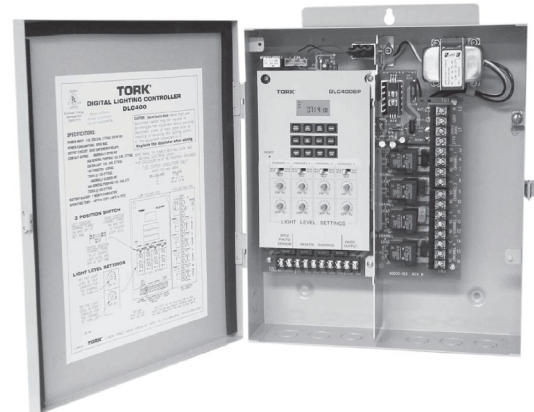


# TORK<sup>®</sup> nsi INDUSTRIES

## INSTRUCTION MANUAL

# DLC400BP

## DIGITAL LIGHTING CONTROLLER



# TORK MODEL DLC400BP DIGITAL LIGHTING CONTROLLER

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**CAUTION: RISK OF ELECTRIC SHOCK** – More than one disconnect switch may be required to de-energize the equipment before servicing. Disconnect power at main panel prior to installing or servicing this lighting control or the equipment connected to it. Connect in accordance with national and local electrical codes.

### INSTALLATION:

UNIT IS TO BE INSTALLED BY A LICENSED ELECTRICIAN

1. Remove unit cover before installing the unit.
2. Lift the deadfront above stud at top side and swing left to access the bottom holes for mounting.
3. Bring in the low voltage wires from the EPC2, remote override, and 24VDC output to the left compartment of the unit and bring in all line voltage wires to the right side of the compartment.
4. Do not run low voltage wires and line wires through the same conduit.
5. Follow all local and NEC codes when wiring the unit.
6. Replace the deadfront after wiring and secure it in place.
7. When attaching conduit to enclosure, exercise care to align and support conduit in order to prevent unnecessary stress on enclosure.
8. **Install 9V lithium battery supplied with the unit.** Note: Unit should be connected to AC power within 24 hours of battery installation in order to prolong battery life which has a 6 month cumulative backup for real time and 7-10 year shelf life. REPLACE WITH ANOTHER 9V NON-RECHARGEABLE LITHIUM BATTERY ONLY.

### GROUNDING:

Ensure that grounding is continuous and in proper electrical contact in all grounding conductors, metallic conduits and grounding terminals, and that the minimum size copper grounding conductors are #10 AWG if the circuit breaker or fuse is 30 or 40 amps, #12 AWG if 20 amps, and #14 AWG if 15 amps, according to National Electrical Code.

**SELECTION OF FUNCTION MODES AND LIGHT LEVEL SETTINGS:**

Each channel can be assigned via the slide switches to one of three distinct function modes:

- 1. **Time ON/Time OFF**
- 2. **Light level (photo) ON/Time OFF**
- 3. **Light level (photo) ON/Light level (photo) OFF**

**NOTE:** Photosensor has instant ON and 20 seconds OFF delay.

- 1. **In Time ON/Time OFF Mode** (figure 1) the channel is controlled by timer functions and light level is irrelevant. All events are executed by the timer schedule. For programming the timer, refer to section 6.0.
- 2. **In Photo ON/Time OFF Mode** (Figure 2, Arrow 2), channel will turn **ON** and **OFF** based on the combination of timer and light level settings. Note: 2 conditions must be met for the channel to turn **ON**. 1) The ambient light level falls below the **ON fc** setting (Arrow 3) and 2) the channel is scheduled to be **ON** at that time. Typically an **OFF** time setting for during the night will be set by the user. Otherwise, the channel will turn **OFF** when the ambient light comes above the "**OFF fc**" light level setting (Arrow 4). This mode permits the channel to turn **OFF** and **ON** as many times as needed, in the period between SUNSET and SUNRISE. In this illustration, the light level for ON fc is about 10 Foot-Candles, and the light level for OFF fc is about 100 Foot-Candles. Refer to the section 6.0 "Scheduling ON's/OFF's."
- 3. **Photo ON/Photo OFF Mode:** (Figure 3, Arrow 5) channels that are in this mode will turn **ON** and **OFF** based on the light level settings. The timer settings will be ignored in this mode: All programs either **ON** or **OFF** will not be executed.

