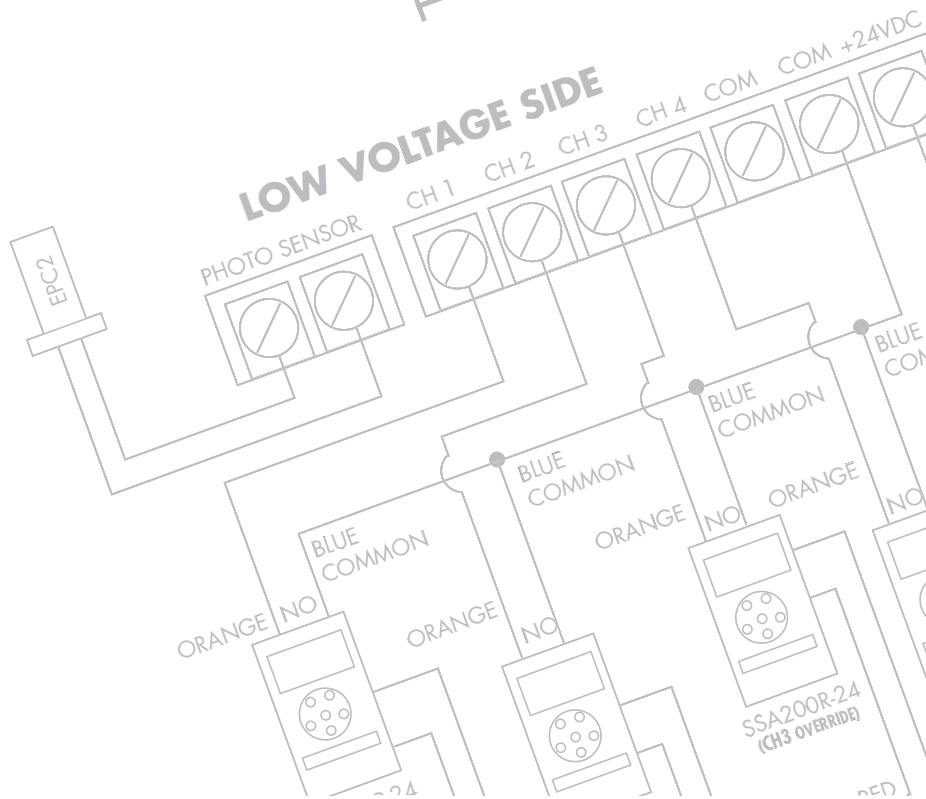
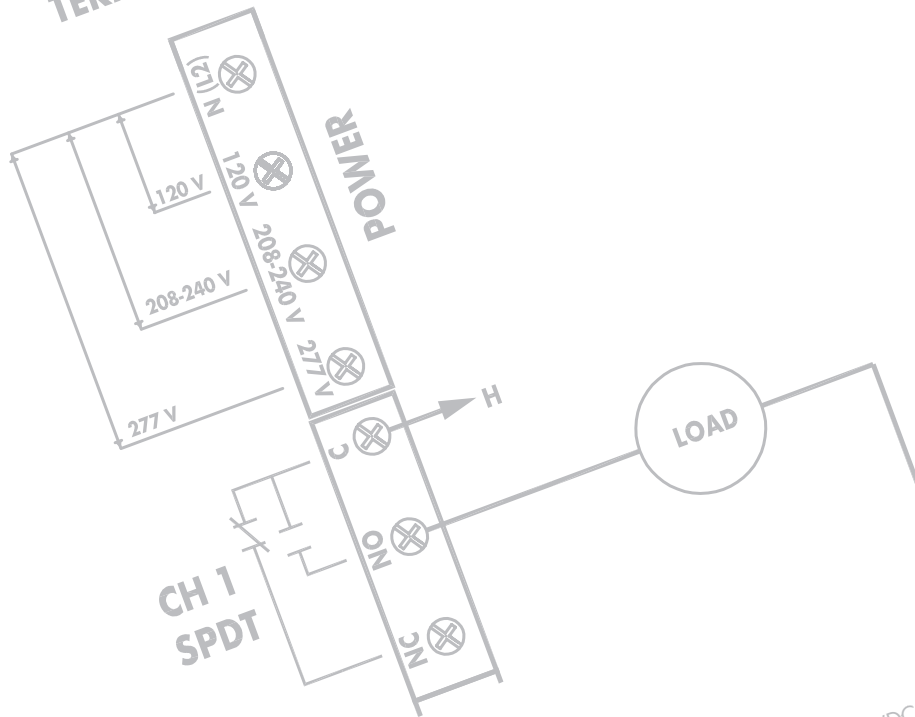


APPLICATION GUIDE

TORK DIGITAL CONTROL
TERMINAL BLOCK



NOVEMBER 2008



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TRANSFORMER RELAY POWERPACKS

APPLICATIONS

- Low voltage switching of line voltage lighting circuits.
- Low voltage switching by digital or mechanical controls for higher amperage loads including those of two different voltages.

DESCRIPTION

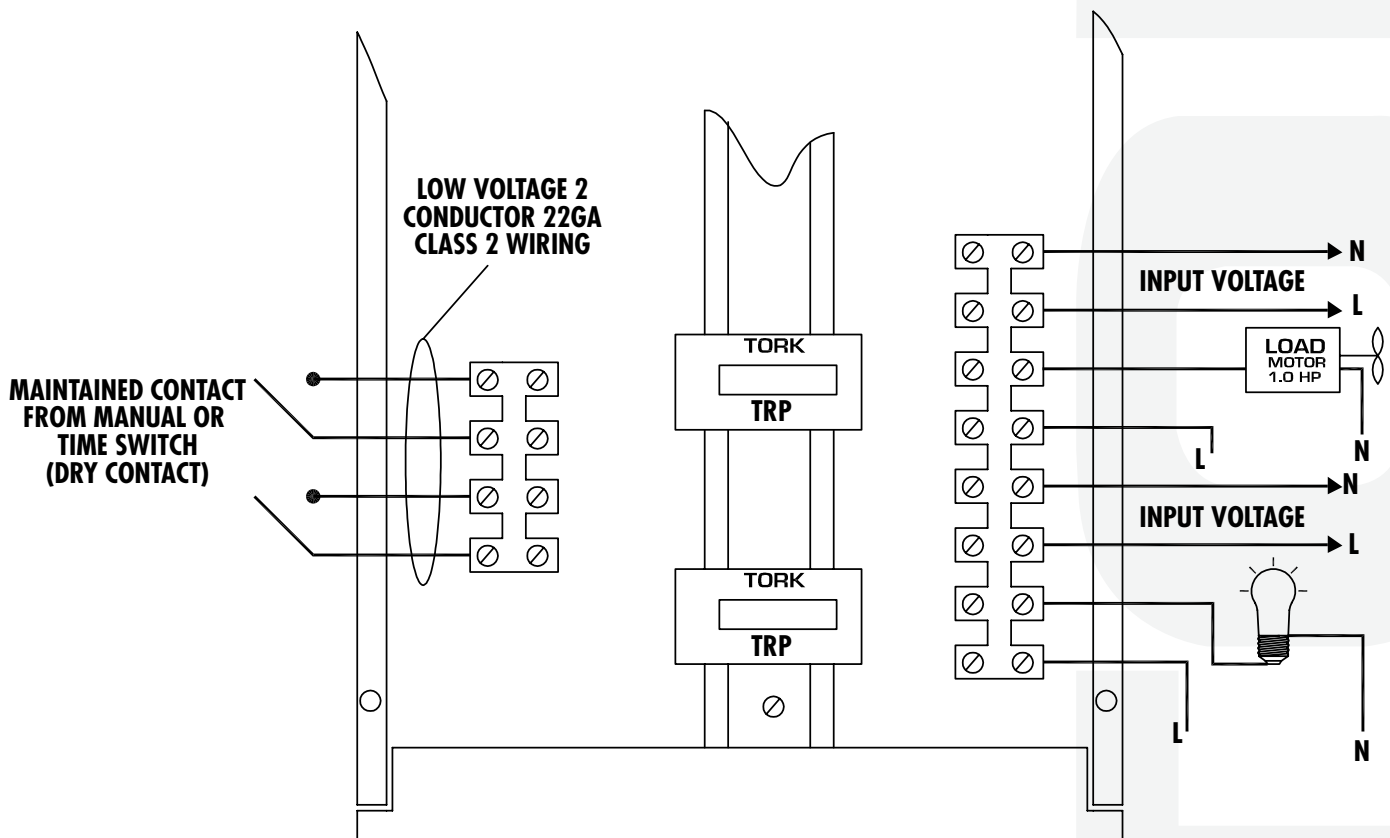
Self contained transformer and relay with SPST dry contacts rated at 20 AMP 120VAC, or 277VAC. Internal power source provides for low voltage control of line voltage contacts, thus eliminating the need for a separate step down transformer.

For multi-channel digital controls, TORK offers output panels, available in groups of 4 or 8

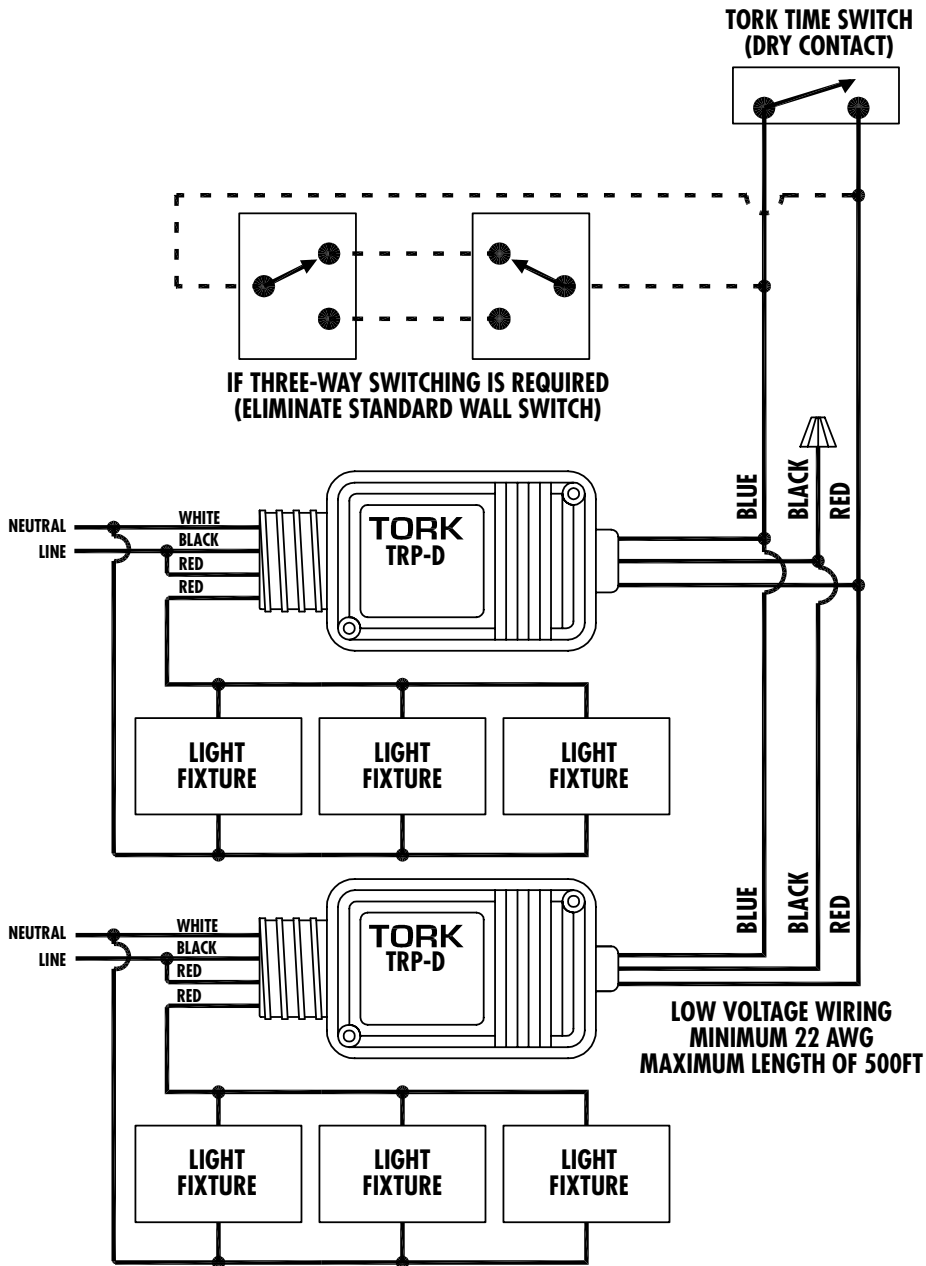
SPECIFICATIONS

Contacts:	SPST Dry Contacts
Contact Rating:	20 Amps Ballast
	20 Amps Incandescent (at 120VAC)
	20 Amps General Purpose
	1.0 Horsepower @ 120VAC
Temperature Range:	0° to 150°F (-18° to 66°C)

Input Voltage	Group of 4	Group of 8
120 VAC	TRP 400	TRP 800
277 VAC	TRP 402	TRP 802



