National
Time & Signal



TimeCast™ Digital & PoE Digital Timer Operating Instructions

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BULLETIN C-629 RevB

All TimeCast™ Digital Clocks can initiate a count up or count down sequence when the optically isolated reset input is activated by other equipment[1]. Two-wire TimeCast™ Digital Clocks, such as WiFi, Radio Frequency, or 2-wire system clocks, may need a 4-wire harness (P/N: A050-W-010266-4) if they were originally equipped with the 2-wire harness. Clocks connected to a 3-wire system cannot use the reset input for timer control because the reset input is already used by the master clock to synchronize the time. For non-Elapsed Timer TimeCast™ Digital Clocks, skip to page 4 for timer instructions and refer to the "*Integration With Other Equipment*" section for wiring diagrams.

The TimeCast™ Digital and PoE Digital Clock/Elapsed Timer units (models with "ET" in the part number) are elapsed timer capable. All functionality of the TimeCast™ Digital Clock is maintained with an additional integrated beeper, auxiliary output, and remote switch panel capability. As a timer, the TimeCast™ and PoE Digitals function as a count up/down elapsed time indicator with a simple intuitive switch interface. Clock or timer display is selectable via the remote switch control (order separately DLU-ET-CTRL)

Timer Remote Switch Functions:



Timer/Clock: Select timer or clock display. The timer will continue to operate while the clock is displayed. *Blinking colon indicates timer mode.*

Up/Down: While in timer mode, this switch will select count-up or count-down timer operation. In the count-down duration setting menu, this switch is used to select between increment or decrement.

Run/Stop: While in timer mode, this switch will start or stop the timer.

In the count-down duration setting menu, this switch is used to modify the values either up or down depending upon the Up/Down switch.

Reset (Count-Up Mode): Will reset the timer to 0:00.

Reset (Count-Down Mode): Will reset the timer to the previous count-down value. Hold for 7 seconds to enter the count-down duration setting menu.

Reset (Count-Down Duration Setting menu): The reset switch is used to enter the values as chosen using the Run/Stop and Up/Down switches.

1. PoE Digital Clocks do not have a reset input so all timer control must be done through the remote switch control panel.

TIP: For installations where the clock function is not desired, connect per the wiring diagram for Timer Only installations. When wired in this fashion, the unit will turn off when "Clock" is selected using the Timer/Clock switch.

Operation using DLU-ET-CTRL Remote Switches

Count-Up Timer Operation:

To time the duration of an event, follow these steps:

1. Set the Timer/Clock switch to **Timer**.
2. Make sure the Run/Stop switch is set to **Stop**.
3. Set the Up/Down switch to **Up**.
4. If not already at 0:00, Momentarily press the **Reset** switch.
5. When the event begins, set the Run/Stop switch to **Run**.
6. When the event ends, set the Run/Stop switch to **Stop**.

During the event the timer can be paused and continued using the Run/Stop switch.

To time the next event, Momentarily press the **Reset** switch.

The time duration will display in HH:MMss format. Maximum event duration is 99h59m59s, then the timer will return to 0:00 and continue.

Count-Down Timer Operation:

To display the time remaining of a known event, the count-down duration can be set to any value between 1s to 99h59m59s. When the duration expires, the built-in beeper can sound. The beeper duration can be adjusted as described later in the B*eeper Duration* menu. Alternately, an open-collector output is available to energize an external relay (consult factory).

1. Set the Timer/Clock switch to **Timer**.
2. Make sure the Run/Stop switch is set to **Stop**.
3. Set the Up/Down switch to **Down**.
4. Momentarily press the **Reset** switch.

The duration of the previous count-down event will display. If this is correct, skip to step 10.

5. To change the duration, Press and **hold the RESET button for 7 seconds**.
6. The hours value will blink, modify the hours value using the **Up/Down** and **Run/Stop** switches. Selecting **Run** will modify the value in the direction of the Up/Down switch. Select **Stop** when the desired hours are shown.
7. Press **Reset** and the minutes value will blink. Modify as necessary using the **Run/Stop** and **Up/Down** switches.
8. Press **Reset** and the seconds value will blink. Modify as necessary.
9. Press the **Reset** switch and the chosen duration will display.

****Make sure the Up/Down Switch is returned to the Down selection**.

If the duration is correct...

