



## **CONFIGURATION SUMMARY**

# **SEAR II APPLICATION 9V871-A01F PREPARED FOR BURLINGTON NORTHERN SANTE FE**

MARCH 2008, REVISED JUNE 2014

DOCUMENT NO. SIG-00-05-11-001  
VERSION F.1

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## DOCUMENT HISTORY

| Version | Release Date | Details of Change   |
|---------|--------------|---|
| A       | 4-25-05      | Initial release of 9V871-A01A.  |
| B       | 7-19-07      | <p>Bumped version per software update. Updated logo and added change notice. Also added following notes at end of section 3:</p> <p>Note: MTSS inputs cannot be changed and are automatically assigned by the application program. Non-MTSS inputs can be assigned to any remaining input.</p> <p>Note: Inputs used for alarm logic must be assigned using the pre-defined input list. These pre-defined inputs automatically assign the correct name/state names to the input which will be used in alarm logic. Inputs should only be named manually if they are used for recording purposes and not for alarming.</p> <p>Note: If there is not sufficient space for inputs onboard the SEAR II, some inputs may be monitored from the SSCC instead. In that case, those inputs must be wired to the assigned SSCC inputs shown in the table above.</p>   |
| C       | 8-22-07      | <p>Not released.</p> <ul style="list-style-type: none"> <li>• \Bumped document revision number from B to C (reflects software change).</li> <li>• Section 7.1 Application Alarms: <ul style="list-style-type: none"> <li>○ Added note indicating when alarms are recorded they will be preceded by double asterisks in the Event Log for easier search capability.</li> <li>○ Changed description of Gate Break alarm.</li> <li>○ Changed Preemption fail to Preemption Alarm.</li> <li>○ Changed Alarm #'s 5, 6 &amp; 7 now mapped to RTU Alarm #2.</li> <li>○ Changed Alarm #'s 3, 10, 11, 12, 14, 15, &amp; 17 now mapped to RTU Alarm #3.</li> </ul> </li> <li>• Section 7.2 Application Messages: <ul style="list-style-type: none"> <li>○ Added note indicating when messages are recorded they will be preceded by an asterisk in the Event Log for easier search capability.</li> </ul> </li> </ul> |
| D       | 8-22-07      | <p>Not released.</p> <ul style="list-style-type: none"> <li>• Bumped document revision number from C to D (reflects software change).</li> <li>• Incorporated changes from version C (as above).</li> <li>• Section 7.1 Application Alarms: <ul style="list-style-type: none"> <li>○ Changed descriptions for Preemption Alarm, Lamp Out, Flash Rate Too Slow, Flash Rate Too Fast and Gate Break.</li> </ul> </li> </ul>   |
| E       | Oct 2007     | <ul style="list-style-type: none"> <li>• Bumped document version number from D to E (reflects software change).</li> </ul>  |

