW DTMF CONTROL=YES
DIGIT #3?	0	9							ALLOW DTMF CONTROL=YES
DIGIT #4?	0	9							ALLOW DTMF CONTROL=YES
DIGIT #5?	0	9							ALLOW DTMF CONTROL=YES
DTMF TIME-OUT?	30	240							ALLOW DTMF CONTROL=YES
DTMF OUTPUT 2 DELAY?	0	20							ALLOW DTMF CONTROL=YES
ACTIVATION CODE?	1	999							VHF COMMUNICATOR =YES
ACTIVATION TIMEOUT (SECONDS)?	1	600							VHF COMMUNICATOR =YES
iLOD MODULES?	0	4							
ANY LED BULBS USED?	NO	YES							iLOD MODULES>0
AUTO INSPECTIONS?	YES	NO							
BELL SENSORS?	0	8							
BELL SENSOR TSS1?	NO	YES							BELL SENSORS>0

Question	Minimum / Sel. 1	Maximum / Sel. 2	Sel. 3	Sel. 4	Sel. 5	Sel. 6	Sel. 7	Sel. 8	Condition For Menu Display
BELL SENSOR TSS2?	NO	YES							BELL SENSORS>0
BELL SENSOR TSS3?	NO	YES							BELL SENSORS>0
BELL SENSOR TSS4?	NO	YES							BELL SENSORS>0
BELL SENSOR TSS5?	NO	YES							BELL SENSORS>0
BELL SENSOR TSS6?	NO	YES							BELL SENSORS>0
BELL SENSOR TSS7?	NO	YES							BELL SENSORS>0
BELL SENSOR TSS8?	NO	YES							BELL SENSORS>0
BELL ON?	GATES LOWERING	GATES MOVING	ALWAYS						BELL SENSORS>0
GFT'S?	YES	NO							
BATTERIES ON GFT1?	1	2							GFT'S?=YES
GATE TIP SENSORS?	YES	NO							GATES>0
RTU?	NO	YES							
VHF VOICE CHANNEL?	1	8							VHF COMMUNICATOR =YES
VHF DATA CHANNEL?	1	8							VHF COMMUNICATOR =YES
USE NON-CRITICAL FEATURE?	NO	YES							
FULL APPROACH MOVE ALARMS?	ACTIVATE	DO NOT ACTIVATE							

3.0 DIGITAL INPUT STANDARD CONFIGURATION

The following tables define the digital inputs for 9V864-A01P. The first table defines the states and conditions for each input function. The second table shows the physical inputs available for each function. The inputs can be configured on the available 4000 GCP inputs or the two digital inputs on the SEAR IIi front panel as indicated in the second table.

INPUT FUNCTION STATES AND CONDITIONS

Wire Tag	Normal	Energized	De-energized	Condition
POK 1	ON	ON	OFF	Configured on GCP 4000
POK 2	ON	ON	OFF	Configured on GCP 4000
DOOR 1	OFF	ON	OFF	Configured on GCP 4000
DOOR 2	OFF	ON	OFF	Configured on GCP 4000
NVD	OFF	ON	OFF	Configured on GCP 4000
SVD	OFF	ON	OFF	Configured on GCP 4000
VDH	OFF	ON	OFF	Configured on GCP 4000
GP 1.1	OFF	ON	OFF	Configured on GCP 4000
GP 1.2	OFF	ON	OFF	Configured on GCP 4000
GP 2.1	OFF	ON	OFF	Configured on GCP 4000
GP 2.2	OFF	ON	OFF	Configured on GCP 4000
GD 1.1	OFF	ON	OFF	Configured on GCP 4000
GD 1.2	OFF	ON	OFF	Configured on GCP 4000
GD 1.3	OFF	ON	OFF	Configured on GCP 4000
GD 1.4	OFF	ON	OFF	Configured on GCP 4000
GD 2.1	OFF	ON	OFF	Configured on GCP 4000
GD 2.2	OFF	ON	OFF	Configured on GCP 4000
GD 2.3	OFF	ON	OFF	Configured on GCP 4000
GD 2.4	OFF	ON	OFF	Configured on GCP 4000
TSS1	TSS	TSS	TSS	Configured on GCP 4000
TSS2	TSS	TSS	TSS	Configured on GCP 4000
TSS3	TSS	TSS	TSS	Configured on GCP 4000
TSS4	TSS	TSS	TSS	Configured on GCP 4000
TSS5	TSS	TSS	TSS	Configured on GCP 4000
TSS6	TSS	TSS	TSS	Configured on GCP 4000
TSS7	TSS	TSS	TSS	Configured on GCP 4000
TSS8	TSS	TSS	TSS	Configured on GCP 4000
GFT1	GFT	GFT	GFT	Configured on GCP 4000
GFT2	GFT	GFT	GFT	Configured on GCP 4000
GFT3	GFT	GFT	GFT	Configured on GCP 4000
General 1	OFF	ON	OFF	Configured on GCP 4000
General 2	OFF	ON	OFF	Configured on GCP 4000
General 3	OFF	ON	OFF	Configured on GCP 4000
General 4	OFF	ON	OFF	Configured on GCP 4000

Wire Tag	Normal	Energized	De-energized	Condition
TX	ON	ON	OFF	Configured on GCP 4000
EXT ISL 1	OFF	ON	OFF	Configured on GCP 4000
EXT ISL 2	OFF	ON	OFF	Configured on GCP 4000
EXT ISL 3	OFF	ON	OFF	Configured on GCP 4000

NOTE

NOTE

The POK1 input is fed by battery through one front contact of every POK relay at the crossing location in a series connection. The POK2 input is fed by battery through one front contact of every POK relay at the crossing location in a parallel connection. If any relay in either the series or parallel circuit drops out, battery is removed from the associated POK input and the trouble light turns off. If there is only one POK relay at a crossing location, both POK1 and POK2 must be fed through a front contact of that relay.

PHYSICAL INPUT ASSIGNMENTS

	SEAR IIi		4000 GCP Front Panel																								
TAG	DI O1	DI O2	SP2.1	SP3.1	SP4.1	SP5.1	SP6.1	SSCC77.1	SSCC77.2	SSCC77.3	SSCC77.4	SSCC77.5	SSCC88.1	SSCC88.2	SSCC88.3	SSCC88.4	SSCC88.5	IN1.1	IN1.2	IN2.1	IN2.2	IN3.1	IN3.2	IN4.1	IN4.2	IN5.1	IN5.2	IN6.1	IN6.2
POK 1	X	X	P	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
POK 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DOOR 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DOOR 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NVD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SVD	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
VDH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GP 1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GP 1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GP 2.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	P	X	X	X	X	X	X	X	X	X	X	X	X
GP 2.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 1.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 1.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 1.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 2.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 2.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 2.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GD 2.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TSS 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
TSS 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
TSS 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												

PHYSICAL INPUT ASSIGNMENTS (*Continued*)

	SEAR IIi		4000 GCP Front Panel																									
TSS 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
TSS 5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
TSS 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
TSS 7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
TSS 8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
GFT 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
GFT 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
GFT 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
General 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General 4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TX	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXT ISL 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXT ISL 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EXT ISL 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes: X Indicates that this input may be used for this indication
P Indicates that this is the preferred input for this indication

4.0 **USER PROGRAMMABLE LED CONFIGURATION**

The following tables define operation of the tri-color User Programmable LEDs for 9V864-A01P.