LOW VOLTAGE CONTROL OF LIGHTING USING TRANSFORMER RELAY POWERPACKS



Low voltage wiring:
Minimum 22AWG
Maximum length of 500ft
TRP-D 120 / 277 Vac =
20amps ballast
20amps incandescent

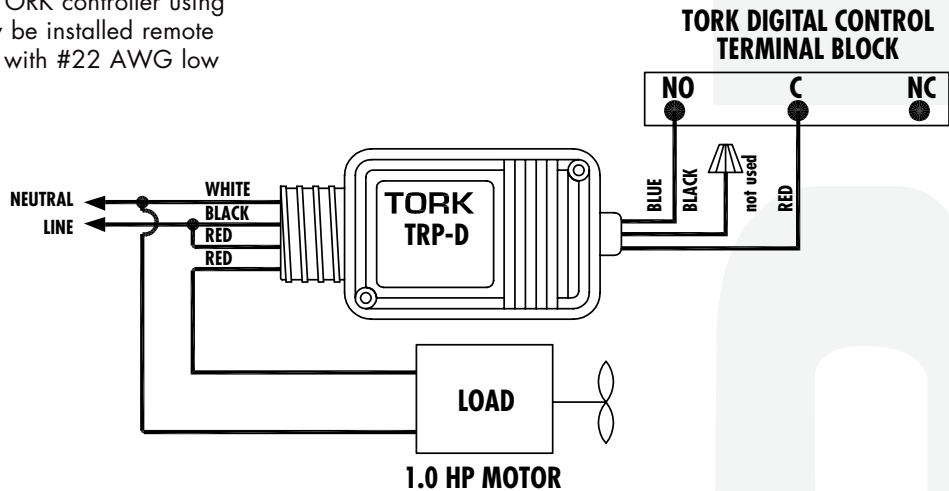
If three-way switching is required
(eliminate standard wall switch)

Standard wall switch or any digital time switch

ContactsNote: ALL SWITCHES SHOWN ARE MAINTAINED - NO MOMENTARY SWITCHES

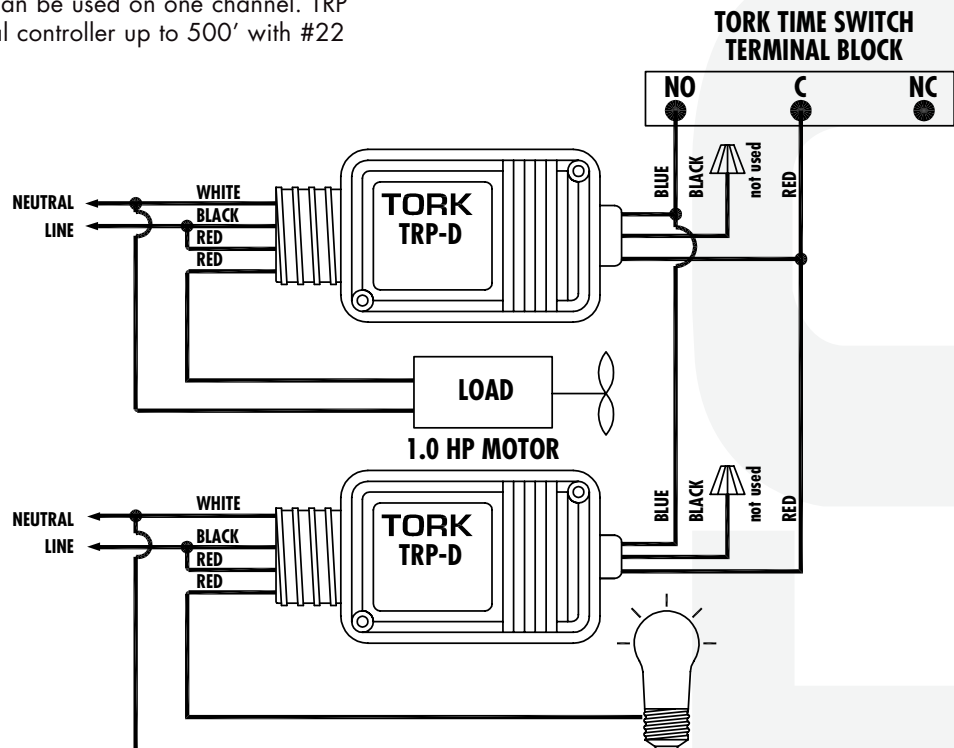
SWITCHING LOADS HIGHER THAN THE TIME SWITCH CONTACTS: SINGLE CIRCUIT CONTROL

For control by TORK digital time switches or lower amperage mechanical time switches where switching of higher load capacity is necessary. For example, 1.0 HP exhaust fan is switched by a TORK controller using simple low voltage wire. TRP may be installed remote from digital controller up to 500' with #22 AWG low voltage wire.



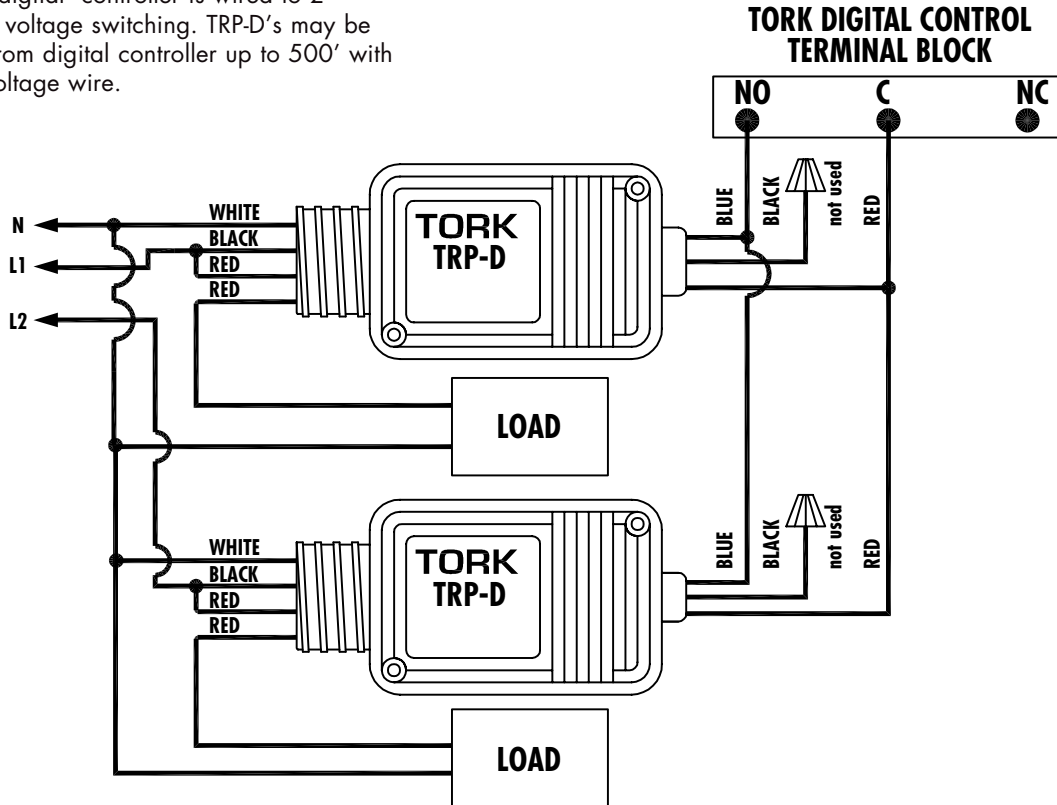
MULTI CIRCUITS: SINGLE CHANNEL CONTROL

For control of 2 different loads at the same time using low voltage wire with a single channel TORK controller. Use 2 TRP-D's which are connected in parallel. For example, exhaust fan and lighting load (each are 120V). Up to 5 TRP-D's can be used on one channel. TRP may be installed remote from digital controller up to 500' with #22 AWG low voltage wire.



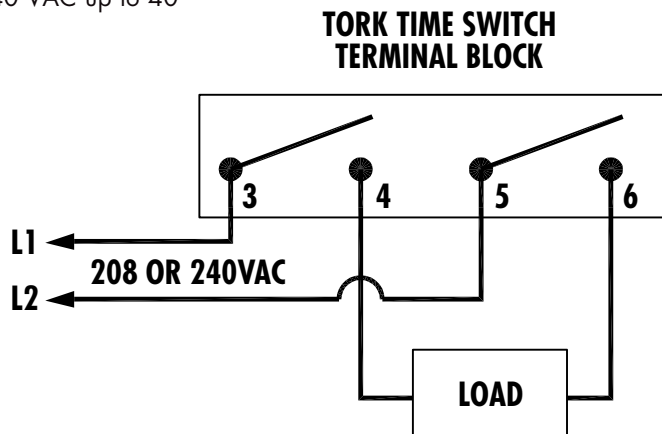
TYPICAL WIRING WITH TORK DIGITAL CONTROL SWITCHING 208-240 VOLTS WITH NEUTRAL: USING 2 TRP-D'S

To control 2 separate 120V circuits using 240V 3 wire lines. TORK digital controller is wired to 2 TRP-D's using low voltage switching. TRP-D's may be installed remote from digital controller up to 500' with #22 AWG low voltage wire.



SWITCHING 208-240 VOLTS WITHOUT NEUTRAL: E103B, EW103B AND EWZ103

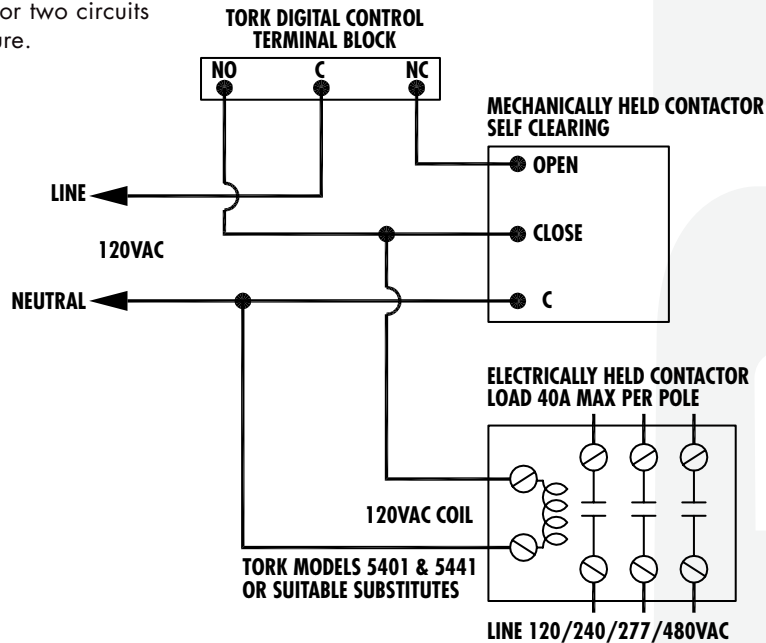
For control of loads rated 208-240 VAC up to 40 Amps resistive/inductive.



SWITCHING HIGHER VOLTAGE AND/OR AMPERAGE USING CONTACTORS

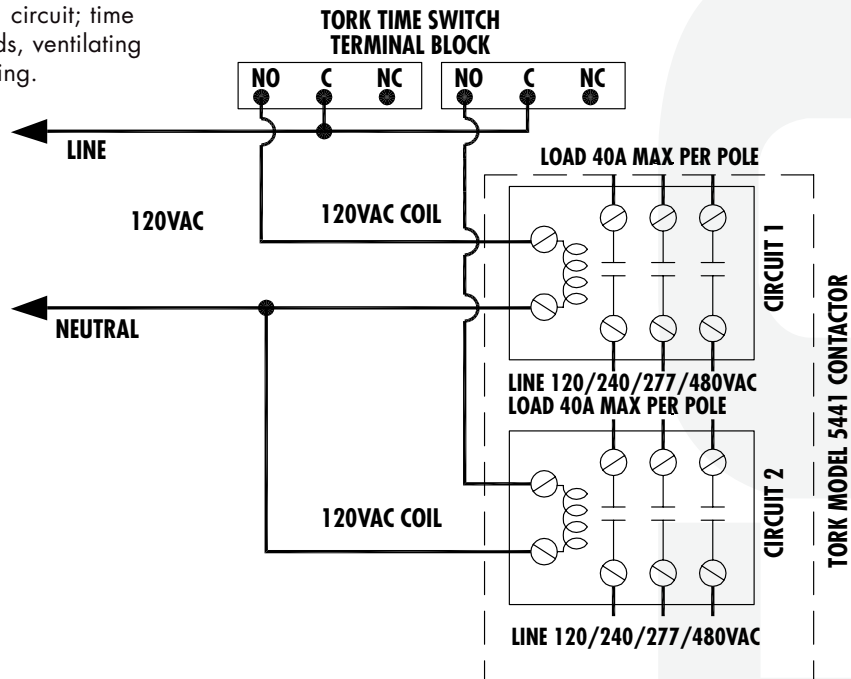
To control 120 volt circuits where increased voltage and/or amperage switching is necessary, close to or remote from controller. Can switch up to 40 amps per pole from 120VAC to 480 VAC, one or two circuits simultaneously. Indoor-outdoor enclosure.