10. When the event begins, switch the Run/Stop switch to **RUN**.
11. To pause the count-down, switch to **Stop**.

When the count reaches 0, the beeper will sound for the duration selected in the *Beeper Duration* menu.

12. To time another event, set the Run/Stop switch to Stop and repeat from step 4.

Clock System Connections:

TimeCast™ Digital Clock/Timers can integrate into a clock system for synchronized time keeping, and are compatible with WiFi, TimeCast™ Radio Frequency, and traditional wired clock systems. Refer to Bulletin C-618 for wireless clocks or Bulletin C-631 for wired clocks.

PoE Digital Timers:

PoE Digital Clock/Timers operate individually and receive power and time data via one Power over Ethernet network cable. For more information refer to Bulletin C-636. Stand-Alone Time Keeping mode is not available on PoE Digital Clocks.

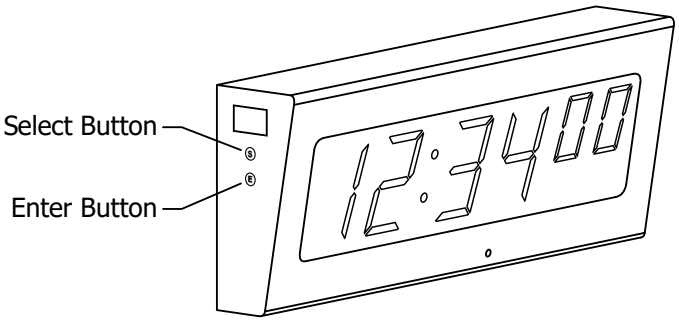
Stand-Alone Time Keeping:

When not connected to a clock system, the TimeCast™ Digital Clock/Timer can keep time internally. The time can be set through the user interface display on the side of the clock, and a built-in battery-less backup system will keep time during power outages. Power outages of multiple days are survivable. (Timer event progress will not survive power loss.) Instructions for switching to Stand-Alone mode and setting the time can be found in the TimeCast Setup Guide, Bulletin C-620.

For installations where the clock function is not desired, connect per the wiring diagram for Timer Only installations. When wired in this fashion, the unit will turn off when "Clock" is selected using the Timer/Clock switch on the DLU-ET-CTRL remote switch control panel.

Timer Configuration Settings:

Timer settings are configured through the user interface display on the TimeCast™ Digital Clock. In normal operation, the user interface display is turned off to prolong display life. Press the ENTER button to wake the display.



Use the SELECT button to scroll through the menu choices. When the "Timer Settings" menu is highlighted, press the ENTER button to choose the highlighted selection. The following settings are available in the "Timer Settings" menu.

Timer Mode: Select the mode of timer operation desired.

Timer Controls - (Default) Timer will be controlled by remote switches. Timer/Clock display, up/down, run/stop and reset. Count down duration can be adjusted through the user interface display or from the remote switches. Order DLU-ET-CTRL.

Count-Down - If used on a 2-wire clock system or stand-alone, a momentary reset input will initiate a count down sequence. Often used for class change timer function. Remote switches not operational. Count down duration can be adjusted through the user interface display.

Count-Up - If used on a 2-wire clock system or stand-alone, the clock will change to the timer count up display while the reset input is active. Removal of reset input will return to clock display. Often used as "code blue" or event timer integration with other equipment. Remote switches not operational.

**Timer Controls* is the only Timer Mode compatible with PoE Digital Clock/Timers.

Countdown Duration: Located inside the "Timer Settings" menu, this menu will set the default duration for the countdown timer function. The count down duration can also be set using the DLU-ET-CTRL remote switches.

In the "Countdown Duration" menu, the SELECT button will increment the highlighted value and the ENTER button will move to the next field. When the last field is highlighted, the ENTER button will confirm the count down value.

Beeper Duration: Located inside the "Timer Settings" menu, set the duration of the beeper at the end of a count down cycle. The duration can be set between 1 second and 10 seconds in 1 second increments.

Beeper Output: Located in the "Advanced Config" menu, select the desired action at the end of a count down cycle.

Beeper Only - The end of a count down cycle will sound the integrated beeper inside the clock.

Relay Only - The end of a count down cycle will activate the clock's Auxiliary Output for the selected beeper duration. Used to activate remote signaling equipment. Order the Auxiliary Output Cable for TimeCast™ Digital Elapsed Timers (P/N: DTC-AUX-CABLE).