A channel will turn **ON** when light level is below the **ON fc** light level setting for that channel (Arrow 6). The channel will then turn **OFF** when light level goes above the **OFF fc** setting for that channel (Arrow 7).

In this illustration, the light level for **ON fc** is about 30 Foot-Candles, and the light level for **OFF fc** is about 10 Foot-Candles.

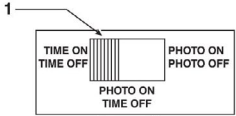


Figure 1

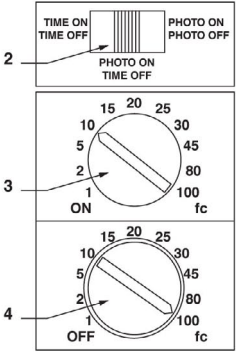


Figure 2

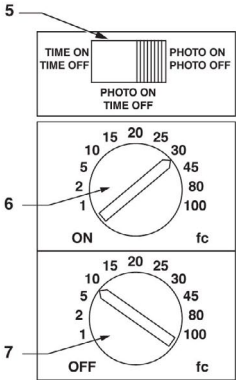
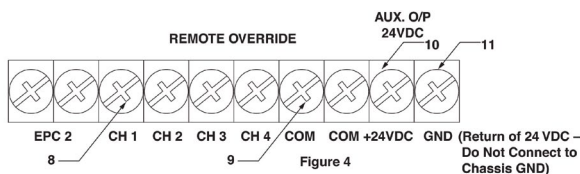


Figure 3

Set both the **ON fc** and **OFF fc** light levels (using a small screwdriver) for every channel which the slide switch is in the **PHOTO ON/TIME OFF** or **PHOTO ON/PHOTO OFF** position.

## Maintained Input, Remote Override:

Each channel has an isolated contact closure remote override input. This input can be used for "after hour" needs. For maintained override using a standard toggle switch, wiring can be connected to the input for each channel (in this illustration, Channel 1 (Arrow 8), and the COM terminals (Arrow 9). For timed override using TORK's SSA100R-24 the 24 VDC supply on the terminal block can deliver up to 500 mA of current, which eliminates the need for separate power supplies. The positive voltage connects to the +24VDC terminal (Arrow 10) and the ground connects to the GND terminal (Arrow 11). The other 2 wires from the SSA100R-24 connect to a channel's remote override and a COM.



### NOTE:

1. Use only EPC2 low voltage light sensor and connect at terminal marked EPC2.
2. DO NOT run EPC2, remote override and 24VDC wires along with high voltage wires.
3. EPC2 Sensor has instant **ON** and 20 seconds **OFF** delay.
4. DO NOT apply external voltage to EPC2 and remote override.

## INSTRUCTIONS FOR SETTING THE UNIT

Connect unit to main power source prior to entering the settings. When powering up the unit for the first time, allow 1-2 minutes before the display will show 12 HOUR. Press reset button after 2 minutes if screen is blank.

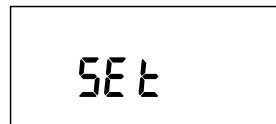


Press **HOUR** to change to 24 hour (military format) or press **ENTER** to set 12 hour (AM/PM format).