LED	Alarm Numbers	Designator
T01	5, 17-19, 34-38, 47	POWER
T02	6, 8, 9, 20, 21, 28, 44, 53, 55, 90	GATE
T03	1, 11-14, 16, 25, 30, 45, 46	WARNING DEVICES
T04	2, 3, 4, 15, 22, 23, 33, 50-52, 60, 61, 70-89	CROSSING
T05	7, 56	ANALYZER FAILURE
T06		RESERVED
T07		RESERVED
T08	10	ONLINE
T09		234.249 GROUND TEST
T10		234.251 STANDBY POWER
T11		234.253 FLASHING LIGHT UNITS
T12		234.255 GATE ARM AND GATE MECHANISMS
T13		234.257 WARNING SYSTEM OPERATION
T14		234.259 WARNING TIME
T15		234.261 TRAFFIC PREEMPTION
T16		MONTHLY MANUAL INSPECTIONS

4.1 **LED STATES (T01 – T08)**

LED	No Alarm / Reserved	In Alarm	Alarm Stop	User Test Mode Enabled	User Test Mode Disabled
T01	GREEN	FAST FLASH RED	SLOW FLASH RED		
T02	GREEN	FAST FLASH RED	SLOW FLASH RED		
T03	GREEN	FAST FLASH RED	SLOW FLASH RED		
T04	GREEN	FAST FLASH RED	SLOW FLASH RED		
T05	GREEN	FAST FLASH RED	SLOW FLASH RED		
T06	GREEN				
T07	GREEN				
T08				FAST FLASH RED	SLOW FLASH GREEN

4.2 **LED STATES (T09 – T16)**

LED	Test Pending	Test Ready To Run	Test Passed	Test Failed
T09	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T10	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T11	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T12	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T13	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T14	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T15	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED
T16	YELLOW	SLOW FLASH YELLOW	FAST FLASH GREEN	RED

5.0 **BATTERY INPUT CONFIGURATION**

The following table shows the 9V864-A01P default names, software designators, resolutions and menu conditions for the SEAR IIi battery inputs on channels 1 through 4.

Channel	Menu Conditions		Name
	BATTERY	RAILROAD NUMBER	
1	BATTERY BANKS? >0	22	MB
		103	B12
		125	OB
		260	B12
		400	B10
		550	B12 *
		671	MB-12
2	BATTERY BANKS? >1	22	1XB
		103	1XB12
		125	X-B
		260	1XB12
		400	1XB12
		550	B16 *
		671	XB-14
3	BATTERY BANKS? >2	22	2XB
		125	X-B2
		103	2XB12
		260	2XB12
		400	2XB12
		550	B16A
		671	BATT3 *
4	BATT MON NOT USED? = YES	22	Batt Mon
		103	Batt Mon
		125	Batt Mon
		260	Batt Mon
		400	Batt Mon
		550	Batt Mon *
		671	Batt Mon

* Default battery name.

6.0 **RELAY OUTPUT CONFIGURATION**

The following table shows the 9V864-A01P default names, software designators and menu conditions for the SEAR IIi relay outputs on channels 1 through 8.

Channel	Menu Conditions		Name	Software Designator	Alarm Number
	RTU?	RAILROAD NUMBER			
1	YES	22	RTU1		4
		103	DTMFOUT1A		
		260	RTU1		4
		400	N/A		
		550	N/A		
		671	RTU1		4
2	YES	22	RTU2		9, 49
		103	DTMFOUT1B		
		260	RTU2		9
		400	N/A		
		550	N/A		
		671	RTU2		6
3	YES	22	RTU3		6
		103	DTMFOUT2A		
		260	RTU3		6
		400	N/A		
		550	N/A		
		671	RTU3		9
4	YES	22	RTU4		1, 7, 11, 12, 13, 14, 18, 19, 35, 36
		103	DTMFOUT2B		
		260	RTU4		1, 7
		400	N/A		
		550	N/A		
		671	RTU4		19
5	YES	22	N/A		
		103	N/A		
		260	N/A		
		400	N/A		
		550	N/A		
		671	N/A		
6	YES	22	N/A		
		103	N/A		
		260	RTU6		5
		400	N/A		
		550	N/A		
		671	RTU6		18

Relay Output Configuration (continued)

Channel	Menu Conditions		Name	Software Designator	Alarm Number
	RTU?	RAILROAD NUMBER			
7	YES	22	GROUND FAULT TESTER	GFTTEST	N/A
		103	GROUND FAULT TESTER		
		260	GROUND FAULT TESTER		
		400	GROUND FAULT TESTER		
		550	GROUND FAULT TESTER		
		671	GROUND FAULT TESTER		
8	YES	22	AC POWER TEST	AC_CONTROL	N/A
		103	AC POWER TEST		
		260	AC POWER TEST		
		400	AC POWER TEST		
		550	AC POWER TEST		
		671	AC POWER TEST		

7.0 MESSAGES

The tables in the following subsections list all of the messages generated by the 9V864-A01P application. Messages generated by the SEAR IIi executive are not presented here.

Messages fall into categories defined by message numbers:

0	Internal SEAR IIi Messages
1-100	Application Alarms
101-200	Application Alarm Clears
201-230	Automatic Inspection Alarms
231-250	Application Information Messages
251-255	Automatic Inspection Information
1000-1099	Office Software Alarms
1100–1199	Office Software Alarm Clears

7.1 APPLICATION ALARMS

The 9V864-A01P application generates these alarms. These alarms will be preceded by two asterisks in the event log for easier viewing.

