1. Our relays are dry contacts, it DOES NOT output power (it just simply connect & disconnect circuits).

2. Please make sure the target circuit fits our relay's rating before wiring, especially when dealing with motors etc (motors are inductive load, rating is strictly 6A @ 14VDC). *Full relay ratings are at the bottom of this page.*
  Use exceed relay rating may CAUSE DAMAGE immediately or in the long run.

3. Use regulated power supply (e.g. 12V adapter) if possible, it might help when receiver shows weird behaviour.

202U receiver has two relays on board which provide normally open & normally closed voltage-free dry contact terminals for controlling virtually any electronic device. In default standard mode, both relays can be set to any of three modes – *pulse (momentary), hold (toggle) or interlock latching* using DIP switches.

Setting Relay Operation *in Standard Mode*

Pulse / Momentary – Relay contact is active whilst transmitter button is pressed, min. active period is > 0.5s

Hold / Toggle – Relay changes state at each press of transmtter button. Hold, Release, Hold etc. (like an on/off switch)

Interlock Latching – Two relays interact with each other, Relay 1 on then Relay 2 off, Relay 2 on then Relay 1 off. (useful for small DC motor reverse polarity control)

DIP Switch 1	ON	ON	OFF	OFF
DIP Switch 2	ON	OFF	ON	OFF

↓ with **DIP Switch 3 & 4 OFF**

Relay 1	Pulse	Hold	Interlock	Pulse
Relay 2	Hold	Hold	Latching ①	Pulse

① To turn off both relays in this mode, press the **special function button** which is assigned to both relays 1&2 (programmed by press both PRG1 & PRG2 when storing transmitter code).

Storing Transmitter Code

1. Press and hold **PRG1** (for Relay 1) or **PRG2** (for Relay 2) or **PRG1 and PRG2** (for both Relay 1 & 2) until **SIG LED** turned on.

2. Release **PRG** button.

3. Press the transmitter button you would like to control the channel once until **SIG LED** flashes, then release transmitter button.

4. The **SIG LED** will flash quickly three times, indicating that the code has been stored.

5. Press the programmed transmitter button to test operation.

Remove Single Transmitter Code: Repeat steps 1-5 above. During removal process, **SIG LED** on step 4 will flash **slowly** three times (instead of quickly), indicating that the code has been removed.

Deleting All Stored Transmitter Codes

1. Turn power off to receiver.

2. Press and hold **both PRG1 and PRG2** button.

3. While holding **both PRG1 and PRG2** - turn power on again. After 5 seconds the **SIG LED** will illuminate to indicate receiver's memory has been cleared.

4. Release **PRG1 and PRG2**. All the stored codes should now be deleted. Confirm this by pressing transmitters previously used to operate the device. There should be no response.

Receiver Function Diagram
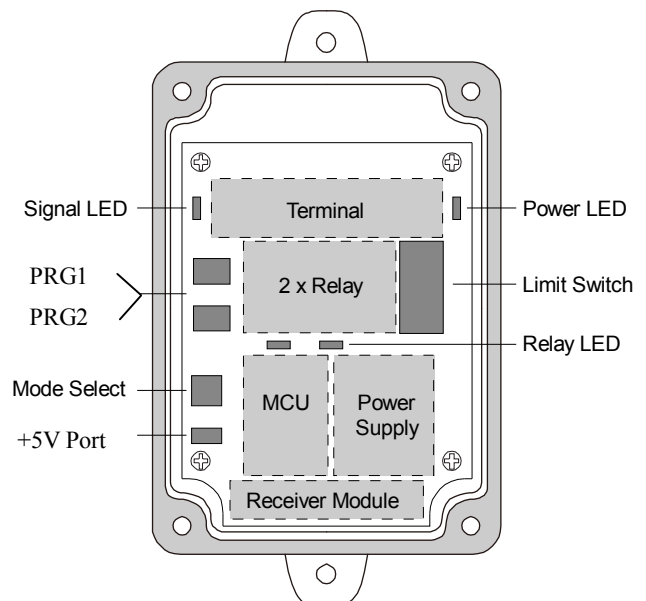
Technical Specifications

Power Supply: 9V-24V AC or 9V-30V DC

Memory Capacity: 510 Transmitters (up to 14 buttons each)

Antenna Impedance: 50 Ohms (RG58)

