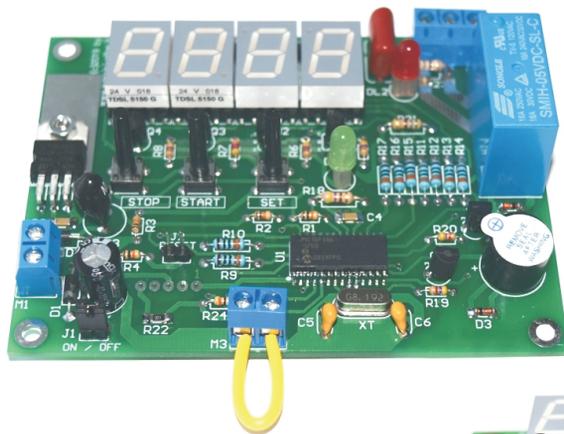# STC *Rev.2* - SUPER TIMER

STC *Rev.2*

**Programmable Timer
for Exposure Box or
Photography Darkroom**

based on PIC16F886 SO-28

STC_{Rev2} - SUPER TIMER
CARATTERISTICHE - FEATURES

CARATTERISTICHE

- Tensione di alimentazione: **12Vcc** (± 10%)
- Gestione a **Microcontrollore** (PICmicro 16F886 SMD SO-28)
- Precisione al **Quarzo**
- Conteggio tipo '**Count-Down**' (conto alla rovescia)
- **Facile** da utilizzare
- 3 pulsanti di comando: **START STOP** e **SET**
- **Tempo Programmabile** da **1s**ec. a **99m**in. **59s**ec.
- **Memorizzazione** e richiamo automatico all'accensione dei valori programmati dall'utente
- **Buzzer on-board** per segnalazione di fine conteggio e scansione audio dei secondi
- **LED rosso** per visualizzazione stato relè (**LOAD ON**)
- **LED verde** per visualizzazione dello stato di PRONTO (**READY**)
- **Uscita relè**: AC250V 16A su morsettiera a vite (**NC-Com-NA**)
- Visualizzazione: **4 x Display** a 7-segmenti (0,59" - 13 mm.)
- **PCB professionale** serigrafato (doppia faccia)
- Può essere utilizzato come normale Timer **multiuso**, in **camera oscura** o per **bromografi**.
- Dimensioni scheda (mm): **100 x 76**

FEATURES

- Input Voltage: **12Vcc** (± 10%)
- Management with **Microcontroller** (PICmicro 16F886 SMD SO-28)
- **Time** can be set from **1s**ec. to **99m**in. **59s**ec.
- Accuracy to **Quartz**
- **Count-Down** Timer
- **Easy** to use
- 3 control buttons: **START STOP** and **SET**
- Installed **16A/250V Relay** and 3 way screw Terminal Block (**NC, Com, NO**)
- **Buzzer on-board** for signalling counting end and for audio scanning of the seconds
- The time and setting are **stored** in the controller's Eeprom, retrieved during Timer's power on
- **Red LED** for showing the **LOAD ON**
- **Green LED** for showing the Timer **Ready**
- Displaying: **4 x Display** 7-segment (0.59" - 13 mm.)
- **Professional quality PCB** with silkscreen (double sided)
- Can be used like a multipurpose timer, **Exposure** light box, **Darkroom** photography, etc.
- Board dimensions: **100 x 76 mm.**

STC_{Rev2} - SUPER TIMER
USER's GUIDE

This **SUPER TIMER** manages times from **1 SECOND** up to **100 MINUTES** (**MM:SS** format) and the values to be programmed are in steps of 1 SECOND.

After Power ON, the **Timer** displays the last value programmed by the user and by pressing the **START** button, the relay is activated (RED LAMP ON) and the Timer begins to count down. At the end of programmed time, the value "`00:00`" appears on the display, the relay is deactivated, the RED LED turns off and the buzzer emits 5 beeps.

If there is a **black out**, the Timer switches off completely and the relay deactivates: when the power is restored, the Timer displays the last value programmed by the user and it is ready to be activated again by pressing the **START** button.

DEFAULT VALUE AT FIRST USE

When Power ON, the display always shows **the last value programmed by the user**: if the Timer never been used, after Power ON the Timer automatically sets the following default value:

`02:00` (Relay active for 2 minutes)

The **Audio**-**Scan** (of the seconds), by default is disabled and therefore set to `0`.