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T01	5	n/a	AC POWER OFF FOR 20 MINUTES	POK1 has been off for 20 minutes or more.	Yes	Always
T01	17	22	MB GROUND FAULT ALARM	BAT 1 (Battery Channel 1) on GFT1 is in FAULT state. This alarm is sent to the office once every 24 hours until it is cleared.	Yes	Always
		125	OB GROUND FAULT ALARM			
		400	B10 GROUND FAULT ALARM			
		550, 103 or 260	B12 GROUND FAULT ALARM			
		671	MB-12 GROUND FAULT ALARM			
T01	18	22	LOW MB	Battery Channel 1 is less than 85% of calibrated voltage for at least 20 seconds.	Yes	Always
		125	LOW OB			
		400	LOW B10			
		550, 103 or 260	LOW B12			
		671	LOW MB-12			
T01	19	22	LOW 1XB	Battery Channel 2 is less than 85% of calibrated voltage for at least 20 seconds.	Yes	Always
		125	LOW X-B			
		400, 103 or 260	LOW 1XB12			
		550	LOW B16			
		671	LOW XB-14			
T01	34	22	1XB GROUND FAULT ALARM	BAT 2 (Battery Channel 2) on GFT1 is in FAULT state. This alarm is sent to the office once every 24 hours until it is cleared.	Yes	Always
		125	X-B GROUND FAULT ALARM			
		400, 103 or 260	1XB12 GROUND FAULT ALARM			
		550	B16 GROUND FAULT ALARM			
		671	XB-14 GROUND FAULT ALARM			
T01	35	22	LOW 2XB	Battery Channel 3 is less than 85% of calibrated voltage for at least 20 seconds.	Yes	Always
		125	LOW X-B2			
		400, 103 or 260	LOW 2XB12			
		550	LOW B16A			
		671	LOW BATT3			

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T01	36	22	LOW BATT MON	Battery Channel 4 is less than 85% of calibrated voltage for at least 20 seconds.	Yes	Always
		103	LOW BATT MON			
		125	LOW BATT MON			
		260	LOW BATT MON			
		400	LOW BATT MON			
		550	LOW BATT MON			
		671	LOW BATT MON			
T01	37	22	2XB GROUND FAULT ALARM	BAT 1 (Battery Channel 3) on GFT2 is in FAULT state. This alarm is sent to the office once every 24 hours until it is cleared.	Yes	Always
		125	X-B2 GROUND FAULT ALARM			
		400, 103 or 260	2XB12 GROUND FAULT ALARM			
		550	B16A GROUND FAULT ALARM			
		671	BATT3 GROUND FAULT ALARM			
T01	38	22	BATT MON GROUND FAULT ALARM	BAT 2 (Battery Channel 4) on GFT2 is in FAULT state. This alarm is sent to the office once every 24 hours until it is cleared.	Yes	Always
		103	BATT MON GROUND FAULT ALARM			
		125	BATT MON GROUND FAULT ALARM			
		260	BATT MON GROUND FAULT ALARM			
		400	BATT MON GROUND FAULT ALARM			
		550	BATT MON GROUND FAULT ALARM			
		671	BATT MON GROUND FAULT ALARM			
T01	47	n/a	AC POWER NOT ON AFTER TEST	POK1 did not come back on after FRA standby power test ended.	Yes	During FRA Test