✔ **Relay Contact Rating**

Resistive Load (cosΦ=1): 10A @ 14V DC or 10A @ 120V AC

Inductive Load (cosΦ=0.4 L/R=7msec): 6A @ 14VDC

Temperature Rating: -4°F to 131°F (-20°C to 55°C)

Weight: 0.25 lbs. (0.11kg)

Physical Size: 4.33"L x 2.36"W x 1.37"H (11cmL x 6cmW x 3.5cmH)

Basic Wiring Diagram

Wiring maybe complex depending on different applications, we just included two simple diagrams below to explain the basic idea.
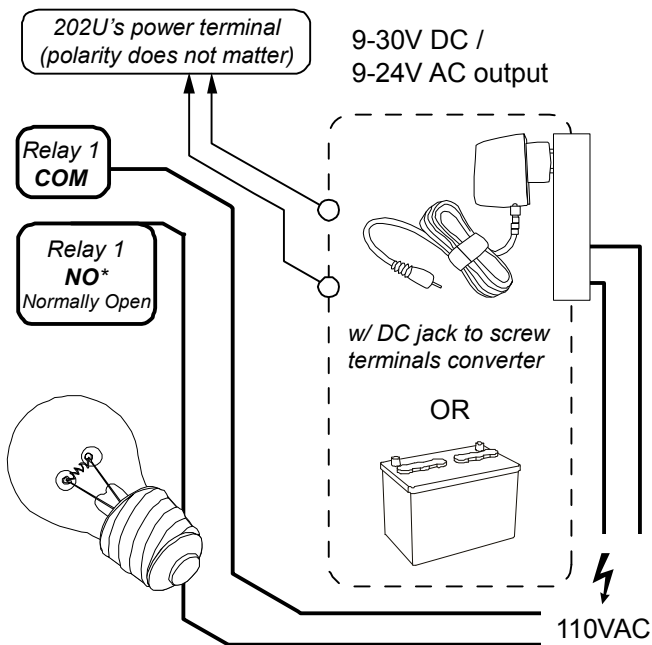
⚠ Basic electronics knowledge is **Required**, customer needs to make sure all parts in diagram meets our specifications (for example, light bulb not exceeding relay ratings), or it may cause unexpected results or damage.

Following examples are using 202U's Relay 1 for wiring, you can use Relay 2 of course, the idea is the same.

Basic wiring using separate power supplies

The following is a simple wiring diagram for controlling light bulb on & off using our 202U receiver.

The light bulb is using 110Vac mains power, while our receiver is using 12Vdc regulated power through power adapter or battery.

202U's power terminal
(polarity does not matter)

9-30V DC /
9-24V AC output

Relay 1
COM

Relay 1
NO*
Normally Open
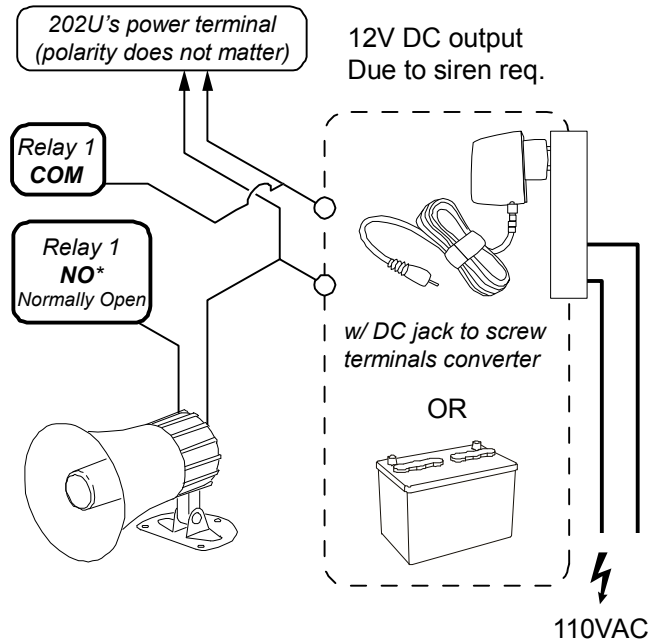
w/ DC jack to screw
terminals converter

OR

110VAC

NO terminal means normally open (disconnected to COM), and it will close (connect to COM) when relay is activated (clicks).

