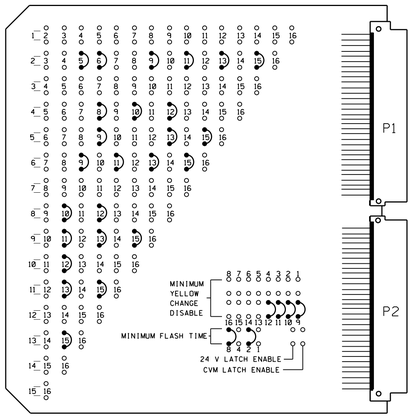
PROJECT REFERENCE NO.	SHEET NO.
I-5700	Sig. 4.1

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	DISABLE
2	ENABLE
3	DISABLE
4	ENABLE
5	ENABLE
6	ENABLE
7	DISABLE
8	ENABLE
9	ENABLE
10	ENABLE
11	ENABLE
12	ENABLE
13	ENABLE
14	DISABLE
15	ENABLE
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	ON
CH 7-16	OFF
RED/YEL INPUT ENABLE	
CH 1	ON
CH 3	OFF
CH 5	ON
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 1, 3, 7, 14 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 Walk and 6 Walk.
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. Program phases 2 and 6 for volume density operation.
6. Enable simultaneous gap-out feature for all phases.
7. Program detectors in accordance with the manufacturer's instructions to accomplish the detection schemes shown on the signal design plans.
8. Program detector call delay and extension timing on the controller, unless otherwise specified.
9. Set all detector card unit channels to "presence" mode.
10. Program phases 4 and 8 for dual entry.
11. 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.	NU	21,22	NU	41,42	42	51★	62,63	NU	81,82	P21, P22	P41, P42	P61, P62	P81, P82	61★	NU	51★	NU
RED		2R		4R		✳	6R		8R								
YELLOW		2Y		4Y			6Y		8Y								
GREEN		2G		4G			6G		8G								
RED ARROW														13R		15R	
YELLOW ARROW					5Y									13Y		15Y	
FLASHING YELLOW ARROW														13G		15G	
GREEN ARROW					5G	5G											
✋										9R	10R	11R	12R				
🚶										9G	10G	11G	12G				

NU = Not Used

✳ Denotes install load resistor. See Load Resistor Installation Detail below.

★ 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 #1	BIU	CH1 L3 ø4 / CH2 L5 ø5	SLOT EMPTY	SLOT EMPTY	CH1 L5 ø5 / CH2 L6 ø2 ✳	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

LOOP NO.	LOOP PANEL TERMINALS
NU	L1A, L1B
NU	L2A, L2B
4A	L3A, L3B
5B	L4A, L4B
5A	L5A, L5B
	L6A, L6B
NU	L7A, L7B
NU	L8A, L8B
NU	L9A, L9B
NU	L10A, L10B
NU	L11A, L11B
NU	L12A, L12B
NU	L13A, L13B
NU	L14A, L14B
NU	L15A, L15B
NU	L16A, L16B

ADD JUMPERS FROM: L5A TO L6A, AND L5B TO L6B

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

CONTROLLER DETECTOR NO.	FUNCTION	TIMING	
		FEATURE	TIME(SEC)
1			
2			
3	ø4		
4	ø5	DELAY	15
5	ø5	DELAY	15
✳ 6	ø2	DELAY	3
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

✳ Detector Type - G

NOTE

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

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans for zones 2A, 2B, 5A, 6A, 6B, 6C, and 8A.

For Detection Zone 5A the equipment placement and slots reserved for wired inputs are typical for a NCDOT installation.

EQUIPMENT INFORMATION

CONTROLLER.....2070EN2
CABINET TS-2
SOFTWARE .....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
LOADBAY POSITIONS.....16
LOAD SWITCHES USED.....2,4,5,6,8,9,10,11,12,13,15
PHASES USED.....2,2PED,4,4PED,5,6,6PED,8,8PED
OLA.....✳
OLB.....NOT USED
OLC.....✳
OLD.....NOT USED

✳ See overlap programming detail on sheet 2

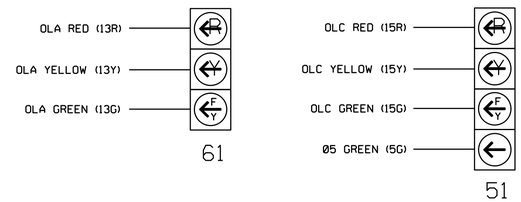
LOAD SWITCH ASSIGNMENT DETAIL

(program controller according to schedule in chart below)

LOAD SWITCH NUMBER	FUNCTION
1	ø1
2	ø2
3	ø3
4	ø4
5	ø5
6	ø6
7	ø7
8	ø8
9	ø2 PED
10	ø4 PED
11	ø6 PED
12	ø8 PED
13	OLA
14	OLB
15	OLC
16	OLD

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

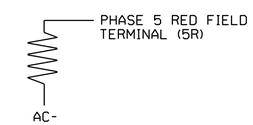


LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2088T3
DESIGNED: February 2019
SEALED: 7/24/2019
REVISED: N/A

Electrical Detail - Temp Design 3 (TMP Phase III)
Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3015 (Airport Boulevard) at SR 1641 (Slater Road)

Division 5 | Wake County | Morrisville

PLAN DATE: May 2019 | REVIEWED BY:
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

DocuSigned by: Ryan W. Hough 8/1/2019
430320FAA2854C3... DATE

SIG. INVENTORY NO. 05-2088T3

24-JUL-2019 07:46
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armstrong