

# TOMAR ELECTRONICS

## Strobecom II

### Model 2085 External Preemption Adapter Installation and User Manual (REV 1)

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#### ATTENTION

THE STROBECOM II SYSTEM IS DESIGNED TO AID IN THE TRANSIT OF DESIGNATED VEHICLES THROUGH THE TRAFFIC CONTROL SYSTEM, TO THEIR DESTINATIONS.

IT IS IMPERATIVE THAT THE DRIVERS OF EACH TYPE OF VEHICLE THAT USES THE STROBECOM II SYSTEM BE MADE AWARE OF THE RESPONSE HE CAN EXPECT FROM THE TRAFFIC CONTROL SYSTEM.

IT IS THE RESPONSIBILITY OF THE CUSTOMER TO CONFIGURE THE SYSTEM'S RESPONSE TO EACH VEHICLE TYPE AND TO EDUCATE EACH DRIVER TO EXPECT THE APPROPRIATE RESPONSE FROM THE SYSTEM.

AT NO TIME SHOULD A DRIVER OF A VEHICLE EXPECT THAT HE IS GUARANTEED TO RECEIVE PROTECTED RIGHT-OF-WAY THROUGH TRAFFIC INTERSECTIONS. DRIVERS OF VEHICLES THAT WILL OPERATE OUTSIDE OF THE NORMAL TRAFFIC LAWS AND CONVENTIONS MUST ALWAYS TAKE RESPONSIBILITY FOR ENSURING THE SAFE PASSAGE OF HIS VEHICLE THROUGH AN INTERSECTION REGARDLESS OF THE OPERATION OR NON-OPERATION OF THE STROBECOM II SYSTEM.

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**September 2000**

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# **Strobecom II – Model 2085 Installation & User Manual**

## **1. MODEL 2085 DESCRIPTION & THEORY OF OPERATION**

The Model 2085 External Preemption Adapter is an accessory module that allows the Strobecom II Optical Preemption System to interface with older NEMA type traffic controllers that do not have internal preemption software.

Using various NEMA controller inputs, the 2085 enables a Strobecom II Optical Signal Processor (OSP) to effect preemption and priority control of controllers whose signaling is compliant with NEMA TS1-1989.

A fully encapsulated module measuring 7.6" x 3.8" x 1.3" tall, the 2085 connects to the OSP via its front-panel mounted high-speed expansion bus. Utilizing plug and play technology, simply install the 2085 per instructions and the OSP will detect the 2085's presence on power up.

The 2085 can use two alternative methods for effecting limited preemption of normal traffic controller timing depending upon the traffic engineer's desired pedestrian clearance timing. When using either method the traffic controller times all mandatory minimum intervals.

### **1.1. INTERVAL ADVANCE Method**

The **INTERVAL ADVANCE method** of external preemption is the fastest method and allows the controller to progress from the current interval to the desired interval at a rate *partially set by the 2085*. The NEMA controller continues to time the vehicle change and clearance intervals.

Using the INTERVAL ADVANCE method, the 2085 achieves limited preemption of normal controller timing by actuating the MANUAL CONTROL ENABLE input of the controller, applying OMIT inputs for the phases NOT to be displayed green during preemption, and then cycling the INTERVAL ADVANCE input to sequence the controller to the desired green display, while omitting intermediate green phases. Additional FREE and COORDINATION ISOLATION outputs are available for use if needed.

When using the INTERVAL ADVANCE method of preemption, the controller continues to time the vehicle change and clearance intervals, but pedestrian clearance intervals are preempted. Concurrent pedestrian walk and clearance

intervals will be shortened to the time provided for by the 2085 interval advance rate.

### **1.2. FORCE OFF Method**

The **FORCE OFF method** of external preemption is slower and allows the controller to progress from the current interval to the desired interval at a rate determined by the *vehicle change and clearance intervals, and the pedestrian clearance intervals, programmed into the NEMA controller*.

Using the FORCE OFF method the 2085 achieves limited preemption of normal controller timing by applying OMIT inputs for the phases NOT to be displayed green during preemption, actuating the EXTERNAL MINIMUM RECALL TO ALL VEHICLE PHASES input, and then actuating the FORCE OFF RING 1 and FORCE OFF RING 2 inputs. An additional FREE input is provided for use if needed.