When relay activates, NO is connected to COM internally through onboard relay, circuit closed -> then light bulb should be turned on.

Basic wiring using the same power supply

When the target device also uses low power such as 12Vdc (for example, the 12Vdc siren in diagram below), then our receiver can share the same power supply with target device.

202U's power terminal
(polarity does not matter)

12V DC output
Due to siren req.

Relay 1
COM

Relay 1
NO*
Normally Open

w/ DC jack to screw
terminals converter

OR

110VAC

⚠ Shared power source is not recommended for motor or other electronics which introduce noise into power line.

Although 202U doesn't care about polarity, your target device may care, so inspect wiring carefully before power up, to avoid damage.

Simple Onboard NO (Normally Open) Limit Switch

LS on receiver board stands for limit switch, LS1 & LS2 controls relay 1 & 2 respectively, they share a common connection COM, so the 3 blue terminals from up to down can be read as LS1 COM LS2.

For example, when LS1 is connected to COM (by external limit switch or other sensor outside), then relay 1 will be forced off, even if remote control tells it to stay on.

⚠ Our limit switch is only for feedback control (to turn relay off), NOT for direct manual override control!

Discover new features in V6 online!

There are many new features in V6 version receiver, please check our full manual online.

It is available at solidremote.help website, search for "*SR-RCS-202U receiver manual*" topic.

Thank you.

What's new in V6 – You asked, we listened, thank you!

Hardware

1. <mark>New</mark> Easy-to-connect 4-pin PH2.0 port, provide possibility to communicate with other systems. See (https://docdro.id/QZcgbVb) for connector hardware specification.

    > The port currently implements standard I2C protocol, which outputs remote's serial number, as well as other information, which can be useful for some applications.

2. Dip switches has changed from 3 pos to 4 pos, provides more configuration possibilities.
3. More powerful MCU with up to 50% performance gain as well as significantly less power consumption. Now 202U's standby current is ~8mA @ 12Vdc (compared to ~13mA @12Vdc in V5a version).
4. After six months field run, all V6 receiver are shipped with 3rd gen receiver module (B2c), which provide better -114dBm sensitivity (another 3dBm link budget compared to B1a's -111dBm)
5. Redesigned power supply circuit layout, as well as fine tuned component values, provide more pure & stable power.

Software

1. Breaking Change Now all interlock working mode (both interlock latching & new interlock pulse) implement mandatory 0.3 seconds delayed-on feature between relay on/off switch.
2. Breaking Change Receiver will remain in learn mode for maximum 25 seconds after learn button is released, no need to keep pressing learn button anymore. (better for in-car remote training)
3. <mark>New</mark> Interlock pulse mode, the difference from interlock latching is that, when remote control button released, the relay will turn off (instead of stays on).
4. <mark>Improved</mark> More versatile timer mode, now it is possible to only put (relay #1) into timer mode, while keep (relay #2) in either pulse or hold mode.
5. <mark>Improved</mark> More values to choose from in timer mode, 1~60 seconds *(1 second interval)*, 1~60 minutes *(1 minute interval)*, 1~32.5 hours *(30 minutes interval)* as well as some micro step values such as 200ms~900ms *(100ms interval)*.