TYPICAL WIRING WITH TORK CONTACTORS 5401, 5440 AND OTHER CONTROL SYSTEMS



TORK's model 5441 contains 4-3PST contactors - 40 Amp contacts - 8VA coil power per contactor - 120 VAC. Electrically-held in one enclosure (indoor only). Wire close to or remote from controller. Up to 4 contactors may be parallel wired to 1 circuit; time controlled, indoor lighting, motor loads, ventilating systems, refrigeration ambient defrosting.

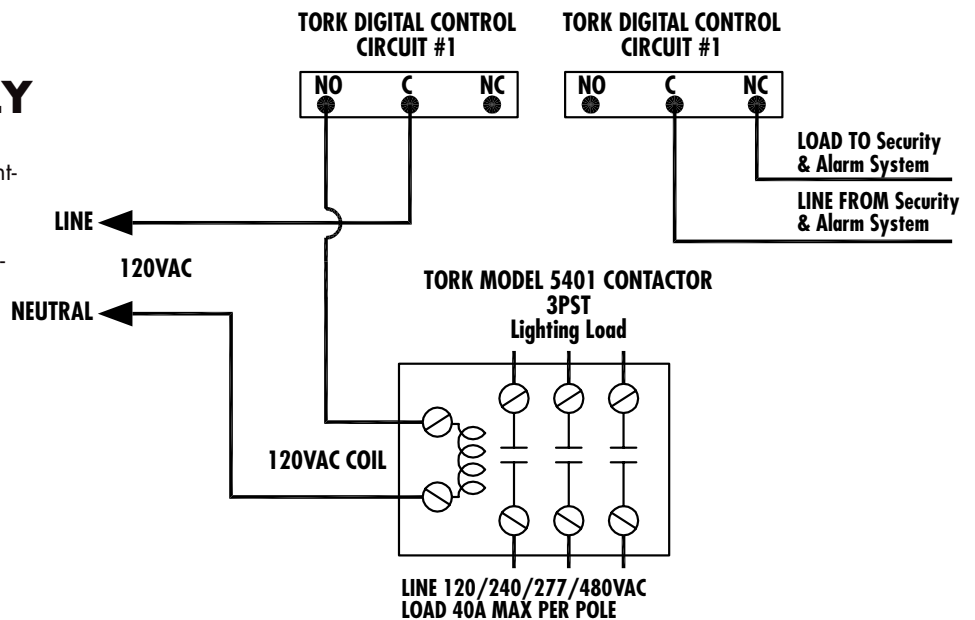
TYPICAL WIRING WITH TORK MODEL 5441 MULTIPLE ELECTRICALLY-HELD CONTACTORS



SINGLE CHANNEL CONTROLLING TWO DIFFERENT CIRCUITS ALTERNATELY

Combination day-time control of lighting/night-time control of security system.

Use NC of circuit 2 to turn "ON" security system when circuit 1 turns "OFF".

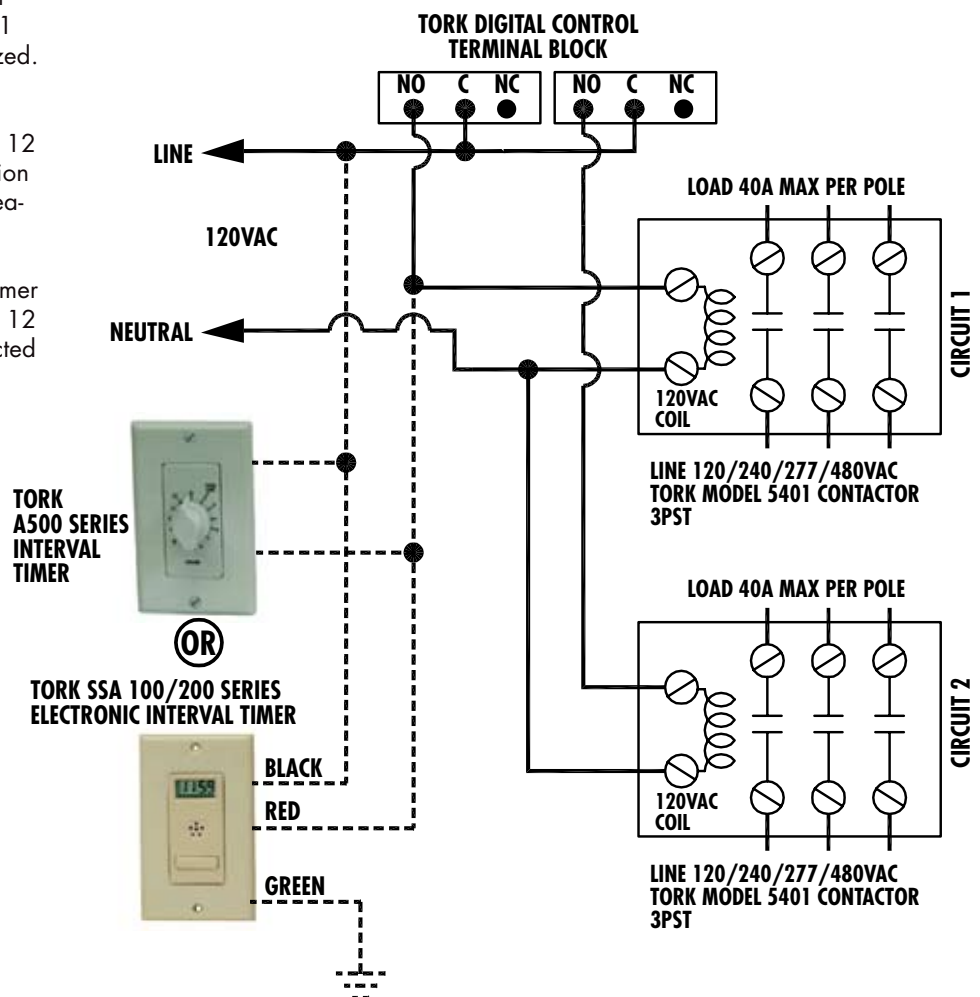


REMOTE STATION TIMED OVERRIDE OF LIGHTING CIRCUITS USING INTERVAL TIMER

For remote station timed override of lighting circuits where the TORK Digital Time Switch does not offer this feature. Two Model 5401 electrically-held lighting contactors are utilized.

TORK "A500 Series" spring wound interval timers can provide timed overrides of up to 12 hours. For remote manual override in addition to timed override, use models with HOLD feature for constant ON.

Tork SSA100/SSA200 electronic interval timer can provide remote timed override of up to 12 hours. A flicker/beep warning can be selected prior to turn-off.

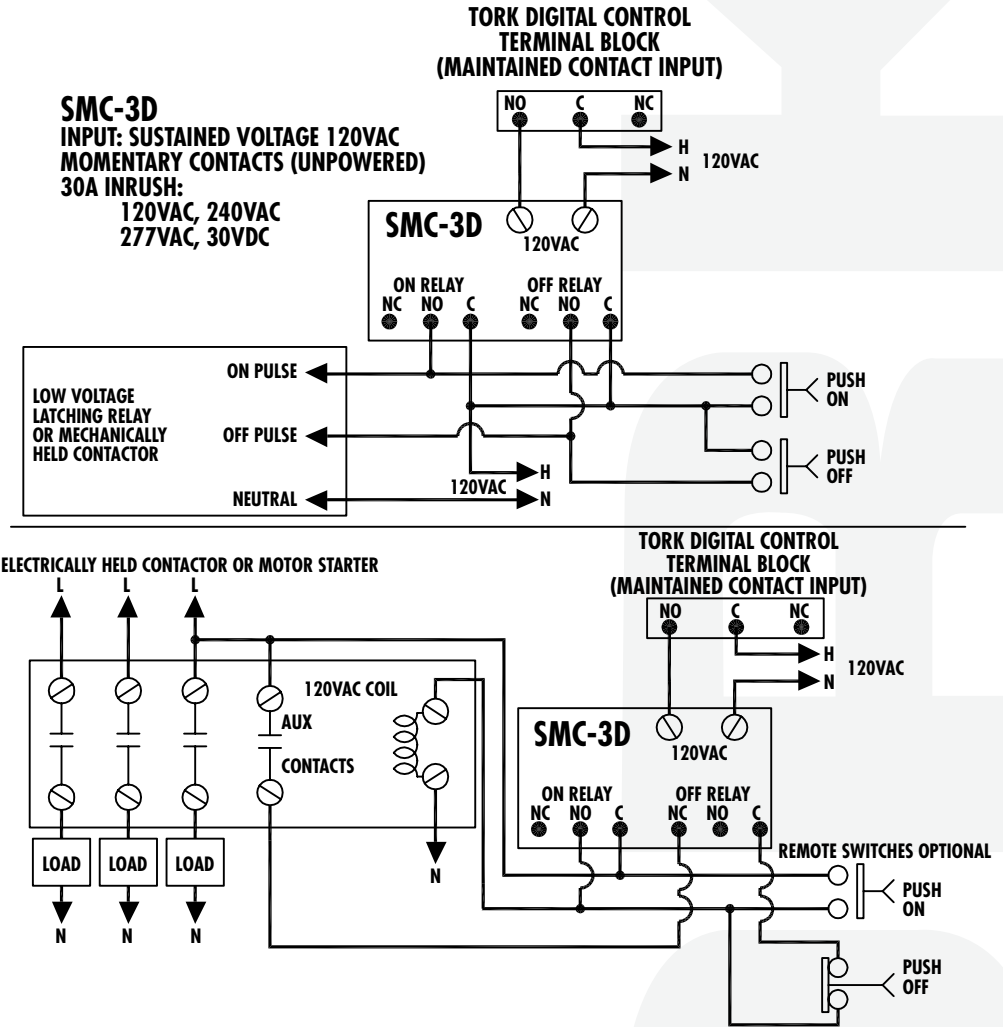


CONVERT MAINTAINED TO MOMENTARY CONTACT

The SMC-3D will operate low voltage latching relays or mechanically held contactors with or without remote manual push button override.

The adapter converts a constant applied 120VAC (input) to a 2 second contact closure at the "ON RELAY" output closing common and normally open (C, NO). When the constant applied 120VAC input opens, a 2 second contact closure at the "OFF RELAY" output between common and normally open (C, NO) occurs. The SMC-3D can be operated by any TORK time controller or a remote manual SPST standard constant "ON-OFF" switch.

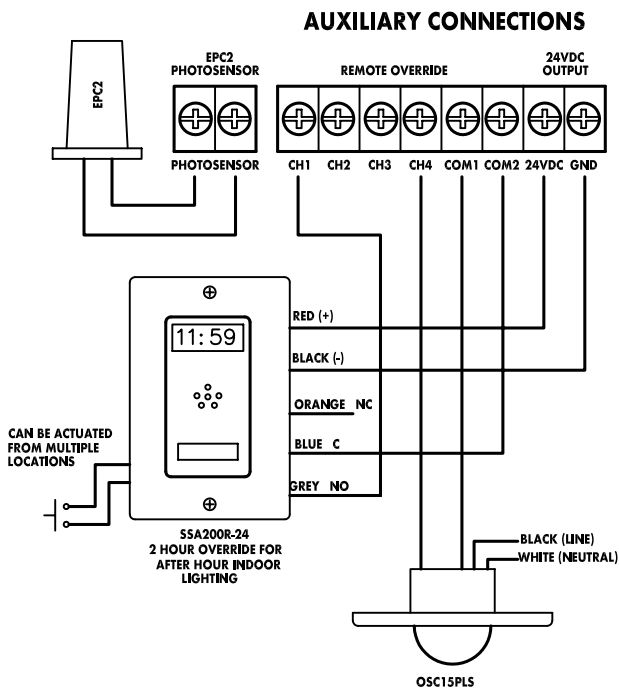
The SMC-3D with pulse "ON" an electrically held contactor or motor starter with self contained "ON-OFF" push buttons. "ON" relay will pulse 2 second "ON" and electrically hold the contactor "ON". By interrupting the holding circuit of the contactors "OFF" button across common and normally closed (C, NC) of the SMC-3D "OFF" relay the 2 second opening of common and normally closed (C, NC) will allow the electrically held contactors to open, thereby going "OFF".



