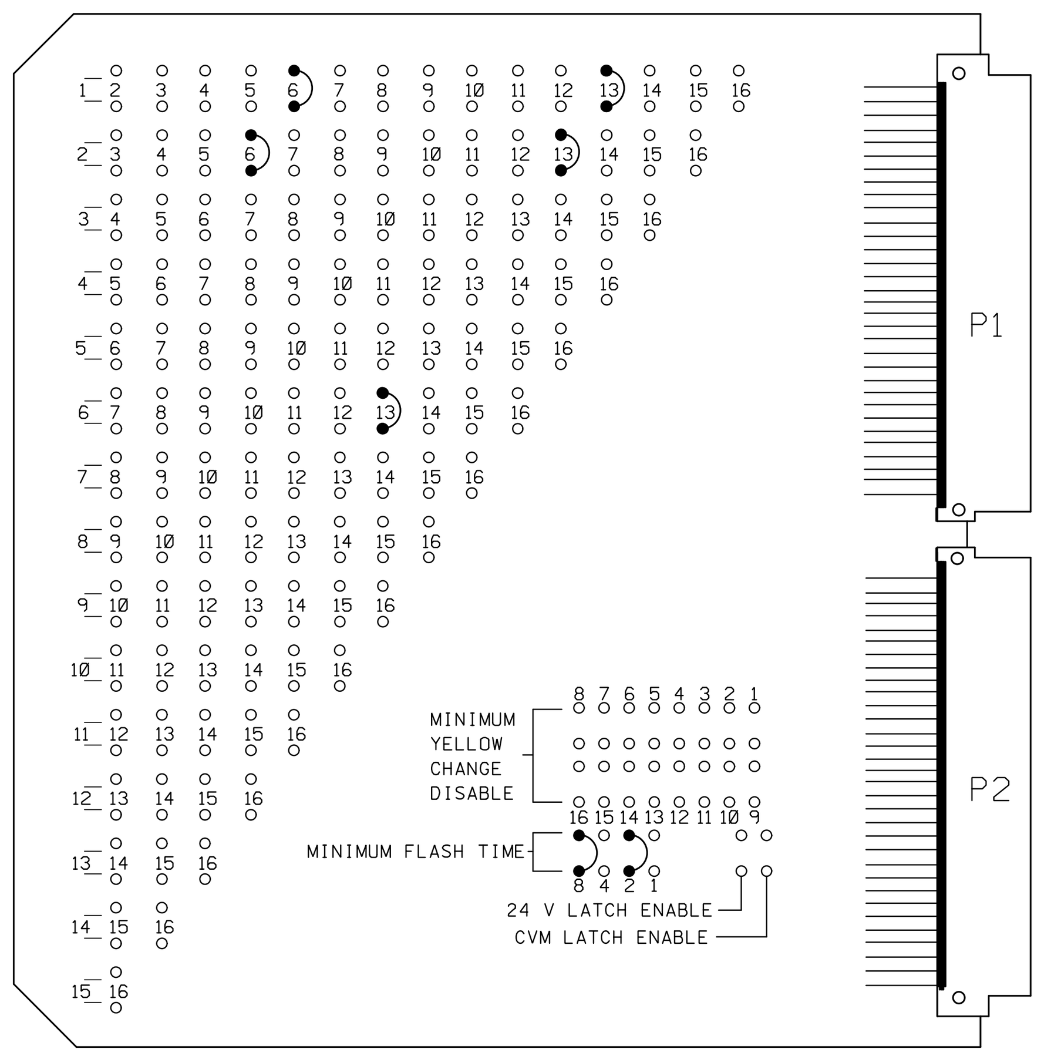
PROJECT REFERENCE NO.	SHEET NO.
U-5828	SIG. 12

EDI MODEL MMU2-16LEip MALFUNCTION MANAGEMENT UNIT PROGRAMMING DETAIL

(program card and tables as shown)



MMU PROGRAMMING CARD

FIELD CHECK ENABLE DUAL IND ENABLE RED FAIL ENABLE	
CHANNEL NUMBER	ENABLE/ DISABLE
1	ENABLE
2	ENABLE
3	DISABLE
4	DISABLE
5	DISABLE
6	ENABLE
7	DISABLE
8	ENABLE
9	DISABLE
10	DISABLE
11	DISABLE
12	DISABLE
13	ENABLE
14	DISABLE
15	DISABLE
16	DISABLE