|     |            |  |
|-----|------------|--|
|     |            | <ul style="list-style-type: none"> <li>• Incorporated changes from versions C &amp; D (as above).</li> <li>• Section 6.0 Indicator LED Configuration:             <ul style="list-style-type: none"> <li>○ Removed Short Warning Time (I01).</li> </ul> </li> <li>• Section 7.1 Application Alarms:             <ul style="list-style-type: none"> <li>○ Removed Short Warning Time alarm.</li> <li>○ Modified descriptions for Flash Rate Too Slow, Flash Rate Too Fast and Preemption Alarm.</li> </ul> </li> </ul>  |
| F   | March 2008 | <ul style="list-style-type: none"> <li>• Bumped document version from E to F (reflects software changes).</li> <li>• Section 2.0 - User Menu Items – Site Setup Table:             <ul style="list-style-type: none"> <li>○ Page 2: Changed Calculate WARNING Time to Calculate ACTIVATION Time for Island 1, 2, 3, 4, 5 and 6.</li> <li>○ Page 5: Added LOW BATTERY PERCENTAGE and HIGH BATTERY PERCENTAGE questions and parameters.</li> </ul> </li> <li>• Section 6.0 - Indicator LED Configuration Table:             <ul style="list-style-type: none"> <li>○ Added LED I01 for clarity – NOT USED.</li> <li>○ LED I02 changed Designator description to XING ACTIVE TOO LONG.</li> <li>○ LED I03 changed Designator description to CONTROLLER TLITE.</li> <li>○ LED I16 - Added alarm number 18 and changed Designator description to ANALYZER FAILURE.</li> </ul> </li> <li>• Section 7.1 - Application Alarms Table:             <ul style="list-style-type: none"> <li>○ LED I03 Description – added note to refer to Section 7 – Troubleshooting in the SSCC IV I &amp; I manual for additional information on Maintenance Call problems.</li> <li>○ LED I04 Description – deleted “after XRK drops”.</li> <li>○ Updated Descriptions for LEDs I10, I11, and I14.</li> <li>○ Added second LED I16 and parameters for Alarm # 18.</li> </ul> </li> <li>• Section 7.2 - Application Messages Table:             <ul style="list-style-type: none"> <li>○ Changed WARNING Time: xx Seconds to ACTIVATION Time: xx Seconds.</li> </ul> </li> </ul> |
| F.1 | June 2014  | 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 II units configured with the 9V871-A01F user program stored in flash memory. This document:

- Explains LED indications
- Lists setup steps unique to 9V871-A01F
- Lists all messages generated by 9V871-A01F
- Lists connector / wire tag assignments

For further information on SEAR II, including configuration of executive software, refer to the SAFETRAN EVENT ANALYZER RECORDER II (SEAR II) – Installation & Operation manual (Siemens document no. SIG-00-02-07).

## 2.0 USER MENU ITEMS – SITE SETUP

The following table lists configuration settings that are unique to 9V871-A01F. Each row presents an entry in the site setup sequence. The first column shows the text that appears on the SEAR II 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             | SPLIT GATE  |                                    |
| NUMBER OF TRACKS?                      | 1                     | 8                     |             |                                    |
| NUMBER OF MD INPUTS?                   | 0                     | 6                     |             |                                    |
| NUMBER OF ISL INPUTS                   | 1                     | 8                     |             |                                    |
| 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                          |
| GATE 1 INPUT                           | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION <> EXIT GATE   |
| GATE 2 INPUT                           | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION <> EXIT GATE   |
| GATE 3 INPUT                           | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION <> EXIT GATE   |
| GATE 4 INPUT                           | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION <> EXIT GATE   |
| GATE 5 INPUT                           | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION <> EXIT GATE   |

| QUESTION             | MINIMUM / SELECTION 1 | MAXIMUM / SELECTION 2 | SELECTION 3 | CONDITION FOR MENU TO BE DISPLAYED |
|----------------------|-----------------------|-----------------------|-------------|------------------------------------|
| GATE 6 INPUT         | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION <> EXIT GATE   |
| GATE 1 CONTROLLED BY | XRK                   | 1XRK                  | 2XRK        | GATE 1 INPUT <> NO                 |
| GATE 2 CONTROLLED BY | XRK                   | 1XRK                  | 2XRK        | GATE 2 INPUT <> NO                 |
| GATE 3 CONTROLLED BY | XRK                   | 1XRK                  | 2XRK        | GATE 3 INPUT <> NO                 |
| GATE 4 CONTROLLED BY | XRK                   | 1XRK                  | 2XRK        | GATE 4 INPUT <> NO                 |
| GATE 5 CONTROLLED BY | XRK                   | 1XRK                  | 2XRK        | GATE 5 INPUT <> NO                 |
| GATE 6 CONTROLLED BY | XRK                   | 1XRK                  | 2XRK        | GATE 6 INPUT <> NO                 |
| GATE 1A INPUT        | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION =EXIT GATE     |
| GATE 2A INPUT        | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION =EXIT GATE     |
| GATE 1B INPUT        | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| GATE 2B INPUT        | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| GATE 1C INPUT        | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| GATE 2C INPUT        | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| EXIT GATE 3A INPUT   | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| EXIT GATE 4A INPUT   | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| EXIT GATE 3B INPUT   | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |

| QUESTION                    | MINIMUM / SELECTION 1 | MAXIMUM / SELECTION 2 | SELECTION 3 | CONDITION FOR MENU TO BE DISPLAYED |
|-----------------------------|-----------------------|-----------------------|-------------|------------------------------------|
| EXIT GATE 4B INPUT          | NO                    | YES                   | MTSS        | LAMP/GATE OPERATION = EXIT GATE    |
| GATE 1 BELL SENSOR          | YES                   | NO                    |             | GATE 1 INPUT = MTSS                |
| GATE 2 BELL SENSOR          | YES                   | NO                    |             | GATE 2 INPUT = MTSS                |
| GATE 3 BELL SENSOR          | YES                   | NO                    |             | GATE 3 INPUT = MTSS                |
| GATE 4 BELL SENSOR          | YES                   | NO                    |             | GATE 4 INPUT = MTSS                |
| GATE 5 BELL SENSOR          | YES                   | NO                    |             | GATE 5 INPUT = MTSS                |
| GATE 6 BELL SENSOR          | YES                   | NO                    |             | GATE 6 INPUT = MTSS                |
| GATE 1A BELL SENSOR         | YES                   | NO                    |             | GATE 1A INPUT = MTSS               |
| GATE 2A BELL SENSOR         | YES                   | NO                    |             | GATE 2A INPUT = MTSS               |
| GATE 1B BELL SENSOR         | YES                   | NO                    |             | GATE 1B INPUT = MTSS               |
| GATE 2B BELL SENSOR         | YES                   | NO                    |             | GATE 2B INPUT = MTSS               |
| GATE 1C BELL SENSOR         | YES                   | NO                    |             | GATE 1C INPUT = MTSS               |
| GATE 2C BELL SENSOR         | YES                   | NO                    |             | GATE 2C INPUT = MTSS               |
| EXIT GATE 3A BELL SENSOR    | YES                   | NO                    |             | EXIT GATE 3A INPUT = MTSS          |
| EXIT GATE 4A BELL SENSOR    | YES                   | NO                    |             | EXIT GATE 4A INPUT = MTSS          |
| EXIT GATE 3B BELL SENSOR    | YES                   | NO                    |             | EXIT GATE 3B INPUT = MTSS          |
| EXIT GATE 4B BELL SENSOR    | YES                   | NO                    |             | EXIT GATE 4B INPUT = MTSS          |
| VEHICLE DETECTION           | YES                   | NO                    |             | LAMP/GATE OPERATION = EXIT GATE    |
| ILOD'S                      | 0                     | 8                     |             |                                    |
| DO ILOD'S HAVE WIRE WRAPS?  | NO                    | YES                   |             | ILOD'S>0                           |
| DOES ILOD1 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |

| QUESTION                    | MINIMUM / SELECTION 1 | MAXIMUM / SELECTION 2 | SELECTION 3 | CONDITION FOR MENU TO BE DISPLAYED |
|-----------------------------|-----------------------|-----------------------|-------------|------------------------------------|
| DOES ILOD2 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| DOES ILOD3 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| DOES ILOD4 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| DOES ILOD5 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| DOES ILOD6 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| DOES ILOD7 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| DOES ILOD8 HAVE WIRE WRAPS? | NO                    | YES                   |             | WIRE WRAPS="YES"                   |
| ILOD 1 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 0                          |
| ILOD 2 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 1                          |
| ILOD 3 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 2                          |
| ILOD 4 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 3                          |
| ILOD 5 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 4                          |
| ILOD 6 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 5                          |
| ILOD 7 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 6                          |
| ILOD 8 OPERATES WITH        | XRK                   | 1XRK                  | 2XRK        | ILODs > 7                          |
| SSCC IIIa, IIIplus, IV      | 0                     | 4                     |             |                                    |
| BATTERY BANKS               | 1                     | 8                     |             |                                    |
| LOW BATTERY PERCENTAGE      | 1                     | 99                    |             |                                    |
| HIGH BATTERY PERCENTAGE     | 101                   | 199                   |             |                                    |
| PREEMPTION                  | NO                    | YES                   |             |                                    |
| OUTPUTS CONNECTED TO RTU    | NO                    | YES                   |             |                                    |
| AUXILARY DIGITAL I/O        | NO                    | YES                   |             |                                    |
| AUXILARY ANALOG I/O         | NO                    | YES                   |             |                                    |