### NOTES:

1. During the RUN mode, the Hour, Minutes, Seconds, Day of Week and flashing colons will be displayed.
2. Unit will not go into run mode unless the clock and date information has been entered. In any other mode, if no entry is made for 5 minutes, the unit will automatically revert to the run mode.
3. Unit will display "PF" (Power Failure) in the absence of AC power.
4. When previously programmed unit comes back from a power failure, it will "look back" and update the schedule, executing the last scheduled event. Settings can be manually updated by pressing the **EVENT** key in the run mode.

After pressing **ENTER** the unit will display:



**NOTE:** AFTER MAKING ANY CHANGES TO THE PROGRAM, PRESS **MODE** TO GO TO RUN MODE AND THEN PRESS **EVENT** TO UPDATE THE LOAD STATUS.

## 1.0 TO SET THE CLOCK

Press **HOUR** and **MIN** to advance to the present hour and minutes. Check AM/PM, and press **ENTER**.

## 1.1 TO MODIFY THE CLOCK

Press **MODE** until the display shows: CLK. Press **HOUR** and **MIN** to modify the clock and press **ENTER**.

## 2.0 TO SET THE DATE

If you are setting unit for the first time, display will show:



Press **MONTH**, **DATE**, and **YEAR** key to advance to the desired month, date, and year, then press **ENTER**.

**NOTE:** The day of the week will be automatically set once the date is set.

## 2.1 TO MODIFY THE DATE

Press **MODE** until the display shows DATE. Press **MONTH**, **DATE**, and **YEAR** to modify present settings and then press **ENTER**.

## 3.0 DAYLIGHT SAVING TIME

After setting or modifying the date, display will show:



- For standard USA daylight savings (DST), press **MODE** and go to step 4.0.
- For dates other than standard USA dates, press **MONTH** and go to step 3.1.
- If daylight saving time (DST) is NOT required, press **DEL** and display will show:



Press **ENTER** then go to step 4.0.

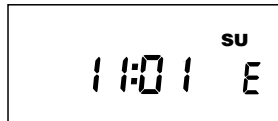
## 3.1 TO MODIFY STANDARD USA DAYLIGHT SAVINGS DATES

**NOTE:** The first two digits represent the month and the second set of digits represents the week in the month. Choices for week are 01 (1st), 02 (2nd), 03 (3rd) or L (Last) week of the month. The default day is Sunday (SU). Once modified date is set, the unit will automatically calculate the correct start dates in the future.



Now press the **MONTH** and **DATE** buttons to modify the starting DST settings. Pressing **DAY** changes default day. EXAMPLE: A screen showing "04:01 SU S" represents April (04), the first week (01), Sunday (SU) and the Start (S) of daylight savings time.

Press **ENTER** to save and the display will show:



Now press **MONTH** and **DATE** buttons to modify the ending DST settings. Pressing **DAY** changes default day. EXAMPLE: A screen showing "10: L SU E" represents October (10), the last week (L), Sunday (SU), and the End (E) of daylight savings time.

Press **ENTER** to save and the display will show the modified DST starting date.

Press **MODE** twice to go to step 4.0.

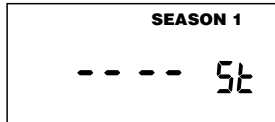
#### 4.0 SEASON DURATION SET

Up to 4 different season durations can be set by entering the START and END dates.

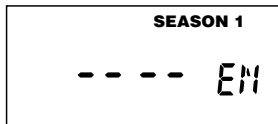
##### NOTE:

1. If season durations are not set, they will not appear on the schedule and astronomic mode.
2. Each season can be set up to 364 days.
3. Any season can cross the year boundary, i.e., the current year and end the next year.
4. When any two or more seasons overlap, the higher numbered season has priority.

Press **MODE** until display shows:



Press **MONTH** and **DATE** to set the starting period of season 1 and then press **ENTER**. The display will show:

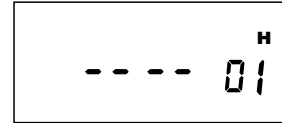


Press **MONTH** and **DATE** to set the ending period of season 1 and then press **ENTER**. Follow the above procedure to set the other 3 seasons, if desired. To delete any entry press **DEL** and **ENTER**.

