

# Multi-functional Timer relay.

Configurable via smartphone

## User Manual



2021/11/21 V1.0.7

### **!!! Warning !!!**

**DO NOT** return the item to the original retailer. Contact the support for any problem with the item or item delivery.

[timersshop@gmail.com](mailto:timersshop@gmail.com)

## Table of Contents

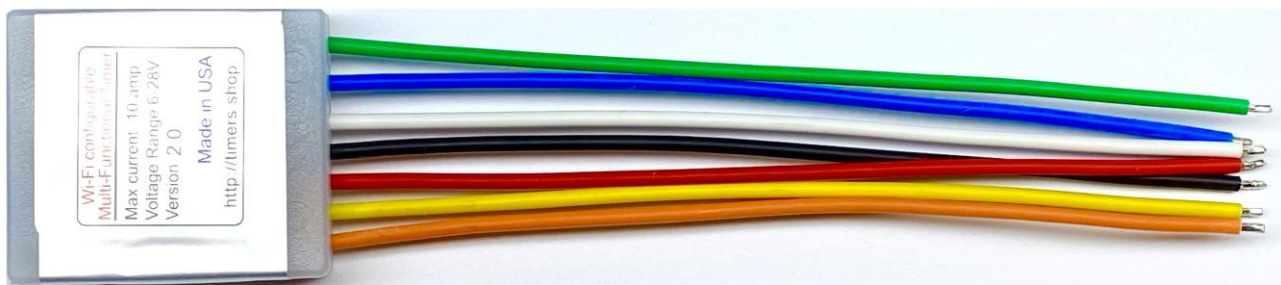
1.	Multi-functional Timer Relay description.....	3
2.	Timer's wiring diagram .....	5
3.	Understanding Timer Delay Relay Function. ....	6
4.	Timer function table with charts.....	7
5.	Timer's digital trigger.....	18
5.1	<i>Timer trigger operation with charts.</i> .....	18
5.2	<i>Example of the trigger configuration.</i> .....	19
5.3	<i>Timer trigger configuration table.</i> .....	20
6.	Timer's analog trigger.....	21
6.1	<i>Timer analog trigger operation with charts.</i> .....	21
7.	Timer Output:.....	23
7.1	<i>Type</i> .....	23
7.2	<i>Gradual</i> .....	23
7.3	<i>Reversed</i> .....	24
8.	Timer installation and programming .....	25
9.	Low Power Mode .....	27
10.	Updating timer's firmware .....	27
11.	Updating timer's UI interface .....	27
12.	Custom firmware .....	27
13.	Troubleshooting .....	28
14.	Older manuals .....	28

# 1. Multi-functional Timer Relay description

**The multi-functional Timer** delay module is a revolutionary circuit with many commonly used timer delay and signal processing functions. It is perfect for many applications from hobby to industrial controls. The **timer** has more than thirty different timing functions with the optional ability to trigger by application of voltage to the trigger wire. Dry contacts can be used as a trigger as well. The **timer** can be used for hundreds of various applications from delaying power to the circuit, supplying power in cycling fashion, or creating a self-latching timed circuit. The **timer** is easy to connect and configure. All the configurations are permanently saved into the internal flash memory. The **timer** works with 6 V to 28 V supply voltage and can handle up to 10 Amp of current. Wide voltage supply range and high current capabilities make the **timer** applicable to a variety of applications. The maximum current can be extended with the use of the external relay. The timer can run in Low Power mode which is suitable for battery-powered applications. Built-in in fly-back diode allows for direct connect of an inductive load.

The **timer's** configuration changes are done via a smartphone or computer connected to the timer via a Wi-Fi network generated by the timer. No Internet or external Wi-Fi router is required. Timer's firmware is upgradeable, allowing the user to flash updates and extend the functionality of the device.

Voltage range:	6-28 V
Max current:	10 Amp
Output types:	Positive or Sink outputs
Minimum time duration:	0.1 Second
Maximum time duration:	400 Days
Idle current consumption:	1.5 ma 0.05 ma (in LOW POWER mode)
Temperate rating	-40C + 100C



