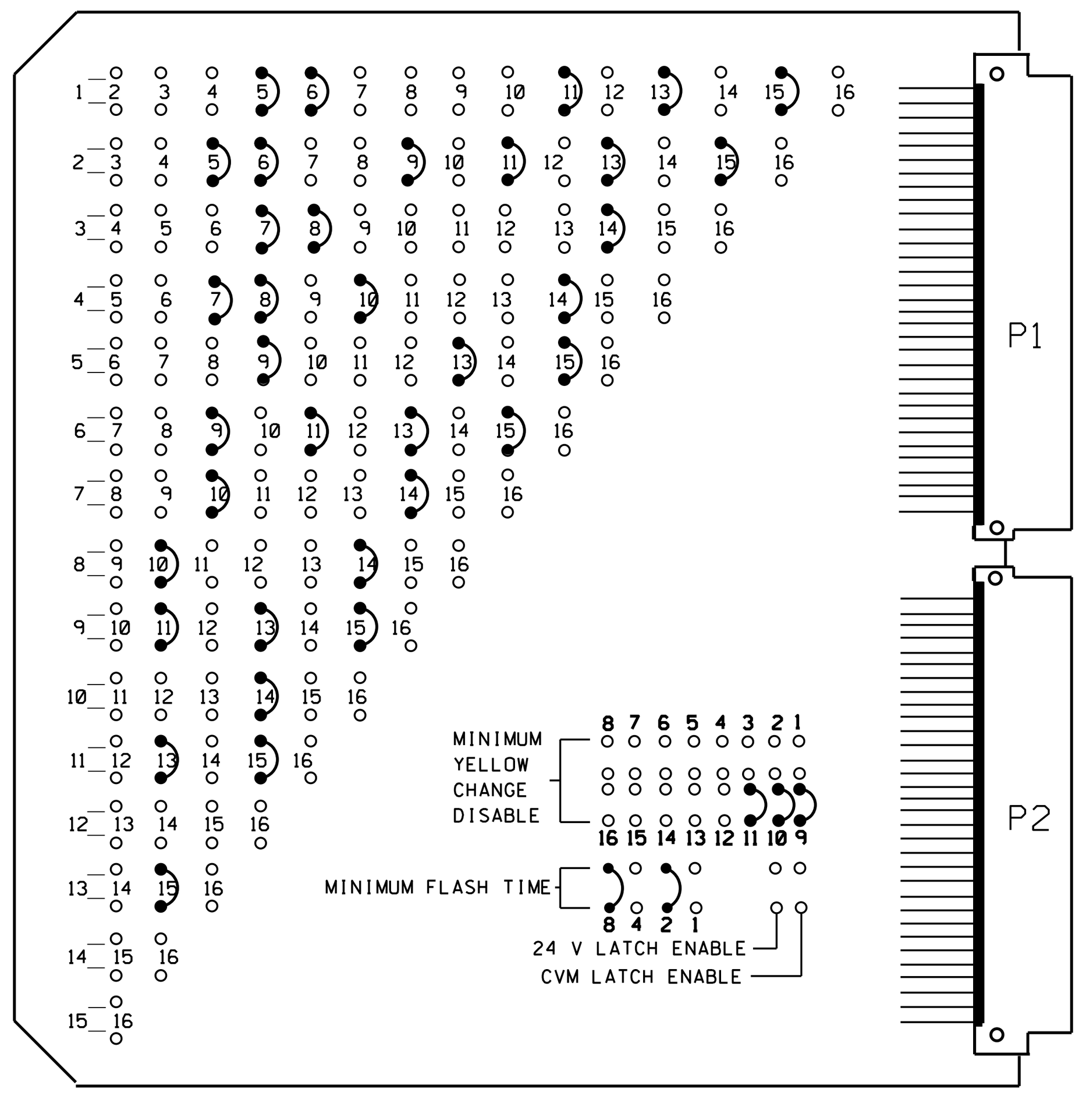
EDI MODEL MMU2-16LEip MALFUNCTION MANAGEMENT UNIT PROGRAMMING DETAIL

(program card and tables as shown below)



