SIEMENS

CONFIGURATION SUMMARY

SEAR III APPLICATION 9V958-A01B PREPARED FOR BURLINGTON NORTHERN SANTE FE

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DOCUMENT HISTORY

Version	Release Date	Sections Changed	Details of Change
A	March 2008		Initial release of 9V958–A01A.
B	December 2008	Front matter 2.0 3.0 7.0 8.1	• Added Translations disclaimer • User Menu Items – Site Setup, Expanded table • Module Configuration, Added Nodes 13 & 14 to LAN Node Assignments in table. • Indicator LED Configuration, Modified LED I11 table parameters • Application Alarms, Modified table Descriptions for LEDs I07, I08 & I09
B.1	June 2014	all	Rebrand 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 9V958-A01B user program stored in flash memory. This document:

- Explains LED indications

- Lists setup steps unique to 9V958-A01B

- Lists all messages generated by 9V958-A01B

- Lists connector / wire tag assignments

For further information on SEAR IIi, including configuration of executive software, refer to the GRADE CROSSING PREDICTOR MODEL 4000 Reference Manual (Siemens document no. SIG-00-02-02).

2.0 USER MENU ITEMS – SITE SETUP

The following table lists configuration settings that are unique to 9V958-A01B. Each row presents an entry in the site setup sequence. The first column shows the text that appears on the SEAR IIi screen or in the terminal display. 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: the 'CALCULATE WARNING TIME FOR ISLAND 2' entry will appear only if the entry for 'NUMBER OF ISL INPUTS' is greater than one.

QUESTION	MINIMUM / SELECTION 1	MAXIMUM / SELECTION 2	SELECTION 3	CONDITION FOR MENU TO BE DISPLAYED
LAMP / GATE OPERATION	NORMAL	EXIT GATE		
CALCULATE ACTIVATION TIME FOR ISLAND 1	YES	NO		
CALCULATE ACTIVATION TIME FOR ISLAND 2	YES	NO		ISLANDS>1
CALCULATE ACTIVATION TIME FOR ISLAND 3	YES	NO		ISLANDS>2
CALCULATE ACTIVATION TIME FOR ISLAND 4	YES	NO		ISLANDS>3
CALCULATE ACTIVATION TIME FOR ISLAND 5	YES	NO		ISLANDS>4
CALCULATE ACTIVATION TIME FOR ISLAND 6	YES	NO		ISLANDS>5
ENT GATE ON GP1.1/GD1.1	NO	YES		
ENT GATE ON GP1.2/GD1.2	NO	YES		

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QUESTION	MINIMUM / SELECTION 1	MAXIMUM / SELECTION 2	SELECTION 3	CONDITION FOR MENU TO BE DISPLAYED
ENT GATE ON GP2.1/GD2.1	NO	YES		
ENT GATE ON GP2.2/GD2.2	NO	YES		
ENT GATE ON ESSCC1 INPUTS 1&3	NO	YES		
ENT GATE ON ESSCC1 INPUTS 2&4	NO	YES		
ENT GATE ON ESSCC2 INPUTS 1&3	NO	YES		
ENT GATE ON ESSCC2 INPUTS 2&4	NO	YES		
ENT GATE ON ESSCC3 INPUTS 1&3	NO	YES		
ENT GATE ON ESSCC3 INPUTS 2&4	NO	YES		
ENT GATE ON ESSCC4 INPUTS 1&3	NO	YES		
ENT GATE ON ESSCC4 INPUTS 2&4	NO	YES		
ENT GATE ON TSS1	NO	YES		
ENT GATE ON TSS2	NO	YES		
ENT GATE ON TSS3	NO	YES		
ENT GATE ON TSS4	NO	YES		
EXIT GATE ON GP1.1/GD1.1	NO	YES		ENT GATE ON GP1.1/GD1.1 = "NO"
EXIT GATE ON GP1.2/GD1.2	NO	YES		ENT GATE ON GP1.2/GD1.2 = "NO"
EXIT GATE ON GP2.1/GD2.1	NO	YES		ENT GATE ON GP2.1/GD2.1 = "NO"
EXIT GATE ON GP2.2/GD2.2	NO	YES		ENT GATE ON GP2.2/GD2.2 = "NO"
EXIT GATE ON ESSCC1 INPUTS 1&3	NO	YES		ENT GATE ON ESSCC1 INPUTS 1&3 = "NO"
EXIT GATE ON ESSCC1 INPUTS 2&4	NO	YES		ENT GATE ON ESSCC1 INPUTS 2&4 = "NO"