40 x 35 x 10 mm

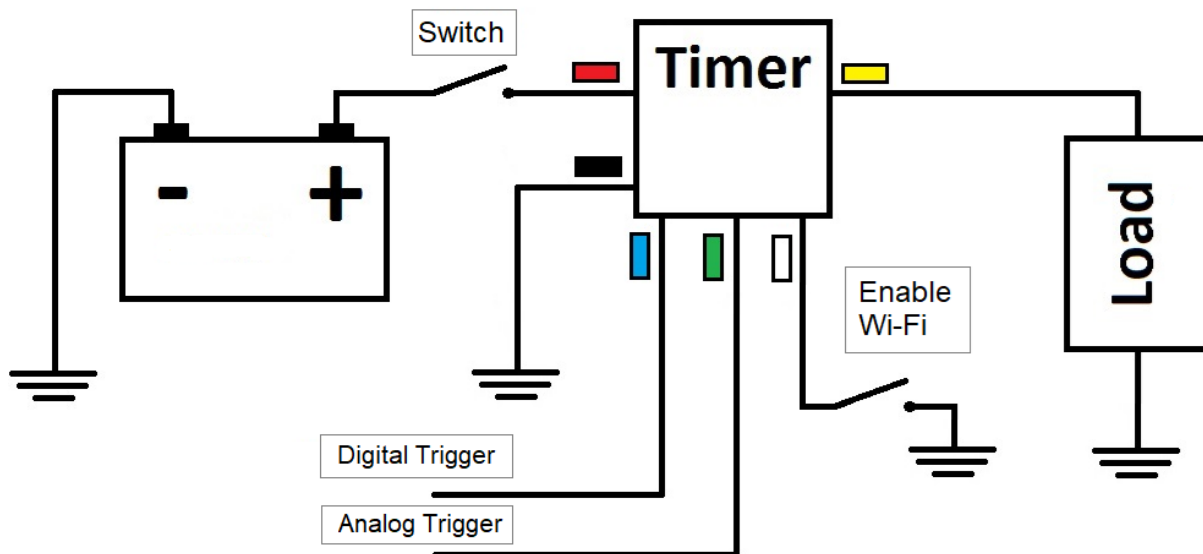
120 mm Automotive TXL 18 AWG wire



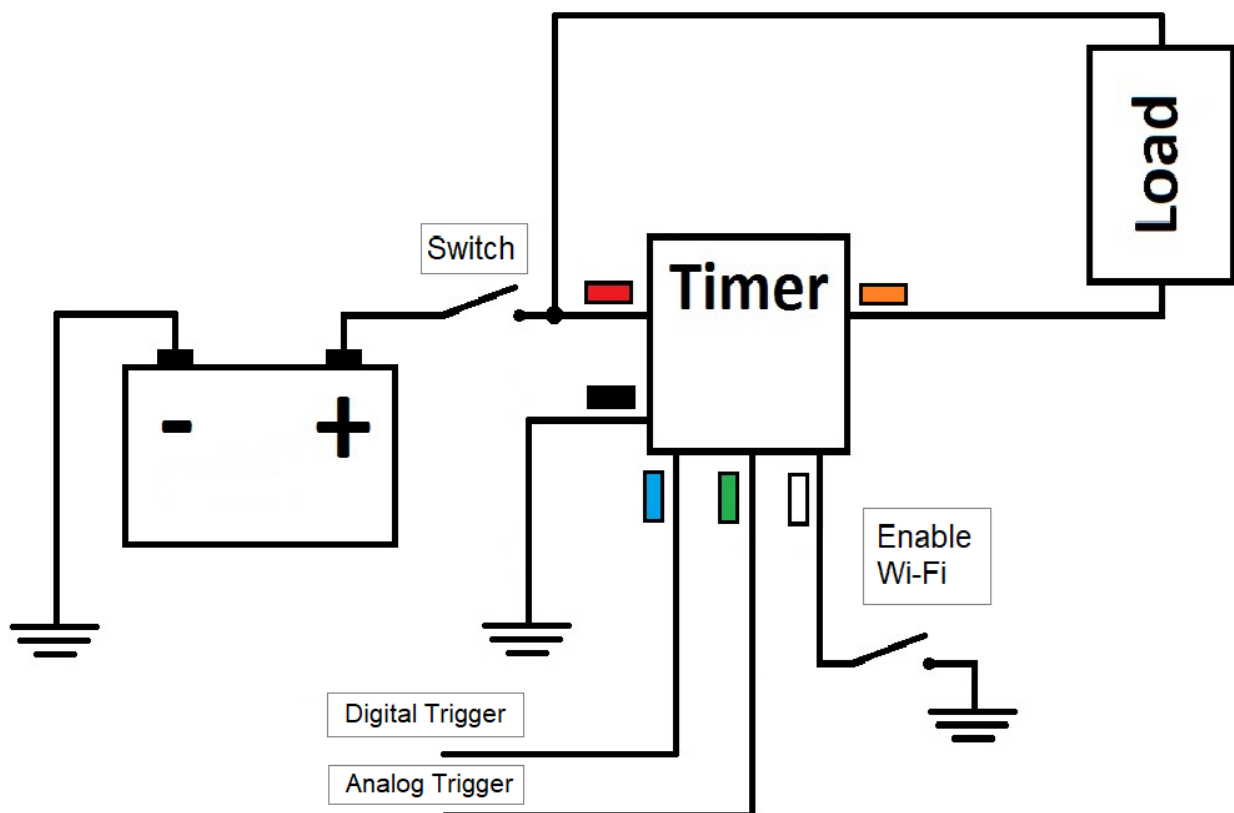
- Do not short timer's output to the power or ground. It would cause excessive current, possible device overheating, and smoke.
- Do not exceed the timer's current capacity.
- Do not reverse power supply polarity. It could cause the timer's internal components to fail and overheat.
- Do not put a timer into a hot environment causing it to exceed specified temperate range working conditions.
- Do not disconnect the ground from the timer while under power.
- Do not connect the White wire to the power supply, only to the ground.

## 2. Timer's wiring diagram

Positive Output configuration



Sink (Ground control) Output configuration



\*\*\* For up to date installation instructions and videos visit [bit.ly/timer20](http://bit.ly/timer20)

How to configure timer via Wi-Fi <https://youtu.be/wqbvz5o0pu0>

### 3. Understanding Timer Delay Relay Function.

Understanding all the time delay relay functions available in multifunctional timer can be an intimidating task. During the circuit design questions such as: what initiates the timer delay functions, does the timing starts with the application of the power or trigger signal, for how long output power should stay on, etc., could arise and must be answered.

The timer is simply a logic control circuit to control the output power based on the events. Typically, the timer is initiated or triggered by one of two methods:

- Application of power voltage
- High or Low trigger signal

The trigger signal can be one of the following:


- A control switch (dry contacts): limit switch, push-button, the float switch
- Voltage (power trigger): signal output from another device, power signal, or sink output

To help understand the timer functionality let's look at the common terminology used throughout this manual.

- **Input Voltage** – power voltage applied to the timer. Depending on the selected function, the input voltage will either initiate the timing event or power the timer to be ready to accept the trigger signal.
- **Trigger Signal** – in certain timing functions, a trigger is used to initiate a timing event after the input voltage has been applied. As noted above this trigger can either be a control switch (dry contact switch) or a power trigger (voltage).
- **Output** – output voltage from the timer. The timing of the output voltage is controlled by the selected timing event and trigger method.

Below (**Figure 1**) is a description of the timing functions. A timing chart shows the relationship between Input Voltage, Trigger Signal, and Output. Note that Trigger Signal is optional for some of the timer functions and mandatory for others. Before going through all the available functions look at the first one in detail.

**Figure 1.**

#	Function	Operation	Timing chart
1	ON DELAY	Upon the application of input voltage, the time delay (t) begins. At the end of the time delay (t), the output is energized. Input voltage must be removed to reset the time delay relay & de-energize the output.	

#	Function	Operation	Timing chart

The timer function #1 is **ON DELAY**, it allows to supply power after some time (t). There are two timing charts, one without a trigger and one with a trigger. Trigger selection can be done during timer configuration. Let's look at the first chart where the timer is triggered by the supplied input voltage. Once power is supplied to the timer, the time delay (t) begins, at the end of the time delay (t) output is energized and stays on until power to the timer is removed. Removal of the power resets the timer circuit and the timer is ready for another cycle. The second chart is applicable when a trigger option is selected. In this particular case, the trigger on High (positive) voltage is selected. More on trigger options can be found later in the manual. Upon application of power, the timer is ready to accept the trigger signal. When the trigger is applied, the time delay (t) begins. At the end of the time delay (t) output is energized and stays on until power to the timer is removed. Another application of the trigger during time delay (t) or the output energized period does not affect the timer's function. Only the first application of the trigger matters.

## 4. Timer function table with charts

*(Note that function number # will be used during timer configuration.)*

**Figure 2.**

#	Function	Operation	Timing chart
1	<b>ON DELAY</b>	Upon the application of input voltage, the time delay (t) begins. At the end of the time delay (t), the output is energized. Input voltage must be removed to reset the time delay relay and de-energize the output.	
2	<b>INTERVAL ON</b>	Upon the application of input voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized. The input voltage must be removed to reset the time delay relay.	

