



GE Power Generation Engineering

Materials and Processes Engineering
Schenectady, NY 12345

PROCESS SPECIFICATION

P3K-AL-0360-A01

TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS LOGIC (MODE SELECTION)

DOCUMENT REVISION STATUS: DETERMINED BY THE LAST ENTRY IN THE "REV" AND "DATE" COLUMN

REV.	AN NO.	DESCRIPTION	SIGNATURE	REV. DATE
A	YA00096	SPECIFICATION LISTED IN STEAM TURBINE/GENERATOR INDEX AS "INACTIVE" HAS BEEN FORMALLY REVISED AS "INACTIVE FOR NEW DESIGN". (PR BUDKA)	C.R. Trippi	DEC 02 1991
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REVISIONS

I. SCOPE

This instruction outlines the specifications for testing the Plant Communications Logic board IPC2-B001.

CIRCUIT BOARD 117D9944 -- MODE SELECTION

II. CIRCUIT DESCRIPTION

The plant communications (PC) mode selection logic is designed to incorporate the following features:

1. When the power to the EHC control system is initially turned on, the unit will be in a TRIPPED condition. The PC mode selection will be in MANUAL (MAN).
2. When STANDBY (SB) mode is selected at the standby control on the EHC control panel, all other PC modes are automatically dropped out and the STANDBY light is lit.
3. MANUAL mode can be selected at the EHC control panel any time that STANDBY is not selected, and when in manual the MANUAL light is lit.
4. REMOTE AUTO (RA) mode can be selected at the EHC control panel any time that STANDBY is not selected and the circuit breaker is closed. Opening the circuit breaker reverts this back to MANUAL mode.
5. REMOTE OPERATION (RO) (an extra cost accessory) mode can be selected at the EHC control panel any time that STANDBY is not selected and remote operation control power is available.
6. Return to the MANUAL mode from REMOTE AUTO or REMOTE OPERATION modes can be done anytime the control is in one of these modes by inputs from --
 - a. Manual button on control panel
 - b. Power Load Unbalance (PU)
 - c. Loss of 125 VDC EHC power
 - d. Customer GO MANUAL for REMOTE AUTO
 - e. Customer GO MANUAL from REMOTE OPERATION
7. The REMOTE SPEED MATCHER (RSM) mode is selectable by customer input when the circuit breaker is open and rated speed is selected.
8. The LAMP TEST diodes and resistors are included on the relay logic card. These logic circuits permit all of the lamps to be tested while the EHC system is in operation. A momentary pushbutton switch labeled LAMP TEST is located on the operating panel for checking the lamps.

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TITLE

TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS
LOGIC (MODE SELECTION)

FIRST MADE FOR EHC MARK II (PLANT COMMUNICATIONS)

REVISIONS

II. CIRCUIT DESCRIPTION (continued)

9. The following outputs are provided for various reasons --

- a. Indication of IN STANDBY OPERATING MODE
- b. Remote Speed Match Permission
- c. Permission to go into REMOTE OPERATION control
- d. Permission for REMOTE OPERATION to increase or decrease load set
- e. REMOTE AUTO or REMOTE OPERATION or remote speed match selected signal to load set
- f. 24 VDC to loading rate logic when in REMOTE AUTO or REMOTE OPERATION or when circuit breaker is open, rated speed selected, and customer supplied remote speed matcher is selected
- g. Permission for steam pressure limiter manual increase or decrease
- h. 24 VDC to stage pressure feedback for permission to valve test when in REMOTE AUTO.
- i. Permission for REMOTE AUTO to increase or decrease load set.
- j. REMOTE AUTO mode selected

III. CIRCUIT SPECIFICATIONS

1. Before the board is coated, each diode of the 20 pairs should be checked (using an ohmmeter) both in the forward and reverse direction to insure that redundancy is effective.
2. All functional tests shown in the Logic Testing Table can be made with the board coated as well as uncoated.
3. The symbols used in the Logic Testing Table are as follows:

TABLE SYMBOLS

- 0 = No voltage applied or absence of voltage at output pins and test points or light off.
- 1 = +24 VDC applied to power input pins or presence of +24 VDC at output pins and test points or light on.
- M = +24 VDC momentarily applied.

Omission = No change from previous test condition.