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T02	6	n/a	GATE NOT UP AFTER CROSSING INACTIVE	All gates are not reporting UP or any tip reporting LEVEL after crossing was clear for at least 4 minutes. (Entrance gates only)	Yes	Train Move
T02	8	n/a	FAIL 3 SECOND TEST **	A gate started down less than 3 seconds after Crossing Active. (Entrance gates only)	Yes	Train Move
T02	9	n/a	GATE POSITION FAIL **	1. Gate Control activates 2. Gate position fail time has elapsed 3. All gates are not DOWN 4. All tips are not LEVEL Or any tip sensor turns OFF while island occupied (Entrance gates only)	Yes	Train Move
T02	20	n/a	GATES NOT STARTING **	All Entrance Gates have not started down within 10 seconds of Crossing Active. (User configurable time if RAILROAD=005) (Entrance gates only)	Yes	Train Move
T02	21	n/a	FAIL 5 SECOND TEST **	Any gate not DOWN or any tip not LEVEL within 5 seconds prior to Island Occupied after Crossing Active for at least 15 seconds. (Entrance gates only)	Yes	Train Move
T02	28	n/a	HOLD CLEAR FAIL	TSS gate up input toggles > 10 times after Crossing Inactive.	Yes	Always
T02	44	n/a	VEHICLE DETECTOR HEALTH ALARM	Vehicle Detector Health input is deenergized for 8 seconds.	Yes	Always
T02	53	n/a	EXIT GATE NOT DOWN	Island Occupied and Exit Gates are not down.	Yes	Train Move
T02	55	n/a	INTERIOR GATE NOT DOWN	Island Occupied and Interior Gate is not down.	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T02	90	n/a	GATE BREAK ALARM	Any gates DOWM and gate tip not reporting LEVEL after 9 seconds.	Yes	Train Move
T03	1	n/a	CROSSING CONTROLLER FAILURE	Any crossing controller reports a Vital Health error or communications error and POK1 is ON for 30 seconds.	Yes	Always
T03	11	n/a	TWO BULBS OUT	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. A two bulb out condition exists (ANY LED BULBS USED=NO)	Yes	Train Move
T03	12	n/a	MULTIPLE BULBS OUT	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. A multiple bulb out condition exists (ANY LED BULBS USED=NO)	Yes	Train Move
T03	13	n/a	FLASH RATE TOO SLOW	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. Flash rate is less than 35 flashes per minute	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T03	14	n/a	FLASH RATE TOO FAST	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. Flash rate is greater than 65 flashes per minute	Yes	Train Move
T03	16	n/a	BELL NOT RINGING	Crossing Active and BELL OUT ON and TSS Bell Audio or TSS Bell Power FALSE for at least 3 seconds.	Yes	Train Move
T03	25	n/a	BELL ON DURING ISLAND	**Crossing Active** > 20 seconds and **Island Occupied** and (TSS bell audio ON or BELL OUT ON) **BELL ON MENU OPTION** <> "**ALWAYS**".	Yes	Train Move
T03	30	n/a	BELL SENSOR ERROR	Bell Sensor detects audio or power when Bell Output is off.	Yes	Always
T03	45	n/a	LAMP CURRENT DROPPED ≥ 2.1A	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. The iLODs record a total current drop of ≥ 2.1A . (ANY LED BULBS USED=YES)	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T03	46	n/a	LAMP CURRENT DROPPED 1.4A - 2.1A	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. The iLODs record a total current drop of 1.4A – 2.1A . (ANY LED BULBS USED=YES)	Yes	Train Move
T03	---	n/a	BULB OUT	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds. 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. A single bulb out condition exists (Not sent to office) (ANY LED BULBS USED=NO)	Yes	Train Move
T03	--	n/a	LAMP CURRENT DROPPED .7A - 1.4A	1. Crossing Active for > 11 seconds or Foreign Railroad active > 11 seconds 2. Island Occupied for > 4 seconds (not required for foreign train move) 3. The iLODs record a total current drop of .7A – 1.4A . (Not sent to office) (ANY LED BULBS USED=YES)	No	Train Move
T04	2	n/a	WARNING TIME TK1	Time between Crossing Active and Island 1 Occupied. Sent to office if less than 20 seconds and no train stop is detected since last train move.	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T04	50	n/a	WARNING TIME TK2	Time between Crossing Active and Island 1 Occupied. Sent to office if less than 20 seconds and no train stop is detected since last train move.	Yes	Train Move
T04	51	n/a	WARNING TIME TK3	Time between Crossing Active and Island 1 Occupied. Sent to office if less than 20 seconds and no train stop is detected since last train move.	Yes	Train Move
T04	52	n/a	WARNING TIME TK4	Time between Crossing Active and Island 1 Occupied. Sent to office if less than 20 seconds and no train stop is detected since last train move.	Yes	Train Move
T04	60	n/a	WARNING TIME TK5	Time between Crossing Active and Island 1 Occupied. Sent to office if less than 20 seconds and no train stop is detected since last train move.	Yes	Train Move
T04	61	n/a	WARNING TIME TK6	Time between Crossing Active and Island 1 Occupied. Sent to office if less than 20 seconds and no train stop is detected since last train move.	Yes	Train Move
T04	3	n/a	POSSIBLE TAIL RING TK1 **	1. Crossing Active 2. Island Occupied 3. Valid warning time 4. Within 40 seconds Crossing Active 5. No Island drop 6. Crossing Inactive 7. Activations on same track	Yes	Train Move
T04	70	n/a	POSSIBLE TAIL RING TK2 **	1. Crossing Active 2. Island Occupied 3. Valid warning time 4. Within 40 seconds Crossing Active 5. No Island drop 6. Crossing Inactive 7. Activations on same track	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T04	71	n/a	POSSIBLE TAIL RING TK3 **	1. Crossing Active 2. Island Occupied 3. Valid warning time 4. Within 40 seconds Crossing Active 5. No Island drop 6. Crossing Inactive 7. Activations on same track	Yes	Train Move
T04	89	n/a	POSSIBLE TAIL RING TK4 **	1. Crossing Active 2. Island Occupied 3. Valid warning time 4. Within 40 seconds Crossing Active 5. No Island drop 6. Crossing Inactive 7. Activations on same track	Yes	Train Move
T04	72	n/a	POSSIBLE TAIL RING TK5 **	1. Crossing Active 2. Island Occupied 3. Valid warning time 4. Within 40 seconds Crossing Active 5. No Island drop 6. Crossing Inactive 7. Activations on same track	Yes	Train Move
T04	73	n/a	POSSIBLE TAIL RING TK6 **	1. Crossing Active 2. Island Occupied 3. Valid warning time 4. Within 40 seconds Crossing Active 5. No Island drop 6. Crossing Inactive 7. Activations on same track	Yes	Train Move
T04	4	n/a	CROSSING ACTIVE FOR XX	Crossing has been active for 20 minutes or longer. (User configurable time if RAILROAD=005)	20 min. intervals	Always
T04	15	n/a	POSSIBLE PRE-RING TK1 **	1. Crossing Active 2. No Island/Train Stop 3. Crossing Inactive 4. Crossing Active 5. Island Occupied within 4 minutes	Yes	Train move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T04	74	n/a	POSSIBLE PRE-RING TK2 **	1. Crossing Active 2. No Island/Train Stop 3. Crossing Inactive 4. Crossing Active 5. Island Occupied within 4 minutes	Yes	Train move
T04	75	n/a	POSSIBLE PRE-RING TK3 **	1. Crossing Active 2. No Island/Train Stop 3. Crossing Inactive 4. Crossing Active 5. Island Occupied within 4 minutes	Yes	Train move
T04	76	n/a	POSSIBLE PRE-RING TK4 **	1. Crossing Active 2. No Island/Train Stop 3. Crossing Inactive 4. Crossing Active 5. Island Occupied within 4 minutes	Yes	Train move
T04	77	n/a	POSSIBLE PRE-RING TK5 **	1. Crossing Active 2. No Island/Train Stop 3. Crossing Inactive 4. Crossing Active 5. Island Occupied within 4 minutes	Yes	Train move
T04	78	n/a	POSSIBLE PRE-RING TK6 **	1. Crossing Active 2. No Island/Train Stop 3. Crossing Inactive 4. Crossing Active 5. Island Occupied within 4 minutes	Yes	Train move
T04	22	n/a	PREEMPTION ALARM	Crossing Active and Preempt Health Input is Energized.	Yes	Train Move
T04	23	n/a	FALSE DETECTION TK1	1. Crossing Active 2. No Island/Train Stop/Tail Ring 3. Crossing Inactive 4. No train on same track for 30 minutes	Yes	Train Move
T04	79	n/a	FALSE DETECTION TK2	1. Crossing Active 2. No Island/Train Stop/Tail Ring 3. Crossing Inactive 4. No train on same track for 30 minutes	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T04	80	n/a	FALSE DETECTION TK3	1. Crossing Active 2. No Island/Train Stop/Tail Ring 3. Crossing Inactive 4. No train on same track for 30 minutes	Yes	Train Move
T04	81	n/a	FALSE DETECTION TK4	1. Crossing Active 2. No Island/Train Stop/Tail Ring 3. Crossing Inactive 4. No train on same track for 30 minutes	Yes	Train Move
T04	82	n/a	FALSE DETECTION TK5	1. Crossing Active 2. No Island/Train Stop/Tail Ring 3. Crossing Inactive 4. No train on same track for 30 minutes	Yes	Train Move
T04	83	n/a	FALSE DETECTION TK6	1. Crossing Active 2. No Island/Train Stop/Tail Ring 3. Crossing Inactive 4. No train on same track for 30 minutes	Yes	Train Move
T04	26	n/a	SLOW TRAIN – POSSIBLE SWITCHING MOVE	Train stop is detected prior to Crossing Active or average train speed < 15mph and warning time is less than 20 seconds.	No	Train Move
T04	33	n/a	POSSIBLE RING THRU TK1	All islands unoccupied. The last island active has been unoccupied for 10 seconds and crossing is still active. (User configurable time if RAILROAD=005)	Yes	Train Move
T04	84	n/a	POSSIBLE RING THRU TK2	All islands unoccupied. The last island active has been unoccupied for 10 seconds and crossing is still active. (User configurable time if RAILROAD=005)	Yes	Train Move