#	Function	Operation	Timing chart
3	<b>FLASHER</b> (On First)	Upon the application of voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized and remains in that condition for the time delay (t). At the end of the time delay (t), the output is energized and the sequence repeats until input voltage is removed.	
4	<b>FLASHER</b> (Off First)	Upon the application of input voltage, the time delay (t) begins. At the end of the time delay (t), the output is energized and remains in that condition for the time delay (t). At the end of the time delay (t), the output is de-energized and the sequence repeats until input voltage is removed.	
5	<b>REPEAT CYCLE</b> (On 1 <sup>st</sup> )	Upon the application of input voltage, the output is energized and the time delay (t1) begins. At the end of the time delay (t1), the output is de-energized and remains in that condition for the time delay (t2). At the end of this time delay, the output is energized and the sequence repeats until input voltage is removed.	
6	<b>REPEAT CYCLE</b> (Off 1 <sup>st</sup> )	Upon the application of input voltage, the time delay (t1) begins. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t2). At the end of this time delay, the output is de-energized and the sequence repeats until input voltage is removed.	



#	Function	Operation	Timing chart
7	<b>DELAYED INTERVAL Single Cycle</b>	Upon the application of input voltage, the time delay (t) begins. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t2). At the end of this time delay (t2), the output is de-energized. Input voltage must be removed to reset the time delay relay.	<p>Input Voltage</p> <p>Output</p> <p>t1 t2 t1 t2</p> <p>Input Voltage</p> <p>Trigger</p> <p>Output</p> <p>t1 t2 t1 t2</p>
8	<b>TIMED FLASHER (On First)</b>	Upon the application of voltage, the time delay (t2) begins and the output is energized for the time delay (t1). At the end of the time delay (t1), the output is de-energized and remains in that condition for the time delay (t1). At the end of the time delay (t1), the output is energized and the sequence repeats until time delay (t2) is completed.	<p>Input Voltage</p> <p>Output</p> <p>t1 t1 t1 t1</p> <p>Input Voltage</p> <p>Trigger</p> <p>Output</p> <p>t1 t1 t1 t1</p>
9	<b>TIMED FLASHER (Off First)</b>	Upon the application of voltage, the time delay (t2) begins and the initial time delay (t1) starts. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t1). At the end of the time delay (t1), the output is de-energized and the sequence repeats until time delay (t2) is completed.	<p>Input Voltage</p> <p>Output</p> <p>t1 t1 t1 t1</p> <p>Input Voltage</p> <p>Trigger</p> <p>Output</p> <p>t1 t1 t1 t1</p>

#	Function	Operation	Timing chart
10	<b>ON/OFF DELAY</b>	Upon the application of input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the time delay (t1) begins. At the end of the time delay (t1), the output is energized. When the trigger is removed, the output remains energized for the time delay (t2). At the end of the time delay (t2), the output is de-energized and the time delay relay is ready to accept another trigger. If the trigger is removed during the time delay period (t1), the output will remain de-energized and the time delay (t1) will reset. If the trigger is re-applied during the time delay period (t2), the output will remain energized and the time delay (t2) will reset.	<p>Input Voltage</p> <p>Trigger</p> <p>Output</p> <p>t1 t2</p>
11	<b>TRIGGERED ON DELAY</b>	Upon the application of input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the time delay (t) begins. At the end of the time delay (t), the output is energized and remains in that condition as long as either the trigger is applied or the input voltage remains. If the trigger is removed during the time delay (t), the output remains de-energized and the time delay (t) is reset.	<p>Input Voltage</p> <p>Trigger</p> <p>Output</p> <p>t &lt;t</p>

#	Function	Operation	Timing chart
12	<b>OFF DELAY</b>	Upon the application of input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the output is energized. Upon removal of the trigger, the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Any application of the trigger during the time delay (t) will reset the time delay (t) and the output remains energized.	
13	<b>SINGLE-SHOT WITH TIME RESET</b>	Upon the application of input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the output is energized and timer delay (t) begins. Any application of the trigger during the time delay will reset the time delay (t) and the output remains energized.	
14	<b>SINGLE-SHOT</b>	Upon the application of input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the output is energized and the time delay (t) begins. During the time delay (t), the trigger is ignored. At the end of the time delay (t), the output is de-energized and the time delay is ready to accept another trigger.	

#	Function	Operation	Timing chart
15	<b>TRIGGERED DELAY INTERVAL Single Cycle</b>	Upon the application of the input voltage, the timer relay is ready to accept the trigger. When the trigger is applied, the time delay (t1) begins. At the end of the time delay (t1), the output is energized and remains in that condition for the time delay (t2). At the end of the time delay (t2), the output is de-energized and the relay is ready to accept another trigger. During both time delay (t1) and time delay (t2), the trigger is ignored.	
16	<b>INTERVAL ON WITH OFF TRIGGER</b>	Upon the application of the input voltage, the timer relay is ready to accept the trigger. When the trigger is applied, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Application of trigger during time delay (t) will cause time delay (t) to expire and output is de-energized.	
17	<b>INTERVAL ON TRIGGER CONTROLLED</b>	Upon the application of the input voltage, the timer relay is ready to accept the trigger. When the trigger is applied, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Removal of the trigger during time delay (t) will cause time delay (t) to expire and output is de-energized.	

#	Function	Operation	Timing chart
18	<b>FREEFORM ONE TIME</b> (Up to 16 configuration points)	Upon application of voltage, the time delay begins and a freeform pattern programmed by the user is executed. When the pattern is completed it can be retriggered again.	
19	<b>FREEFORM REPEATED</b> (Up to 16 configuration points)	Upon application of voltage, the time delay begins and a freeform pattern cycle programmed by the user is executed. Once started the cycle will be repeated over and over.	
20	<b>CANCELED INTERVAL</b>	Upon the application of the input voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output is de-energized. If the trigger is applied during the time delay (t) the output is de-energized and the delay canceled. Input voltage must be removed to reset the time delay relay.	
21	<b>SINGLE-SHOT TIME RESET HOLD ON TRIGGER</b>	Upon the application of the input voltage, the timer is ready to accept a trigger. When the trigger is applied, the output is energized and timer delay (t) begins. Any application of the trigger during the time delay will reset the time delay (t) and the output remains energized. If the trigger is still applied after the delay (t) the output remains energized until the trigger is removed.	