MMU PROGRAMMING CARD

FIELD CHECK ENABLE DUAL IND ENABLE RED FAIL ENABLE	
CHANNEL NUMBER	ENABLE/ DISABLE
1	ENABLE
2	ENABLE
3	DISABLE
4	ENABLE
5	DISABLE
6	ENABLE
7	ENABLE
8	ENABLE
9	ENABLE
10	ENABLE
11	ENABLE
12	DISABLE
13	ENABLE
14	ENABLE
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	ON
CH 5-15	ON
CH 7-16	OFF
RED/YEL INPUT ENABLE	
CH 1	ON
CH 3	ON
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 12, 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. 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. Program phase 4 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.	11★	82	21,22 23	31★	41,42, 43	51★	61,62 63	63	71,72	81,82, 83	P21, P22	P41, P42	P61, P62	NU	11★	31★	51★	NU
RED		✳	2R	✳	4R	✳	6R			8R								
YELLOW			2Y	✳	4Y	✳	6Y			8Y								
GREEN			2G		4G		6G			8G								
RED ARROW									7R						13R	14R	15R	
YELLOW ARROW		1Y						7Y	7Y						13Y	14Y	15Y	
FLASHING YELLOW ARROW															13G	14G	15G	
GREEN ARROW	1G	1G		3G		5G		7G	7G									
(hand)											9R	10R	11R					
(walking person)											9G	10G	11G					

NU = Not Used

✳ Denotes install load resistor. See Load Resistor Installation Detail on sheet 3.

★ 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 ø 1	CH1 L1 ø 1	CH1 L7 ø 3	CH1 L5 ø 2 ✳✳	CH1 L11 ø 6 ✳✳ SYS6	CH1 L9 ø 5	CH1 L15 ø 7	CH1 L13 ø 6 ✳✳ SYS8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
		CH2 L4 ø 2 ✳✳	CH2 L2 ø 6 ✳	CH2 L8 ø 8	CH2 L6 ø 4	CH2 L12 ø 6 ✳✳ SYS7	CH2 L10 ø 2 ✳	CH2 L16 ø 8	CH2 L14 ø 7			

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

	LOOP NO.	LOOP PANEL TERMINALS
ADD JUMPERS FROM: L1A TO L2A, AND L1B TO L2B	1A	L1A,L1B
		L2A,L2B
	1B	L3A,L3B
	2A	L4A,L4B
	2B	L5A,L5B
	4A	L6A,L6B
ADD JUMPERS FROM: L7A TO L8A, AND L7B TO L8B	3A	L7A,L7B
		L8A,L8B
ADD JUMPERS FROM: L9A TO L10A, AND L9B TO L10B	5A	L9A,L9B
		L10A,L10B
	6A/S6	L11A,L11B
	6B/S7	L12A,L12B
	6C/S8	L13A,L13B
	7A	L14A,L14B
	7B	L15A,L15B
	8A	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 2		
	6	ø 4	DELAY	10
	7	ø 3	DELAY	15
	8	ø 8	DELAY	3
★	9	ø 5	DELAY	15
★	✳ 10	ø 2	DELAY	3
	✳✳ 11	ø 6	SYSTEM	
	✳✳ 12	ø 6	SYSTEM	
	✳✳ 13	ø 6	SYSTEM	
	14	ø 7	DELAY	3
	15	ø 7		
	16	ø 8		

✳ Detector Type - G (remove delay from existing detector card)

✳✳ Detector Type - N

★ See the Vehicle Detector Setup Programming Detail on sheet 4 for Alternate Phasing.