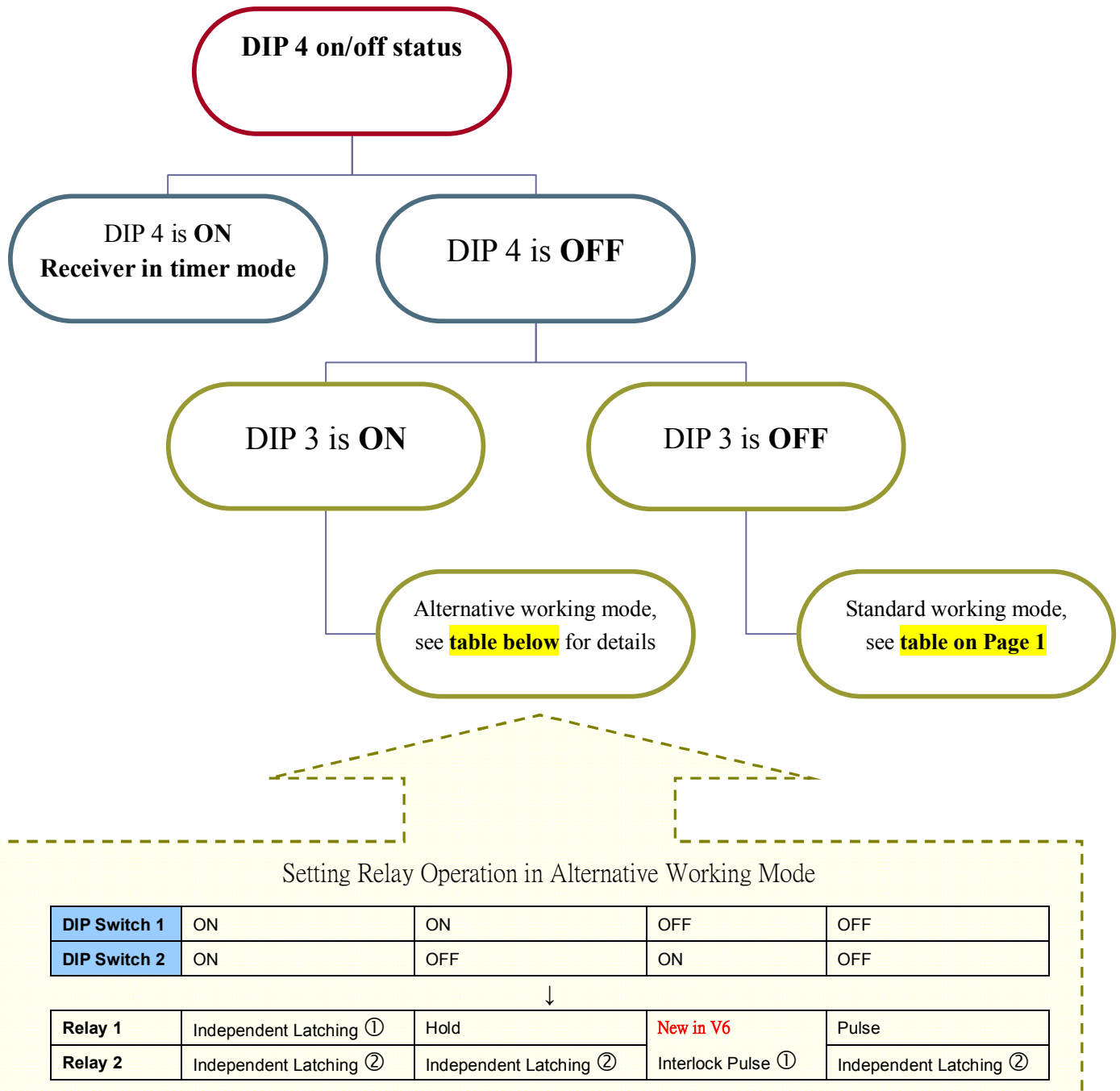All above changes are compared to previous V5 version receiver.
2019-11-01

Discover new features in V6 – Easier switch to alternative working mode

Breaking Change Switching to alternative working mode (incl. independent latching mode and new interlock pulse mode) has been easier. Now you can just flip a DIP switch to make the change in V6, no more reboot necessary.

DIP 4 on/off status

DIP 4 is ON
Receiver in timer mode

DIP 4 is OFF

DIP 3 is ON

DIP 3 is OFF

Alternative working mode, see **table below** for details

Standard working mode, see **table on Page 1**

Setting Relay Operation in Alternative Working Mode

DIP Switch 1	ON	ON	OFF	OFF
DIP Switch 2	ON	OFF	ON	OFF

↓

Relay 1	Independent Latching ①	Hold	New in V6	Pulse
Relay 2	Independent Latching ②	Independent Latching ②	Interlock Pulse ①	Independent Latching ②

Independent latching mode (called True Latching in V5) is introduced in V5 to enable you to control each relay latching on/off **independently** (as opposed to interlock latching mode).

① To turn off relay 1 in these modes, press the **special function button** which is assigned to both relays 1&2 (programmed by press both PRG1 & PRG2 buttons during storing transmitter code).

② To turn off relay 2 in these modes, press the **special function button** which is NOT assigned to any relay (the specific button is not assigned to any relay, but at least one other button on the same transmitter should be assigned).

If you only use basic features (same as pre-V5 202U versions), then just **SKIP** the following section, thanks.