#	Function	Operation	Timing chart
22	<b>FOLLOW</b>	Upon the application of the input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the output is energized and continued to be energized until the trigger is removed. When the trigger is removed the output is de-energized.	
23	<b>BUTTON INTERFACE WITH TIMEOUT</b>	Upon application of input voltage, the timer relay is ready to accept trigger input. With a short ( $< 1\text{sec}$ ) application of the trigger, the output is energized for the time delay ( $t$ ). The second application of the trigger will de-energize the output. With a long ( $> 1\text{sec}$ ) application of the trigger, the output is energized and held energized until the trigger is removed.	
24	<b>BUTTON INTERFACE</b>	Upon the application of the input voltage, the timer relay is ready to accept trigger input. With a short ( $< 1\text{sec}$ ) application of the trigger, the output is energized. The second application of the trigger will de-energize the output. With a long ( $> 1\text{sec}$ ) application of the trigger, the output is energized and held energized until the trigger is removed.	
25	<b>OUTPUT ON TRIGGER CHANGE</b>	Upon the application of the input voltage, the timer relay is ready to accept trigger input. When the trigger is applied the output is energized for the time delay ( $t_1$ ). The release of the trigger also energizes the output for time ( $t_2$ )	

#	Function	Operation	Timing chart
26	<b>BUTTON INTERFACE WITH TIMEOUT</b>	Upon the application of the input voltage, the timer relay is ready to accept trigger input. With short ( $< t_2$ ) application of trigger the output is energized for the time delay ( $t_1$ ). The second application of the trigger will de-energize the output. With long ( $> t_2$ ) application of trigger, the output is energized and held energized until the trigger is removed.	
27	<b>BUTTON INTERFACE</b>	Upon the application of the input voltage, the timer relay is ready to accept trigger input. With short ( $< t_2$ ) application of trigger, the output is energized. The second application of the trigger will de-energize the output. With long ( $> t_2$ ) application of trigger, the output is energized and held energized until the trigger is removed.	
28	<b>FUNCTION 28</b>	Upon the application of the input voltage, the timer relay is ready to accept trigger input. With short ( $< t_2$ ) application of trigger the output is energized for the time delay ( $t_1$ ). The second application of the trigger will reset the delay ( $t_1$ ). With a long ( $> t_2$ ) application of the trigger, the output is energized and held energized until the trigger is removed. With a long ( $> t_2$ ) application of trigger during the active output, the timeout is canceled and output stays energized until the trigger is removed.	

#	Function	Operation	Timing chart
29	<b>INTERVAL WITH LOCKOUT Single Cycle</b>	Upon the application of the input voltage, the timer relay is ready to accept the trigger. When the trigger is applied the output is energized and the time delay (t1) begins. At the end of the time delay (t1), the output is de-energized and remains in that condition for the time delay (t2). During both time delay (t1) and time delay (t2), the trigger is ignored.	
30	<b>POWER INDEPENDENT TIMER</b>	Timer operation is intended as a countdown timer. The countdown stops when power is removed but continues when power is reapplied. To run the timer in this mode first configure timer time, function, and trigger. Activating a trigger for > 5 secs resets the timer and the countdown starts. When the sum of the time is greater than the preset time the output becomes active. Activating trigger for > 5 secs resets the countdown.	
31	<b>REPEAT RANDOM CYCLE</b>	The function is similar to Function #5 (Repeat cycle). The duration of the first active phase of the cycle is randomly calculated with the range set between t1 and t2. The passive phase is between t3 and t4. 09/22/2020 – Custom firmware C12 has implemented random timing for all functions. <a href="#">See customer firmware page.</a>	



#	Function	Operation	Timing chart
32	<b>FOLLOW WITH INITIAL ON</b>	Upon the application of the input voltage, the output is energized and the time delay (t) begins. At the end of the time delay (t), the output follows the trigger level. When the trigger is applied, the output is energized and continued to be energized until the trigger is removed. When the trigger is removed the output is de-energized.	
33	<b>COUNTER</b>	Not available. Will be available in the future release.	
34	<b>DELAY ON WITH TIMEOUT</b>	Upon the application of the input voltage, the timer relay is ready to accept a trigger. When the trigger is applied, the time delay (t1) begins. At the end of the time delay (t1), the output is energized. The output remains energized for a period of t2 unless the trigger is removed. If the trigger is removed the output is de-energized and the cycle ends.	
35	<b>OFF DELAY WITH INITIALIZATION</b>	Upon application of input voltage, the output is energized for t2. The timer relay is ready to accept a trigger. When the trigger is applied, the output is energized. Upon removal of the trigger, the time delay (t) begins. At the end of the time delay (t), the output is de-energized. Any application of the trigger during the time delay (t) will reset the time delay (t) and the output remains energized.	

#	Function	Operation	Timing chart
	<b>CUSTOM FUNCTIONS</b>	<a href="#">Custom created firmware can be downloaded here.</a>	

## 5. Timer's digital trigger.

As described above timer is initiated or triggered by one of two methods:

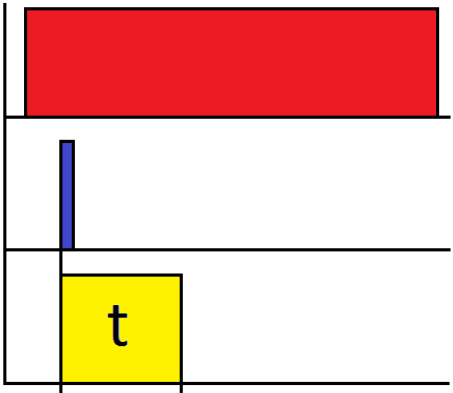
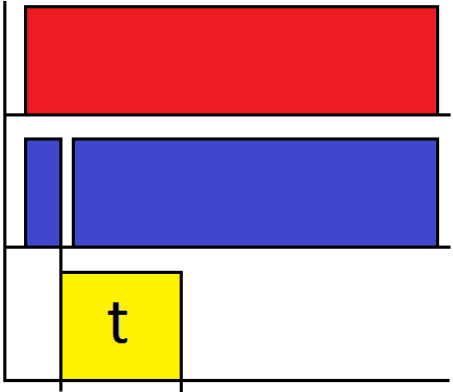
- Application of power voltage
- High or Low trigger signal

The trigger signal can be one of the following:

- A control switch (dry contacts): limit switch, push-button, the float switch
- Voltage (power trigger): signal output from another device, power signal

### 5.1 Timer trigger operation with charts.

Figure 3.