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T04	85	n/a	POSSIBLE RING THRU TK3	All islands unoccupied. The last island active has been unoccupied for 10 seconds and crossing is still active. (User configurable time if RAILROAD=005)	Yes	Train Move
T04	86	n/a	POSSIBLE RING THRU TK4	All islands unoccupied. The last island active has been unoccupied for 10 seconds and crossing is still active. (User configurable time if RAILROAD=005)	Yes	Train Move
T04	87	n/a	POSSIBLE RING THRU TK5	All islands unoccupied. The last island active has been unoccupied for 10 seconds and crossing is still active. (User configurable time if RAILROAD=005)	Yes	Train Move
T04	88	n/a	POSSIBLE RING THRU TK6	All islands unoccupied. The last island active has been unoccupied for 10 seconds and crossing is still active. (User configurable time if RAILROAD=005)	Yes	Train Move
T04	232	n/a	SLOW TRAIN ON ISLAND	Island Occupied within 5 seconds prior to or 2 seconds after Crossing Active. Some alarms will be suppressed.	Yes	Train Move
T05	7	n/a	ANALYZER FAILURE	MTSS, GFT, VHF or iLOD stops communicating with SEAR IIi.	Yes	Always
T05	56	n/a	GCP4K COMM BAD	GCP4K stops communicating with the SEAR IIi.	Yes	Always
T08	10	n/a	USER TEST MODE ENABLED	Application alarms will be bypassed while enabled.	Yes	Always
---	231	n/a	FULL APPROACH MOVE	1. Crossing Active 2. Island Occupied 3. No train stop is detected prior to Crossing Active	Yes	Train Move
---	99	n/a	GCP TRANSFERRING	GCP4K is transferring.	Yes	Always

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
---	234	103	DTMF STATION TRACK 1 CONTROL RECEIVED	Station stop on is enabled.	Yes	Always
---	235	103	DTMF STATION TRACK 2 CONTROL RECEIVED	Station stop 2 is enabled.	Yes	Always
---	236	103	DTMF MAINTENANCE CONTROL RECEIVED	Maintenance is enabled.	Yes	Always
---	237	103	DTMF TIME-OUT	DTMF activation has timed out.	Yes	Always
---	238	103	DTMF STOP CONTROL RECEIVED	Stop DTMF activation control has been received.	Yes	Always
---	239	103	DTMF OFF DUE TO ISLAND	DTMF activation has halted due to island drop.	Yes	Always
---	240	n/a	LOW EZ WHEN XING ACTIVATED XX	The EZ at start of train move is <=33, the average speed is above 15 mph, and warning time is < 20 seconds. Bypassed if any UAX is DOWN or a Prime de-energizes after the XR drops.	Yes	Train Move
---	241	n/a	TRAIN ACCELERATED XX	Island speed – detected speed is >=5 mph, the average speed is above 15 mph, the starting EZ is >33, and the warning time is less than 20 seconds. Bypassed if a Prime de-energizes after the XR drops.	Yes	Train Move

** Island must be occupied at least four seconds for alarm to generate.

7.2 APPLICATION ALARM CLEARS

These messages report cleared alarms. These messages will be preceded by a single asterisk in the event log for easier viewing.

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T01	105	n/a	AC POWER BACK ON	*POK1* back on for at least 1 minute.	Yes	Clears
T01	147	n/a	AC POWER BACK ON	*POK1* back on	Yes	Clears
T01	117	n/a	GFT NORMAL	*Ground Fault* on Battery Channel 1 clears	Yes	Clears
T01	134	n/a	GFT NORMAL	*Ground Fault* on Battery Channel 2 clears	Yes	Clears
T01	137	n/a	GFT NORMAL	*Ground Fault* on Battery Channel 3 clears	Yes	Clears
T01	138	n/a	GFT NORMAL	*Ground Fault* on Battery Channel 4 clears	Yes	Clears
T01	118	22	MB NORMAL	*Low Battery Channel 1* alarm clears for 5 seconds.	Yes	Clears
		125	OB NORMAL			
		400	B10 NORMAL			
		550, 103 or 260	B12 NORMAL			
		671	MB-12 NORMAL			
T01	119	22	1XB NORMAL	*Low Battery Channel 2* alarm clears for 5 seconds.	Yes	Clears
		125	X-B NORMAL			
		400, 103 or 260	1XB12 NORMAL			
		550	B16 NORMAL			
		671	XB-14 NORMAL			
T01	135	22	2XB NORMAL	*Low Battery Channel 3 alarm* clears for 5 seconds.	Yes	Clears
		125	X-B2 NORMAL			
		400, 103 or 260	2XB12 NORMAL			
		550	B16A NORMAL			
		671	BATT3 NORMAL			

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T01	136	22	BATT MON NORMAL	*Low Battery Channel 4 alarm* clears for 5 seconds.	Yes	Clears
		103	BATT MON NORMAL			
		125	BATT MON NORMAL			
		260	BATT MON NORMAL			
		400	BATT MON NORMAL			
		550	BATT MON NORMAL			
		671	BATT MON NORMAL			
T02	106	n/a	GATE NOT UP CLEAR	*Gates Not Up After Crossing Clear* alarm clears.		
T02	108	n/a	FAIL 3 SECOND TEST CLEAR	*Fail 3 Second Test* alarm clears.		
T02	109	n/a	GATE POSITION FAIL CLEAR	*Gate Position Fail* alarm clears.		
T02	120	n/a	GATES NOT STARTING CLEAR	*Gates Not Starting* alarm clears.	Yes	Clears
T02	121	n/a	FAIL 5 SECOND TEST CLEAR	*Fail 5 Second Test* alarm clears.	Yes	Clears
T02	128	n/a	HOLD CLEAR NORMAL	*Hold Clear Fail* alarm clears.	Yes	Clears
T02	153	n/a	EXIT GATE NOT DOWN CLEAR	*Exit Gate Not Down* alarm clears.	Yes	Clears
T02	155	n/a	INTERIOR GATE NOT DOWN CLEAR	*Interior Gate Not Down* alarm clears.	Yes	Clears
T02	144	n/a	VEHICLE DETECTOR HEALTH NORMAL	*Vehicle Detector Health* alarm clears.	Yes	Clears
T02	190	n/a	GATE BREAK ALARM CLEAR	*All gates down and tips reporting level* in at least 9 seconds.	Yes	Clears
T03	101	n/a	CROSSING CONTROLLER NORMAL	*Crossing Controller Failure* clears		
T03	111	n/a	BULBS NORMAL	*Two Bulbs Out* or *Multiple Bulbs Out*, *Lamp Current Dropped 1.4 A - 2.1A, Lamp Current Dropped ≥2.1A,* alarm clears.	Yes	Clears
T03	113	n/a	FLASH RATE NORMAL	*Flash Rate Too Slow* alarm clears.	Yes	Clears