THE COMMAND BUTTONS

START / RESUME

This button is for starting the Timer. The Timer can ONLY started if the **GREEN LED is ON** (**Ready**). When the **START** button is pressed, the Timer activates the relay and starts the countdown starting from the value programmed by the user. During the countdown, the **RED LED is ON** to indicate that the relay is activated.

STOP / RESET

This button, pressed once, set the **Timer** in PAUSE and deactivates the relay. To restart the Timer (and eventually, reactivate the relay), press the **START** button otherwise, a second press of the **STOP** button stops and definitively resets the Timer, ready to be started again.

SET *(Programming)*

Press this button to enter the **PROGRAMMING** mode.
The second time you press the **SET** button, you exit the **PROGRAMMING** mode.

N.B. - The entry in PROGRAMMING mode is possible ONLY when the Timer is ready (GREEN LED ON). If the Timer does not enter PROGRAMMING mode, check that it's not in paused or check if the GREEN LED is ON: if necessary, press the STOP button to reset the Timer (the GREEN LED turns ON).
During a PAUSE (i.e. after pressing the STOP button once), the RED LOW DOT on the display is ON.
While programming, the display indicates the position of the 4 digits with the lighting of the low segments.

- **Choose the single DISPLAY and the VALUE TO PROGRAM** (only **PROGRAMMIN mode**)
  The **START** and **STOP** buttons have a double function: when you enter the **PROGRAMMING mode**, these buttons allow you to choose a single Display and the value to be entered on the selected Display as described below:

  ○ Button ▶ (**START**): each time this button is pressed, a display lights up one at a time, from left to right. The lit display is the one in which the digit to be programmed is entered. After the fourth Display, a further press of the button restarts the sequence from the first Display and so on.

  ○ Button ▲ (**STOP**): each time this button is pressed, a digit from **0** to **9** is entered on the selected display: when the value is **9**, by pressing the button again, it restarts from **0** and so on.

THE DISPLAY

During the operation of the Timer, one or both **RED DOTS** may light up on the display: in addition, the GREEN and RED LEDs will ON to indicate different situations. The following list provides a brief description of all possible situations.

BOTH DOTS ARE ON *(Timer Ready)*

Indicate that the Timer is ready to be started by pressing the **START** button or ready to enter in **Programming** mode by pressing the **SET** button.
The GREEN LED ON indicates that the Timer is ready for both operations (**Ready**).

BOTH DOTS ARE FLASHING *(Countdown in progress)*

Indicate that the Timer is running and the flashing of the dots marks the seconds. During the countdown it is possible to PAUSE the Timer (and therefore deactivate the relay) by pressing the **STOP** button.

LOWER DOT ON *(Pause Timer)*

The lower dot ON when the **STOP** button is pressed to PAUSE the Timer.

In this situation, by pressing the **START** button the Timer restarts from the point at which it was interrupted while pressing again the **STOP** button the count is reset, the relay deactivates, the GREEN LED ON and the Timer is ready to be started (**Ready**)
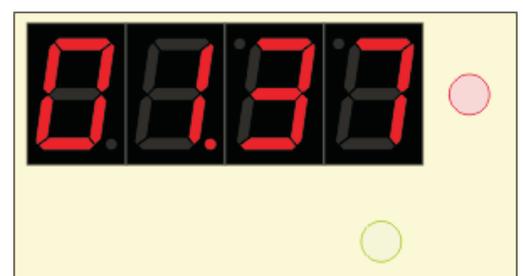
UPPER DOT ON (Opened Panel)

The high dot is ON when the door of the bromograph or the box is opened. To manage the opening of the panel it is necessary to connect a microswitch on the **M3** (**MW**) terminal socket: the microswitch must have **N**ormally **C**losed contacts when it's pressed or when the door is properly closed. In other words, the contacts on the **M3** terminal block must be closed for the Timer to work. Every time the door of the bromograph is opened, the relay is deactivated and the GREEN LED goes out to indicate that the Timer is not ready. If you do not want to manage the opening of the door, it is necessary to short the pins of the **M3** (**MW**) terminal socket with a wire jumper.
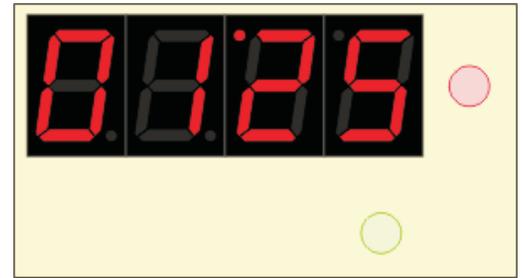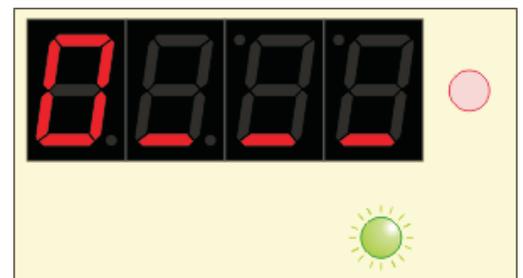
NO DOTS and LOWER SEGMENTS ON (Programming mode)