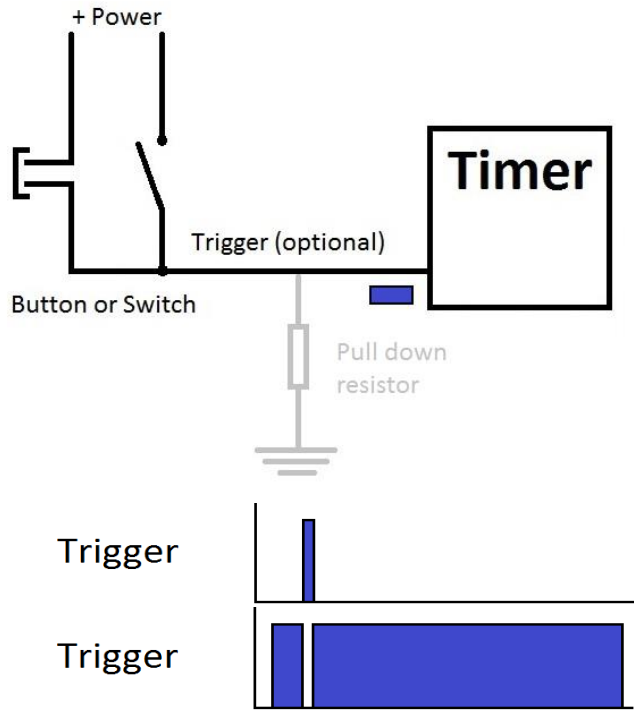
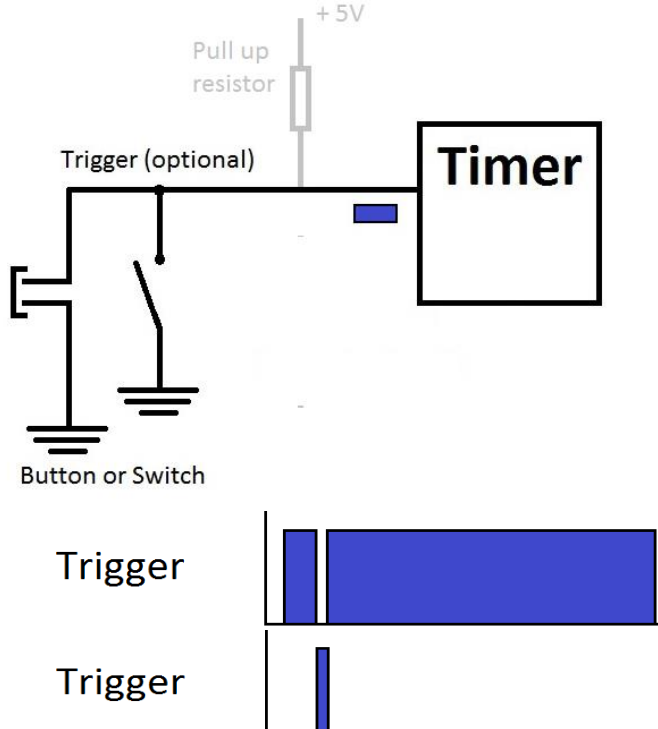
High trigger	Upon application of power the time delay relay is ready to accept the trigger. The transition of the voltage on the trigger wire from low* to high** will trigger the start of the time delay (t).	<div> <div>Input Voltage</div> <div>Trigger</div> <div>Output</div>  </div>
Low trigger	Upon application of power the time delay relay is ready to accept the trigger. The transition of the voltage on the trigger wire from high** to low* will trigger the start of the time delay (t).	<div> <div>Input Voltage</div> <div>Trigger</div> <div>Output</div>  </div>

\***Low** trigger voltage is considered to be less than  $< 0.5v$  and should be as close to  $0v$  as possible. \*\***High** trigger voltage is greater than  $> 0.8v$  and could be as high as the input voltage.

To use trigger input with dry contact (like switch or button), the trigger wire would need to be 'pulled' to either High or Low voltage. Timer configuration allows for the trigger wire to be set to be either pulled to High, where a small current is applied to keep the wire at High voltage or pulled to Low (grounded), keeping the trigger wire at Low voltage. The following table demonstrates when to configure trigger wire pull to High or Low.

## 5.2 Example of the trigger configuration.

**Figure 4.**

Trigger pull configuration	Description	Wiring diagram and trigger chart
Trigger pulled to Low	<p>The trigger is set to be pulled to Low. Upon button or switch engagement the trigger voltage jumps to High (positive voltage).</p> <p>The trigger could also be a positive voltage from the external source applied to the trigger wire.</p> <p><b>Note:</b> event could be triggered either by applying or removing power.</p> <p>The shown Pull-down resistor is built into the timer and does not need to be connected externally.</p>	 <p>The wiring diagram shows a button or switch connected to a timer's trigger input. The switch is normally closed, and the timer's internal pull-down resistor (indicated by a resistor symbol connected to ground) keeps the trigger line at a low level. When the button or switch is pressed, the trigger line goes high. The trigger chart shows two waveforms: the top one is a single high pulse, and the bottom one is a high pulse followed by a long high state.</p>
Trigger pulled to High	<p>The trigger is set to be pulled to High. Upon button or switch engagement the trigger voltage jumps to Low (grounded).</p> <p>The trigger could also be the Ground applied to the trigger wire.</p> <p><b>Note:</b> event could be triggered either by applying or removing ground.</p> <p><i>The shown Pull-up resistor is built into the timer and does not need to be connected externally.</i></p>	 <p>The wiring diagram shows a button or switch connected to a timer's trigger input. The switch is normally open, and the timer's internal pull-up resistor (indicated by a resistor symbol connected to +5V) keeps the trigger line at a high level. When the button or switch is pressed, the trigger line goes low. The trigger chart shows two waveforms: the top one is a low pulse, and the bottom one is a low pulse followed by a long low state.</p>

### 5.3 Timer trigger configuration table.

(Note that timer trigger function number # will be used during timer configuration.)

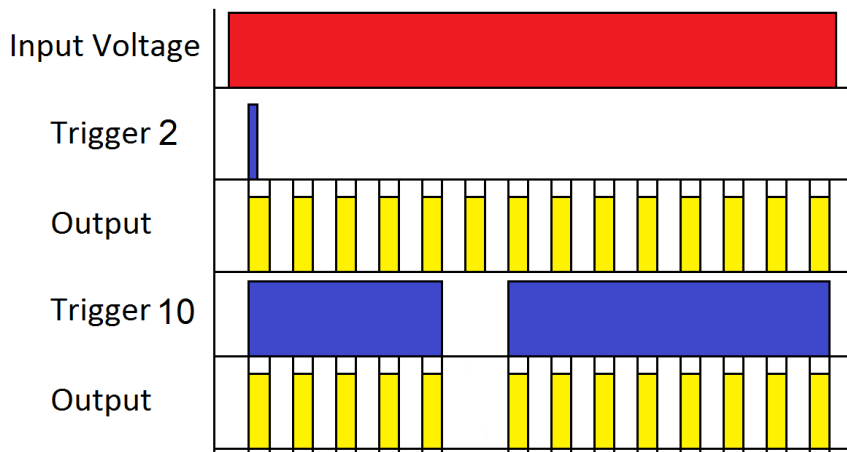
**Figure 5.**

Trigger configuration			Trigger pull	Active Trigger	Description
	*	**			See notes below
1					Trigger is disabled
2	6	10	Low	High	For dry contacts between trigger wire and positive.
3	7	11	Low	Low	For a case where the voltage is applied to a trigger.
4	8	12	High	Low	For dry contacts between trigger wire and ground.
5	9	13	High	High	For a case where the ground is applied to the trigger.