When using the FORCE OFF method of preemption, the controller times all vehicle change and clearance intervals as well as the pedestrian clearance interval. Note that concurrent pedestrian clearance intervals will continue to be timed by the NEMA controller.

An OUTPUT ENABLE input is provided on the 2085. Applying LOGIC GROUND to OUTPUT ENABLE allows the 2085 to apply inputs to the traffic controller. Floating the OUTPUT ENABLE will disable 2085 outputs to the controller. OUTPUT ENABLE can be connected to a signal from the controller or conflict monitor so that preemption can only take place when the controller is able to properly accept inputs. If output control is not desired the OUTPUT ENABLE can be connected directly to LOGIC GROUND.

The 2085 has eight, 8-position, dip switches for selecting the desired phases to omit for up to four different preemption channels with two output priorities per channel. A 16-position rotary switch selects the rate of interval advance allowing minimum times in intervals to be established.

# **Strobecom II – Model 2085 Installation & User Manual**

## **2. MODEL 2085 INSTALLATION**

### **WARNING!**

**INSTALLATION OF THIS DEVICE MAY EXPOSE YOU TO AC VOLTAGE AND THE RISK OF ELECTRIC SHOCK OR ELECTROCUTION. TURN OFF THE AC MAINS AND USE ACCEPTED AND RECOGNIZED SAFETY PRECAUTIONS TO AVOID EXPOSURE TO RISK OF ELECTRIC SHOCK OR ELECTROCUTION. ELECTRIC SHOCK MAY CAUSE SEVER INJURY OR DEATH.**

### **CAUTION**

**Proper preemption operation is dependant on setting the switches on the 2085 properly. If this is your first experience with the 2085, it is strongly recommended that you first install the 2085 into a test controller in your signal shop and familiarize yourself with the 2085's signaling and settings. Only after thorough familiarization and planning should you deploy the 2085 into street intersections. Only a certified traffic technician familiar with the operation of NEMA controllers using OMIT, MCE, INTERVAL ADVANCE, and FORCE OFF signaling should install and configure the 2085.**

*IF USING THE INTERVAL ADVANCE METHOD, REFER TO TOMAR DRAWING #13309 FOR 2085 INSTALLATION AND WIRING PICTORIAL DETAILS.*

*IF USING THE FORCE OFF METHOD, REFER TO TOMAR DRAWING #13315 FOR 2085 INSTALLATION AND WIRING POCTORIAL DETAILS.*

1. See warning above. DISCONNECT AC MAINS BEFORE INSTALLING THE 2085.
2. Referring to the wiring diagram, locate and identify the required inputs to the traffic controller. Only use the 2085 with traffic controllers whose signaling is compliant with TS1-1989.
3. Determine an appropriate installation location and mount the 2085 module. The 3-I2C expansion cable used to hook the 2085 to the OSP is 3' long. Make sure to mount the 2085 within cable reach of the optical signal processor.
4. Connect the controller's inputs to the 2085's terminal blocks as indicated in the appropriate wiring diagram included with this document.
5. Using the eight 8-position dip switches on the 2085, select the desired green phases for each channel and band of preemption. For example, you may wish to display phases 2 and 5 green in response to an emergency band preemption event on channel 1. To do so, simply set the #2 and #5 switches on the CH1 EB dip switch to the phase displayed position and all other switches to the phase omitted position. Refer to the installation and wiring diagram for details.
6. (INTERVAL ADVANCE method only) Using the 16-position rotary switch, select the desired interval advance timing. Position 0 advances the controller at a rate of 1 sec/interval. Each higher switch position adds 1 sec/interval to the timing. Position F advances the signals at a 16 sec/interval rate. Refer to the installation and wiring diagram for details.
7. Connect one end of the 3-I2C expansion cable to either expansion port of the 2085. Connect the other end of the 3-I2C cable to the expansion port on the front panel of the OSP. NOTE: If another Strobecom II accessory is already plugged into the OSP's expansion port, you may plug the 2085 into the open expansion port on the already installed accessory.
8. Verify your wiring and make sure that all connections are properly made.
9. No software settings are required in the OSP to enable the 2085. When power is reapplied to the OSP, the 2085 will be detected and operation will begin.