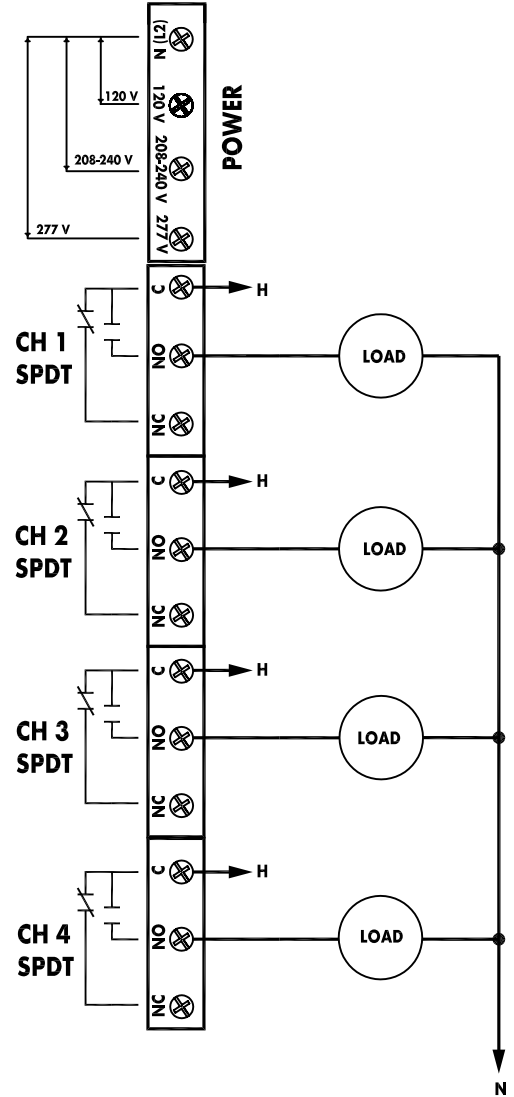
4 ZONE LIGHTING CONTROLLER WITH PHOTO SENSOR INPUT AND DRY CONTACT REMOTE OVERRIDE INPUTS

The DLC400BP is a multi-voltage, dedicated 4 zone lighting controller with photocell input in a NEMA 3 Enclosure. The unit has 30 AMP SPDT heavy duty contacts, therefore eliminating the need for costly contactors in most application. Each zone can be actuated by 1) The photosensor, or 2) Time of day, or 3) A combination of both. Light level setting at which lights turn on and off as well as time schedules are assigned independently to each zone, with the additional capability of remote override inputs from external switches or local override at the keypad.

1. Photo sensor input for all 4 zones each zone can be controlled through:
 - A. Time of Day ON/Time of Day OFF
 - B. Light Level ON/Time of Day OFF
 - C. Light Level ON/Light Level OFF
2. Remote Input override for all 4 zones
 - A. Each zone can accept a dry contact closure for remote override.
 - B. For timed remote override, use SSA 100/200 Series or A500/C500 Series.
3. Low Voltage (24VDC) supply by the unit to power low voltage circuits such as occupancy sensors.

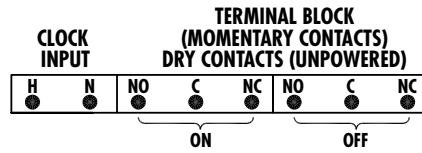


TORK DIGITAL CONTROL TERMINAL BLOCK

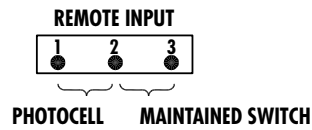


UNIVERSAL INPUT FROM PHOTOCELL

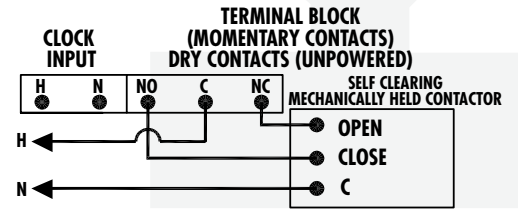
TORK MODEL DGUM 100



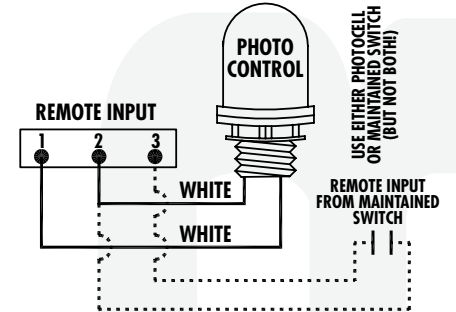
Single channel time switch accepts remote input from any dry maintained contact closure and photocell or thermostat. Use to control outdoor lighting or HVAC.



TORK MODEL DGU 100



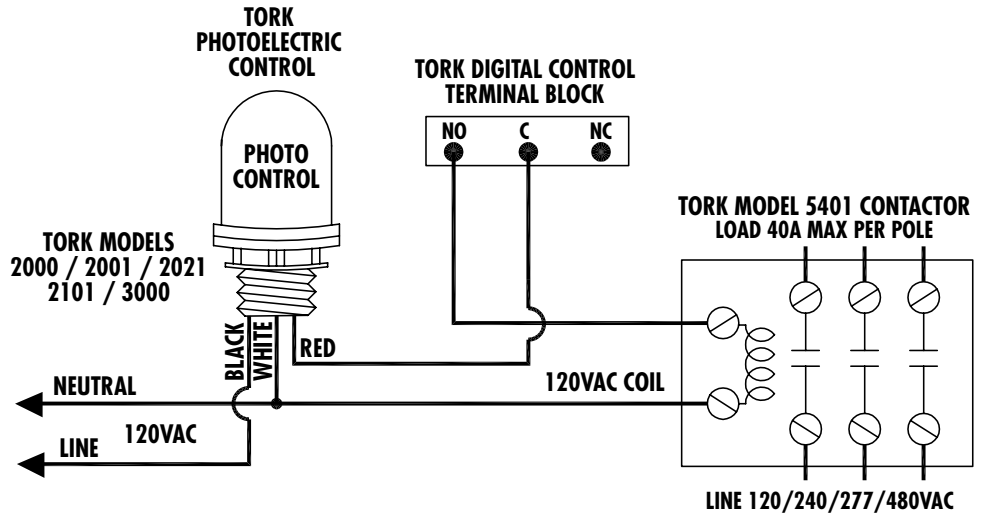
TORK EPC1



COMBINATION PHOTOCONTROL/TIMED ON-OFF SWITCHING OF GREATER LOAD CAPACITIES

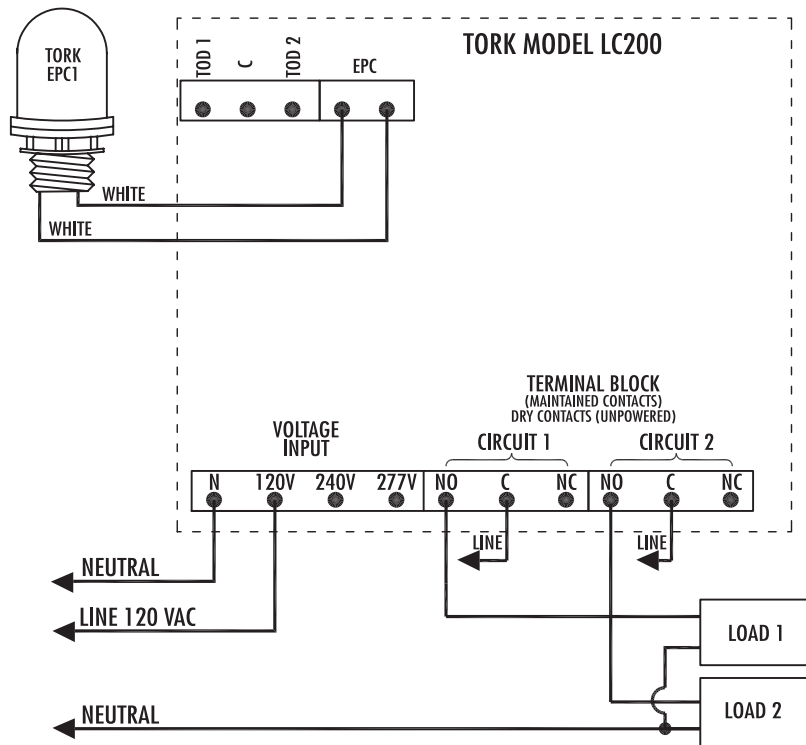
To control lighting circuits where a Photocontrol turns "ON" at dusk (controller should be set for "ON" before dusk) and "OFF" by preset times of 120VAC controller. Controller can be set to turn "ON" early a.m. before dawn, and have Photocontrol turn "OFF" at dawn...turn back "ON" at dusk, and controller turns lights "OFF" during nights when lighting is no longer needed.

Photocontrol can be wired direct to 120VAC control circuits.



LIGHTING CONTROLLER INDEPENDENT LIGHT LEVEL/TIME-OF-DAY OPERATION OF TWO LIGHTING ZONES (I.E. 2 LEVEL ATRIUM LIGHTING)

The LC200 consists of an electronic control and an electronic light sensor interacting. The unit offers separate control of two lighting zones, each with user settable on/off light level setpoints. The Electronic control also offers two digital inputs which will accept a contact closure from any Tork Timer(s), or existing EMS system to provide for independent Time-Of-Day override.



DIGITAL LIGHTING CONTROLLER MODEL DGLC

1. For wiring to electrically-held contactor - see Fig. 1
2. For coil clearing mechanically-held contactor - see Fig. 2
3. Fig. 1 and Fig. 2 - one circuit can be used to control electronically-held contactor while the other circuit controls a mechanically-held contactor.

FIG. 1

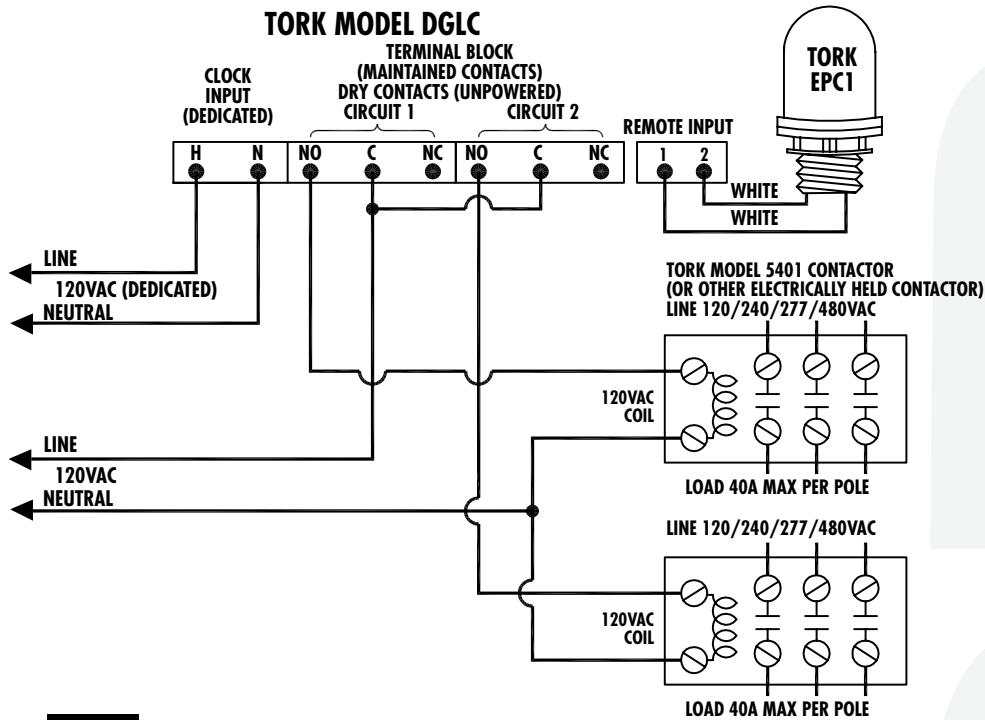
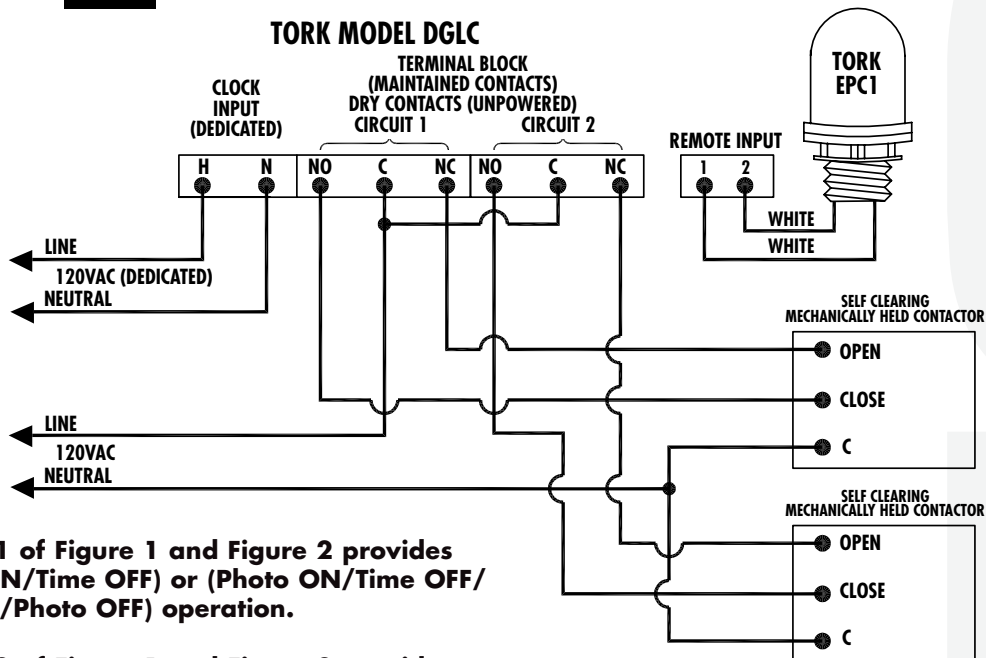


FIG. 2



CIRCUIT 1 of Figure 1 and Figure 2 provides (Photo ON/Time OFF) or (Photo ON/Time OFF/Time ON/Photo OFF) operation.