Discover new features in V6 - Settings

Breaking Change Some settings has been changed since V5 version, due to DIP switch changes (3 pos->4 pos). For existing V5 version users, you might need to check manual below again, thanks.

To make full use of current hardware, and make our receiver as versatile as possible, we have introduced settings.

- Settings change our receiver's behaviour in normal working.
- Settings can be changed by customer **ONLY during power on boot process** (thus only one chance per boot).
- Different settings is achieved by **different PRG button and DIP switches combination** during above process.
- Once new settings is saved, it will retain even after powered off, unless you changed it again.
- Remember: DIP switches **functions differently** in settings mode and normal working mode.

Settings – How to change them?

1. Turn power off to receiver.

2. Set the **DIP switches position** according to manual below.

3. Press and hold *either PRG1 or PRG2* button, **NEVER both (because it is used to clear memory).**

4. While holding *either PRG1 or PRG2* - turn power on again. After 5 seconds the *SIG LED* will illuminate to indicate receiver has accepted & saved new settings.

5. Release *PRG* buttons. Our receiver should now run under new settings.

✔ You can see the above step is very similar to *erase all transmitters step*, one difference is you press **EITHER** PRG1 or PRG2 button in Step 3, **NEVER BOTH.**

Settings – What can I change? What is the difference between press PRG1 and PRG2?

✔ PRG1 and PRG2 controls different settings group, you will find all the settings available below, let's start with PRG1 control group.

settings by using PRG1 Overview

PRG1 controls 4 independent settings, by set different DIP switches position during settings process, as shown in table below.

DIP Switch 1	ON	Pulse / momentary mode delay is **1.5 second**
	OFF ①	Pulse / momentary mode delay is **0.5 second**
DIP Switch 2	ON	**Continuous programming mode** Receiver will remain in learn mode, after programmed one button
	OFF ①	**Single programming mode** Receiver will exit learn mode, after programmed one button
DIP Switch 3	ON	**Only Relay 1 is timed** in timed output mode (New in V6)
	OFF ①	**Both Relays are timed** in timed output mode
DIP Switch 4	ON	When only Relay 1 in timer mode, **Relay 2 is in hold / toggle mode** (New in V6)
	OFF ①	When only Relay 1 in timer mode, **Relay 2 is in pulse / momentary mode** (New in V6)

① **OFF position is factory default.**

PRG1 & <u>DIP Switch 1</u> *Controls pulse / momentary mode delay*

The delay period can be observed by press transmitter button to activate relay in pulse mode, then release transmitter button.

The *relay hold on* period between transmitter button release → relay release is the delay.

The default value is 0.5s for well balance between fast response and high stability.

When you set to 1.5s, the perceived relay stability during pulse mode will be better, while the response speed for relay release is slower.

Please Note Due to our transmitter's repeat transmit feature, it may keep transmitting up to 0.5s after button release, that will add time to our

delay timer, so 0.5s delay can be between 0.5~1.0 seconds, while 1.5s can be between 1.5~2.0 seconds.

`For precise micro step control, please switch to timer mode, and use new micro values in V6`

PRG1 & <u>DIP Switch 2</u> *Controls learn mode behaviour*

Controls receiver's behaviour in learn (programming) mode.

When setting is OFF,

Receiver will auto exit learn mode, after one programming attempt.

When setting is ON,

Receiver will remain in learn mode for another 25 seconds, after one programming attempt.

PRG1 & <u>DIP Switch 3</u> *Controls whether to put both relays in timer mode*

✔ **This setting ONLY matters when receiver is in timer mode.**

When setting is OFF, then both relays are timed when receiver in timer mode.

When setting is ON, then only relay 1 is timed in timer mode, while relay 2 can be in either pulse or hold mode, according to following setting.

PRG1 & <u>DIP Switch 4</u> *When only relay 1 in timer mode, switch relay 2's mode between pulse and hold*

✔ **This setting ONLY matters when receiver is in timer mode AND above setting *PRG1 & DIP Switch 2 is ON*.**

When this setting is OFF, then relay 2 is in pulse mode.

When this setting is ON, then relay 2 is in hold mode.