UNIT OPTIONS	
OPTION	SETTING
RECURRENT PULSE	ON
WALK DISABLE	OFF
LOG CVM FAULTS	ON
EXTERN WATCHDOG	OFF
24V-2=12VDC	OFF
PGM CARD MEMORY	ON
LEDguard	ON
FORCE TYPE 16	OFF
TYPE12-SDLC	OFF
VM 3x/Day Latch	ON

FLASHING YELLOW ARROW	
CONFIG MODE	B
ENABLE CHANNEL PAIR, FYA	
CH 1-13	ON
CH 3-14	OFF
CH 5-15	OFF
CH 7-16	OFF
RED/YEL INPUT ENABLE	
CH 1	ON
CH 3	OFF
CH 5	OFF
CH 7	OFF
FLASH RATE FAULT	ON
FYA TRAP DETECT	ON

MMU PROGRAMMING NOTE

ENSURE YELLOW CHANGE PLUS RED CLEARANCE MONITORING IS ENABLED FOR ALL CHANNELS.

NOTES

1. To prevent "flash-conflict" problems, wire all unused load switches to flash red. Verify that signal heads flash in accordance with the signal plans.
2. To prevent red failures on unused monitor channels, tie unused load switch red outputs 3, 4, 5, 7, 9, 10, 11, 12, 14, 15 and 16 to load switch AC+ by inserting a jumper plug in the unused load switch socket from pin 1 (LS AC+) to pin 3 (RED out). Make sure all flash transfer relays are in place.
3. Program controller to start up in phase 2 Green and 6 Green.
4. Set power-up flash time to 10 seconds and implement on the Malfunction Management Unit. Set controller power-up flash time to 0 seconds.
5. Enable simultaneous gap-out feature for all phases.
6. Program detectors in accordance with the manufacturer's instructions to accomplish the detection schemes shown on the signal design plans.
7. Program detector call delay and extension timing on the controller, unless otherwise specified.
8. Set all detector card unit channels to "presence" mode.
9. Program phases 2 and 6 for volume density operation.
10. The cabinet and controller are a part of the Cary Signal System.

SIGNAL HEAD HOOK-UP CHART

PHASE	1		2	3	4	5	6	7	8	2 PED	4 PED	6 PED	8 PED	OLA	OLB	OLC	OLD
SIGNAL HEAD NO.	11★	82	21,22	NU	NU	NU	61,62	NU	81,82	NU	NU	NU	NU	11★	NU	NU	NU
RED	✳		2R				6R		8R								
YELLOW			2Y				6Y		8Y								
GREEN			2G				6G		8G								
RED ARROW														13R			
YELLOW ARROW		1Y												13Y			
FLASHING YELLOW ARROW														13G			
GREEN ARROW	1G	1G															
[hand]																	
[pedestrian]																	

NU = Not Used

✳ Denotes install load resistor. See Load Resistor Installation Detail on sheet 2.

★ See pictorial of head wiring detail this sheet.

DETECTOR RACK SET-UP DETAIL

INSERT DETECTOR CARDS IN RACK ACCORDING TO THE DETAIL SHOWN BELOW. PARTICULAR DETECTOR CHANNELS WILL CALL PHASES INDICATED.

RACK		Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11
RACK #1	BIU	CH1 L3 Ø1 / CH2 L4 Ø2 **	CH1 L1 Ø1 / CH2 L2 Ø6 *	SLOT EMPTY	CH1 L5 Ø1 / NOT USED	CH1 L11 NOT USED / CH2 L12 Ø6 **	SLOT EMPTY	CH1 L15 Ø8 / NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
RACK #2	BIU	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY

WIRE LOOPS TO TERMINALS ON LOOP PANEL AS SHOWN IN THE CHART BELOW

ADD JUMPERS FROM: L1A TO L2A, AND L1B TO L2B

LOOP NO.	LOOP PANEL TERMINALS
1A	L1A,L1B
	L2A,L2B
1C	L3A,L3B
2A	L4A,L4B
1B	L5A,L5B
NU	L6A,L6B
NU	L7A,L7B
NU	L8A,L8B
NU	L9A,L9B
NU	L10A,L10B
NU	L11A,L11B
6A	L12A,L12B
NU	L13A,L13B
NU	L14A,L14B
8A	L15A,L15B
NU	L16A,L16B