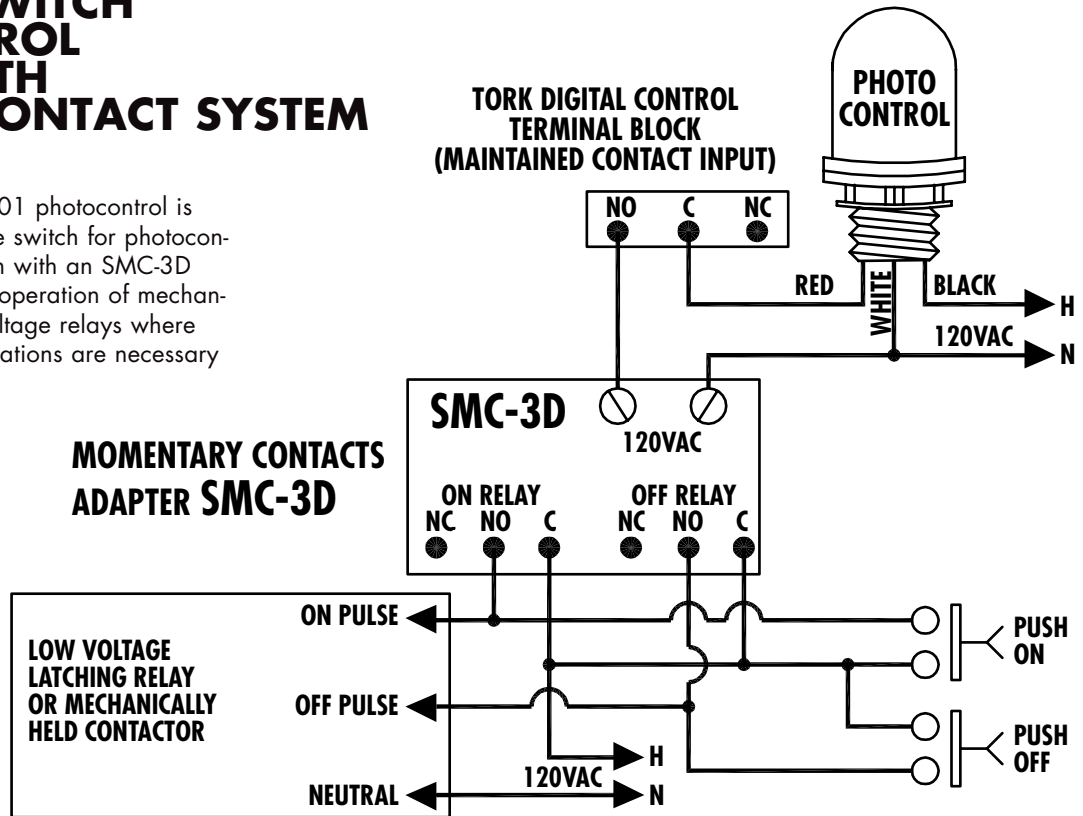
CIRCUIT 2 of Figure 1 and Figure 2 provides (Photo ON/Photo OFF) operation.

**MODEL DGLC - 120 V
MODEL DGLC-3 - 277V**

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DIGITAL TIME SWITCH & PHOTOCONTROL OPERATING WITH MOMENTARY CONTACT SYSTEM

TORK Model 2000, 2001 or 2101 photocontrol is wired in series with a digital time switch for photocontrol ON/timed OFF in connection with an SMC-3D momentary contact adapter. For operation of mechanically-held contactors and low voltage relays where remote momentary push button stations are necessary or already exist.



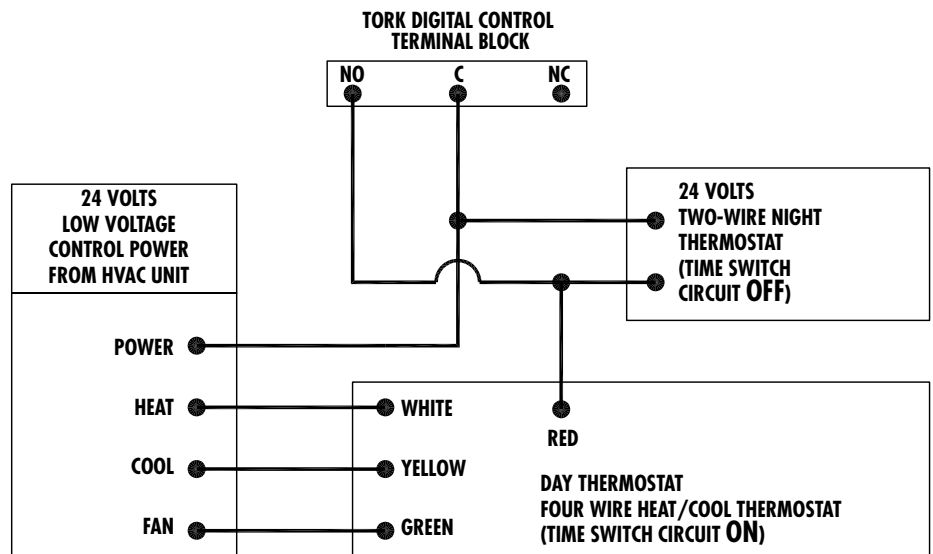
TIME SWITCH CONTROLLING DAY/NIGHT THERMOSTATS (SET-BACK/SET-UP)

A typical wiring diagram using a digital control for night set-back for heating or night set-up for cooling.

Winter Set-back: Set 2-wire night thermostat at 55°F. When control is "OFF" temperature will not go below 55°.

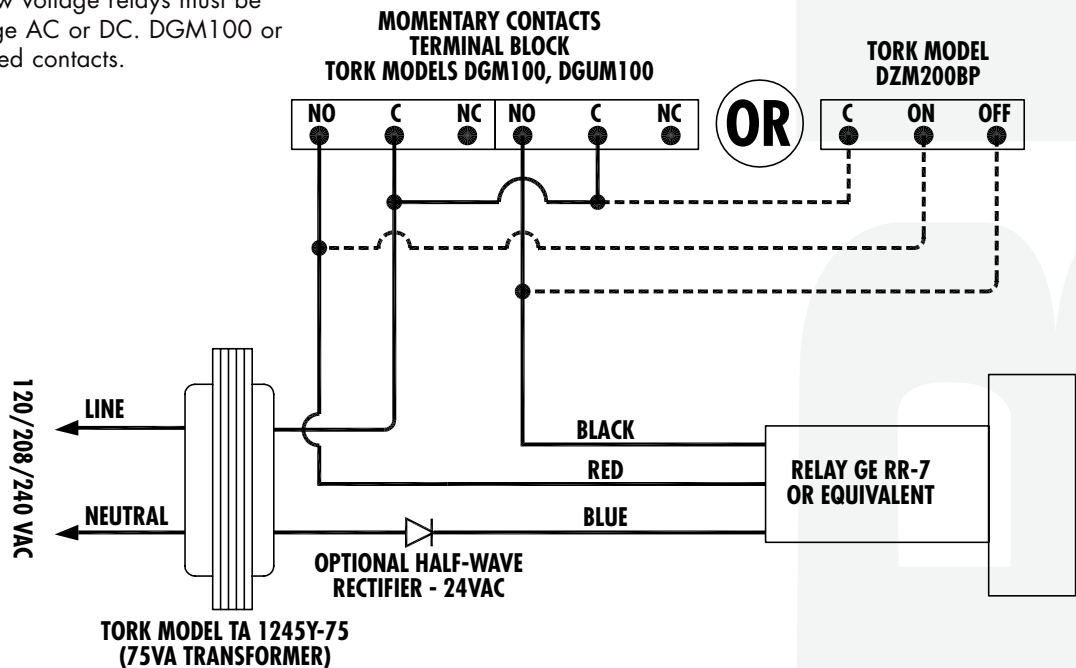
When control is "ON" (day hours) day thermostat set at 70° to 72° will override night thermostat.

Summer set-up: Night thermostat is usually set at 90° to 95°. When control turns "ON", day thermostat will override night setting and cool to (76° to 78°) day setting.



MOMENTARY CONTACT TIME SWITCH FOR LOW VOLTAGE LIGHTING CONTROL

To operate GE type low voltage control of lighting, ventilating, etc. where low voltage relays must be pulsed. Switch low voltage AC or DC. DGM100 or DGUM100 has unpowered contacts.

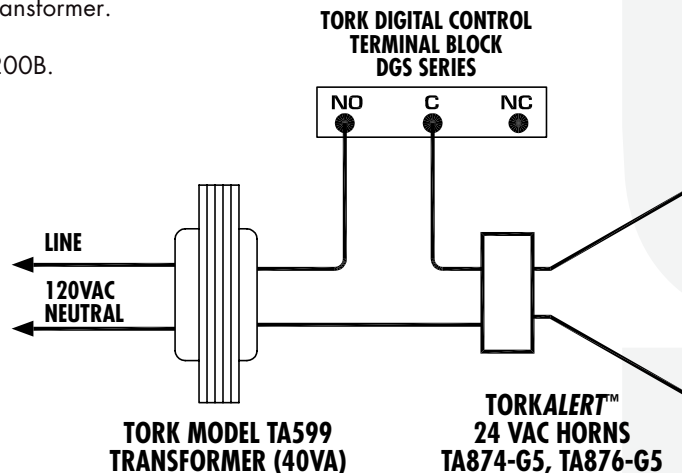


DIGITAL CONTROL FOR SIGNALING DEVICES

For control of low voltage horns, bells, or lights.
Varied schedules are possible on different days + 2
different user selectable signal durations.

For line voltage signaling devices, omit transformer.

For 2 channel signaling, use Model DTS200B.



TIMED OVERRIDE "ON" FOR LIGHTING, HVAC WITH WARNING OFF INDICATION COVERS FROM 120 THRU 277 VAC

The LDS / LDS-A is an accessory to any TORK maintained contact time switch and is used to extend the lighting time after the main time switch turns OFF a lighting circuit. An approximate $\frac{1}{2}$ second blink will occur as a warning that the lighting will go OFF in (user selectable) 1 or 5 minute warning period.

Remote momentary ON/OFF push button switches can be connected to the designated terminal of the Lighting Delay Switch using low voltage # 18 - 22 AWG twisted pair wires. Pressing the remote ON button momentarily during the 1 or 5 minute warning period (before the lights go out) will extend the time ON for a user selectable $\frac{1}{2}$ hour, 1 hour, 1-1/2 hour, 2 hours, 6 hours, 9 hours, or 12 hours. At the end of the extended time a warning blink will again occur, allowing personnel to repeat another 12 hour extension if necessary. Pressing the remote OFF button for 3 to 4 seconds will terminate the extension of time, and initiate the warning blink. The lights will turn OFF after the 1 or 5 minute warning period.

The LDSH / LDSH-A is an accessory to any TORK maintained contact time switch and is used to extend the time on of lighting, HVAC, and other main building loads after the time switch turns OFF. An auxiliary contact closes, turning on a user selected signal device (i.e. bell, horn, light, or other warning device), which turns off along with the main load at the end of the user selected 1 or 5 minute warning period.

Remote momentary ON/OFF push button switches can be connected to the designated terminal of the Lighting Delay Switch using low voltage # 18 - 22 AWG twisted pair wires. Pressing the remote ON button momentarily during the 1 or 5 minute warning period will extend the time on (main load) for a user selectable 1/2 hour, 1 hour, 1 1/2 hour, 2 hours, 6 hours, 9 hours or 12 hours. At the end of the extended time, the user selected signal device will turn on again, allowing personnel to repeat another 1/2 hour – 12 hour extension of the main load. Pressing the remote off button for 3 to 4 seconds will terminate the extension of time for the main load and warning circuit. The main load and warning circuit will turn off after the 1 or 5 minute warning period.