### 3.0 DIGITAL INPUT CONFIGURATION

The SEAR II provides 18 digital inputs. Additional digital I/O can be added using external expansion modules or other Echelon-capable devices as nodes on a common LAN . These devices and the assigned nodes are as follows:

| EXTERNAL DEVICE PART NUMBER | DEVICE DESIGNATION               | LAN NODE ASSIGNMENT(S) |
|-----------------------------|----------------------------------|------------------------|
| 80271 Module                | iLOD 1-8                         | Nodes 3-10             |
| 91210 Module                | SSCC III plus / SSCC IV Entrance | Node 11                |
| 91210 Module                | SSCC IV Exit                     | Node 12                |
| 91210 Module                | SSCC IV Auxiliary Entrance       | Node 13                |
| 91210 Module                | SSCC IV Auxiliary Exit           | Node 14                |
| 80258 Module                | 24 input module                  | Node 15                |
| 80258 Module                | 4 analog input module            | Node 16                |

The left column of the following table shows the suggested input assignments. The second column from the left indicates the normal state for each input followed by the input logic states in the third and fourth columns. The recommended SEAR II inputs are listed in the fifth column followed by specific Solid-State Crossing Controller (SSCC) inputs in the sixth column. The column on the far right shows the conditions that must exist for that input to be used.

**NOTE**
**NOTE**

Inputs from the SSCC on Exit Gate Applications can NOT be changed.

**NOTE**
**NOTE**

XRK is normally de-energized when using an SSCC and energized for all other controllers or relays.

| NAME  | NORM | '1' | '0'  | INPUT | SSCC INPUT | MENU CONDITION |
|-------|------|-----|------|-------|------------|----------------|
| 1ISLK | UP   | UP  | DOWN | N/A   | 2          | ISLANDS>0      |
| 2ISLK | UP   | UP  | DOWN | N/A   | 3          | ISLANDS>1      |
| 3ISLK | UP   | UP  | DOWN | N/A   | 4          | ISLANDS>2      |
| 4ISLK | UP   | UP  | DOWN | N/A   | N/A        | ISLANDS>3      |
| 5ISLK | UP   | UP  | DOWN | N/A   | N/A        | ISLANDS>4      |
| 6ISLK | UP   | UP  | DOWN | N/A   | N/A        | ISLANDS>5      |
| 7ISLK | UP   | UP  | DOWN | N/A   | N/A        | ISLANDS>6      |
| 8ISLK | UP   | UP  | DOWN | N/A   | N/A        | ISLANDS>7      |
| 1MDK  | UP   | UP  | DOWN | N/A   | 1          | MDCOUNT>0      |
| 2MDK  | UP   | UP  | DOWN | N/A   | N/A        | MDCOUNT>1      |
| 3MDK  | UP   | UP  | DOWN | N/A   | N/A        | MDCOUNT>2      |
| 4MDK  | UP   | UP  | DOWN | N/A   | N/A        | MDCOUNT>3      |