Both - At the end of a count down cycle, both the internal beeper and Auxiliary Output will activate for the selected beeper duration.

Off - Neither the internal beeper or Auxiliary Output will activate at the end of a count down cycle.

NOTE: The Timebase setting will override an incompatible Timer Mode selection. The Count-Down and Count-Up Timer Modes are not compatible with a 3-wire clock system. If the 3-wire clock system Timebase is selected, the Count-Down and Count-Up modes are unavailable. The Count-Down and Count-Up modes are compatible with WiFi, Radio Frequency, Stand-Alone, and 2-wire clock system modes. Timer Controls mode is compatible with all time keeping options.

Wiring for 2-Wire Clock System, WiFi, Radio Frequency, or Stand-Alone:

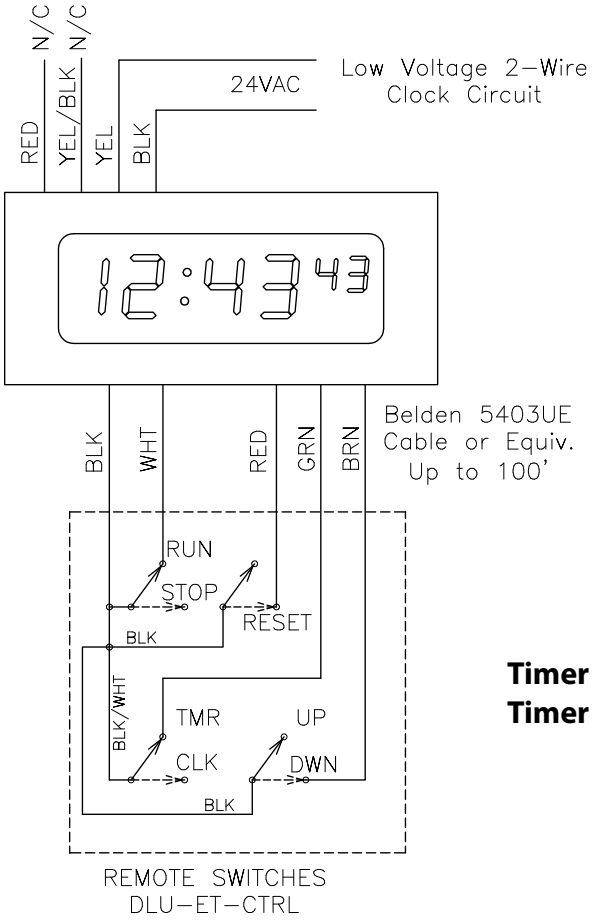


Figure 1

Timer Mode:
Timer Controls

Wiring as shown above will allow the clock to be used as a WiFi, TimeCast™ Radio Frequency, Stand-Alone, or 2-wire system clock. With WiFi or TimeCast™ Radio Frequency timebase selected, the clock will receive wireless time synchronization. When Stand-Alone timebase is selected, the clock will keep time internally with a battery-less backup to survive power outages.

Selecting a 2-Wire Clock System timebase will allow the clock to be reset by a 2-wire clock system. A short power interruption (0.25-1s) will reset the clock to 12:00am. If connected to a National Time master clock, On-Demand Instant Correction can be used to transmit the actual time to the clock at any time. These Clock/Timers may share the clock circuit with DLX/DLU Series digital clocks, TimeCast™ digital clocks, or Spectrum Series analog clocks. Care must be taken if a manual reset is initiated from the master clock since the timer event progress will be lost.

The RESET inputs are available to be used as a class change count down timer. Connecting an existing bell circuit to the RESET input will initiate the the count down sequence from the duration selected in the menu. In this case, timer mode must be changed to *Count-Down*. See the *Integration with other Equipment* section for connection information.