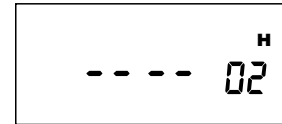
**NOTE:** For any season to be used, the starting **MONTH**, **DATE**, and ending **MONTH**, **DATE** must be preset.

#### 5.0 SET INDIVIDUAL HOLIDAY DATES

Press **MODE** until display shows:



Press **MONTH** and **DATE** to set holiday 1 and then press **ENTER**. The display will show:



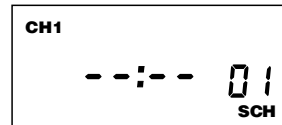
To delete any holiday press **DEL** and press **ENTER**.

##### NOTE:

- a. A total of 24 holidays can be set, all following the same schedule.
- b. For any holiday to be used, the **MONTH** and **DATE** must be preset.

#### 6.0 SCHEDULE SET MODE

Press **MODE** until display shows:



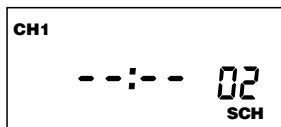
Press **SELECT** to select desired channel.

#### 6.1 SETTING HOURS AND MINUTES

- a. Press **HOUR** and **MIN** to set desired time.
- b. Press **EVENT** to set desired event.

## 6.2 SETTING DAYS, HOLIDAY AND SEASONS

Press **SELECT** to select the flashing desired days, holiday and/or seasons, otherwise press **DAY** to skip and then press **ENTER**. To delete entry, press **DAY** until previously selected entry flashes, press **SELECT** and then press **ENTER**. The display will show:



Follow the same procedures above to set more schedule entries for channel 1. At the next blank screen press **SELECT** to select desired channel and proceed with the steps above to set more schedule entries.

## 7.0 TO SET ASTRONOMIC SCHEDULE

Press the **MODE** key until display shows:



Press **SELECT** to select desired channel. Press **LAT** key to advance to the desired degree of latitude, from 0° to 60° north or 0° to 60° south. Press **ENTER**.

### 7.1 SELECTING ASTRO DAYS

Press **SELECT** to select desired days, holiday and/or seasons in which you want the indicated channel to turn ON at sunset and then press **ENTER**. Display will show:



**NOTE:** Sunset Time will be based on Date and Latitude entered.

Press **ENTER**. The display will show:



If an offset to sunset time is required, press **HOURL** and **MIN**. Offset can be set to 4 hours and 59 minutes max. Press **EVENT** to select + or - and then press **ENTER**.

**NOTE:** A + sign will turn load ON that many hours and/or minutes after the sunset. A - sign will turn load ON that many hours and/or minutes before sunset. The display will show:



Press **SELECT** and then **ENTER** to activate sunrise time.

**NOTE:** to turn load OFF at a preset OFF time, leave this field blank. Press **ENTER**. Display will show:



If an offset to sunrise time is required, press **HOURL** and **MIN**. Offset can be set to 4 hours and 59 minutes max. Press **EVENT** to select + or - then press **ENTER**.

**NOTE:** A + sign will turn load OFF that many hours and/or minutes after sunrise. A - sign will turn load OFF that many hours and/or minutes before sunrise.

## 7.2 ASTRONOMIC ON AND TIME OFF

Set astronomic ON per sections 7.0 and 7.1.

### TIME OFF:

Press **MODE** until "sch01" appears. Press **ENTER** until a blank schedule appears then press **SELECT** to select channel 1 or 2. Press **HOUR** and **MIN** to set desired OFF time. Press **SELECT** to select desired days, holiday and/or seasons and then press **ENTER**.

### TIME ON AND ASTRONOMIC OFF

Press **MODE** until "sch01" appears. Press **ENTER** until a blank schedule appears then **SELECT** to select channel 1 or 2. Press **HOUR**, **MIN** and **EVENT** to set desired ON time. Press **SELECT** to select desired days, holiday and/or seasons and then press **ENTER**.