| NAME  | NORM        | '1'  | '0'         | INPUT | SSCC INPUT | MENU CONDITION |
|-------|-------------|------|-------------|-------|------------|----------------|
| 5MDK  | UP          | UP   | DOWN        | N/A   | N/A        | MDCOUNT>4      |
| 5MDK  | UP          | UP   | DOWN        | N/A   | N/A        | MDCOUNT>5      |
| XRK   | UP          | UP   | DOWN        | N/A   | N/A        | CONROLLERS=0   |
| XRK   | UP          | DOWN | UP          | N/A   | N/A        | CONTROLLERS>0  |
| 1XRK  | UP          | UP   | DOWN        | N/A   | N/A        | CONROLLERS=0   |
| 1XRK  | UP          | DOWN | UP          | N/A   | N/A        | CONTROLLERS>0  |
| 2XRK  | UP          | UP   | DOWN        | N/A   | N/A        | CONROLLERS=0   |
| 2XRK  | UP          | DOWN | UP          | N/A   | N/A        | CONTROLLERS>0  |
| 1GUK  | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 1=YES     |
| 1GDK  | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE1=YES      |
| 2GUK  | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 2=YES     |
| 2GDK  | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE2=YES      |
| 3GUK  | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 3=YES     |
| 3GDK  | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE3=YES      |
| 4GUK  | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 4=YES     |
| 4GDK  | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE4=YES      |
| 5GUK  | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 5=YES     |
| 5GDK  | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE5=YES      |
| 6GUK  | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 6=YES     |
| 6GDK  | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE6=YES      |
| 1AGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 1A=YES    |
| 1AGDK | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE1A=YES     |
| 2AGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 2A=YES    |
| 2AGDK | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE2A=YES     |
| 1BGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 1B=YES    |
| 1BGDK | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE1B=YES     |
| 2BGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 2B=YES    |
| 2BGDK | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE2B=YES     |
| 1CGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 1C=YES    |
| 1CGDK | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE1C=YES     |
| 2CGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 2C=YES    |
| 2CGDK | NOT<br>DOWN | DOWN | NOT<br>DOWN | N/A   | N/A        | GATE2C=YES     |
| 3AGUK | UP          | UP   | NOT UP      | N/A   | N/A        | GATE 3A=YES    |

| NAME           | NORM     | '1'  | '0'      | INPUT | SSCC INPUT | MENU CONDITION |
|----------------|----------|------|----------|-------|------------|----------------|
| 3AGDK          | NOT DOWN | DOWN | NOT DOWN | N/A   | N/A        | GATE3A=YES     |
| 3BGUK          | UP       | UP   | NOT UP   | N/A   | N/A        | GATE 3B=YES    |
| 3BGDK          | NOT DOWN | DOWN | NOT DOWN | N/A   | N/A        | GATE3B=YES     |
| 4AGUK          | UP       | UP   | NOT UP   | N/A   | N/A        | GATE 4A=YES    |
| 4AGDK          | NOT DOWN | DOWN | NOT DOWN | N/A   | N/A        | GATE4A=YES     |
| 4BGUK          | UP       | UP   | NOT UP   | N/A   | N/A        | GATE 4B=YES    |
| 4BGDK          | NOT DOWN | DOWN | NOT DOWN | N/A   | N/A        | GATE4B=YES     |
| GATE 1 (MTSS)  | N/A      | N/A  | N/A      | 2     | N/A        | GATE 1=MTSS    |
| GATE 2 (MTSS)  | N/A      | N/A  | N/A      | 3     | N/A        | GATE 2=MTSS    |
| GATE 3 (MTSS)  | N/A      | N/A  | N/A      | 4     | N/A        | GATE 3=MTSS    |
| GATE 4 (MTSS)  | N/A      | N/A  | N/A      | 5     | N/A        | GATE 4=MTSS    |
| GATE 5 (MTSS)  | N/A      | N/A  | N/A      | 6     | N/A        | GATE 5=MTSS    |
| GATE 6 (MTSS)  | N/A      | N/A  | N/A      | 7     | N/A        | GATE 6=MTSS    |
| GATE 1A (MTSS) | N/A      | N/A  | N/A      | 2     | N/A        | GATE 1A=MTSS   |
| GATE 2A (MTSS) | N/A      | N/A  | N/A      | 3     | N/A        | GATE 2A=MTSS   |
| GATE 1B (MTSS) | N/A      | N/A  | N/A      | 4     | N/A        | GATE 1B=MTSS   |
| GATE 2B (MTSS) | N/A      | N/A  | N/A      | 5     | N/A        | GATE 2B=MTSS   |
| GATE 1C (MTSS) | N/A      | N/A  | N/A      | 16    | N/A        | GATE 1C=MTSS   |
| GATE 2C (MTSS) | N/A      | N/A  | N/A      | 17    | N/A        | GATE 2C=MTSS   |
| GATE 3A (MTSS) | N/A      | N/A  | N/A      | 7     | N/A        | GATE 3A=MTSS   |
| GATE 4A (MTSS) | N/A      | N/A  | N/A      | 10    | N/A        | GATE 4A=MTSS   |
| GATE 3B (MTSS) | N/A      | N/A  | N/A      | 8     | N/A        | GATE 3B=MTSS   |
| GATE 4B (MTSS) | N/A      | N/A  | N/A      | 11    | N/A        | GATE 4B=MTSS   |
| PREEMPT        | UP       | UP   | DOWN     | N/A   | 8          | PREEMPTION=YES |
| 1MAINT         | ON       | ON   | OFF      | N/A   | N/A        | CONTROLLERS>0  |