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T03	114	n/a	FLASH RATE NORMAL	*Flash Rate Too Fast* alarm clears.	Yes	Clears
T03	116	n/a	BELL NOT RINGING CLEAR	Bell Not Ringing alarm clears.	Yes	Clears
T03	125	n/a	BELL RINGING DURING ISLAND CLEAR	Bell Ringing During Island alarm clears.	Yes	Clears
T03	130	n/a	BELL SENSOR ERROR CLEAR	Bell Sensor Error alarm clears.	Yes	Clears
T04	102	n/a	WARNING TIME NORMAL TK1	Warning Time TK1 alarm clears.	Yes	Clears
T04	150	n/a	WARNING TIME NORMAL TK2	Warning Time TK2 alarm clears.	Yes	Clears
T04	151	n/a	WARNING TIME NORMAL TK3	Warning Time TK3 alarm clears.	Yes	Clears
T04	152	n/a	WARNING TIME NORMAL TK4	Warning Time TK4 alarm clears.	Yes	Clears
T04	160	n/a	WARNING TIME NORMAL TK5	Warning Time TK5 alarm clears.	Yes	Clears
T04	161	n/a	WARNING TIME NORMAL TK6	Warning Time TK6 alarm clears.	Yes	Clears
T04	103	n/a	TAIL RING CLEAR TK1	Possible Tail Ring TK1 alarm clears.	Yes	Clears
T04	170	n/a	TAIL RING CLEAR TK2	Possible Tail Ring TK2 alarm clears.	Yes	Clears
T04	171	n/a	TAIL RING CLEAR TK3	Possible Tail Ring TK3 alarm clears.	Yes	Clears
T04	172	n/a	TAIL RING CLEAR TK4	Possible Tail Ring TK4 alarm clears.	Yes	Clears
T04	173	n/a	TAIL RING CLEAR TK5	Possible Tail Ring TK5 alarm clears.	Yes	Clears
T04	174	n/a	TAIL RING CLEAR TK6	Possible Tail Ring TK6 alarm clears.	Yes	Clears
T04	104	n/a	CROSSING NORMAL	*Crossing Active Too Long* alarm clears.	Yes	Clears
T04	115	n/a	PRE-RING CLEAR TK1	Possible Pre-Ring TK1 alarm clears.	Yes	Clears
T04	174	n/a	PRE-RING CLEAR TK2	Possible Pre-Ring TK2 alarm clears.	Yes	Clears
T04	175	n/a	PRE-RING CLEAR TK3	Possible Pre-Ring TK3 alarm clears.	Yes	Clears
T04	176	n/a	PRE-RING CLEAR TK4	Possible Pre-Ring TK4 alarm clears.	Yes	Clears
T04	177	n/a	PRE-RING CLEAR TK5	Possible Pre-Ring TK5 alarm clears.	Yes	Clears

LED	Alarm Code	Railroad Number	Name	Description	Sent To Office	Tested
T04	178	n/a	PRE-RING CLEAR TK6	Possible Pre-Ring TK6 alarm clears.	Yes	Clears
T04	122	n/a	PREEMPT NORMAL	*Preemption Fail* alarm clears.	Yes	Clears
T04	123	n/a	FALSE DETECTION CLEAR TK1	False Detection TK1 alarm clears.	Yes	Clears
T04	179	n/a	FALSE DETECTION CLEAR TK2	False Detection TK2 alarm clears.	Yes	Clears
T04	180	n/a	FALSE DETECTION CLEAR TK3	False Detection TK3 alarm clears.	Yes	Clears
T04	181	n/a	FALSE DETECTION CLEAR TK4	False Detection TK4 alarm clears.	Yes	Clears
T04	182	n/a	FALSE DETECTION CLEAR TK5	False Detection TK5 alarm clears.	Yes	Clears
T04	183	n/a	FALSE DETECTION CLEAR TK6	False Detection TK6 alarm clears.	Yes	Clears
T04	133	n/a	RING THRU CLEAR TK1	Possible Ring Thru TK1 alarm clears.	Yes	Clears
T04	184	n/a	RING THRU CLEAR TK2	Possible Ring Thru TK2 alarm clears.	Yes	Clears
T04	185	n/a	RING THRU CLEAR TK3	Possible Ring Thru TK3 alarm clears.	Yes	Clears
T04	186	n/a	RING THRU CLEAR TK4	Possible Ring Thru TK4 alarm clears.	Yes	Clears
T04	187	n/a	RING THRU CLEAR TK5	Possible Ring Thru TK5 alarm clears.	Yes	Clears
T04	188	n/a	RING THRU CLEAR TK6	Possible Ring Thru TK6 alarm clears.	Yes	Clears
T05	107	n/a	ANALYZER NORMAL	*Analyzer Failure* alarm clears.	Yes	Clears
T05	156	n/a	GCP4K COMM GOOD	*GCP4K Comm Bad* clears.	Yes	Clears
T08	110	n/a	USER TEST MODE DISABLED	Application alarms will be generated when disabled	Yes	Clears
-	199	n/a	GCP4K TRANSFER COMPLETE	GCP4K Transferred	Yes	Clears

7.3 AUTOMATIC INSPECTION ALARMS

The following are generated by 9V864-A01P during automatic inspections. These inspection failures will be preceded by two asterisks in the log for easier viewing.

LED	Alarm Code	Railroad Number	Name	Description	Inspection Result #
T09	201	22	FRA FAIL: MB GFT 234.249	The GFT is tested before checking for active faults. Entire test is as follows: • Turn on GFTTEST output • 4-5 seconds, check for grounds • Turn off GFTTEST 7 seconds later • Check for faults 10 seconds later • Test complete	• Fail 1
		125	FRA FAIL: OB GFT 234.249		
		400	FRA FAIL: B10 GFT 234.249		
		550, 103 or 260	FRA FAIL: B12 GFT 234.249		
		671	FRA FAIL: MB-12 GFT 234.249		
T09	202	n/a	FRA FAIL: NO GFT INSTALLED 234.249	No GFT was configured for this location.	• Fail 1
T09	213	n/a	FRA FAIL: GFT DEFECTIVE 234.249	One of the GFT units is reporting STUCK LOW, STUCK HIGH or DATA ERROR.	• Fail 1
T09	214	22	FRA FAIL: 1XB GFT 234.249	The GFT is tested before checking for active faults. Entire test is as follows: • Turn on GFTTEST output • 4-5 seconds, check for grounds • Turn off GFTTEST 7 seconds later • Check for faults 10 seconds later • Test complete	• Fail 1
		125	FRA FAIL: X-B GFT 234.249		
		400, 103 or 260	FRA FAIL: 1XB12 GFT 234.249		
		550	FRA FAIL: B16 GFT 234.249		
		671	FRA FAIL: XB-14 GFT 234.249		