By pressing the **SET** button, you enter the **PROGRAMMING mode** and the display appears as shown in the figure.

Press the ▶ (START) button to change the position of the single digit or

press the ▲ (STOP) button to enter a value from **0** to **9** on the selected digit.

Press the **SET** button again to **exit the PROGRAMMIN mode** and return to the Timer ready.

*NOTE - It's not possible to enter **Programming mode** if the contactsin the **M3** terminal socket are open.*

SET THE AUDIO SCAN (of the SECONDS)

When the **Audio Scan of Seconds** is activated, the buzzer emits a short acoustic signal every second (a classic "toc").
To activate the **Audio Scan of Seconds**, press and hold the **STOP** button and press the **SET** button at the same time, then release both. Each time this procedure is performed, the number "0" or "1" showns briefly on the last display as shown in the following figures (by default, the **Audio Scan** is set to "0").
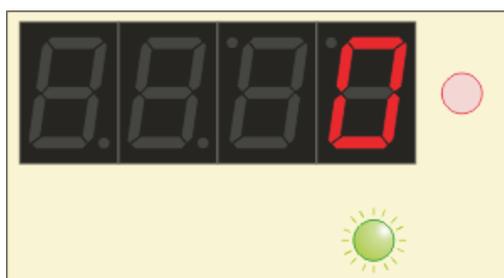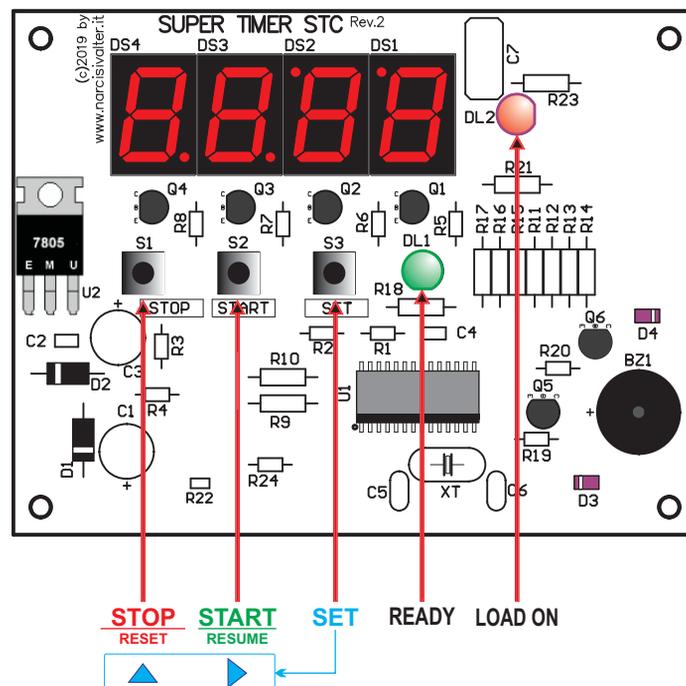
*AUDIO SCAN **DISABLED***
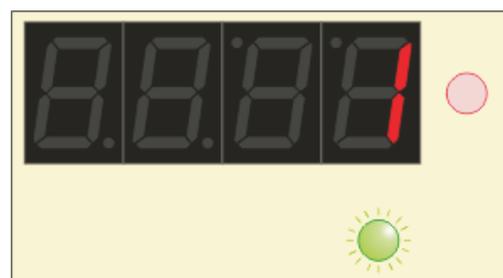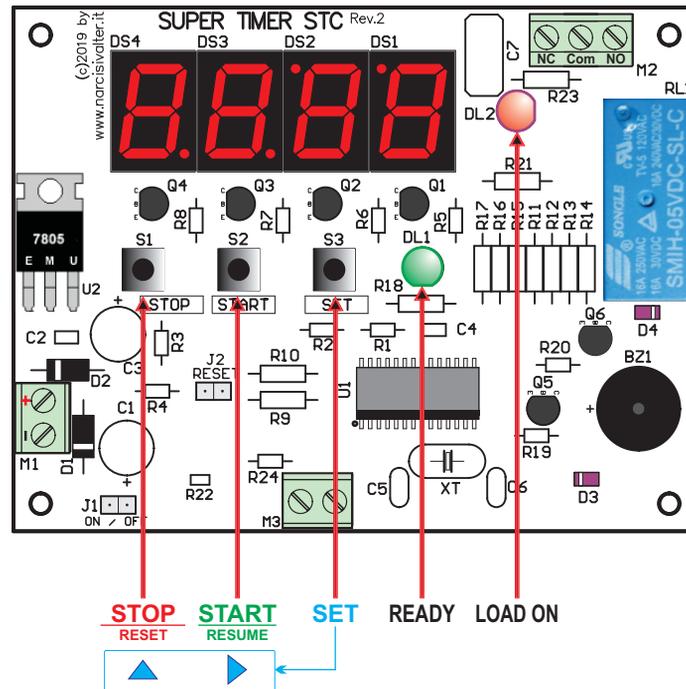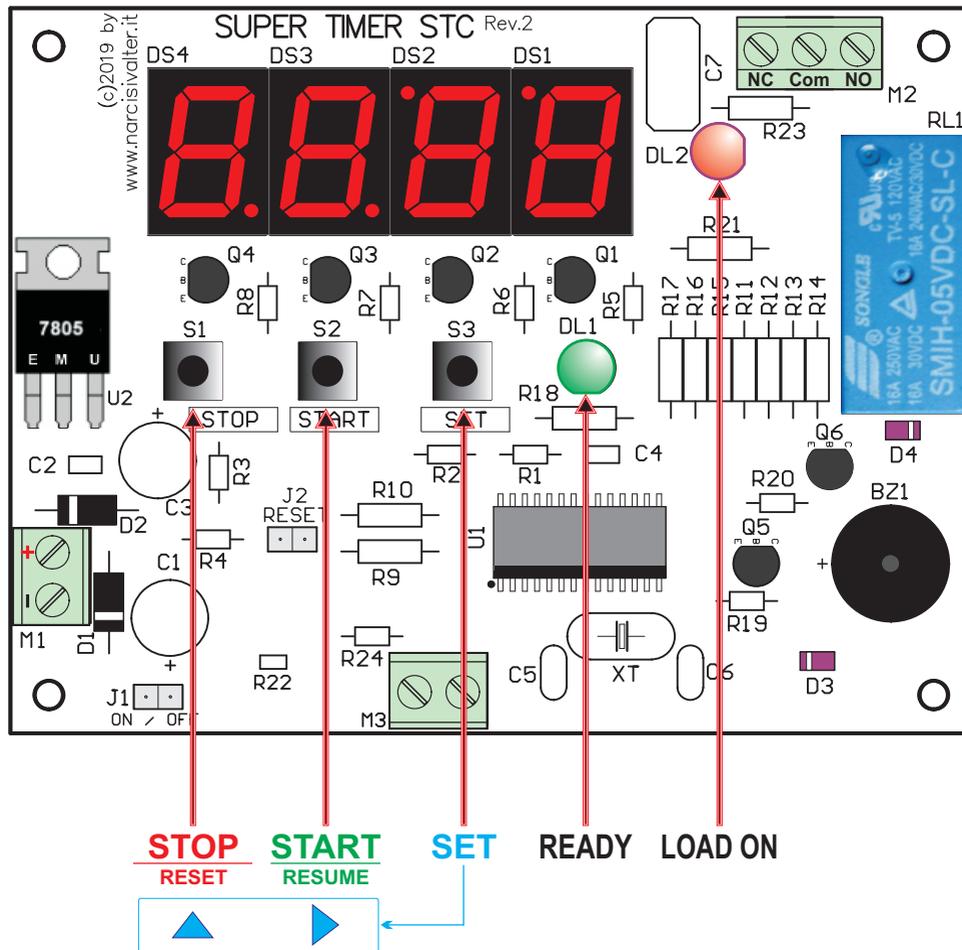
*AUDIO SCAN **ENABLED***

There are TWO LED in the Timer:

● The **RED LED is ON** ONLY when the **relay is activated**.