4. Apply +24 VDC to pin 38 and common to pin 40 for all steps in the Logic Testing Table except step 1.
5. Before applying +24 VDC to circuit board, perform the following continuity checks:

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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS
LOGIC (MODE SELECTION)

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III. CIRCUIT SPECIFICATIONS (continued)

5. (continued)

CONTINUITY: Pins 8 to 34 to 36 to 38 to TP1

16 to TP53

17 to 22 to TP52 to TP54

20 to 21 to TP55

24 to 25 to 26

29 to 30

40 to TP2

OPEN CIRCUIT 3 to 38

13 to TP52

33 to TP55

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TEST INSTRUCTIONS FOR PLANT COMMUNICATIONS
LOGIC (MODE SELECTION)
 FIRST MADE FOR **EHC MARK II (PLANT COMMUNICATIONS)**

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MODE SELECTION LOGIC TESTING TABLE
 (TEST IN SEQUENCE SHOWN)

STEP NO.	FUNCTION UNDER TEST	POWER INPUTS AT PINS					MOMENTARY INPUTS AT PINS				POWER OUTPUTS AT PINS								LIGHTS AT PINS				TEST POINTS												
		Lamp Test	Ckt. Bkr. Condition	RA Control Power	RSM Selection	SB Mode Select	RO Control Power	RA Mode Select	RO Mode Select	MANUAL Mode Select	Loss of 125 VDC	PU Actuation	24VDC to Load Control	Power to Control Panel	RA Permission #2	RSM Permission	RO Permission	RO Permission	RA Permission #1	In SB Mode	RA, RO, or RSM mode	MANUAL Mode	MANUAL Light	RO Light	SB Light	RA Light	TP1	TP2	TP50	TP51	TP52	TP53	TP54	TP55	
1	EHC Power Off	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	EHC Power On	1	1			1							1								1		1				1								
3	Go to SB				1								0						1			0		1					1	1					
4	Try other modes							M*	M*	M*	M*																								
5	Try RO							0	M	0	0	0	1							1	0													1	
6	Go from SB				0								0	1					0	0	1	1		0					0	0				0	
7	Go to RO							M					1			1	1			1	0		0	1										1	
8	Try RSM			1											1																				
9	Go to SB				1			0					0	0		0	0	0	1	0	1		0	1					1	1				0	
10	Go to RO				0	0		M					1	1		1	1		0	1	0		1	0				1	0					1	
11	Remove RO Control Power				0			0					0			0	0			0	1		1	0										0	
12	Replace RO Control Power				1																														
13	Close Ckt. Bkr.	0																																	
14	Go to RA							M					1	1				1	1	0		0		1					1	1	1	1			
15	Open Ckt. Bkr.	M						0					0	0				0	0	1		1		0					0	0	0	0			
16	Go to RA	0						M					1	1				1	1	0		0		1					1	1	1	1			
17	Remove RA Control Power			0									0	0				0	0	1		1		0					0	0	0	0			
18	Replace RA Control Power			1																															
19	Go to RA							M					1	1				1	1	0		0		1					1	1	1	1			
20	Try GO MANUAL							0		M			0	0				0	0	1		1		0					1	1	0	0			
21	Lamp Test	1																					1	1	1										
22	Go to SB	0			1								0						1			0	0	1	0				1	1					
23	Lamp Test	1																					1	1	1										

*Momentary power applied one at a time.

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 1. *07/28/75* AUG 7 1975
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TITLE
Test Instruction for Plant Communications Logic (Mode Selection)
FIRST MADE FOR EHC Mark II (Plant Communications)

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TEST INSTRUCTIONS 1PC2-B001

Assembly 117D9944

Schematic 117D9805

PROCEDURE:

1. Refer to Fig. A for test circuit of Section I.
Refer to Fig. B for test circuit of Section II.
2. Measure all test point voltages with respect to TP2.
3. The chart which follows outlines the procedure for testing the relay logic of this circuit.