## **3. MODEL 2085 MAINTENANCE**

The 2085 requires no routine maintenance.

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## **4. MODEL 2085 TROUBLESHOOTING**

If a report of system failure is received from the field, the Strobecom II system must be analyzed and the source of the failure repaired. The major components of the Strobecom II system have diagnostic functions that aid in troubleshooting.

When troubleshooting a Strobecom II system with a 2085 installed, first follow the trouble shooting steps in the Strobecom II System Manual for the Optical Signal Processor itself. After you have determined that the OSP is working properly, then proceed to the following trouble shooting steps.

If the OSP is receiving an emitter and the front panel is displaying a green LED for the channel and band, but the 2085 does not activate its outputs, check the following items.

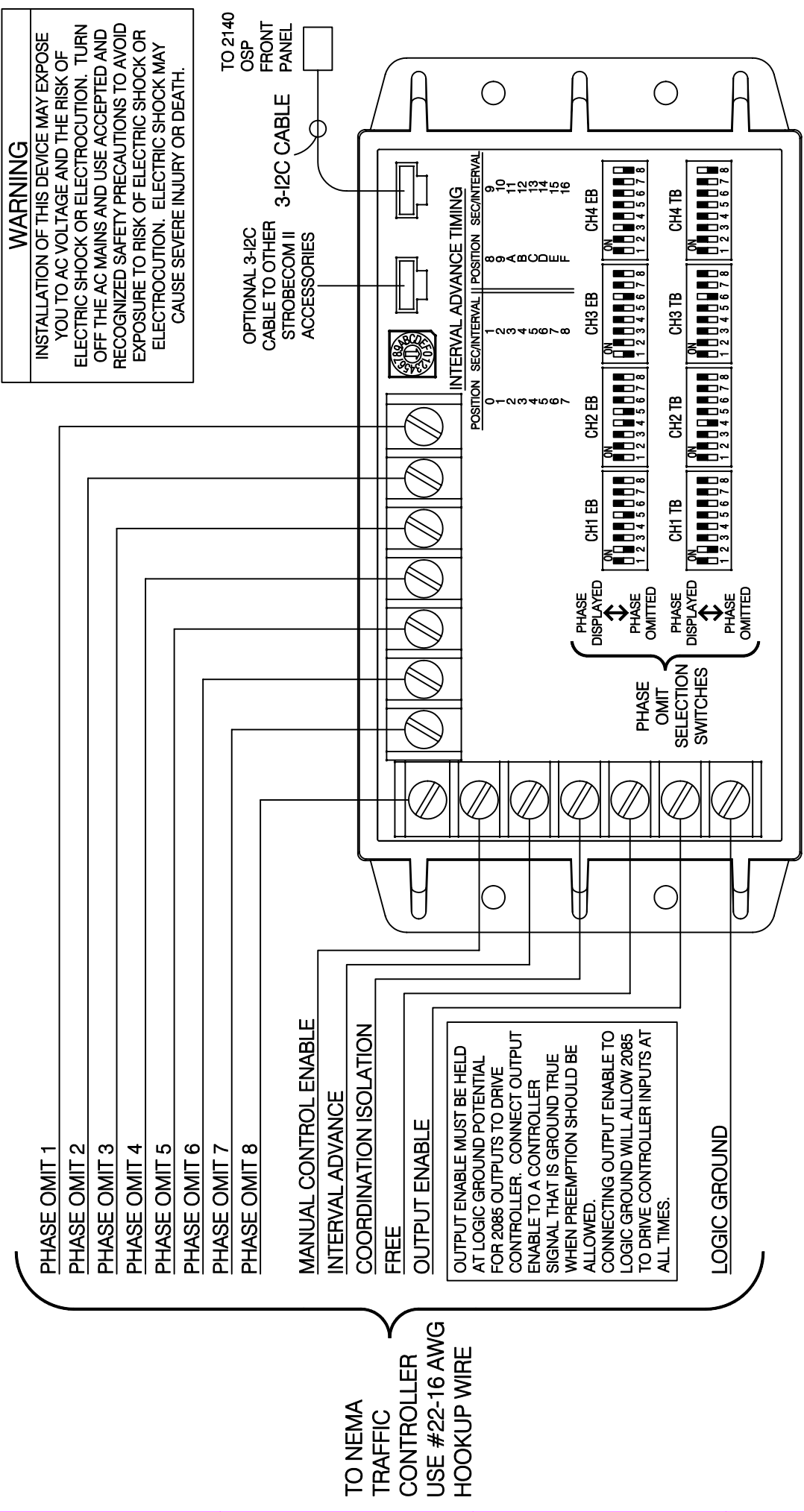
1. Toggle the OSP's power switch to off and check to make sure the I2C cable from the front panel of the OSP to the 2085 is firmly seated at both ends. If the cable is in question replace the 3-I2C cable with a known good spare.