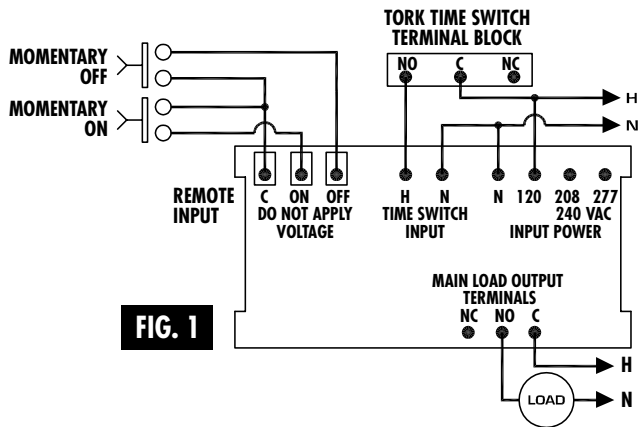


FIG. 1

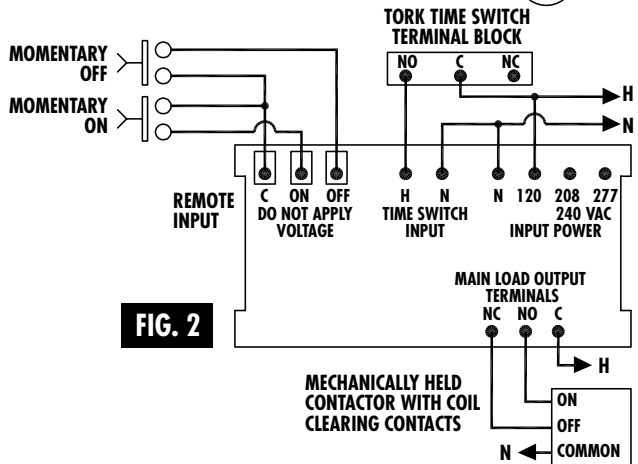


FIG. 2

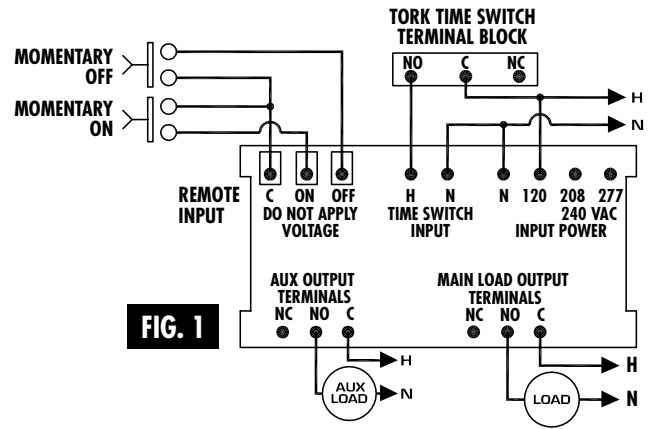


FIG. 1

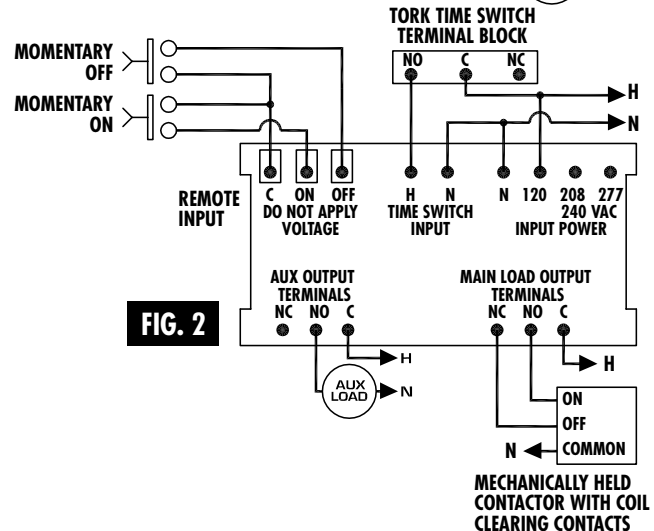
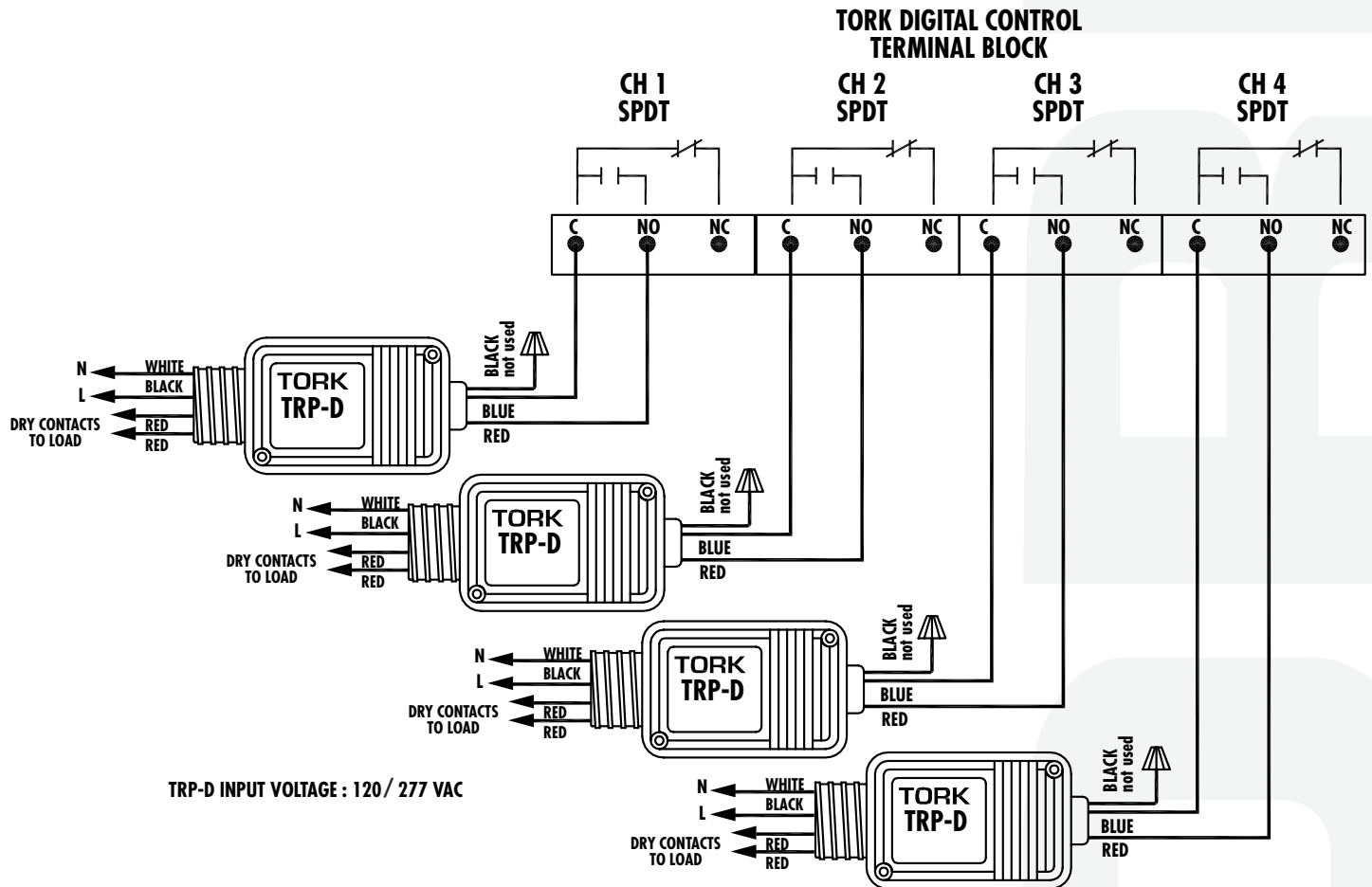


FIG. 2

TYPICAL WIRING WITH TRANSFORMER RELAY POWERPACK (TRP-D) FOR SWITCHING OF GREATER LOADS DRY CONTACT OUTPUT



APPLICATIONS:

Use TORK Model TRP-D directly with TORK Digital Controls Model K400Z/K401Z/K600Z/K601Z/K800Z/K801Z (dry contact output) where switching of higher load capacity is necessary.

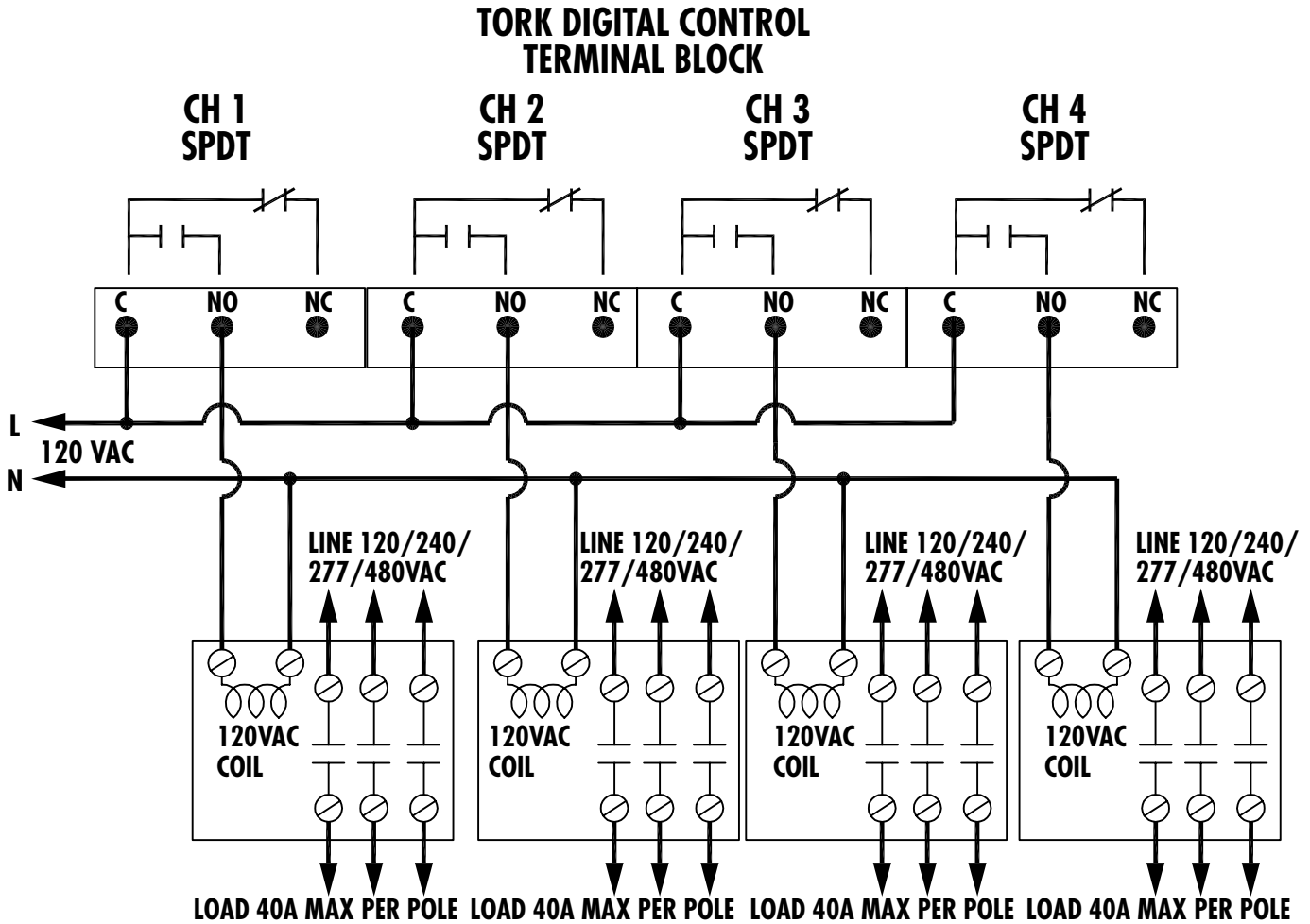
SWITCH CAPACITY

- 20A Ballast
- 20A Incandescent (at 120VAC)
- 20A General Use
- 1.0HP at 120VAC

TRP-D 120VAC or 277VAC input

Use low voltage wiring between TORK Digital Control contacts and TRP-D - minimum 22 AWG, maximum length 500 feet.

TYPICAL WIRING WITH 5401 OR 5441 FOR SWITCHING OF GREATER LOADS DRY CONTACT OUTPUT



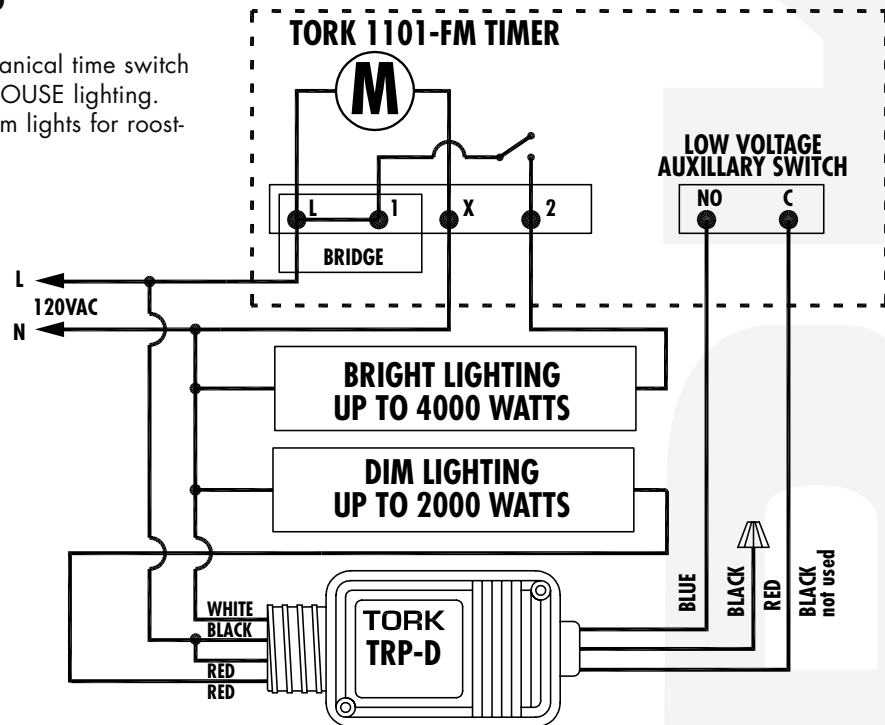
APPLICATIONS:

TYPICAL WIRING OF TORK CONTACTORS 5401, 5441 TO MULTI-CHANNEL K400Z/ K401Z/K600Z/K601Z/K800Z/K801Z

Use where increased voltage and/or amperage switching is necessary, close to or remote from controller.
Can switch up to 40 amps per pole from 120VAC to 480VAC.