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Test Instruction for Plant Communications
Logic (Mode Selection)

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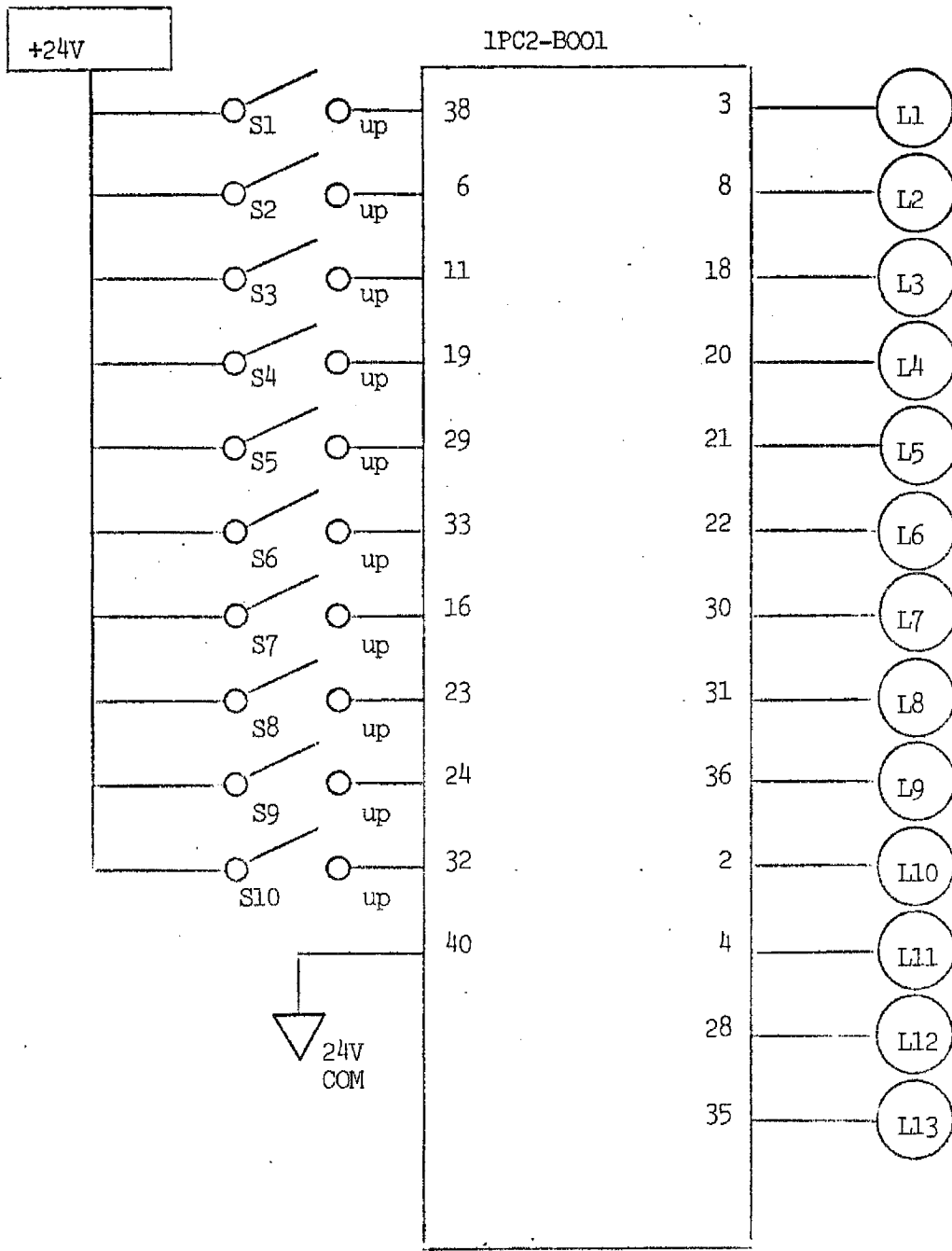


Figure A
(Use for Section I)