LED	Alarm Code	Railroad Number	Name	Description	Inspection Result #
T09	215	22	FRA FAIL: 2XB GFT 234.249	The GFT is tested before checking for active faults. Entire test is as follows: • Turn on GFTTEST output • 4-5 seconds, check for grounds • Turn off GFTTEST 7 seconds later • Check for faults 10 seconds later • Test complete	• Fail 1
		125	FRA FAIL: X-B2 GFT 234.249		
		400, 103 or 260	FRA FAIL: 2XB12 GFT 234.249		
		550	FRA FAIL: B16A GFT 234.249		
		671	FRA FAIL: BATT3 GFT 234.249		
T09	216	22	FRA FAIL: Batt Mon GFT 234.249	The GFT is tested before checking for active faults. Entire test is as follows: • Turn on GFTTEST output • 4-5 seconds, check for grounds • Turn off GFTTEST 7 seconds later • Check for faults 10 seconds later • Test complete	• Fail 1
		103	FRA FAIL: Batt Mon GFT 234.249		
		125	FRA FAIL: Batt Mon GFT 234.249		
		260	FRA FAIL: Batt Mon GFT 234.249		
		400	FRA FAIL: Batt Mon GFT 234.249		
		550	FRA FAIL: Batt Mon GFT 234.249		
		671	FRA FAIL: Batt Mon GFT 234.249		
T10	203	n/a	FRA FAIL: AC OFF 234.251	POK2 is not ON when Standby Power Test is initiated.	• Fail 2 • Fail 3
T10	204	n/a	FRA FAIL: AC NOT OFF FOR TEST 234.251	SEAR IIi is unable to set POK2 OFF via AC Power Relay for Standby Power Test.	• Fail 2 • Fail 3

LED	Alarm Code	Railroad Number	Name	Description	Inspection Result #
T10	205	n/a	FRA FAIL: STANDBY POWER 234.251	Any of the following alarms occur: 1. *AC In Fail, No Test* 2. *AC Not Off, No Test* 3. *Low Battery Alarm*	• Fail 2 – B12 • Fail 3 – B16
T11	206	n/a	FRA FAIL: LAMP TEST 234.253	Any of the following alarms occur: 1. *Single Bulb Out* 2. *Two Bulbs Out* 3. *Multiple Bulbs Out* 4. *Lamp Current Dropped .7 A – 1.4A* 5. *Lamp Current Dropped 1.4 A – 2.1A* 6. *Lamp Current Dropped ≥2.1A* 7. *Flash Rate Too Slow* 8. *Flash Rate Too Fast*	• Fail 4 – Flash • Fail 5–EB1 Lamp • Fail 6–EN1 Lamp • Fail 7–EB2 Lamp • Fail 8–EN2 Lamp • Fail 21 – EB3 Lamp • Fail 22 – EN3 Lamp • Fail 23 – EB4 Lamp • Fail 24 – EN4 Lamp
T11	207	n/a	FRA FAIL: NO LAMP SENSOR 234.253	Crossing not configured with an iLOD for checking lamp current/flash rate.	• Fail 4 – Flash • Fail 5–EB1 Lamp • Fail 6–EN1 Lamp • Fail 7–EB2 Lamp • Fail 8–EN2 Lamp • Fail 21 – EB3 Lamp • Fail 22 – EN3 Lamp • Fail 23 – EB4 Lamp • Fail 24 – EN4 Lamp
T11	217	n/a	FRA FAIL: iLOD COMM BAD 234.253	iLOD is not communicating with the SEAR IIi during auto test	• Fail 4 – Flash • Fail 5–EB1 Lamp • Fail 6–EN1 Lamp • Fail 7–EB2 Lamp • Fail 8–EN2 Lamp • Fail 21 – EB3 Lamp • Fail 22 – EN3 Lamp • Fail 23 – EB4 Lamp • Fail 24 – EN4 Lamp

LED	Alarm Code	Railroad Number	Name	Description	Inspection Result #
T12	208	n/a	FRA FAIL: GATES 234.255	Any of the following alarms occur: 1. *Fail 3 Second Test* 2. *Gates Not Starting* 3. *Fail 5 Second Test* 4. *Gate Position Fail* 5. *Gate Not Up After Crossing Clear* 6. *Hold Clear Fail*	• Fail 9
T12	218	n/a	FRA FAIL: MTSS COMM BAD 234.255	An MTSS is not communicating with the SEAR IIi during auto test	• Fail 9
T13	209	n/a	FRA FAIL: BELL 234.257b	Any of the following alarms occur: 1. *Bell Not ringing* 2. *Bell On During Island*	• Fail 17
T13	210	n/a	FRA FAIL: WARNING SYSTEM 234.257	*Crossing Controller Failure* alarm occurs.	• Fail 10
T13	219	n/a	FRA FAIL: BELL MTSS COMM BAD 234.257b	An MTSS with a connected bell sensor is not communicating with the SEAR IIi during auto test	• Fail 17
T14	211	n/a	FRA FAIL: WARNING TIME 234.259	*Short Warning Time* alarm on any track occurs.	• Fail 11
T15	212	n/a	FRA FAIL: PREEMPTION 234.261	*Preemption Fail* alarm occurs.	• Fail 12

7.4 AUTOMATIC INSPECTION INFORMATION MESSAGES

The 9V864-A01P application generates the following informational messages during inspections.

LED	Alarm Code	Name	Description	Sent To Office	Tested
---	250	AUTO TEST COMPLETE, AWAITING MANUAL	Automatic inspections have passed, awaiting completion of monthly Manual inspections.	Yes	FRA
---	251	AUTOMATIC INSPECTION(S) FAILED	One or more Inspections failed. Failed tests now available for manual entry.	Yes	FRA
---	252	AUTOMATIC INSPECTIONS COMPLETE	All Automatic and monthly Manual Inspections were completed successfully. ***** LEDs T09 - T16 are green now *****	Yes	FRA
---	253	AUTOMATIC INSPECTIONS LOCAL START	A local request has been issued, placing the Automatic Inspections in Ready To Run mode.	Yes	FRA
---	254	AUTOMATIC INSPECTIONS STARTED	The Office has set the Automated Inspections to Ready to Run status.	Yes	FRA
---	256	MANUAL INSPECTIONS COMPLETE	**AUTOMATED INSPECTIONS=NO** and all tests have been entered manually.	Yes	FRA

8.0 SPECIAL TRAIN MOVE CONDITIONS

The following definitions cover train move conditions monitored by the 9V864-A01P application.

CrossingActive

Any AND that is used as an XR is de-energized.

IslandOccupied

Any island is occupied.

FullApproachMove

CrossingActive TRUE, IslandOccupied TRUE, and no train stop/slow train move has been detected.

9.0 AUTOMATED/MANUAL INSPECTION RESULTS

The following table presents a listing of test numbers that will appear in SEAR IIi records for 9V864-A01P.

When a test applies only to a specific paragraph within a FRA subsection, it is called out with the alphabetic designator as in 'Test 253c' below.