PRG2 & <u>DIP Switches 1.2.3.4</u> *These settings enables you to select one specific timing you want in timed output mode*

Our timed output mode supports count down timing in **1~60 seconds**, **1~60 minutes** and **1~32.5 hours**. (Smaller **200ms ~ 900ms** microstep value also added in **V6**)

<mark>**NOT continuous**, only preset timer values in the range is available</mark>. See the lookup table below for all available values and their settings.

```
                    ╭─────────────────────╮
                    │  Which timer value do │
                    │     you need?        │
                    ╰─────────────────────╯
```

1~60 seconds, or 200~500ms	1~60 minutes, or 600~900ms	1~32.5 hours
Choose **Table #1**	Choose **Table #2**	Choose **Table #3**
Set **DIP3 = OFF / DIP4 = OFF** during boot setting	Set **DIP3 = ON / DIP4 = OFF** during boot setting	Set **DIP3 = OFF / DIP4 = ON** during boot setting

See corresponding table below for more details
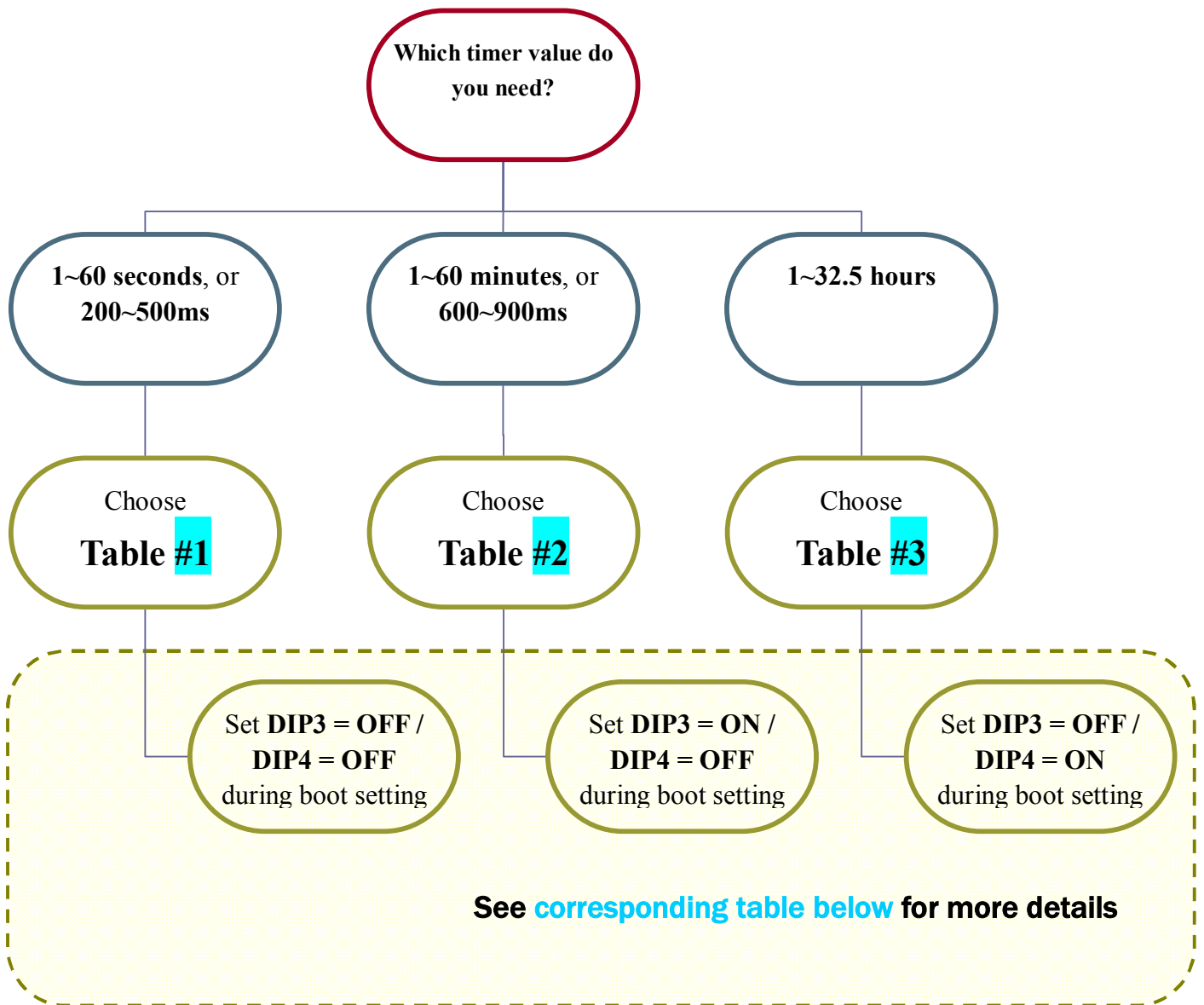
Then check the table (#1,#2,#3,#4) below accordingly for more specific settings.