● The **GREEN LED ON** indicates that the Timer is **ready to be activated** or ready to enter in **PROGRAMMING mode**.

COMMANDs and LEDs

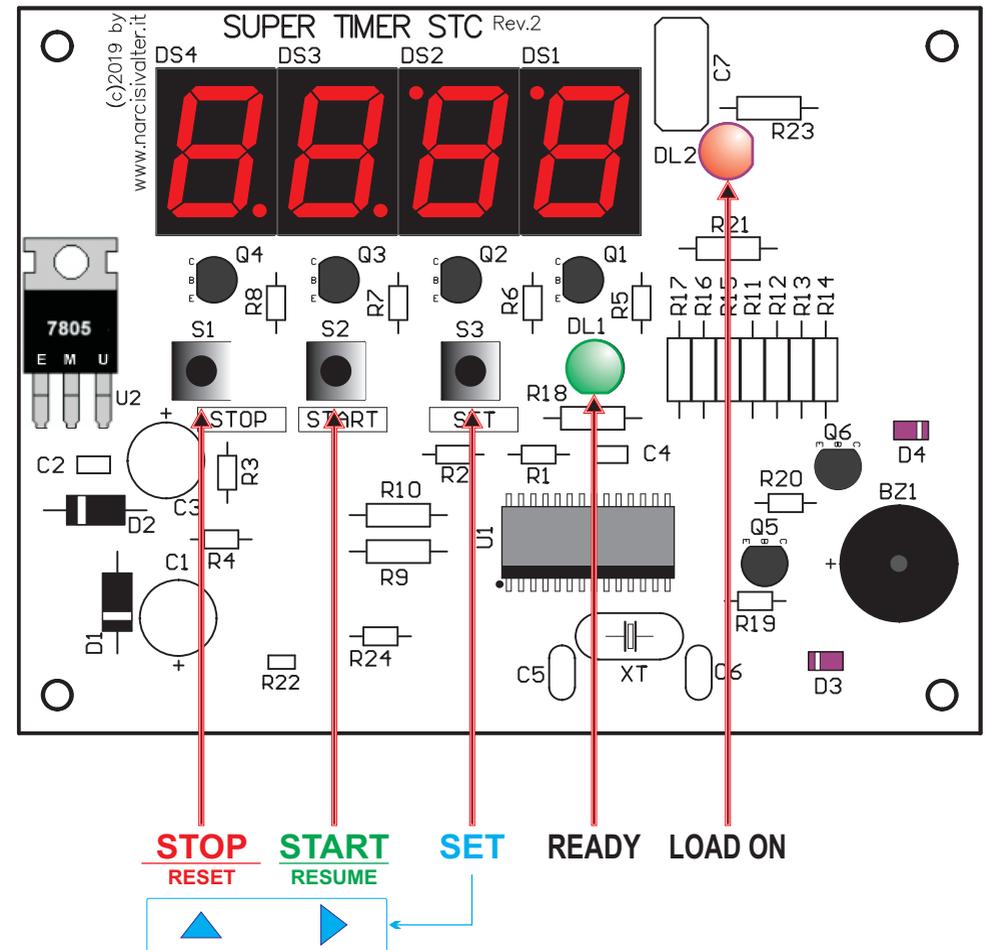## Installation to WALL or to a BOTTOM of the box
(ALL COMPONENTS ARE IN THE TOP SIDE OF PCB)

STOP START SET READY LOAD ON
RESET RESUME

Installation to PANEL
(SOME COMPONENTS ARE IN THE BOTTOM SIDE)

STOP START SET READY LOAD ON
RESET RESUME

WIRING DIAGRAM

12Vdc
Power Supply

12V
Battery

12Vcc

To
LOAD

SUPER TIMER STC Rev.2

ON/OFF Switch
(Insert a jumper on **J1**
if you don't use
the ON/OFF Switch)

RESET
(Optional: the switch
must be **N**ormally **O**pen)

