

HYTimer® Advanced Repeat Cycle Timer by Level2 Concepts, LLC

HYTIMER USER MANUAL (PRO-ZM-G05-2x-v4.0.4)

General Description

HYTimer PRO ZM is a state-of-the-art, commercial-grade, 100% waterproof, microcontroller-based, WiFi-enabled, harsh environment, digital timing device. It provides optimal, efficient, and safe control of equipment requiring precise time-of-day or repeating ON/OFF cycle power switching.

Functions, Features, and Specs at a Glance:

- Advanced digital microcontroller design
- Easy programming via any WiFi device with a web browser App (iPhone, Android, Tablet, Laptop, etc.)
- No Internet connection or cellular service required for programming
- Programming retention across power failures
- 100% waterproof - conforms to NEMA 4X / IP66 Ingress Protection Code, IEC standard 60529
- Built-In time-of-day clock with battery backup
- Dynamic Sunrise/Sunset Tracking (DSST) – Use of DSST does not require access to sunlight
- Two independent Power Outputs
- Two Schedules per Power Output
- Two operational modes per Schedule: Manual schedule start/end time entry or DSST
- Two programmable Timers per Schedule
- Three operational modes per Timer: Always-ON, Always-OFF, and Repeat Cycle (On/Off)
- Repeat Cycle mode has fully adjustable On/Off times ranges from 5 seconds to 24 hours
- UV stabilized polycarbonate enclosure for long life in harsh environments
- Built-in mounting flanges for convenient securing to most surfaces
- Unique weatherproof electrical connection gaskets & covers for all power plugs and receptacles
- Design virtually eliminates false GFCI device trips common with other timing devices
- Works with universal power grids - input: 110-240VAC, 50/60 Hz, Output: 15 Amps max
- Operating temperature range: -4°F (-20°C) to 113°F (45°C)
- Safe for indoor/outdoor residential and commercial use.
- Enclosure UL Listed to UL 508A, Type 1, 2, 4, 4X, 6, 6P, 12 & 13
- Conforms to CE Safety Standards (applicable EU directives and regulations)
- Enclosure Dimensions: 4.50 in x 4.50 in x 2.44 in
- Designed, Engineered & Assembled with pride in the USA
- 1-year warranty

Each HYTimer by Level2 Concepts is carefully inspected and tested to ensure both safety and operating performance. Failure to follow the instructions and warnings in this manual may result in HYTimer damage and possible user injury.

Be sure to read this entire document and save it for future reference

WARNINGS

- This device is supplied with a grounding conductor and a grounding-type attachment plug. To reduce the risk of electric shock, connect HYTimer only to a properly grounded power outlet
- Do not remove the grounding pin from the power plug or use any type of “ground eliminator” adapter
- Do not connect to any voltage other than that shown on the device
- Do not use near flammable liquids or vapors
- HYTimer must be connected to an electrical branch circuit with a 15 amp circuit breaker
- A Ground Fault Circuit Interrupter (GFCI) device must be used with HYTimer
- HYTimer’s rated operational temperature range is -4°F (-20°C) to 113°F (45°C)
- Device servicing should be performed by authorized personnel only

Safety Compliance

HYTimer is designed with the following safety standards in mind:

- UL 60730-1 (Type 1 action, Pollution degree 1 microenvironment, Pollution degree 4 environment)
- UL 60730-2-7
- CSA E60730-1
- CE (applicable EU directives and regulations)

Quick Start Instructions

1. Before installation, verify that you have received all the parts. The base HYTimer package consists of the following:
 - a. HYTimer Control Unit (1).
 - b. Weatherproof Receptacle Gaskets (3).
 - c. Plastic Receptacle Covers (2).
 - d. This User Manual (1).

IMPORTANT: Do not discard the plastic receptacle covers or the weatherproof receptacle gaskets!



2. Connect all devices to be controlled to HYTimer. Keep extension cord use and length to a minimum. When using extension cords, a grounded 14/3 AWG gauge (minimum) outdoor-rated cord is required. Ensure that you comply with all local electrical code wire gauge/length requirements.

IMPORTANT:

Do not exceed HYTimer's 15 amp maximum load current capacity.

>> The total amperage of ALL devices connected to HYTimer must not exceed 15 amps <<

3. Use a weatherproof receptacle gasket at each electrical outlet/plug connection.
Note: Keep weatherproof receptacle gaskets clean. Use only mild soap and warm water to clean gaskets.
4. Use a plastic receptacle cover and a weatherproof receptacle gasket on all unused outlets
Note: Additional gaskets & outlet covers are available at [Level2 Concepts.com](http://Level2Concepts.com).
5. Plug HYTimer into a 15 amp, GFCI protected, 120-240 VAC, 50-60 Hz. electrical service outlet
6. After a brief initialization period, HYTimer will begin the factory default programmed On/Off cycle timing schedule.
FYI: The factory default programming is a repeating 1-minute On, 5-minutes Off cycle, 24-hours a day.
7. Continue to the next section, "Accessing the HYTimer Control Panel" if you would like to change HYTimer's factory default operation.