The timed output value → DIP switches position lookup table (Table #1)

Table #1 covers range from 1~60 seconds, as well as 200~500ms

To use this table, set **D3 OFF / D4 OFF** during boot settings procedure

		D1 OFF / D2 OFF / D3 OFF		D1 ON / D2 OFF / D3 OFF		D1 OFF / D2 ON / D3 OFF		D1 ON / D2 ON / D3 OFF		D1 OFF / D2 OFF / D3 ON		D1 ON / D2 OFF / D3 ON		D1 OFF / D2 ON / D3 ON		D1 ON / D2 ON / D3 ON	
D1 OFF / D2 OFF	→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D1 ON / D2 OFF		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
D1 OFF / D2 ON		33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
D1 ON / D2 ON		49	50	51	52	53	54	55	56	57	58	59	60	**200ms**	**300ms**	**400ms**	**500ms**

Units above are in seconds, unless otherwised mentioned.

For example,

If you need a timed output of 31 seconds (relay turn on for 31 seconds then auto turn off)

- set DIP 1 ON, DIP 2 OFF, DIP 3 OFF, DIP 4 OFF **during boot** (see Page 6 - *Settings – How to change them?*)
- set DIP 1 ON, DIP 2 ON, DIP 3 ON, DIP 4 ON **after boot**, then activate **relay #1**

If you need a timed ouput of 200 milliseconds (relay turn on for 200 milliseconds then auto turn off, useful for application requires microsteps)

- set DIP 1 ON, DIP 2 ON, DIP 3 OFF, DIP 4 OFF **during boot** (see Page 6 - *Settings – How to change them?*)
- set DIP 1 OFF, DIP 2 ON, DIP 3 ON, DIP 4 ON **after boot**, then activate **relay #1**

✔ Information: Timed output mode is entered by **DIP Switch 4 in ON position**, in normal working mode after boot.

Legend & abbreviations

D1 = DIP Switch 1

D2 = DIP Switch 2   **ms** = millisecond

D3 = DIP Switch 3

D4 = DIP Switch 4

D1 ___ D2 ___	This setting is **changed during boot period**
D1 ___ D2 ___	DIP position is in **normal working after boot**
___	This is RELAY 1 timing value
___	This is RELAY 2 timing value

The timed output value → DIP switches position lookup table (Table #2)

Table #2 covers range from 1~60 minutes, as well as 600~900ms

To use this table, set **D3 ON / D4 OFF** during boot setting procedure

	D1 OFF D2 OFF D3 OFF		D1 ON D2 OFF D3 OFF		D1 OFF D2 ON D3 OFF		D1 ON D2 ON D3 OFF		D1 OFF D2 OFF D3 ON		D1 ON D2 OFF D3 ON		D1 OFF D2 ON D3 ON		D1 ON D2 ON D3 ON	
D1 OFF / D2 OFF	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D1 ON / D2 OFF	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
D1 OFF / D2 ON	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
D1 ON / D2 ON	49	50	51	52	53	54	55	56	57	58	59	60	600ms	700ms	800ms	900ms

Units above are in minutes, unless otherwised mentioned.

For example,

If you need a timed output of 37 minutes (relay turn on for 37 minutes then auto turn off)

- set DIP 1 OFF, DIP 2 ON, DIP 3 ON, DIP 4 OFF **during boot** (see Page 6 - *Settings – How to change them?*)
- set DIP 1 OFF, DIP 2 ON, DIP 3 OFF, DIP 4 ON **after boot**, then activate **relay #1**

If you need a timed ouput of 700 milliseconds (relay turn on for 700 milliseconds then auto turn off, useful for application requires microsteps)

- set DIP 1 ON, DIP 2 ON, DIP 3 ON, DIP 4 OFF **during boot** (see Page 6 - *Settings – How to change them?*)
- set DIP 1 OFF, DIP 2 ON, DIP 3 ON, DIP 4 ON **after boot**, then activate **relay #2**

✔ Information: Timed output mode is entered by **DIP Switch 4 in ON position**, in normal working mode after boot.