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QUESTION	MINIMUM / SELECTION 1	MAXIMUM / SELECTION 2	SELECTION 3	CONDITION FOR MENU TO BE DISPLAYED
EXIT GATE ON ESSCC2 INPUTS 1&3	NO	YES		ENT GATE ON ESSCC2 INPUTS 1&3 = "NO"
EXIT GATE ON ESSCC2 INPUTS 2&4	NO	YES		ENT GATE ON ESSCC2 INPUTS 2&4 = "NO"
EXIT GATE ON ESSCC3 INPUTS 1&3	NO	YES		ENT GATE ON ESSCC3 INPUTS 1&3 = "NO"
EXIT GATE ON ESSCC3 INPUTS 2&4	NO	YES		ENT GATE ON ESSCC3 INPUTS 2&4 = "NO"
EXIT GATE ON ESSCC4 INPUTS 1&3	NO	YES		ENT GATE ON ESSCC4 INPUTS 1&3 = "NO"
EXIT GATE ON ESSCC4 INPUTS 2&4	NO	YES		ENT GATE ON ESSCC4 INPUTS 2&4 = "NO"
EXIT GATE ON TSS1	NO	YES		ENT GATE ON TSS1 = "NO"
EXIT GATE ON TSS2	NO	YES		ENT GATE ON TSS2 = "NO"
EXIT GATE ON TSS3	NO	YES		ENT GATE ON TSS3 = "NO"
EXIT GATE ON TSS4	NO	YES		ENT GATE ON TSS4 = "NO"
VEHICLE DETECTION	YES	NO		
ILOD'S	0	8		
EXTERNAL SSCC IIIa, IIIplus, IV	0	4		
BATTERY BANKS	1	3		
BATT MON USED	NO	YES		
LOW BATTERY PERCENTAGE	1	99		
HIGH BATTERY PERCENTAGE	101	199		
PREEMPTION	NO	YES		
RTU	NO	YES		
AUXILARY DIGITAL I/O	NO	YES		
AUXILARY ANALOG I/O	NO	YES		

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3.0 MODULE CONFIGURATION

External modules can communicate with the SEAR IIi via the echelon network. The table below shows the node numbers that are automatically assigned for each module when present:

EXTERNAL DEVICE PART NUMBER	DEVICE DESIGNATION	LAN NODE ASSIGNMENT(S)
80258 Module	24 input module	Node 1
80258 Module	4 analog input module	Node 2
80271 Module	iLOD 1–8	Nodes 3–10
91210 Module	SSCC III plus / SSCC IV	Node 11
91210 Module	SSCC III plus / SSCC IV	Node 12
91210 Module	SSCC III plus / SSCC IV	Node 13
91210 Module	SSCC III plus / SSCC IV	Node 14
	GCP4000	Node 16

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4.0 **DIGITAL INPUT STANDARD CONFIGURATION**

The following tables define the digital inputs for 9V958-A01B. 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

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WIRE TAG	NORMAL	ENERGIZED	DE-ENERGIZED	CONDITION
General 3	OFF	ON	OFF	Configured on GCP 4000
General 4	OFF	ON	OFF	Configured on GCP 4000
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