Test Name	Railroad Number	Test Description	Interval	Recorded Value
Test 249	22	XB Ground Fault Detection	Self-test when tests execute, checked 10 seconds later	None
	125	OB Ground Fault Detection		
	400	B10 Ground Fault Detection		
	550, 103 or 260	B12 Ground Fault Detection		
	671	MB-12 Ground Fault Detection		
Test 249	22	MB Ground Fault Detection	Self-test when tests execute, checked 10 seconds later	None
	125	X-B Ground Fault Detection		
	400, 103 or 260	1XB12 Ground Fault Detection		
	550	B16 Ground Fault Detection		
	671	XB-14 Ground Fault Detection		
Test 249	22	1XB Ground Fault Detection	Self-test when tests execute, checked 10 seconds later	None
	125	X-B2 Ground Fault Detection		
	400, 103 or 260	2XB12 Ground Fault Detection		
	550	B16A Ground Fault Detection		
	671	BATT3 Ground Fault Detection		
Test 249	22	Batt Mon Ground Fault Detection	Self-test when tests execute, checked 10 seconds later	None
	103	Batt Mon Ground Fault Detection		
	125	Batt Mon Ground Fault Detection		
	260	Batt Mon Ground Fault Detection		
	400	Batt Mon Ground Fault Detection		
	550	Batt Mon Ground Fault Detection		
	671	Batt Mon Ground Fault Detection		
Test 251	22	XB		Voltage read
	125	OB		
	400	B10		
	550, 103 or 260	B12		
	671	MB-12		

Test Name	Railroad Number	Test Description	Interval	Recorded Value
Test 251	22	MB		Voltage read
	125	X-B		
	400, 103 or 260	1XB12		
	550	B16		
	671	XB-14		
Test 251	22	1XB		Voltage read
	125	X-B2		
	400, 103 or 260	2XB12		
	550	B16A		
	671	BATT3		
Test 251	22	Batt Mon		Voltage read
	103	Batt Mon		
	125	Batt Mon		
	260	Batt Mon		
	400	Batt Mon		
	550	Batt Mon		
	671	Batt Mon		
Test 253		Flash Rate	One train move	Flashes per minute
Test 253		Lamps – EB1	One train move	Current read
Test 253		Lamps – EN1	One train move	Current read
Test 253		Lamps – EB2	One train move	Current read
Test 253		Lamps – EN2	One train move	Current read
Test 253		Lamps – EB3	One train move	Current read
Test 253		Lamps – EN3	One train move	Current read
Test 253		Lamps – EB4	One train move	Current read
Test 253		Lamps – EN4	One train move	Current read
Test 255		Gates	One train move	None
Test 257		Warning System	Continuous	None
Test 259		Warning Time	One train move	Warning time in seconds
Test 261		Traffic Preemption	One train move	None
Test 253c		Lamp Inspection	User entry	Adjusted/Repaired
Test 257		Bell Ringing	User entry	Adjusted/Repaired
Test 257		Bell	One train move	None

10.0 **TEST MODES**

Three different test modes may be selected. These settings can be accessed by pressing the User Test button on the SEAR IIi interface (displayed on 4000 GCP Display Module), or through the 'Tests' option under the main menu of the terminal interface.

10.1 **USER TEST MODE**

When selected, this mode will cause all application messages numbered 1-240 to be ignored and not processed. These alarms will not be generated in the event buffer nor will they be sent to the Office. A **User Test Mode Enabled** and **User Test Mode Disabled** message will be sent to the Office when the mode is entered or exited, respectively. The maintainer will have the option of selecting 1, 4, 8 and 12 hour test modes. The local display will show **SKIP ALARMS: XXX MIN. User test mode will be enabled when a DTMF activation is requested. User test mode cannot be enabled locally when auto tests are ready to run. Additionally, DTMF activation is not allowed when auto tests are flagged as Ready To Run.**

10.2 **ACTIVATE INSPECTIONS**

When selected, this mode will cause the Automatic Inspections to be flagged as Ready To Run. A message is recorded to the event buffer indicating this status. It is also sent to the Office. In the event of a SEAR IIi reset while all Automatic Inspections are in Ready To Run mode, the tests will return to that state when the SEAR IIi comes back online. If the SEAR IIi resets while automatic inspections are being run, the SEAR IIi will save any existing results and restart the auto tests in 65 minutes. If all auto inspections have run and only manual tests remain, the unit will return to that state in the event of a SEAR IIi reset.

10.3 **MANUAL TESTS**

When selected, the user may enter results for manual tests. If an automated test fails, it will appear in this list. If Auto Inspections = NO then all tests may be entered manually. Corresponding test LED's will flash green when user has entered a pass value for a test. On the first of the month, test LED's will return to solid yellow indicating the next set of manual tests is ready to run.

11.0 **TROUBLE LIGHT CONTROL**

If POK1 or POK2 is off, the trouble light will be OFF. If POK1 and POK2 are on, the trouble light will be ON.

12.0 **INSTALLATION NOTES**

12.1 **BATTERY/LAMP CALIBRATIONS**

Upon initial site setup, the user will be prompted to calibrate batteries and lamps. Any time that a battery or lamp is changed out, calibrations should be repeated. These portions of site setup can be performed individually onboard the SEAR IIi unit. They are located under MENU>SITE SETUP>LAMP CALIBRATIONS and MENU>SITE SETUP>BATTERY CALIBRATIONS. The user can then follow the prompts to re-calibrate. When calibrating lamps, all gates must be down in order to activate the gate tip sensors.

13.0 **CELL MODEM NON-CRITICAL FEATURE**

When a cell modem is selected as the office communication device, the cell modem non-critical feature may be used to reduce the minutes used on the device. Alarms/messages will be sent in when the health check occurs, when the comm queue is full (50 messages/alarms), any time a connection is initiated from WAMS or when one of the following alarms occurs:

CROSSING CONTROLLER FAILURE
WARNING TIME TK1-6 (if less than 20 seconds)
CROSSING ACTIVE FOR XX MINUTES
AC POWER OFF FOR 20 MINUTES
LOW BATTERY

To enable this feature, answer “YES” to “Use non-critical feature?” during site setup.

14.0 **STANDARD DTMF ACTIVATION**

When VHF communicators are utilized, the user may enable DTMF activation during site setup. The “activation code” and “activation timeout (seconds)” questions asked during site setup are related to DTMF activation. “Activation code” is a three digit code, usually, the last 3 digits of the DOT#, which will be used for activation. “Activation timeout (seconds)” is the time that the crossing will be allowed to stay active. The user’s radio must match the frequency that the VHF communicator is set to. To activate the crossing, you must enter the activation code, then #. To de-activate, enter the activation code, then *. To activate the lights only, enter the activation code, then 1, then #. To de-activate a lights only activation, enter the activation code, then 1, then *. Timers set in the GCP4K programming can add some delay to the activation/de-activation times.

NOTES

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