TIME SWITCH DIMS LIGHTING DURING SELECTED PERIODS

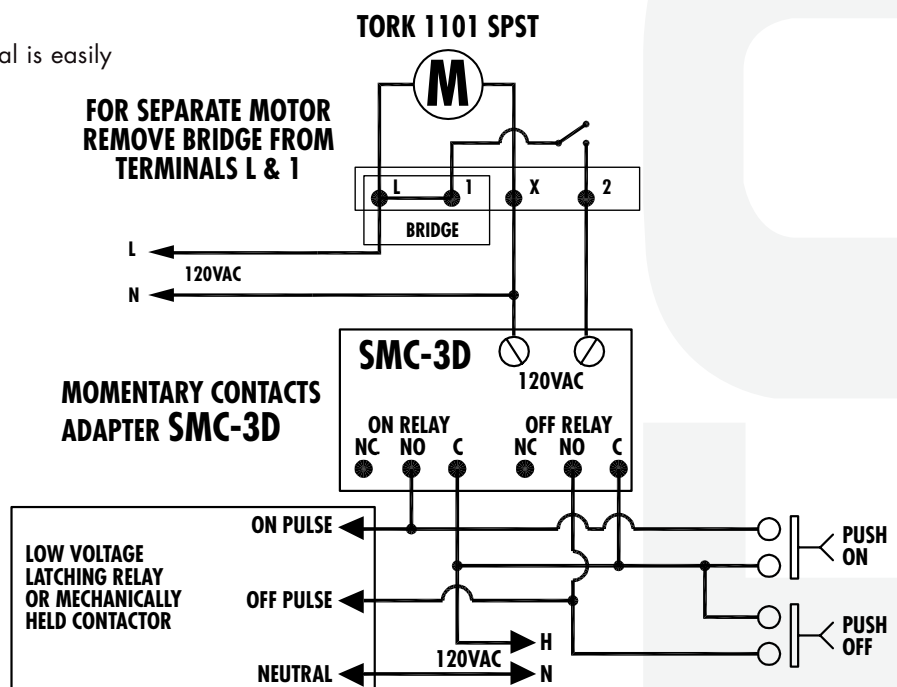
Typical wiring with TORK electromechanical time switch for automatic switching of POULTRY HOUSE lighting. Bright lighting to simulate daylight - dim lights for roosting.



TIME SWITCH OPERATING WITH MOMENTARY CONTACT SYSTEM

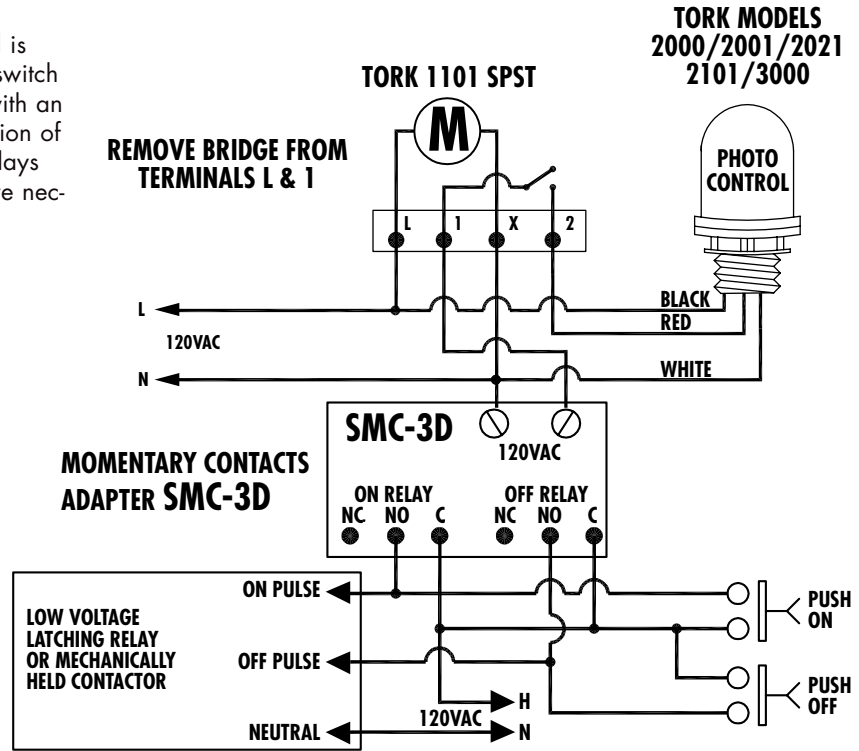
TORK Model 1101 SPST time switch for scheduled ON-OFF is connected to an SMC-3D momentary contact adapter. For operation of mechanically-held contactors and low voltage relays where remote momentary push button stations are necessary or already exist.

For outdoor lighting, Z kit astronomic dial is easily adaptable to Models 1101.



MECHANICAL TIME SWITCHES AND PHOTOCONTROL OPERATING WITH MOMENTARY CONTACT SYSTEM

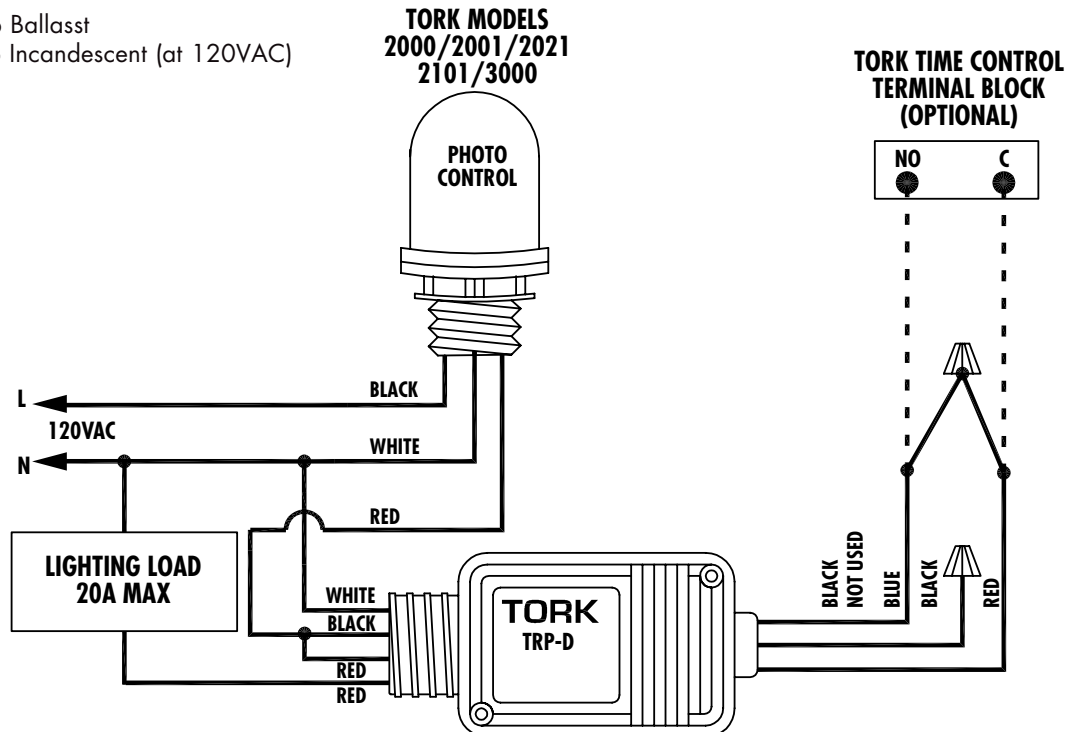
TORK Model 2000, 2001 or 2101 photocontrol is wired in series with Model 1101 or 1102 time switch for photocontrol ON/timed OFF in connection with an SMC-3D momentary contact adapter. For operation of mechanically-held contactors and low voltage relays where remote momentary push button stations are necessary or already exist.



TIME SWITCH/PHOTOCONTROL SWITCHING GREATER LOAD CAPACITIES

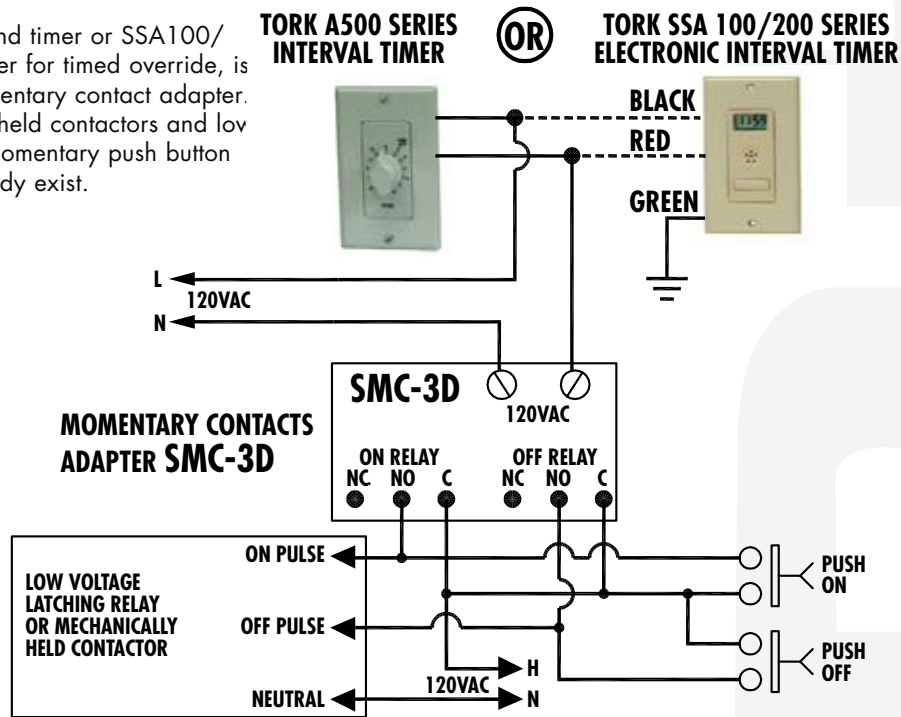
Use TRP-D for direct switching of remote lighting loads by photocontrol / time switch.

Applicable for 20 Amp Ballast
20 Amp Incandescent (at 120VAC)



SPRING-WOUND TIMER OPERATING WITH MOMENTARY CONTACT SYSTEM

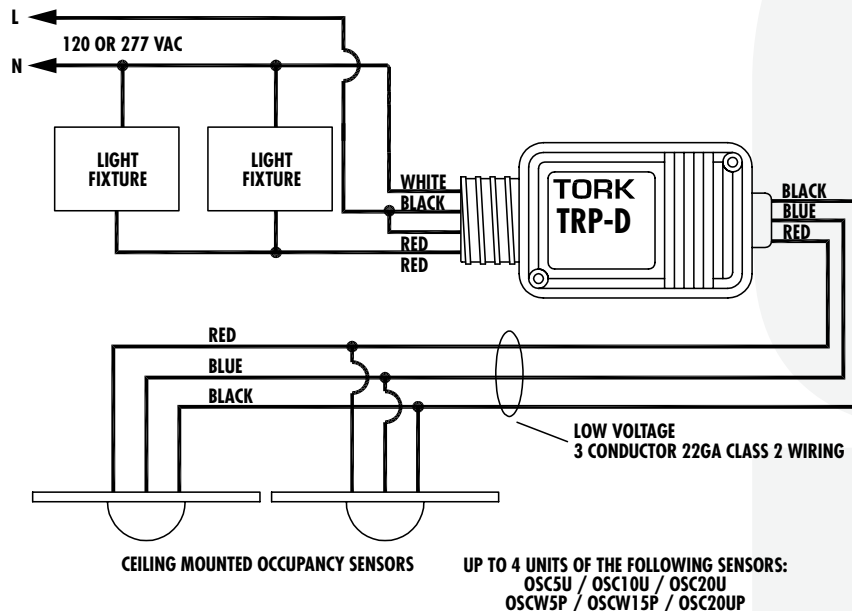
TORK A500 series spring-wound timer or SSA100/SSA200 electronic interval timer for timed override, is connected to an SMC-3D momentary contact adapter. For operation of mechanically-held contactors and low voltage relays where remote momentary push button stations are necessary or already exist.