### ASTRO OFF

Set astronomic OFF per sections 7.0 and 7.1.

## 8.0 REVIEW, MODIFY AND DELETE SCHEDULES

Press **MODE** to advance to any of the following MODES:

1. **CLOCK MODE**: Press **HOUR** and **MIN** to modify existing settings. Press **ENTER**.
2. **DATE MODE**: Press **MONTH**, **DATE** and **YEAR** to modify existing settings. Press **ENTER**. Day is automatically adjusted.
3. **DST Daylight Saving Time**: To review press **ENTER**. To modify press **MONTH**, **DATE**, and **DAY** to change existing settings. Press **ENTER**.
4. **SEASON MODE**: Press **ENTER** to advance to desired season. Press **MONTH** and **DATE** to modify, **DEL** to delete. Press **ENTER** to confirm.
5. **HOLIDAY MODE**: Press **ENTER** to advance to desired holiday. Press **MONTH** and **DATE** to modify, **DEL** to delete. Press **ENTER**.
6. **SCHEDULE MODE**: Press **ENTER** to advance to desired setpoint. Press **HOUR**, **MIN**, **EVENT** to modify time settings. Press **SELECT** and **DAY** to modify days, holiday and/or seasons, **DEL** to delete. Press **ENTER** after each modification.

7. **ASTRO MODE**: Press **SELECT** to select desired channel. Press **LAT** to change latitude. Press **ENTER**. Press **DAY** and **SELECT** to add or delete days in the sunset mode. Press **ENTER**. Press **HOUR** and/or **MIN** to change offset for sunset. Press **EVENT** to change offset from + to -. Press **ENTER** and follow the same procedure above to modify or review sunrise settings.
8. **RUN MODE**: Time, day and seconds are displayed. If today is a programmed holiday, an H (Holiday) will be displayed steady. If today falls within a programmed season that season # will be displayed.

## 9.0 OVERRIDE

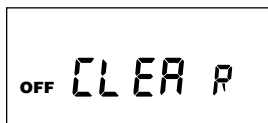
Override keys are effective only in the **RUN** mode. If a channel is scheduled for ON/OFF, then the channel will change the present load status until the next scheduled event. CH# will flash when the load is overridden from scheduled event.

**EVENT** (in the RUN mode) key is used to update the load status. It will execute the last scheduled event for all channels.

The display will only show the last scheduled event for CH1. To view the last scheduled event for other channels, simply press the **EVENT** key again. If there is no schedule programmed for a specific channel, the display will show --:-

### NOTES:

1. Unit will go to RUN MODE automatically if no key is pressed for 5 minutes.
2. Unit has a look back feature. If you have just finished setting the unit and an output is to be updated, press the **EVENT** key. Unit will automatically pick up the last schedule.
3. Clear all memory. To clear all memory, while in the RUN mode, press **ENTER**, display will show:





Press **EVENT**, the display will show:



Press **ENTER** briefly and everything in the timer memory is wiped off including real time and date. 12HOUR will flash.

Season			
#	Start Date	End Date	Description
1			
2			
3			
4			

Holiday (H)		
#	Date	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Light Level		
Channel 1	ON	OFF
Channel 2		
Channel 3		
Channel 4		



ASTRONOMIC SCHEDULE

Latitude _____											Sunset		Sunrise		
Scn. #	Ch. #	MO	TU	WE	TH	FR	SA	SU	H	SEASON				Offset	Offset
										1	2	3	4		

ASTRONOMIC SCHEDULE

Latitude _____											Sunset		Sunrise		
Sdn. #	Ch. #	MO	TU	WE	TH	FR	SA	SU	H	SEASON				Offset	Offset
										1	2	3	4		

ASTRONOMIC LATITUDE ZONES