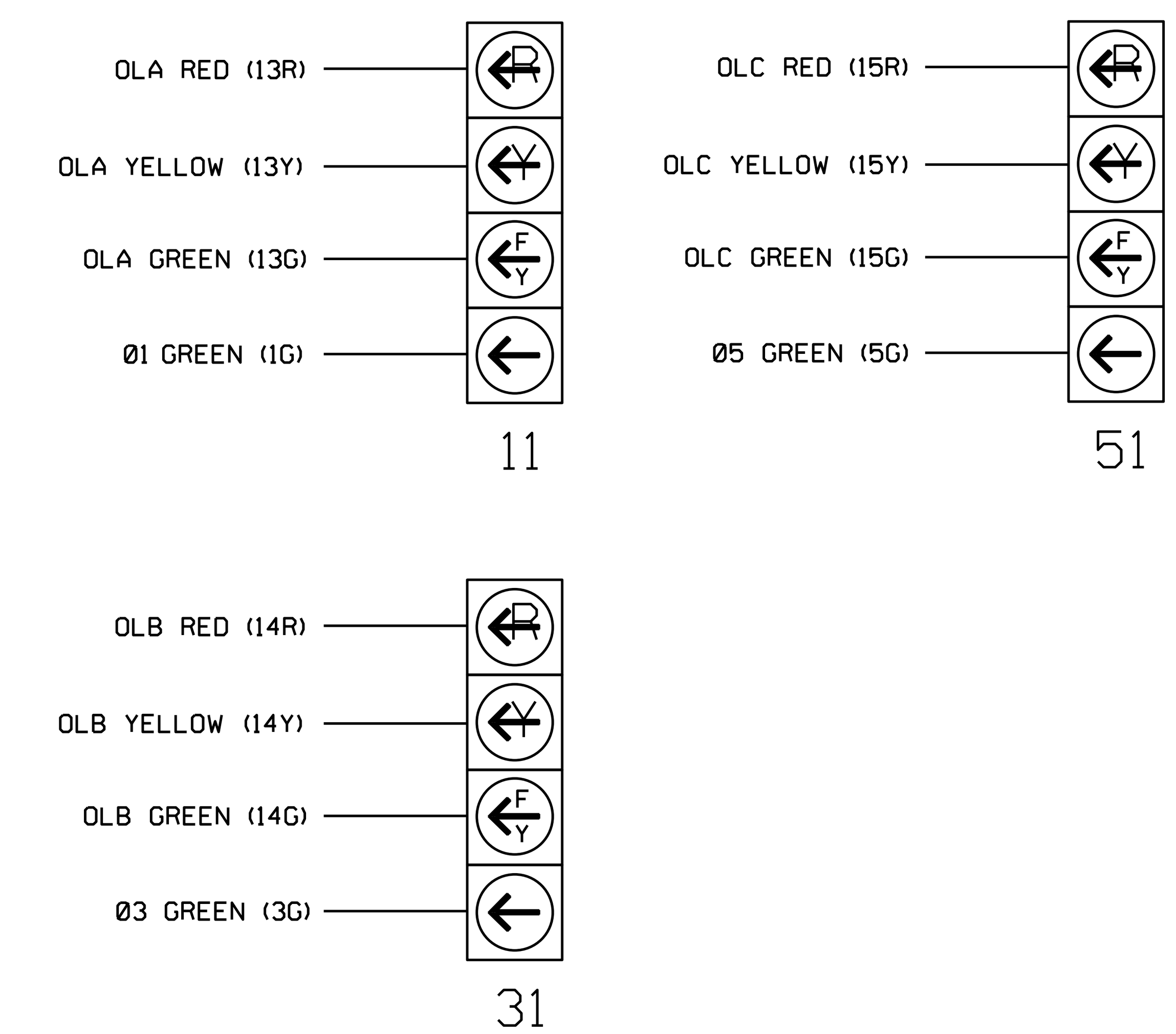
EQUIPMENT INFORMATION

CONTROLLER.............2070EN2
CABINET NC-8 TS-2
SOFTWARE ....ECONOLITE ASC/3-2070
CABINET MOUNT..........BASE
LOADBAY POSITIONS.......16
LOAD SWITCHES USED......1,2,3,4,5,6,7,8,9,10,11,13,14,15
PHASES USED............1,2,2PED,3,4,4PED,5,6,6PED,7,8
OLA....................✳
OLB....................✳
OLC....................✳
OLD....................✳

✳ SEE OVERLAP PROGRAMMING DETAIL ON SHEET 2

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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: 05-1726
DESIGNED: March 2019
SEALED: 7/24/2019
REVISED: N/A

Electrical Detail - Final Design - Sheet 1 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3015 (Airport Blvd.)
at
Factory Shops Road/
Aerial Center Parkway

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: ITS & Signals Management Section, Transportation Mobility and Safety Division, State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH

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

SIG. INVENTORY NO. 05-1726

29-JUL-2019 09:10
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sarmstrong