Remember that the OSP scans for the presence of the 2085 on power up only. If the OSP is turned on before the 2085 is hooked-up, the OSP will operate as if the 2085 is not attached.

2. If the 3-I2C cable appears OK, then check the wiring of the OUTPUT ENABLE connection on the 2085. OUTPUT ENABLE must be at LOGIC GROUND potential for the 2085 to drive the controller's inputs. If the OUPUT ENABLE line is hooked to a controller or conflict monitor output, check to make sure that output is providing a ground true signal to the 2085.
3. Check all wiring for damage.
4. If all above fail replace the 2085 with a known good spare. Return the defective 2085 to Tomar Electronics, Inc. for service.

If the 2085 drives the controller inputs even with no green LED's showing on the front of the attached OSP check the following items:

1. Toggle the power switch on the OSP to the off position. If the outputs of the 2085 remain active with the OSP power off, a transient such as lightning has damaged the 2085. Return the unit to Tomar Electronics, for service.



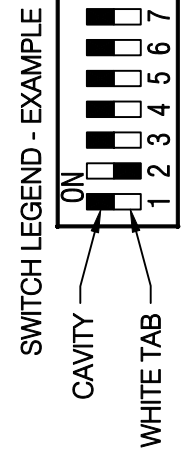
**WARNING**  
 INSTALLATION OF THIS DEVICE MAY EXPOSE YOU TO AC VOLTAGE AND THE RISK OF ELECTRIC SHOCK OR ELECTROCUTION. TURN OFF THE AC MAINS AND USE ACCEPTED AND RECOGNIZED SAFETY PRECAUTIONS TO AVOID EXPOSURE TO RISK OF ELECTRIC SHOCK OR ELECTROCUTION. ELECTRIC SHOCK MAY CAUSE SEVERE INJURY OR DEATH.