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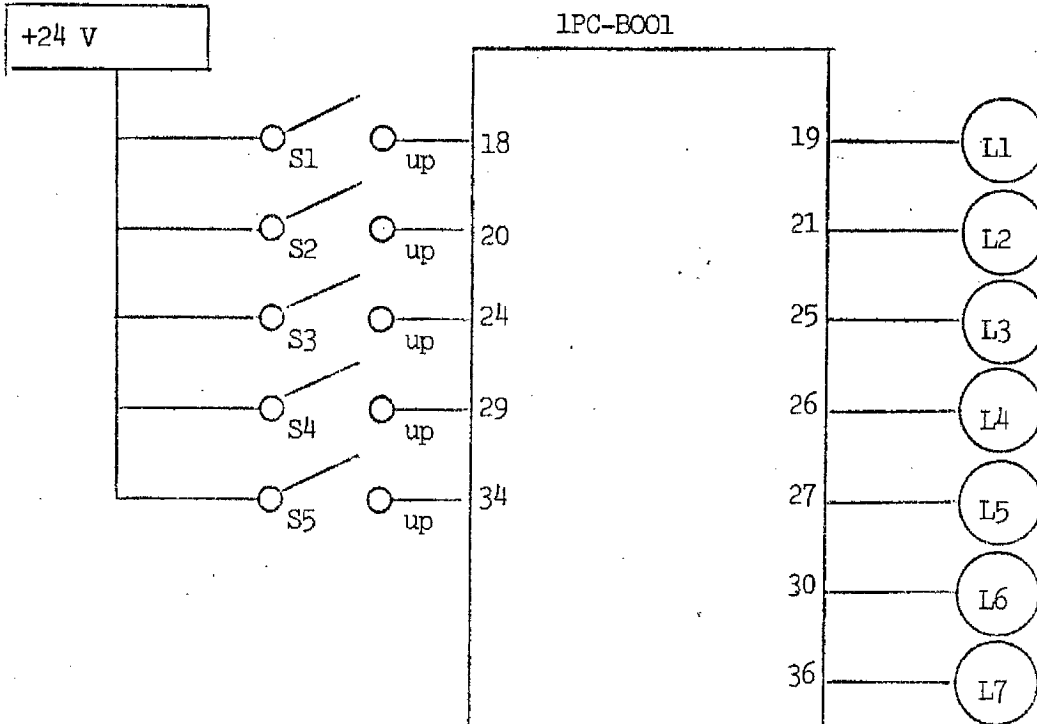


Figure B
(Use for Section II)

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SECTION I	PROCEDURE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
1	All Switches Down												
2	S1 up check for +24 VDC @ TP1	X	X	X									
3	S3 up												
4	S6 up												
5	S5 up check for +24 VDC at TP50 & 51												
6	S7 up												
7	S7 down												
8	S9 up												
9	S9 down												
10	S10 up												
11	S10 down												
12	Check for +24 VDC at TP55	X											
13	S8 down												
14	S5 down												
15	S8 up		X	X	X								
16	S8 down		X	X	X								

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Test Instructions for Plant Communications
Logic (Mode Selection)
FIRST MADE FOR EHC Mark II

PROCEDURE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13
17 S4 up	X	X	X	X	X								
18 S5 up							X						
19 S4 down													
20 S5 down													
21 S8 up	X	X	X	X	X								
22 S8 down													
23 S6 down													
24 S6 up													
25 S3 down													
26 S7 up check for +24 VDC at TP52,53,54	X	X	X	X	X	X	X	X	X	X	X	X	X
27 S7 down													
28 S3 up	X	X	X	X	X	X	X	X	X	X	X	X	X
29 S3 down	X	X	X	X	X	X	X	X	X	X	X	X	X
30 S7 up	X	X	X	X	X	X	X	X	X	X	X	X	X
31 S7 down													
32 S10 up													

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Logic (Mode Selection)

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SECTION II

PROCEDURE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
1 All Switches Down												
2 S1 up	X											
3 S1 down		X										
4 S2 up												
5 S2 down												
6 S3 up			X									
7 S3 down			X									
8 S4 up						X						
9 S4 down												
10 S5 up							X					
11 S5 down												
12 End of Test												

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<div style="display: flex; justify-content: space-between; margin-bottom: 20px;"> <div> PREPARED BY <u>George W. Kessler</u> G.W. Kessler EHC DESIGN ENGINEERING </div> <div> DATE <u>4/24/73</u> </div> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 20px;"> <div> APPROVED BY <u>P.C. Callan</u> P.C. Callan - MANAGER EHC DESIGN ENGINEERING </div> <div> DATE <u>1-13-75</u> </div> </div> <div style="display: flex; justify-content: space-between;"> <div> TEST PROCEDURE PREPARED BY <u>C. Bugg</u> C. Bugg EHC TEST ENGINEERING </div> <div> DATE <u>8/7/74</u> </div> </div> <div style="display: flex; justify-content: space-between;"> <div> TEST PROCEDURE APPROVED BY <u>George W. Kessler</u> G.W. Kessler EHC DESIGN ENGINEERING </div> <div> DATE <u>1/6/75</u> </div> </div>		REVISIONS <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">1</td> <td style="width:40%;">O.W.M. -</td> <td style="width:20%;">AUG 7</td> <td style="width:30%;">1975</td> </tr> </table> <p style="margin-top: 5px; font-size: small;">Revised into 13, 14, 15</p>	1	O.W.M. -	AUG 7	1975
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