| NAME    | NORM | '1' | '0'  | INPUT | SSCC INPUT | MENU CONDITION             |
|---------|------|-----|------|-------|------------|----------------------------|
| 2MAINT  | ON   | ON  | OFF  | N/A   | N/A        | CONTROLLERS>1              |
| 3MAINT  | ON   | ON  | OFF  | N/A   | N/A        | CONTROLLERS>2              |
| 4MAINT  | ON   | ON  | OFF  | N/A   | N/A        | CONTROLLERS>3              |
| NVDK    | UP   | UP  | DOWN | N/A   | 5          | VEHICLE<br>DETECTION="YES" |
| SVDK    | UP   | UP  | DOWN | N/A   | 6          | VEHICLE<br>DETECTION="YES" |
| VDHK    | UP   | UP  | DOWN | N/A   | 7          | VEHICLE<br>DETECTION="YES" |
| POK     | ON   | ON  | OFF  | N/A   | N/A        | N/A                        |
| BELLOUT | OFF  | ON  | OFF  | N/A   | N/A        | N/A                        |
| 3XGRK   | DOWN | UP  | DOWN | N/A   | N/A        | GATE 3A OR 3B <> NO        |
| 4XGRK   | DOWN | UP  | DOWN | N/A   | N/A        | GATE 4A OR 4B <> NO        |

**NOTE****NOTE**

MTSS inputs cannot be changed and are automatically assigned by the application program. Non-MTSS inputs can be assigned to any remaining input.

**NOTE****NOTE**

Inputs used for alarm logic must be assigned using the pre-defined input list. These pre-defined inputs automatically assign the correct name/state names to the input which will be used in alarm logic. Inputs should only be named manually if they are used for recording purposes and not for alarming.

**NOTE****NOTE**

If there is not sufficient space for inputs onboard the SEAR II, some inputs may be monitored from the SSCC instead. In that case, those inputs must be wired to the assigned SSCC inputs shown in the table above.

#### 4.0 BATTERY INPUT CONFIGURATION

The following table shows the 9V871-A01F default names, node assignments, and resolutions for the possible battery inputs to the SEAR II.

| 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      |

#### 5.0 A80258 OUTPUT CONFIGURATION

The following table shows the 9V871-A01F default names and node assignments for the four digital outputs when using the A80258 Analog and Digital I/O Unit.

| NAME | NODE-OUTPUT |
|------|-------------|
| RTU1 | 15-01       |
| RTU2 | 15-02       |
| RTU3 | 15-03       |
| RTU4 | 15-04       |

## 6.0 INDICATOR LED CONFIGURATION

This table and the following material on LED conventions define operation of the red Indicator LEDs for 9V871-A01F.

| LED | ALARM NUMBERS | DESIGNATOR           | CHECKED    |
|-----|---------------|----------------------|------------|
| I01 | N/A           | NOT USED             | -----      |
| I02 | 2             | XING ACTIVE TOO LONG | ALWAYS     |
| I03 | 3             | CONTROLLER TLITE     | 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 | 11, 12        | FLASH RATE ALARM     | TRAIN MOVE |
| I12 | N/A           | NOT USED             | -----      |
| 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     |

## 6.1 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.
6. Preemption fail will activate if a PREEMPT input is defined and it does not activate within 1 second after XRK drops.