Legend & abbreviations

D1 = DIP Switch 1

D2 = DIP Switch 2   **ms** = millisecond

D3 = DIP Switch 3

D4 = DIP Switch 4

D1 ___ D2 ___	This setting is **changed during boot period**
D1 ___ D2 ___	DIP position is in **normal working after boot**
___	This is RELAY 1 timing value
___	This is RELAY 2 timing value

3

The timed output value → DIP switches position lookup table (Table #3)

Table #3 covers range from 1~32.5 hours

To use this table, set D3 OFF / D4 ON during boot settings procedure

		D1 OFF D2 OFF D3 OFF		D1 ON D2 OFF D3 OFF		D1 OFF D2 ON D3 OFF		D1 ON D2 ON D3 OFF		D1 OFF D2 OFF D3 ON		D1 ON D2 OFF D3 ON		D1 OFF D2 ON D3 ON		D1 ON D2 ON D3 ON	
D1 OFF / D2 OFF		1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5
D1 ON / D2 OFF	→	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5
D1 OFF / D2 ON		17	17.5	18	18.5	19	19.5	20	20.5	21	21.5	22	22.5	23	23.5	24	24.5
D1 ON / D2 ON		25	25.5	26	26.5	27	27.5	28	28.5	29	29.5	30	30.5	31	31.5	32	32.5

Units above are in hours, unless otherwised mentioned.

For example,

If you need a timed output of 15 hours (relay turn on for 15 hours then auto turn off)

- set DIP 1 ON, DIP 2 OFF, DIP 3 OFF, DIP 4 ON **during boot** (see Page 6 - *Settings – How to change them?*)
- set DIP 1 OFF, DIP 2 ON, DIP 3 ON, DIP 4 ON **after boot**, then activate **relay #1**

If you need a timed ouput of 24.5 hours (relay turn on for 24.5 hours then auto turn off)

- set DIP 1 OFF, DIP 2 ON, DIP 3 OFF, DIP 4 ON **during boot** (see Page 6 - *Settings – How to change them?*)
- set DIP 1 ON, DIP 2 ON, DIP 3 ON, DIP 4 ON **after boot**, then activate **relay #2**

✔ Information: Timed output mode is entered by **DIP Switch 4 in ON position**, in normal working mode after boot.

Legend & abbreviations

D1 = DIP Switch 1

D2 = DIP Switch 2   **ms** = millisecond

D3 = DIP Switch 3

D4 = DIP Switch 4

D1 ___ D2 ___	This setting is **changed during boot period**
D1 ___ D2 ___	DIP position is in **normal working after boot**
___	This is RELAY 1 timing value
___	This is RELAY 2 timing value

4

The timed output value → DIP switches position lookup table (**Table #4**)

Table #4 – Reserved

To use this table, set D3 ON / D4 ON during boot settings procedure

		D1 OFF D2 OFF D3 OFF	D1 ON D2 OFF D3 OFF	D1 OFF D2 ON D3 OFF	D1 ON D2 ON D3 OFF	D1 OFF D2 OFF D3 ON	D1 ON D2 OFF D3 ON	D1 OFF D2 ON D3 ON	D1 ON D2 ON D3 ON
D1 OFF / D2 OFF	→								
D1 ON / D2 OFF			Reserved for future use, now filled with dummy value all 1 seconds.						
D1 OFF / D2 ON									
D1 ON / D2 ON									

⚠ Disclaimer: The timer accuracy depends on factors such as temperature etc,

it should be in **-0.8% ~ +1.8% range** under -4°F to 131°F (-20 ~ 55C) temp.

+/-0.3% range under 77°F (25C) room temperature

* Characterized value only, **NOT tested** in production.

    It should be good enough for common purpose, but **NOT SUITABLE** for applications that requires very precise timing control.

Legend & abbreviations

D1 = DIP Switch 1

D2 = DIP Switch 2   **ms** = millisecond

D3 = DIP Switch 3

D4 = DIP Switch 4

D1 ___ D2 ___	This setting is **changed during boot period**
D1 ___ D2 ___	DIP position is in **normal working after boot**
___	This is RELAY 1 timing value
___	This is RELAY 2 timing value