Accessing the HYTimer “Home” Control Panel

1. Using a WiFi (802.11g, WPA2-PSK) capable device with a web browser App (iPhone, Android, Tablet, Laptop, etc.), navigate to your device’s WiFi network setup page.
2. After HYTimer has been plugged-in and initialized, you will see a new WiFi network appear in your device’s WiFi network list. This new network will have an SSID of “HYTIMER-#####”. The “#####” will correspond to the last six numbers/letters of the “MAC ##:##:##:##:##:##” information located on the bottom of the HYTimer Home web page (shown below).
3. Select the “HYTIMER-#####” WiFi network. Your WiFi device will then prompt you for a password. The factory default password for HYTimer is “hytimer1” (all lower case, do not include the quotes). Optionally, you can change the HYTimer password. See the “Changing the HYTimer WiFi Password” section below for additional instructions.
4. Once your WiFi device has connected to the “HYTIMER-#####” WiFi network, open your WiFi device’s web browser App (Internet Explorer, Google Chrome, Firefox, Safari, etc.).
5. In your web browser’s web address field type: “10.3.2.1” (excluding quotes) and select Go/Enter/OK. If all goes well, you should see HYTimer Home web page:



Programming HYTimer

1. Set the Local Date, Time, and UTC Time Zone Offset:

- a. On the HYTimer Home page, select the “DATTIM” radio button in the “CONFIG” section and then press the “Submit” button in the “GOTO PAGE” section. The DATTIM (Date/Time) page is displayed:

The screenshot shows the HYTimer web interface. At the top is the logo "HYTimer®". Below it is a section titled "DATE/TIME SET" with two rows of input fields. The first row is labeled "DATE:" and contains three fields: "06" (MN), "17" (DD), and "20" (YY). The second row is labeled "TIME:" and contains three fields: "18" (HH), "17" (MM), and "25" (SS). Below this is a section titled "TIMEZONE" with an "OFFSET:" field containing "-4". At the bottom is a section titled "CONFIG" with a "Submit" button and a "Reset" button with a checkbox. At the very bottom, there is a status bar with the text: "MAC: DA:BF:C0:F9:92:B8 / VER: 4.0.1 / MEM: 28288" and "© 2016-2020 Level2 Concepts, LLC."

- b. Enter your UTC local time zone offset value in the “OFFSET” field. This offset is the number of hours offset your local time is from UTC (typically -12:00 to +14:00). Example: If you are in the Eastern Standard Time (EST) Time Zone, then your offset is -5 hours. Eastern Daylight Time (EDT) would be -4 hours, Central Standard Time (CST) would be -6 hours, etc.

Tip: Visit https://en.wikipedia.org/wiki/List_of_time_zone_abbreviations for a complete list of Global Time Zones and their UTC Offset values.

- c. Enter today’s date in the DATE: MN (month), DD (day), YY (year) fields.
- d. Enter the current local time in the TIME: HH (hours), MM (minutes), SS (seconds) fields then **press the “Submit” button in the “CONFIG” section at the exact moment the time you entered is valid.**
- e. HYTimer will briefly display “**HYTIMER UPDATED**” and then return you to the Home page.

Note: HYTimer will discard all of your input on the page if any of the values you entered are invalid.

2. Set the Sunrise/Sunset Location Latitude and Longitude:

- a. On the HYTimer Home page, select the “SR/SS” radio button in the “CONFIG” section and then press the “Submit” button in the “GOTO PAGE” section. The SR/SS (Sunrise/Sunset) page is displayed:

HYTimer®

Date/Time: 06/17/20 - 18:18:00

LOCATION

LATITUDE: 26.87315

LONGITUDE: -80.07301

CONFIG

Submit **Reset**

MAC: DA:BF:C0:F9:92:B8 / VER: 4.0.1 / MEM: 28872

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- a. Enter your location’s Latitude and Longitude coordinates in the “Latitude” and “Longitude” fields. Latitude and Longitude are coordinate values of the Geographic coordinate system.

Tip: Visit <https://www.latlong.net> to get the Latitude and Longitude coordinates for your local address.

FYI: https://en.wikipedia.org/wiki/Geographic_coordinate_system

- b. Press the “Submit” button in the “CONFIG” section.
- c. HYTimer will briefly display “**HYTIMER UPDATED**” and then return you to the Home page.