\* Trigger functions ensure the trigger transition from inactive to activate state upon startup.

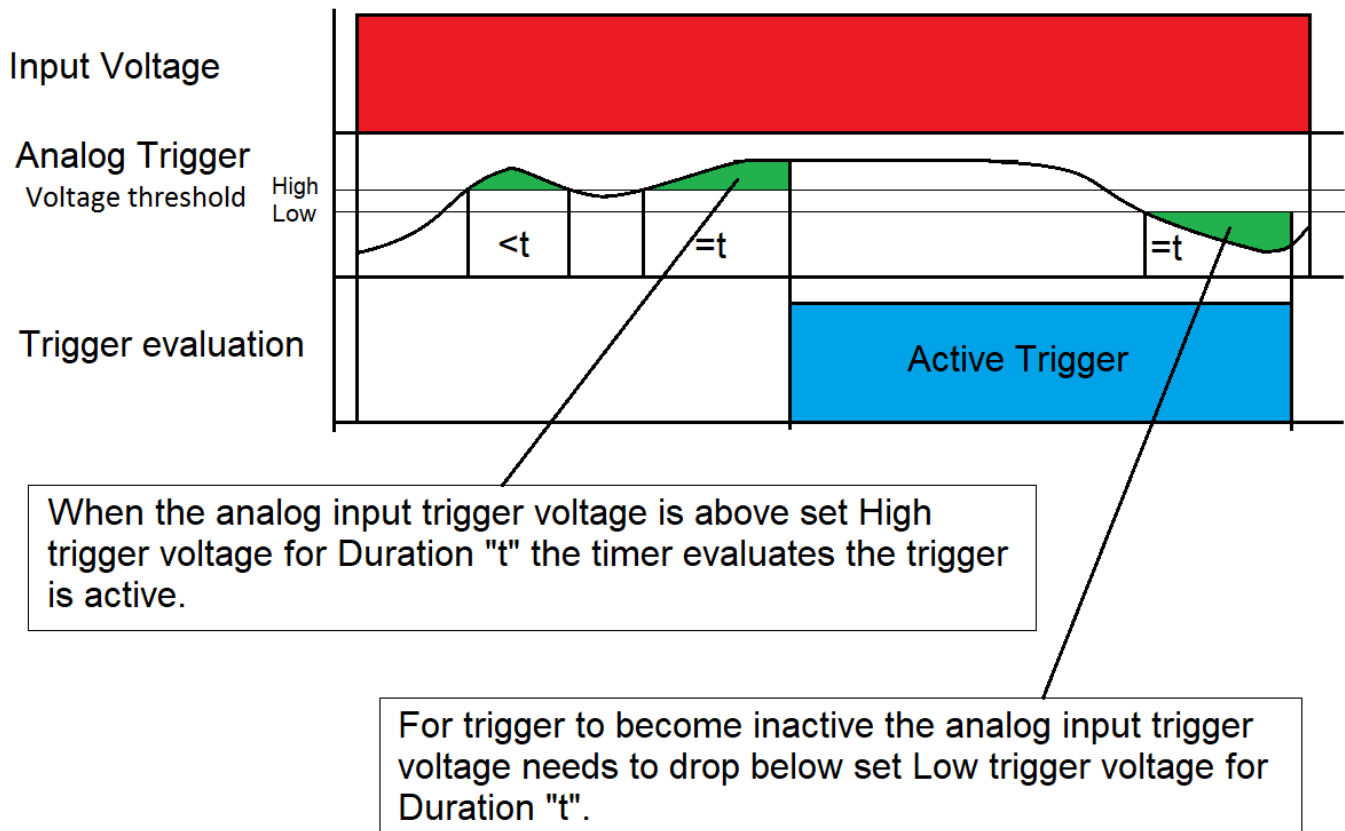
\*\*Trigger acts as an enable/disable switch. Applies to function: 3, 4, 5, 6, 8, 9, 18 and 19.

Example of the Trigger set to 2 vs 10 with Function 3. Trigger set to 2 will trigger the cycle. Trigger set to 10 will enable and disable the function.



## 6. Timer's analog trigger.

The timer can also use an analog trigger where the function is triggered when the input voltage is above or below a certain value.

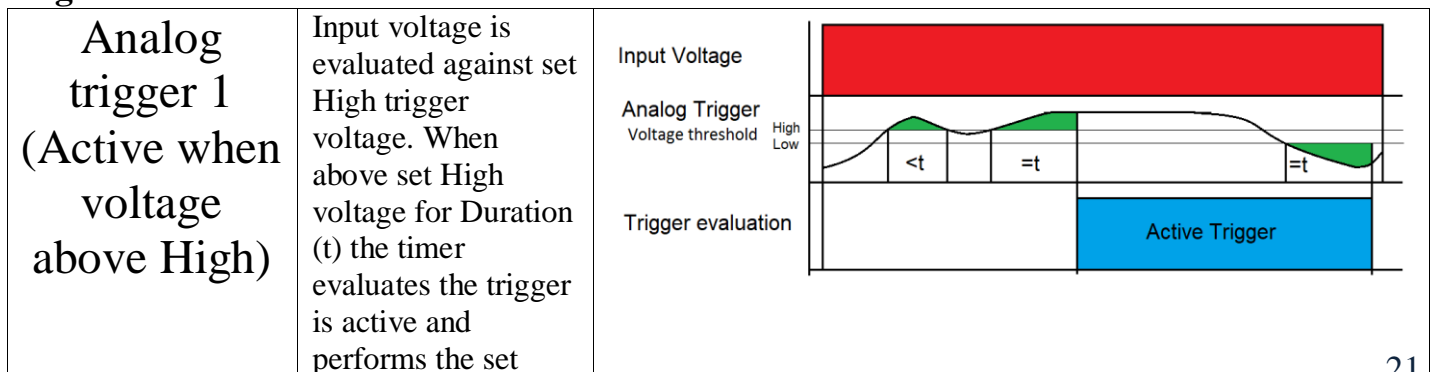


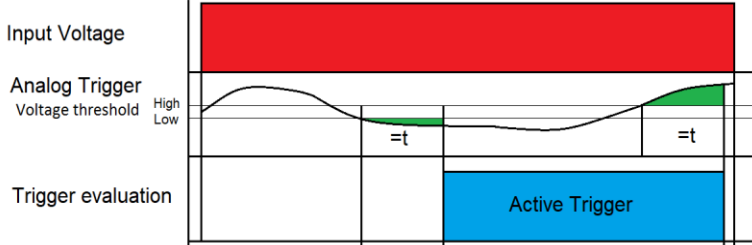
The timer evaluates the input voltage and when the voltage is higher than the set threshold for Duration (t) the timer evaluates the trigger is active.