PHYSICAL INPUT ASSIGNMENTS

TAG	SEAR IIi		4000 GCP FRONT PANEL																										
	DIO1	DIO2	SP2.1	SP3.1	SP4.1	SP5.1	SP6.1	SSCC7.1	SSCC7.2	SSCC7.3	SSCC7.4	SSCC7.5	SSCC8.1	SSCC8.2	SSCC8.3	SSCC8.4	SSCC8.5	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	P	X	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												
TSS 4	X	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	X												
TSS 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												

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TAG	SEAR IIi DIO1	DIO2	SP2.1	SP3.1	SP4.1	SP5.1	SP6.1	SCC7.1	SCC7.2	SCC7.3	SCC7.4	SCC7.5	SCC8.1	SCC8.2	SCC8.3	SCC8.4	SCC8.5	IN1.1	IN1.2	IN2.1	IN2.2	IN3.1	IN3.2	IN4.1	IN4.2	IN5.1	IN5.2	IN6.1	IN6.2
TSS 7	X	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	X												
GFT 1	X	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	X												
GFT 3	X	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	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	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	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	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	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	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	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	X

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

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5.0 BATTERY INPUT CONFIGURATION

The following table shows the 9V958-A01B default names, node assignments, and resolutions for the possible battery inputs to the SEAR IIi.

NAME	NODE-INPUT	RESOLUTION
MB	Not assigned	1 VDC
1MB	Not assigned	1 VDC
2MB	Not assigned	1 VDC
3MB	Not assigned	1 VDC
4MB	Not assigned	1 VDC
XB	Not assigned	1 VDC
1XB	Not assigned	1 VDC
2XB	Not assigned	1 VDC
3XB	Not assigned	1 VDC
4XB	Not assigned	1 VDC
B	Not assigned	1 VDC
B12	Not assigned	1 VDC

6.0 RTU OUTPUT CONFIGURATION

The following table shows the 9V958-A01B default names for RTU outputs on the AUX port of the SEAR IIi.

NAME	AUX-OUTPUT
RTU1	AUX-01
RTU2	AUX-02
RTU3	AUX-03
RTU4	AUX-04

7.0 INDICATOR LED CONFIGURATION

This table and the following material on LED conventions define operation of the red Indicator LEDs for 9V958-A01B.

LED	ALARM NUMBERS	DESIGNATOR	CHECKED
I01	N/A	NOT USED	N/A
I02	2	XING ACTIVE TOO LONG	ALWAYS
I03	3	CONTROLLER TLIGHT	ALWAYS
I04	4	VEHICLE LOOP HEALTH	TRAIN MOVE
I05	5	GATE BREAK	ALWAYS
I06	6	GATE NOT UP	ALWAYS
I07	7	EXIT GATE NOT UP	ALWAYS
I08	8	GATE NOT DOWN	TRAIN MOVE
I09	9	EXIT GATE NOT DOWN	TRAIN MOVE
I10	10	LAMP OUT	TRAIN MOVE
I11	N/A	NOT USED	N/A
I12	N/A	NOT USED	N/A
I13	13	POWER OFF	ALWAYS
I14	14, 15	LOW OR HIGH BATTERY	ALWAYS
I15	16	PREEMPTION FAIL	TRAIN MOVE
I16	17, 18	ANALYZER FAILURE	ALWAYS

7.1 STANDARD LED CONVENTIONS

1. LEDs are ON (RED) steady when in Normal Mode.
2. LEDs FLASH FAST when an alarm condition exists.
3. LEDs FLASH SLOW if an alarm has occurred since the last time the CLEAR ALARM key was pressed, but has been cleared.
4. The CLEAR ALARM key will clear out alarms if the conditions that caused them no longer exist.
5. Any alarm associated with a train move can be cleared by the CLEAR ALARM key even if there has not been a train move without an alarm since the alarm occurred.

8.0 MESSAGES

8.1 APPLICATION ALARMS

The 9V958-A01B application generates these alarms.

NOTE
NOTE
When these alarms are recorded they will be preceded by double asterisks (**) in the Event Log, for easier search capability.