Note: HYTimer will discard all of your input on the page if any of the values you entered are invalid.

A few words about HYTimer Outputs, Schedules, and Timers before we go any further:

General Functional Overview

- An “Output” controls power to the device(s) you connect to HYTimer (pump, light, fan, etc.)
- A “Schedule” defines WHEN something will happen to an Output
- A “Timer” describes the “something” (the WHAT) that will occur during a Schedule
- Each Output has two Schedules (#1 and #2) and two Timers (#1 and #2)
- Schedule #1 defines the WHEN for Timer #1
- Schedule #2 defines the WHEN for Timer #2
- Timer #1 defines WHAT is going to happen to an Output during Schedule #1
- Timer #2 defines WHAT is going to happen to an Output during Schedule #2

Schedule Modes - Manual or SR/SS (a.k.a. DSST - Dynamic Sunrise/Sunset Tracking)

- A Schedule can be set in one of two modes: “Manual” or “SR/SS” (a.k.a. DSST)
- Setting a Schedule to Manual mode allows you to input Schedule Start and End times manually
- Setting a Schedule to SR/SS mode enables DSST for the associated Output
- Placing any Schedule in SR/SS mode presets Schedule #1 Start to sunrise time and Schedule #1 End to sunset time. It also presets Schedule #2 Start to sunset time and Schedule #2 End to sunrise time
- You cannot modify Schedule Start and End times while the Schedule is in SR/SS (DSST) mode
- DSST is accurate to within approximately +/- 1 minute of the civil sunrise and sunset times for your location

FYI: Sunrise/Sunset times for any location in the world: <https://sunrise-sunset.org>

- In the event of a conflict or time overlap, Schedule 1 takes precedence over Schedule 2

Schedule Gaps

- Any time that falls in-between the defined Schedules of an Output is referred to as a “Schedule Gap”

Example:

> Schedule #1 - Start: 06:00, End: 18:00 / Schedule #2 – Start: 20:00, End: 03:00

> In the above example both time ranges 03:00 to 06:00 and 18:00 to 20:00 are Schedule Gaps

- An Output will remain off during a schedule gap

Timer Modes

- A Timer can be set in one of three Modes: Always “ON”, Always “OFF”, or “Timer” (a.k.a. Repeating Cycle)
- “ON” Mode will keep the associated Output in a constant ON state for the duration of the active Schedule
- “OFF” Mode will keep the associated Output in a constant OFF state for the duration of the active Schedule
- “Timer” Mode will repeatedly cycle the associated Output between ON and OFF times defined in the “ON: HH, MM, SS” and “OFF: HH, MM, SS” section of the TIMER page
- Valid Repeating Cycle ON/OFF times are 00:00:05 (5 seconds) to 23:59:59 (23 hours, 59 minutes, 59 seconds)

Now on to configuring Schedules and Timers...

3. Set Schedule Mode, Start, and End Times for each Output:

- a. On the HYTimer Home page, select the "SCH:1" radio button in the "OUT:1" section and then press the "Submit" button in the "GOTO PAGE" section. The OUT1/SCHED1 (Output 1/Schedule 1) page is displayed:

HYTimer®

OUT:1 **SCH:1 MODE**

MANUAL **SR/SS**

OUT:1 **SCH:1** **TIME**

START: **06** **26**
 HH **MM**

END: **20** **16**
 HH **MM**

CONFIG

Submit **Reset**

MAC: DA:BF:C0:F9:92:B8 / VER: 4.0.1 / MEM: 27992
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- b. Select the desired Schedule Mode: "Manual" or "SR/SS" (a.k.a. DSST). If setting the Schedule Mode to "SR/SS", skip Steps c & f.
 - c. For "Manual" Mode, enter the desired Schedule Start and End times using military time format.
 - d. Press the "Submit" button in the "CONFIG" section.
 - e. HYTimer will briefly display "HYTIMER UPDATED" and then return you to the Home page.
- Note:** HYTimer will discard all of your input on the page if any of the values you entered are invalid.
- f. Repeat the steps above for Schedule #2.
 - g. Repeat the steps above for each HYTimer Output (some model HYTimers have more than one Output).

4. Set Timer Mode, On, and Off Times for each Output Schedule:

- a. On the HYTimer Home page, select the “TIMER” radio button in the “OUT:1” section and then press the “Submit” button in the “GOTO PAGE” section. The OUT1/TIMER1 (Output 1/Timer 1) page is displayed:

The screenshot shows the HYTimer web interface for configuring Output 1/Timer 1. The interface is divided into three main sections:

- OUT:1 TMR:1 MODE:** This section contains three radio buttons. The "Timer" radio button is selected, while "ON" and "OFF" are unselected.
- OUT:1 TMR:1 TIME:** This section contains two rows of time input fields. The first row is for "ON:" and the second row is for "OFF:". Each row has three input fields for HRS, MIN, and SEC. The "ON:" row has values 00, 01, and 01. The "OFF:" row has values 00, 05, and 01.
- CONFIG:** This section contains two buttons: "Submit" and "Reset".