TO 2140  
 OSP  
 FRONT  
 PANEL

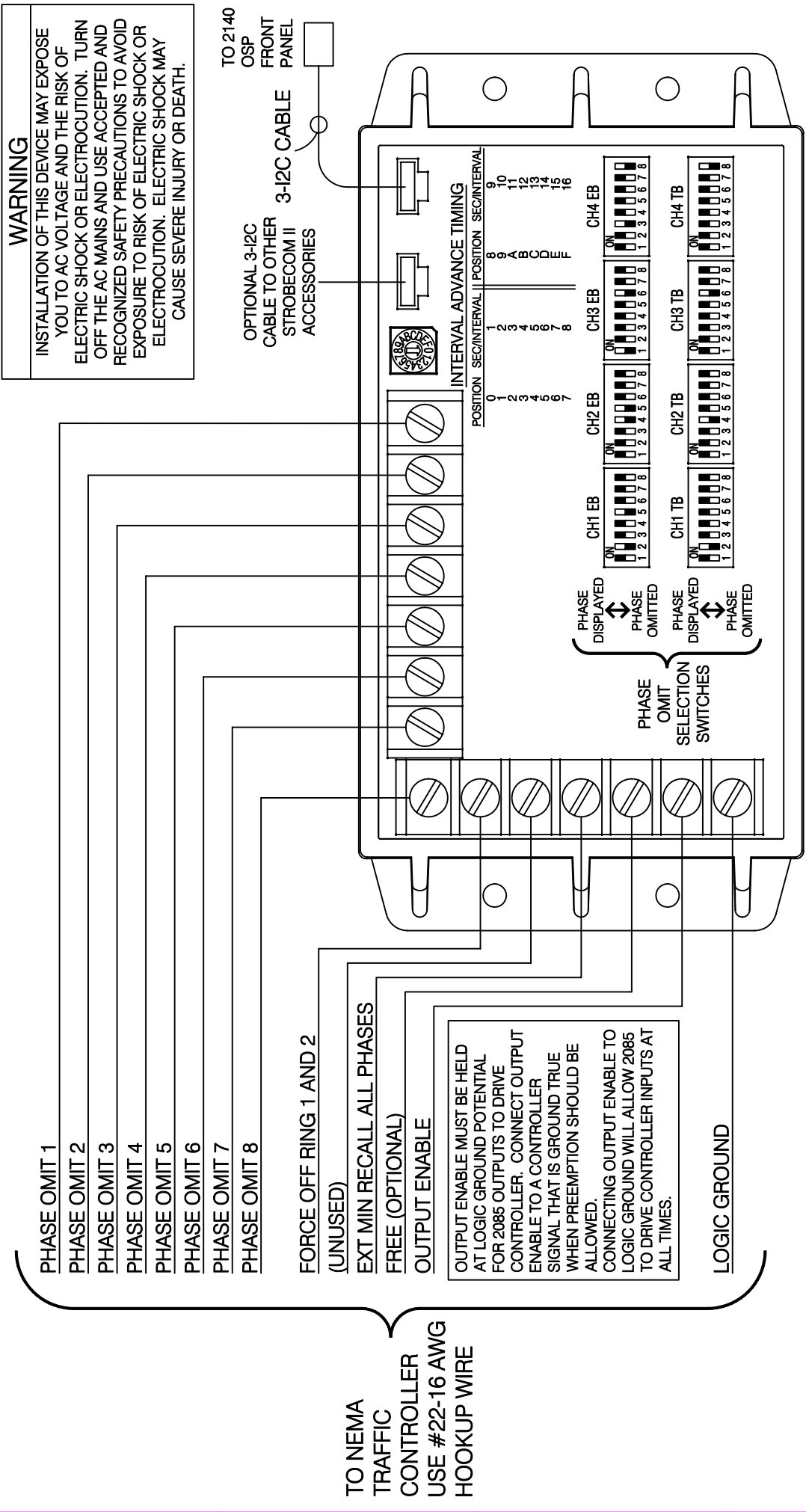
OPTIONAL 3-12C  
 CABLE TO OTHER  
 STROBECOM II  
 ACCESSORIES

OUTPUT ENABLE MUST BE HELD AT LOGIC GROUND POTENTIAL FOR 2085 OUTPUTS TO DRIVE CONTROLLER. CONNECT OUTPUT ENABLE TO A CONTROLLER SIGNAL THAT IS GROUND TRUE WHEN PREEMPTION SHOULD BE ALLOWED. CONNECTING OUTPUT ENABLE TO LOGIC GROUND WILL ALLOW 2085 TO DRIVE CONTROLLER INPUTS AT ALL TIMES.

**TOP VIEW**



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|--|----------|--|-------------------|
|  |          | TOMAR ELECTRONICS INC.<br>2100 WEST OSBORN<br>GILBERT, ARIZONA 85233   |                   |
| REV  | DATE     | DESCRIPTION  | REVISED DWG TITLE |
| 01   | 09/07/00 | STROBECOM II MODEL 2085<br>EXTERNAL PREEMPTION ADAPTER<br>INSTALLATION AND WIRING DIAGRAM<br>INTERVAL ADVANCE METHOD |                   |
| UNLESS OTHERWISE SPECIFIED,<br>DIMENSIONS ARE IN INCHES.<br>DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS.<br>JOG +<br>ANGLES +<br>SCALE NOTE: DO NOT SCALE DRAWING<br>PAPER: AXL _____ 08/03/00<br>APPROVED: _____ |          | DRAWING NO. REV<br>13309 01<br>TYP. DATE<br>13309 01   |                   |
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**TOP VIEW**

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.  
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TOMAR ELECTRONICS INC.  
 2100 WEST OSBORN  
 GILBERT, ARIZONA 85233

STROBECOM II MODEL 2085  
 EXTERNAL PREEMPTION ADAPTER  
 INSTALLATION AND WIRING DIAGRAM  
 FORCE OFF METHOD

TOMAR PART NO: 2085

DRAWING NO. REV  
 13315 01

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