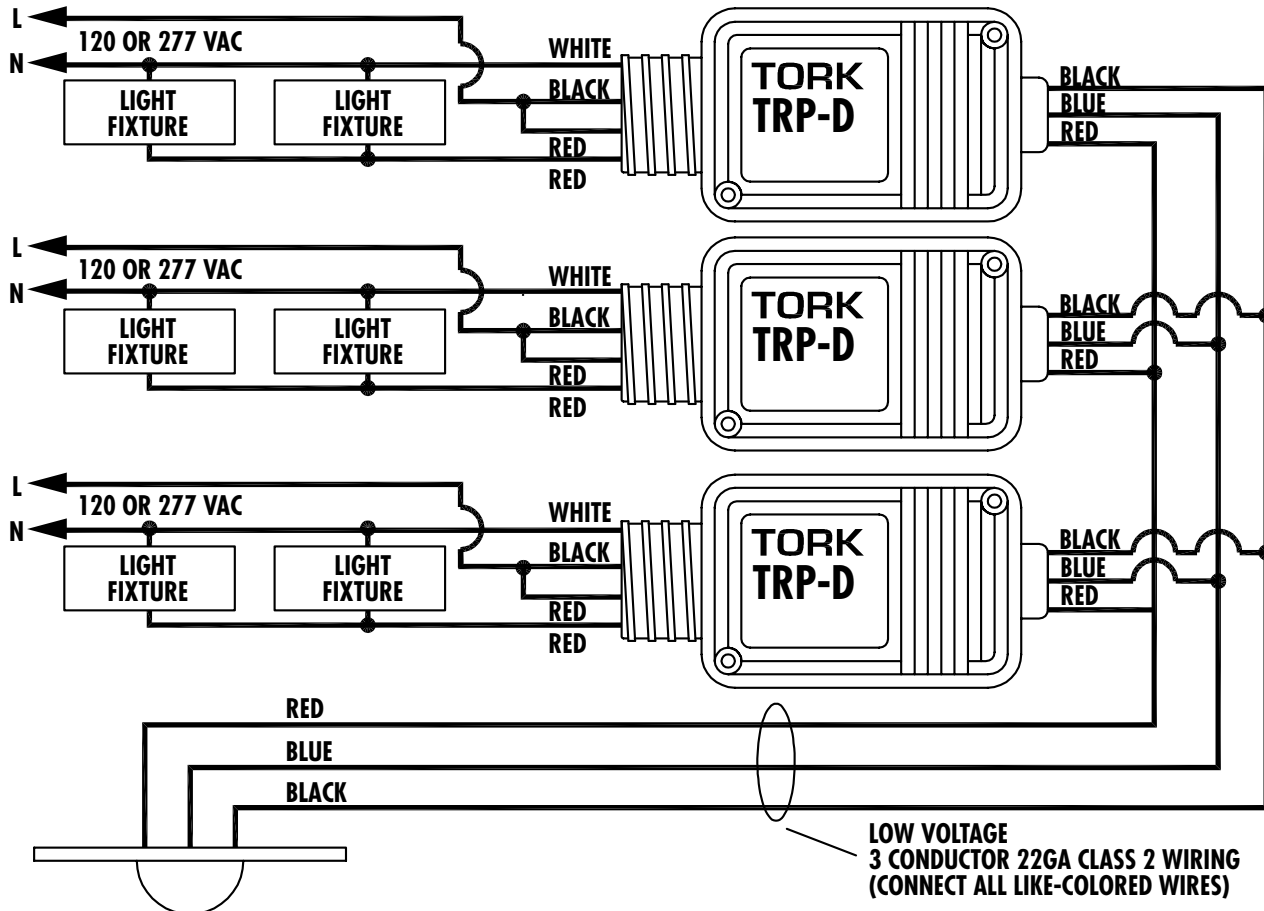
FOR INCREASED AREA COVERAGE, ONE TRP-D POWERPACK CAN OPERATE A MAXIMUM OF 4 OSC5U/OSC10U/OSC20U/OSCW5P/PSCW15P/OSC20UP SENSORS

Use TRP-D for direct switching of remote lighting loads by photocontrol / time switch.

Applicable for
20 Amp Ballast
20 Amp Incandescent
(at 120VAC)



FOR MULTI CIRCUIT CONTROL, A MAXIMUM OF 5 TRP-D POWERPACKS CAN BE CONNECTED TO ONE OSC5U/OSC10U/OSC20U/OSCW5P/OSCW15P/OSC20P SENSOR



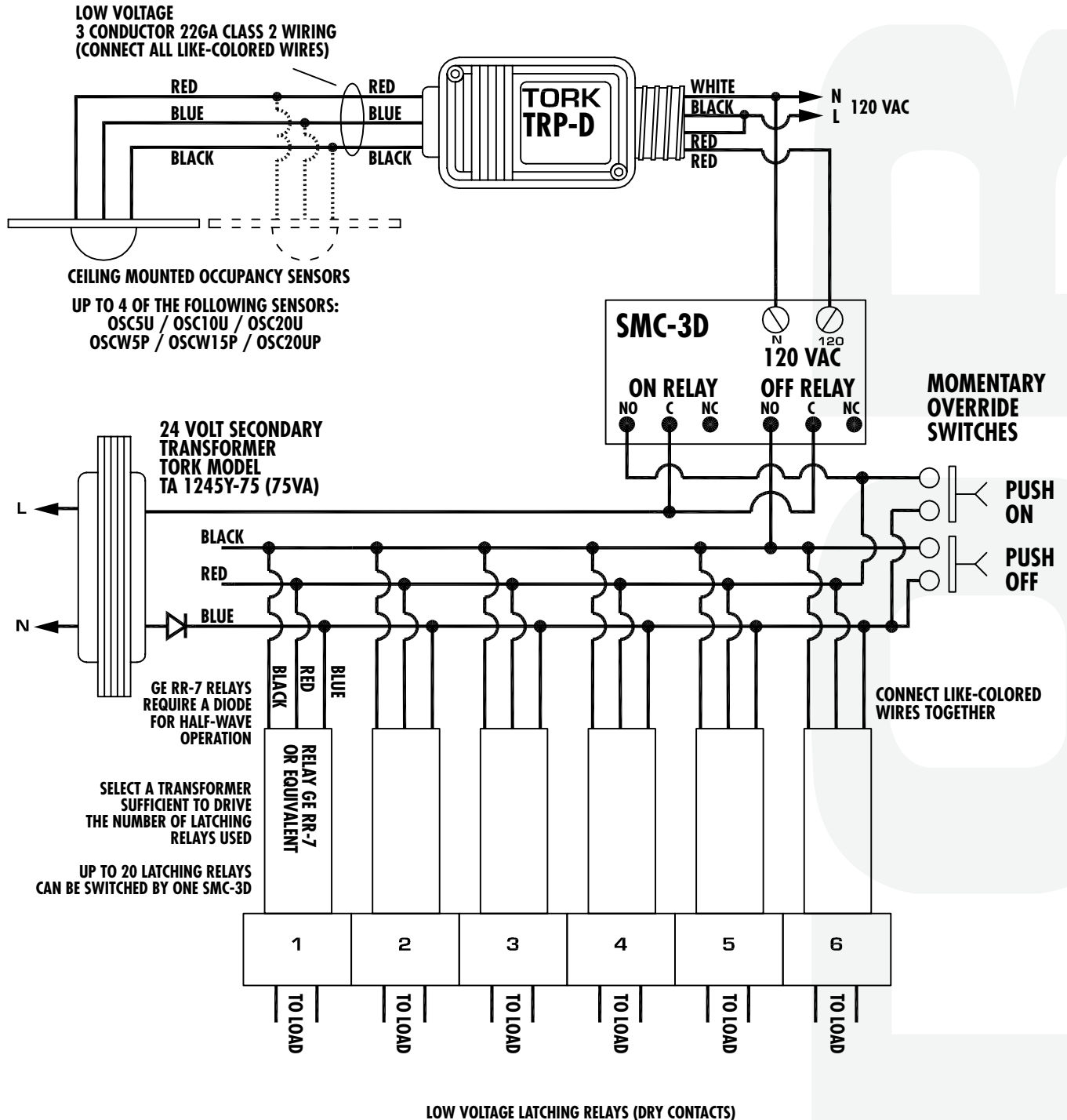
CEILING MOUNTED OCCUPANCY SENSORS

OSC5U / OSC10U / OSC20U
OSCW5P / OSCW15P / OSC20UP

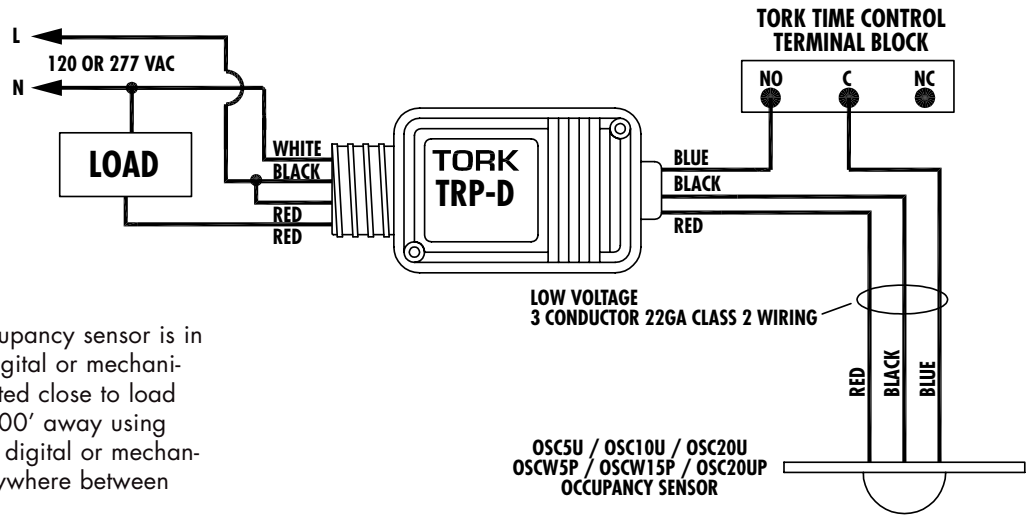
OCCUPANCY SENSORS FOR LOW VOLTAGE LIGHTING SYSTEMS USING TORK MODEL SMC-3D

NOTES:

1. For increasing area coverage, a maximum of 4 OSC5U/OSC10U/OSC20U/OSCW5P/OSCW15P/OSC20UP sensors can be connected.
2. For additional loads, a maximum of twenty (20) latching relays can be connected to each SMC-3D
3. To override load OFF when exiting, momentary push-button switches can be installed at strategic locations.

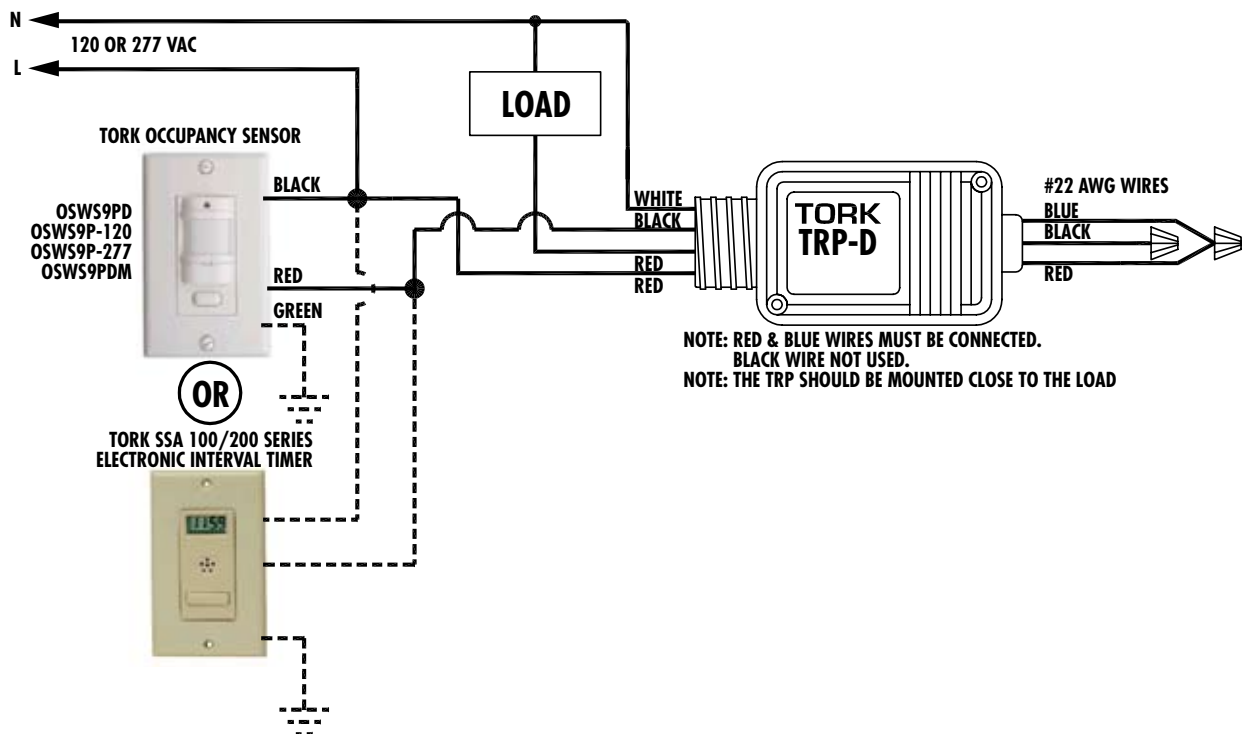


TIME SWITCH DETERMINING PERIODS DURING WHICH OCCUPANCY SENSOR IS OPERATING



To control what time of day the occupancy sensor is in operation determined by a TORK digital or mechanical time switch. TRP-D can be mounted close to load and sensor can be installed up to 500' away using #22 AWG low voltage wire. TORK digital or mechanical time switch can be installed anywhere between the TRP-D and sensor.

OSWS9P OCCUPANCY SENSOR OR SSA100/SSA200 INTERVAL TIMER SWITCHING GREATER LOAD CAPACITIES BY USING TRP-D



NOTES

Empty rectangular box for notes.

TORK TECHNICAL INFORMATION: 888.500.4598