Wiring on 3-Wire Clock System:

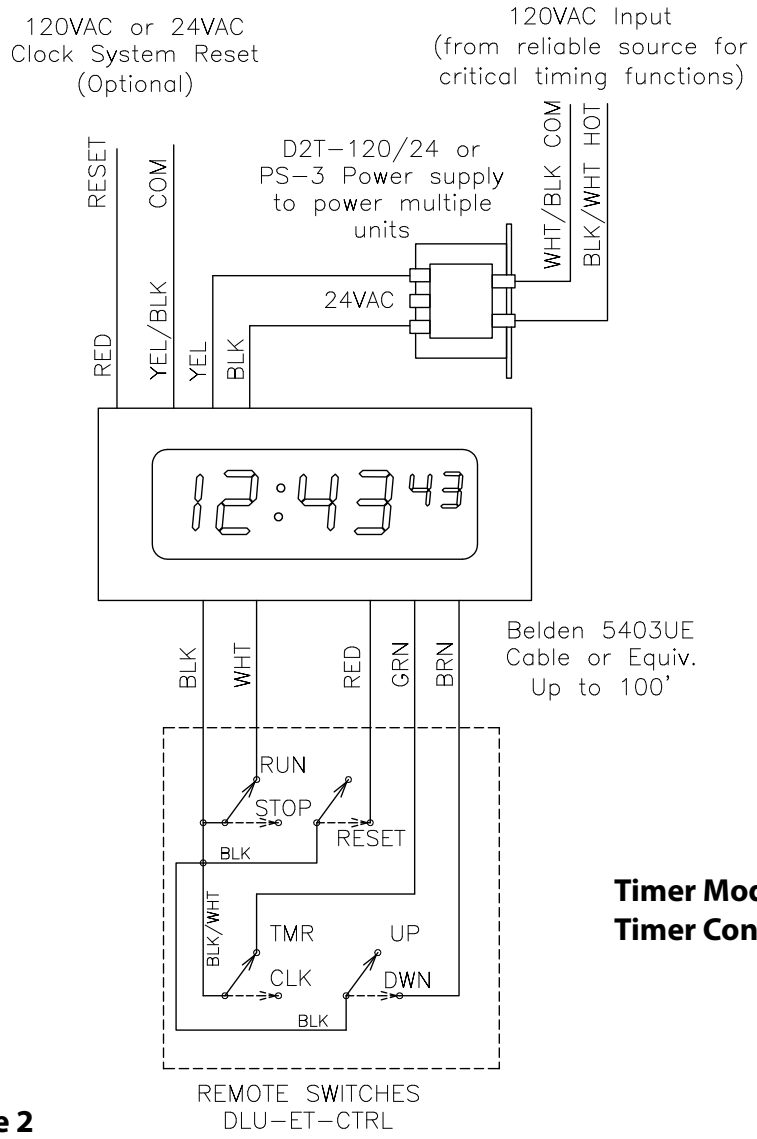


Figure 2

Timer Mode:
Timer Controls

Wiring as shown above will allow the clock time to be reset by a 3-wire conventional synchronous clock system. Compatible with most protocols, refer to compatibility list in Bulletin C-630. Timer function will not be affected by clock resets. With the timebase set for a 3-Wire Clock System, the clock will maintain internal timekeeping during power outages of multiple days. When power resumes, clock will be on time instantly while legacy clocks will reset using scheduled hour and 12-hour reset sequences. Power from a reliable 120VAC circuit is required for critical timing applications since event timing progress will not survive power outages.

Stand-Alone Timer Only Wiring:

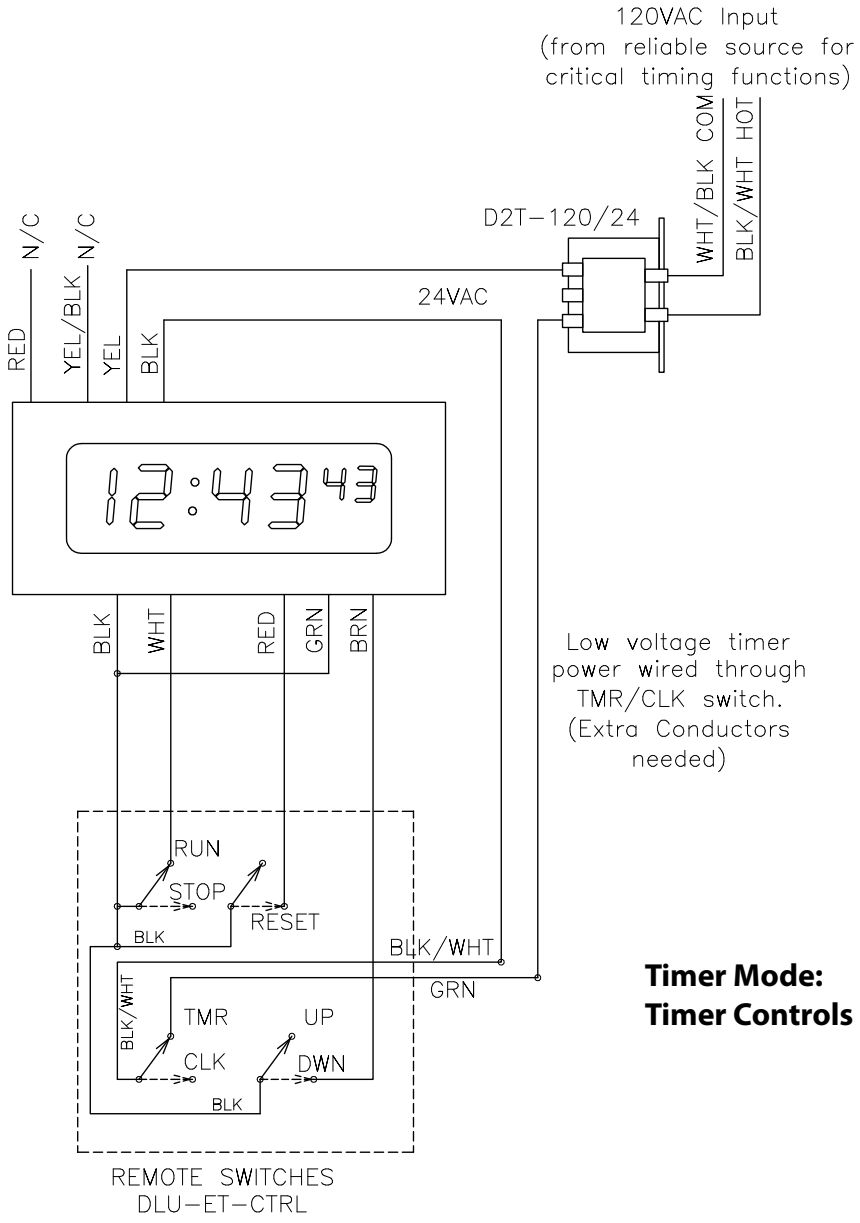


Figure 3

Timer Mode:
Timer Controls

Wire as shown above for timer only operation. Clock/Timer switch is wired in series with the power to the unit. When switch is set to *CLOCK*, the timer will turn off and the display will go blank. Timer event duration progress will not survive power loss.

Integration With Other Equipment:

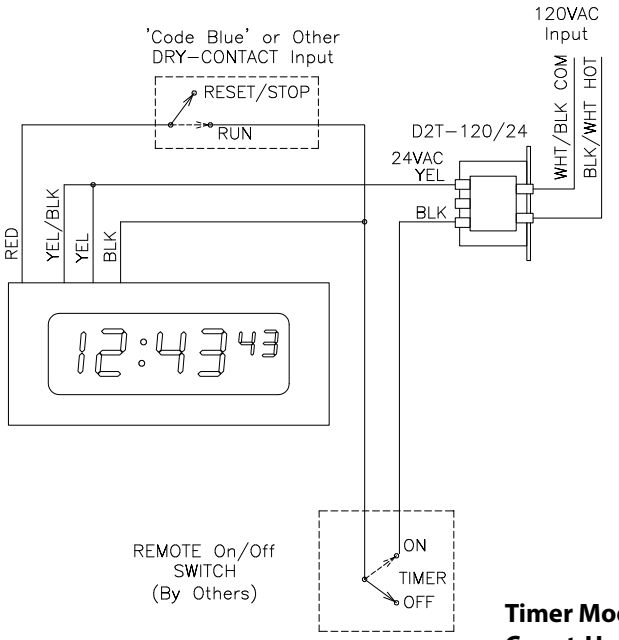


Figure 4

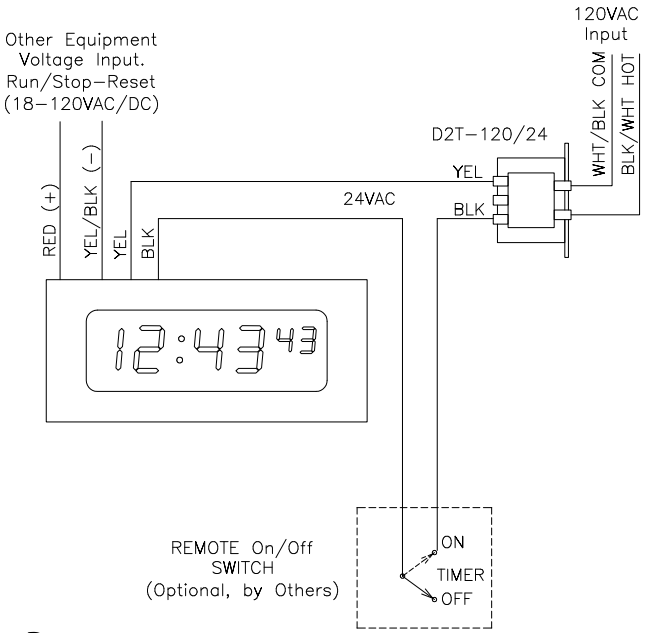


Figure 5

Timer Modes:
Count-Up or Count-Down

Figure 4 shows wiring to other equipment using a dry-contact closure. 24VAC power is run through the contact activating the reset input when the contact is closed. Figure 5 shows activation using a voltage input from external equipment. Activation voltage can be 24VAC/DC. The input is optically isolated from the timer power supply.

Count-Down mode will initiate the count down sequence with a momentary activation. Set the Count Down Duration through the menu on the user interface display on the clock. Count-Up mode will count up from 0:00 while the input is active and return to the clock display when removed.

An optional On/Off switch can be added as shown to turn off the timer when not in use or controlled by external equipment using an additional relay.

The clock operation can also be used in this configuration without the remote On/Off switch. The clock can be connected to a 2-wire clock system and is compatible with National Time's On-Demand Instant Correction. The unit can also connect to WiFi, TimeCast™ Radio Frequency, or keep time internally in Stand-Alone mode. During power outages, internal timekeeping is maintained for multiple days.

Wiring for PoE Digital:

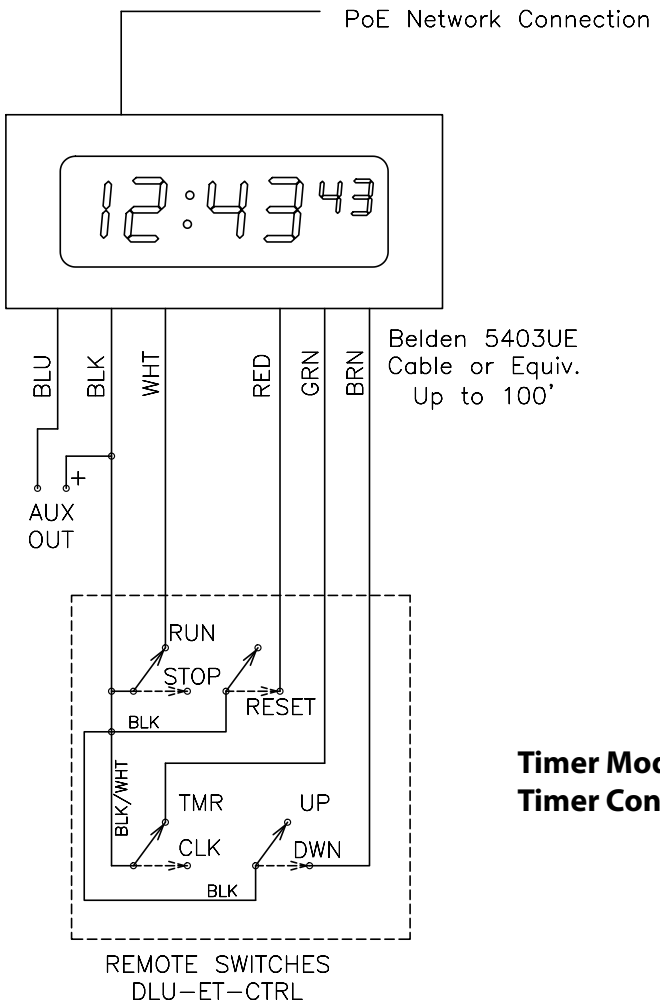


Figure 6

Timer Mode:
Timer Controls

Wire as shown above for PoE installations to have network timekeeping with elapsed timer functions. The Aux Out can be used for an external beeper or relay to signal the end of a count down sequence. Timer event duration progress will not survive power loss.