Setting a larger gap between the trigger's High and Low voltages levels and increasing Duration (t) makes the trigger less sensitive to the sudden voltage fluctuations.

### 6.1 Timer analog trigger operation with charts.

**Figure 3.**



	function. When the input voltage is below set Low voltage for Duration (t) the timer evaluates the trigger as inactive.	
<b>Analog trigger 2</b> (Active when voltage below Low )	Input voltage is evaluated against set Low trigger voltage. When below set Low voltage for Duration (t) the timer evaluates the trigger as active. When input voltage is above High for Duration (t) the timer evaluates the trigger as inactive.	 <p>The diagram illustrates the logic for Analog Trigger 2. It consists of three horizontal tracks:</p> <ul style="list-style-type: none"> <li><b>Input Voltage:</b> A solid red bar representing a constant high voltage level.</li> <li><b>Analog Trigger Voltage threshold:</b> A line with two horizontal segments. The first segment is labeled 'High' and the second 'Low'. A wavy line represents the input voltage signal. Two green shaded areas under the 'Low' threshold segment are each labeled '=t', indicating the duration the voltage is below the threshold.</li> <li><b>Trigger evaluation:</b> A blue rectangular block labeled 'Active Trigger' is shown, which is active (filled) during the two time intervals marked '=t' in the threshold track.</li> </ul>

## 7. Timer Output:

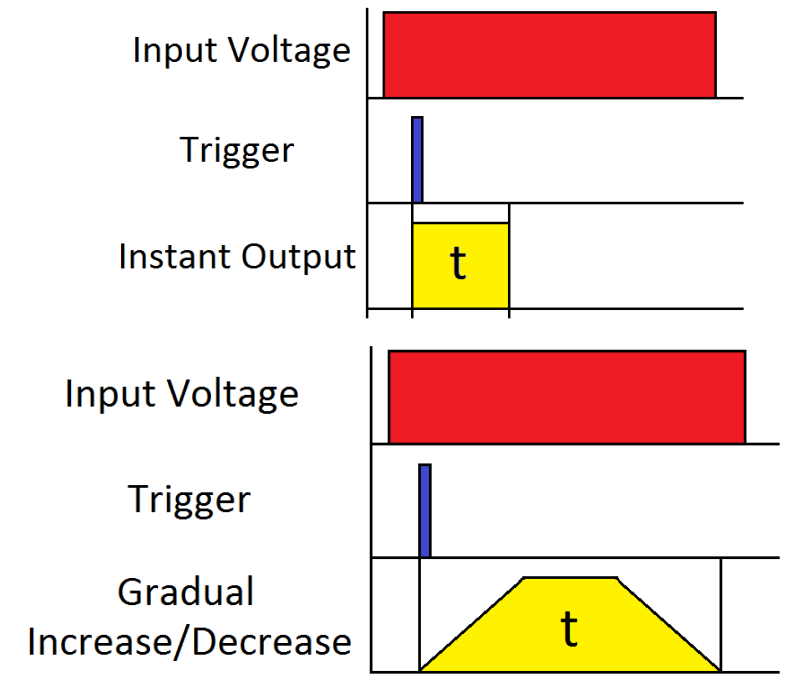
### 7.1 Type

The timer's output circuit can be either configured in Positive voltage output or Ground Sink mode. When positive voltage output is configured the timer Yellow wire will output voltage when output is active, during the inactive period the output will be floating. With positive voltage output, the load should be connected between the timer's Yellow output wire and ground.

With Ground Sink output mode the Orange output will sink the load current to the ground. The load should be connected between the timer's Orange output wire and power.

### 7.2 Gradual

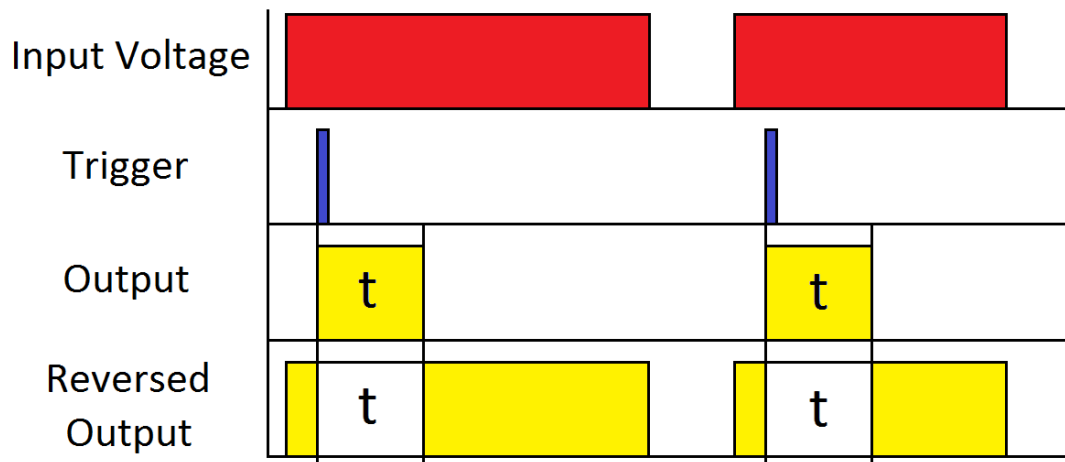
Timer output mode allows the user to set either instant output, where the output comes on and goes off instantly, or gradual increase/decrease, where the output is PWM (Pulse Width Modulation) controlled and ramps up to 100% duty in about 4 seconds. The gradual output is great for the lighting system to gradually increase and dim the lights.



## 7.3 Reversed

In some circumstances, it is required to supply reversed output to the load, so instead of supplying power to the load during the time delay (t), the output is de-energized.

The following diagram shows a sample timer operation with normal and reversed output.



The timer is preconfigured with normal output.