LED	NAME	DESCRIPTION	RTU ALARM	TESTED	ALARM #
I02	Crossing Active Too Long	AND1 de-energized for 30+ minutes	1	Always	2
I03	Controller Trouble Light	A vital health bad indication is reported by a crossing controller or echelon communication is lost with a crossing controller for more than 20 seconds. **NOTE**: Refer to section 7 – Troubleshooting in the SSCC IV I & I manual (Doc# SIG-00-03-02) for additional information on Maintenance Call problems.	3	Always	3
I04	Vehicle Loop Health	The vehicle loop health input is de-energized for more than 20 seconds.	4	Non-train move	4
I05	Gate Break	Any gate DOWN and tip sensor NOT LEVEL within 10 seconds. Will not generate after gate has been declared horizontal	2	Always	5
I06	Gate Not Up	AND1 energized and any entrance gate does not report UP after > 40 seconds.	2	Non-train move	6
I07	Exit Gate Not Up	Exit gate output is de-energized and corresponding exit gate(s) are NOT UP after > 40 seconds	2	Always	7
I08	Gate Not Down	AND1 de-energized for > 30 seconds and ANY ENTRANCE GATE NOT DOWN	2	Train Move	8
I09	Exit Gate Not Down	Exit gate output energized for > 20 seconds and corresponding exit gate(s) NOT DOWN	2	Always	9

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LED	NAME	DESCRIPTION	RTU ALARM	TESTED	ALARM #
I10	Lamp Out	Any iLOD reports that the lamps are OFF for 1 minute during a train move and remain OFF thru the end of the move.	3	Train Move	10
I13	Power Off	POK1 is OFF for 30 minutes	N/A	Always	13
I14	Low Battery	Any battery voltage drops below the user defined percentage of calibrated capacity for 30 seconds	3	Always	14
I14	High Battery	Any battery voltage rises above the user defined percentage of calibrated capacity for 30 seconds	3	Always	15
I15	Preemption Alarm	If no preemption activation within 30 seconds prior to, or 5 seconds after the AND1 de-energizes, the preemption alarm will be recorded.	N/A	Train Move	16
I16	Echelon Health	Any comm. lost for any node for 30 seconds	3	Always	17
I17	MTSS Comm Bad	Communication is lost with any MTSS unit for 30 seconds	3	Always	18

8.2 APPLICATION MESSAGES

The 9V958-A01B application generates these status messages.

NOTE	**NOTE** When these messages are recorded they will be preceded by an asterisk (*) in the Event Log, for easier search capability.

NAME	SET WHEN
TRAIN ON APPROACH	AND1 de-energizes
PREEMPTION ACTIVATED	Preemption Health Input de-energizes
LAMPS ON	Set by iLOD immediately upon seeing current.
LAMPS FLASHING NORMAL: xx FPM	Lamps flashing greater than 35 FPM and less than 65 FPM
ACTIVATION TIME: xx SECONDS	Time from AND1 de-energized to any island being down
GATES IN TRANSITION	Entrance gates NOT UP or NOT DOWN
GATES HORIZONTAL	ALL ENTRANCE GATES=DOWN
EXIT GATES HORIZONTAL	ALL EXIT GATES=DOWN
ISLAND OCCUPIED	Any island is occupied
TRAIN LEAVING	All islands are unoccupied after islands have been occupied for at least 5 seconds
EXIT GATES VERTICAL	ALL EXIT GATES=UP
GATES VERTICAL	ALL GATES=UP
LAMPS OFF	Set by iLOD when all lamps turn off
PREEMPTION TIME = xx SECONDS	Time from Preemption Health Input=Deenergized to AND1=Deenergized, If less then 1 second = 0
EXIT GATES IN TRANSITION	Exit gates NOT UP and NOT DOWN

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NOTES

SIEMENS

Siemens Industry, Inc., Rail Automation
2400 Nelson Miller Parkway
Louisville, Kentucky 40223
(502) 618-8800

Siemens Industry, Inc., Rail Automation
California R&D Division
9568 Archibald Ave., Suite 100
Rancho Cucamonga, California 91730
(909) 532-5300