At the bottom of the interface, the following information is displayed:

MAC: DA:BF:C0:F9:92:B8 / VER: 4.0.1 / MEM: 28000
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- b. Select the desired Timer Mode: “ON”, “OFF” or “Timer” (a.k.a. Repeating Cycle). If setting Timer Mode to “ON” or “OFF”, skip Step c.
 - c. For “Timer” Mode, enter the desired Repeating Cycle ON and OFF times.
 - d. Press the “Submit” button in the “CONFIG” section.
 - e. HYTimer will briefly display “**HYTIMER UPDATED**” and then return you to the Home page.
- Note:** HYTimer will discard all of your input on the page if any of the values you entered are invalid.
- f. Repeat the steps above for Timer #2.
 - g. Repeat the steps above for each HYTimer Output (some model HYTimers have more than one Output).

After you have completed programming HYTimer, it is recommended that you close your WiFi device’s browser App and disconnect from the “HYTIMER-#####” WiFi network.

Changing the HYTimer WiFi Password

You can change the HYTimer WiFi password - if desired.

CAUTION

If you change the HYTimer WiFi password and forget it, you will no longer be able to access the HYTimer Programming Control Panel. If this happens, your unit may need to be returned to the factory for repair at your expense. Contact Level2 Concepts Technical Support for assistance.

A valid password is comprised of only lowercase alpha-numeric characters (a-z, 0-9) and must be exactly eight characters in length. Examples:

newpass1

secret123

c3p0r2d2

1. To change the WiFi password, first access the HYTimer Home control panel as described “Accessing the HYTimer “Home” Control Panel” section above.
2. Append the characters “/?appswd=xxxxxxx” to the “10.3.2.1” address in the browser’s address bar (where “xxxxxxx” is the new HYTimer WiFi password) and then select Go/press Enter/select OK . Example:

10.3.2.1/?appswd=newpass1

If you enter an invalid password, HYTimer will ignore it, restart and retain the previous valid password.

Resetting HYTimer Back to Factory Defaults

HYTimer can be reset back to Factory Defaults by selecting the “Reset” check box on any programming page and then pressing the “Submit” button.

Note: Performing a Factory Default Reset will disconnect your WiFi device from HYTimer.

Changing the HYTimer WiFi Channel

You can change the HYTimer WiFi Channel - if desired.

HYTimer uses a WiFi signal to communicate with your WiFi-enabled device (phone, tablet, laptop, etc.). This WiFi signal is assigned to a predefined radio frequency channel (much like a TV or radio). For HYTimer, valid WiFi channels are 1 through 11. By default, HYTimer will select a WiFi channel automatically. HYTimer's built-in automatic channel selection algorithm ensures that HYTimer's choice of WiFi signal avoids conflict with other WiFi signals that may be in the local area (like an existing home or business WiFi network for example). In rare situations, HYTimer's auto-channel-select mode may select a WiFi channel that is not optimal for your unique WiFi environment. If that happens, you can override HYTimer's WiFi channel selection and force it to use a specific channel as follows:

1. To change the HYTimer WiFi channel, first access the HYTimer Home control panel as described "Accessing the HYTimer "Home" Control Panel" section above.
2. Append the characters `"/?apchnl=#"` to the `"10.3.2.1"` address in the browser's address bar (where `"#"` is the new HYTimer WiFi channel - 0 through 11) and then select Go/Enter/OK.

Examples:

<code>10.3.2.1/?apchnl=0</code>	(set HYTimer to auto-select the WiFi channel – Factory Default)
<code>10.3.2.1/?apchnl=1</code>	(set HYTimer to use WiFi channel 1)
<code>10.3.2.1/?apchnl=6</code>	(set HYTimer to use WiFi channel 6)
<code>10.3.2.1/?apchnl=11</code>	(set HYTimer to use WiFi channel 11)

If you enter an invalid channel number, HYTimer will ignore it, restart and retain the previous WiFi channel mode.

Electrical Specifications

Input Voltage:	120-240 VAC, 50-60 Hz.
Wattage @ no load:	~3 watts @ 120 VAC, 60 Hz.
Max Load Current:	15 Amps (total of all outputs)
Clock Battery:	CR-2032, Coin Cell, 3 volts
WiFi:	2.4 GHz, 802.11g, Channels 1-11