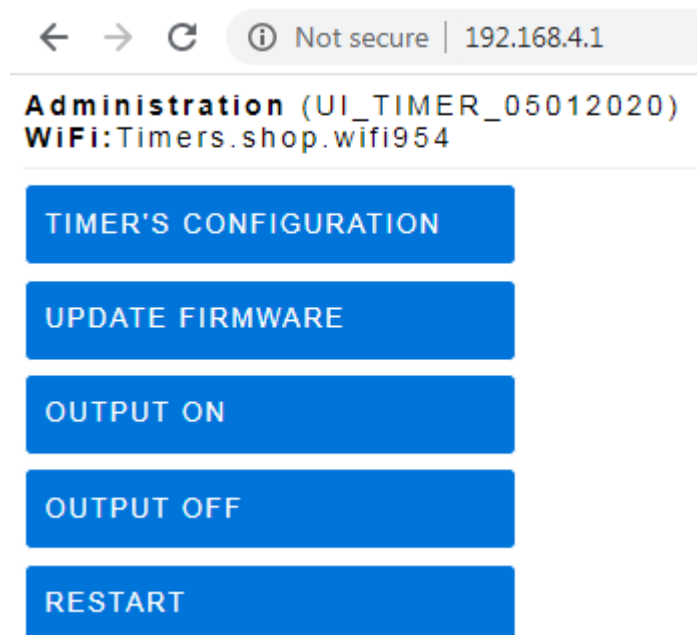
## 8. Timer installation and programming

### Installation:

1. Connect timer as specified in the diagram in Section 2.
2. The **Red** wire is connected to a power source, **Black** to ground, **Yellow** to load for positive control, and **Orange** for sink control. **White** is used to enabling Wi-Fi configuration. **The blue** wire is a trigger wire. Isolate trigger wire with electrical tape if the trigger option is not used.
3. Select the appropriate timer's function from **Figure 2** for your project and note the function number.
4. Skip this step if the trigger is not used. Select the appropriate timer trigger configuration function from **Figure 5** and note the trigger number. Trigger #2 is commonly used to trigger with a positive voltage.

### Programming:

1. Programming is done by connecting a computer or a smartphone to the timer's Wi-Fi network.
2. Connect the **White** wire to the ground and supply power to the timer. The internal blue LED should light up for a short period. **White** wire can now be disconnected from the ground.
3. Search for available Wi-Fi networks on your computer/phone.
4. Connect computer/phone to the '**Timers.shop.wifinnn**' wireless network.
5. Open the browser and enter the following into the address bar: **192.168.4.1** and click go or connect.
6. Once connected you will be presented with a similar menu:



7. Click on **TIMER'S CONFIGURATION** and make necessary changes to the timer's configuration.
8. Wi-Fi ID can be changed for easier identification of the device's network.



## Timer Settings

Firmware: Timer\_10\_V8.3.0  
Checksum: 691  
Bootloader: V1.0.12 HW5.0

WiFi ID:

Time t1:

Days:   
Hours:   
Minutes:   
Seconds:   
1/30 Seconds:

Time t2:

Days:   
Hours:   
Minutes:   
Seconds:   
1/30 Seconds:

Function:

Trigger Type    
Digital Trigger:  blue wire  
Analog Trigger:  green wire

Trigger Thresholds:

High Voltage:  volt  
Low Voltage:  volt  
Duration:  sec

Output:

Type    
Gradual: ☐  
Reversed: ☐

Low Power:



SAVE

9. Once necessary changes are done click SAVE.
10. Turn the power off and then test the timer's functionality.

Troubleshooting:

- If you lose network connection to network 'Timers.shop.wifinnn' try to disable automatic connections to other known networks configured in your computer/phone. Some computer/smartphone will try to switch the network if the current network does not appear to be connected to the Internet.
- To test the light control you need to make sure you have selected the proper output type. Select Positive if the load is connected to the ground. Go back to the main menu and click on OUTPUT ON to turn the output on. If the load is not energized check your connection and measure the voltage on the output wire.
- If no menu actions are taken the timer restarts after 5min of inactivity.

## 9. Low Power Mode

The timer can be configured in Low Power mode which drops the idle current consumption to a much lower value. This mode makes the timer suitable for battery operation. For example, if we take a 9V battery with 500mah capacity we can calculate the duration the timer can run in idle mode.  $500\text{mah}/0.05\text{ma} = 10000$  hours (~1 year). The timer's Low Power mode is enabled by default. But there are several conditions have to be met to have the lowest power draw:

1. The digital trigger should be configured to #2 (if used). The trigger voltage should be 0v for low power consumption.
2. The output is di-energized.
3. The following Functions are enabled for Low Power mode: 2, 10, 12 - 18, 20 – 29.
4. When the analog trigger is used the Low Power mode is disabled.

*Note: Due to internal power storage the timer will not reset with a brief power interruption. To reset the timer in Low Power mode, the power outage should be more than 1sec.*

## 10. Updating timer's firmware

Download the new firmware from the [http://timers.shop/WiFi-Timer-Firmware\\_ep\\_52-1.html](http://timers.shop/WiFi-Timer-Firmware_ep_52-1.html). Put the timer into configuration mode and select the Update Firmware menu.

## 11. Updating timer's UI interface

In some cases, UI (user interface) also needs to be updated along with firmware. If the firmware archive contains a UI update .bin file then execute the following steps. Put the timer into configuration mode, go to the address **192.168.4.1/update**. Select .bin file and upload. Wait until unit reboots and Wi-Fi network is available again (about 10-20 seconds). The update is complete.

## 12. Custom firmware

Download custom firmware from the [http://timers.shop/WiFi-Timer-Custom-Firmware\\_ep\\_49-1.html](http://timers.shop/WiFi-Timer-Custom-Firmware_ep_49-1.html). 27

## 13. Troubleshooting

Symptoms	Solution
The timer is not executing the function.	Make sure the White wire is disconnected from the ground. The timer will not execute the function while in Wi-Fi Configuration mode.

## 14. Older manuals

[http://timers.shop/assets/documentation/Multifunctional\\_Timer\\_Wifi\\_V1.0.1.pdf](http://timers.shop/assets/documentation/Multifunctional_Timer_Wifi_V1.0.1.pdf)

[http://timers.shop/assets/documentation/Multifunctional\\_Timer\\_Wifi\\_V1.0.2.pdf](http://timers.shop/assets/documentation/Multifunctional_Timer_Wifi_V1.0.2.pdf)

[http://timers.shop/assets/documentation/Multifunctional\\_Timer\\_Wifi\\_V1.0.3.pdf](http://timers.shop/assets/documentation/Multifunctional_Timer_Wifi_V1.0.3.pdf)

[http://timers.shop/assets/documentation/Multifunctional\\_Timer\\_Wifi\\_V1.0.4.pdf](http://timers.shop/assets/documentation/Multifunctional_Timer_Wifi_V1.0.4.pdf)

[http://timers.shop/assets/documentation/Multifunctional\\_Timer\\_Wifi\\_V1.0.6.pdf](http://timers.shop/assets/documentation/Multifunctional_Timer_Wifi_V1.0.6.pdf)