## 7.0 MESSAGES

The tables in the following subsections list all of the messages generated by the 9V871-A01F application. Messages generated by the SEAR II executive are not presented here.

Messages fall into categories defined by message numbers:

|            |                                  |
|------------|----------------------------------|
| 0          | Internal SEAR II Messages        |
| 1-100      | Application Alarms               |
| 101-200    | Application Alarm Clears         |
| 231-240    | Application Information Messages |
| 1000-1099  | Office Software Alarms           |
| 1100 –1199 | Office Software Alarm Clears     |

## 7.1 APPLICATION ALARMS

The 9V871-A01F application generates these alarms. **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 | XRK down for 30+ minutes   | 1         | Always         | 2       |
| I03 | Controller Trouble Light | 1MAINT, 2MAINT, 3MAINT or 4MAINT OFF for 20+ seconds. <b>NOTE:</b> 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      | VDHK off for 8+ 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              | XRK up and GUK, 1GUK or 2GUK NOT UP 40+ seconds  | 2         | Non-train move | 6       |
| I07 | Exit Gate Not Up         | 3XGRK OFF and EXIT GATES 3A or 3B NOT UP 40+ seconds or 4XGRK OFF and EXIT GATES 4A or 4B NOT UP 40+ seconds   | 2         | Always         | 7       |
| I08 | Gate Not Down            | XRK down for 20+ seconds and IslandOccupied and ANY GATE NOT DOWN  | 2         | Train Move     | 8       |

| LED | NAME                | DESCRIPTION  | RTU ALARM | TESTED     | ALARM # |
|-----|---------------------|--|-----------|------------|---------|
| I09 | Exit Gate Not Down  | 3XGRK ON 20+ seconds and EXIT GATES 3A OR 3B not down or 4XGRK ON 20+ seconds and EXIT GATES 4A or 4B NOT DOWN   | 2         | Always     | 9       |
| I10 | Lamp Out            | Any iLOD reports that the lamps are OFF for 1 minute during a train move and remain OFF through the end of the move.   | 3         | Train Move | 10      |
| I11 | Flash Rate Too Slow | Flash rate is less than 35 FPM and greater than 0 FPM and XRK has been down for 12 seconds. Flash rate must remain low for 1 minute and not recover prior to the end of the train move – alarm stays valid until cleared on next train move. | 3         | Train Move | 11      |
| I11 | Flash Rate Too Fast | Flash rate is greater than 65 FPM and XRK has been down for 12 seconds. Flash rate must remain high for 1 minute and not recover prior to the end of the train move - alarm stays valid until cleared on next train move.                    | 3         | Train Move | 12      |
| I13 | Power Off           | Power 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 XRK drop, 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      |
| I16 | MTSS Comm Bad       | Communication is lost with any MTSS unit for 30 seconds  | 3         | Always     | 18      |

## 7.2 APPLICATION MESSAGES

The 9V871-A01F application generates these status messages. **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             | XRK=Down  |
| PREEMPTION ACTIVATED          | PREEMPT=Down  |
| 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 XRK=Down to any island being down                   |
| GATES IN TRANSITION           | Gates NOT UP or NOT DOWN                                      |
| GATES HORIZONTAL              | ALL GATES=Down  |
| EXIT GATES HORIZONTAL         | ALL EXIT GATES=DOWN   |
| ISLAND OCCUPIED               | Any island=Down   |
| TRAIN LEAVING                 | All islands=UP after islands occupied for 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 PREEMPT=Down to XRK=Down, If less than 1 second = 0 |
| EXIT GATES IN TRANSITION      | Exit gates NOT UP or NOT DOWN                                 |

**NOTES**

**NOTES**



**NOTES**

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