PROGRAM CONTROLLER DETECTORS ACCORDING TO THE SCHEDULE SHOWN IN THE CHART BELOW

CONTROLLER DETECTOR NO.	FUNCTION	TIMING	
		FEATURE	TIME(SEC)
1	Ø 1	DELAY	15
✳ 2	Ø 6	DELAY	3
3	Ø 1	DELAY	15
✳✳ 4	Ø 2		
5	Ø 1	DELAY	15
6			
7			
8			
9			
10			
11			
✳✳ 12	Ø 6		
13			
14			
15	Ø 8		
16			

✳ Detector Type - G
✳✳ Detector Type - N

WIRE LOOPS TO TERMINALS ON LOOP PANEL AS SHOWN IN THE CHART BELOW

LOOP NO.	LOOP PANEL TERMINALS
NU	L17A,L17B
NU	L18A,L18B
NU	L19A,L19B
NU	L20A,L20B
NU	L21A,L21B
NU	L22A,L22B
NU	L23A,L23B
NU	L24A,L24B
NU	L25A,L25B
NU	L26A,L26B
NU	L27A,L27B
NU	L28A,L28B
NU	L29A,L29B
NU	L30A,L30B
NU	L31A,L31B
NU	L32A,L32B

PROGRAM CONTROLLER DETECTORS ACCORDING TO THE SCHEDULE SHOWN IN THE CHART BELOW

CONTROLLER DETECTOR NO.	FUNCTION	TIMING	
		FEATURE	TIME(SEC)
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

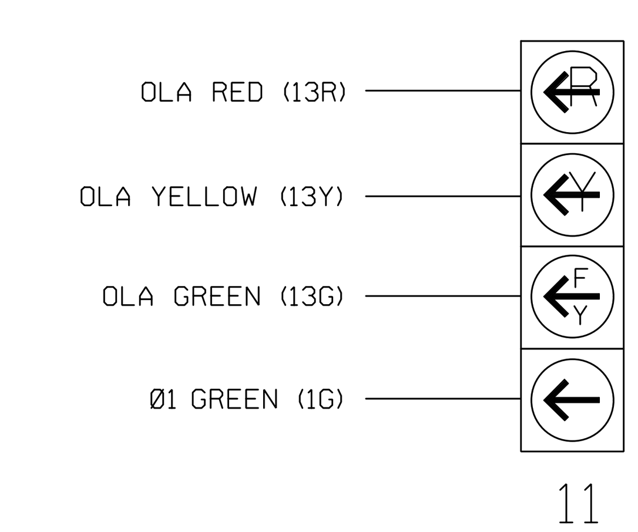
EQUIPMENT INFORMATION

CONTROLLER.............2070LN2
CABINET NC-8 TS-2
SOFTWARE ....ECONOLITE ASC/3-2070
CABINET MOUNT..........BASE
LOADBAY POSITIONS......16
LOAD SWITCHES USED.....1,2,6,8,13
PHASES USED............1,2,6,8
OLA....................✳
OLB....................NOT USED
OLC....................NOT USED
OLD....................NOT USED

✳ See overlap programming detail on sheet 2

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

BE SURE TO PROGRAM DETECTOR TYPES AND TIMERS (EXTEND AND DELAY) AS SHOWN ON THE SIGNAL PLANS.

LOAD SWITCH ASSIGNMENT DETAIL

(program controller according to schedule in chart below)

LOAD SWITCH NUMBER	FUNCTION
1	Ø 1
2	Ø 2
3	Ø 3
4	Ø 4
5	Ø 5
6	Ø 6
7	Ø 7
8	Ø 8
9	Ø 2 PED
10	Ø 4 PED
11	Ø 6 PED
12	Ø 8 PED
13	OLA
14	OLB
15	OLC
16	OLD

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1533T3
DESIGNED: APRIL 2016
SEALED: 9/22/2016
REVISED: N/A

NC Dept of Transportation
Division of Highways
Final Drawing Date: 10/10/2016
DocuSigned by: 1B9B4B66274A494...
ITS & Signals Unit

TEMPORARY DESIGN 3 - SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared For:
Traffic Engineering and Safety Systems Branch — State of North Carolina Department of Transportation — Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1002 (Aviation Parkway) at SR 3084 (Evans Road)

Division 5 Wake County Morrisville

PLAN DATE: April 2016	REVIEWED BY: SL PHILLIPS
PREPARED BY: SP PENNINGTON	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032607 STACIE L. PHILLIPS
DocuSigned by: 0C87A59ED60B437...
9/22/2016
DATE

SIG. INVENTORY NO. 05-1533T3