EXTERNAL STOP
(Contact closed
when PRESSED.
Insert a jumper on M3
if you don't use
the microswitch)
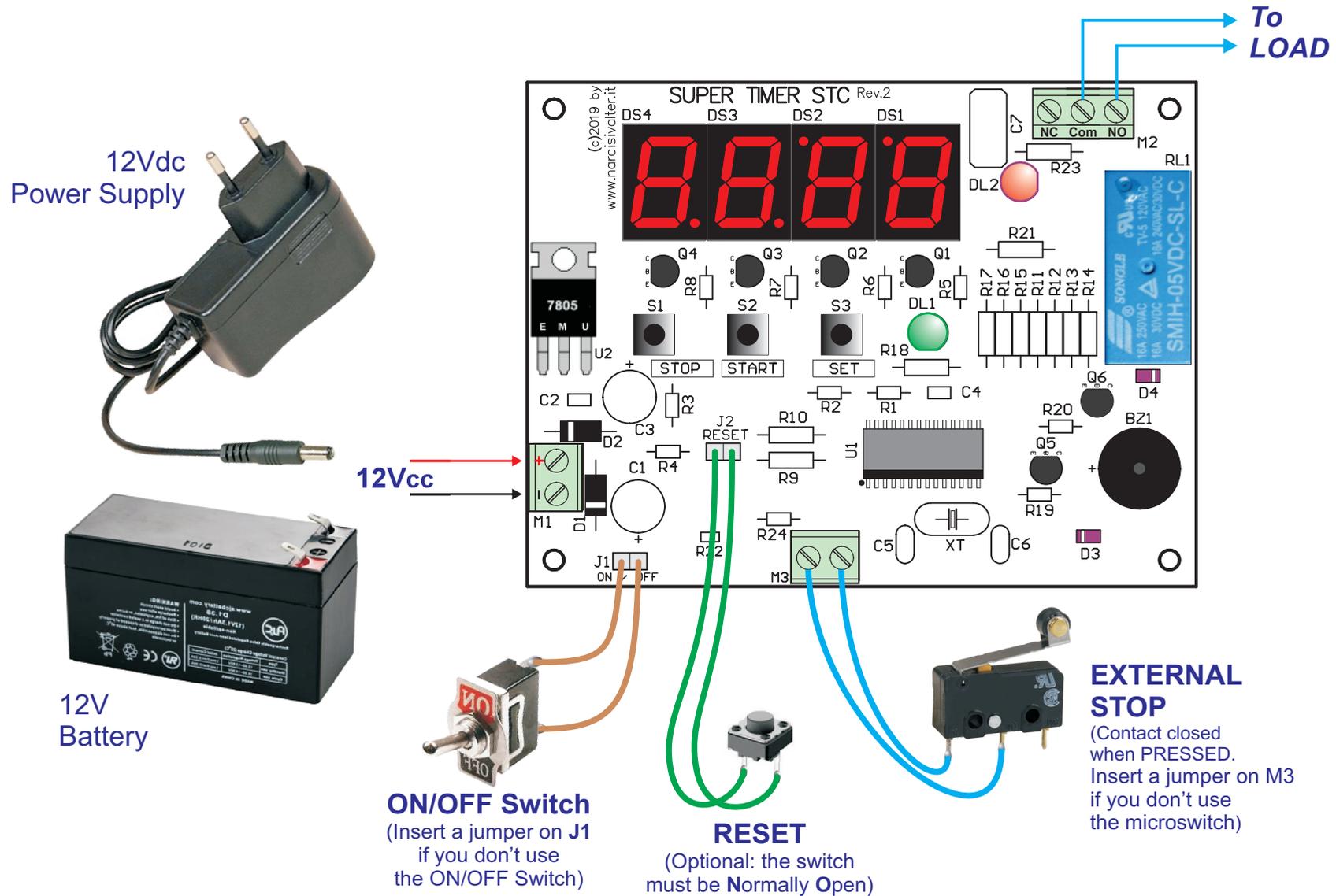
WIRING (panel installation)

To
LOAD

M2 NO Com NC

RL1

SMIH-05VDC-SL-C
SONGLE

BOTTOM SIDE

To install the board on a panel,
the following components
must be solder on the bottom side
(as shown in the figure):
RL1 - **M1** - **M2** - **M3** - **J1** - **J2**

J2
RESET

12Vdc
Power Supply

+

12Vcc

M1

M3

J1

12V
Battery

**EXTERNAL
STOP**
(Contact closed
when PRESSED.
Insert a jumper on **M3**
if you don't use
the microswitch)

RESET
(Optional: the switch
must be **N**ormally **O**pen)

ON/OFF Switch
(Insert a jumper on **J1**
if you don't use
the ON/OFF Switch)

WIRING with an external RELAIS

12Vdc
Power Supply

12V
Battery

12V

SUPER TIMER STC Rev.2

12V
External
Relay