SPD1100.1

Countdown timer device
14mm 7 segment LED display and 3 buttons

Handbook

Version: Firmware 1.80-146

StefPro™
Software development for processors

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Table of Contents

Safety

Follow the manual

The device is only safe in operation if all instructions are read in this handbook.

General understanding of safety
By the device there are no hazard under normal use.

Intended Use
The device is designed for driving small to middle displays.This device is designed to switch resistive 230 Volt AC loads. A so-called snubber [WIKI] for inductive loads is not installed.

- This device uses mains voltage, a maximum of 240 Volt AC may be connected!
- The device complies with the provisions of protection class I. This means that your house installation must have a functioning protective conductor.
- The used electrical parts and components are designed for a temperature between 0 °C ... +45 °C, so the device may only be operated and stored in this temperature range. During transport, the temperature may be between -10 °C ... + 50 °C.
- If condensation has formed during transport or storage, the modules must be acclimatized for approx. 2 hours before commissioning.
- It must not be operated in an increased dust, high humidity, explosion risk or aggressive chemical exposure.
- Ensure proper operation and connection. Operating and/or connection errors are outside our area. Unfortunately, we can not accept any liability for damages resulting of this.
- The improper operation of this module may result in damage of this module, personal injury or property damage.
- The safety instructions must be observed!
- The manufacturer is not responsible for all personal injury and property damage caused by improper operation.

Safety Notes

- Since the built device is operated with an electrical voltage, the valid VDE regulations are complied with.
- This device is not in the hands of children!
- The device complies with the requirements of protection class I.
- The "device" may NOT directly to line voltage (or voltage > maximum operating voltage) in any case! It can be fatal!
  - Whenever it is that safe operation is no longer possible, the device must be taken out of service and secured against inadvertent operation. This assumption is justified,
  - when the device has visible damage,
  - when the device has loose parts
  - when the device no longer works
  - after prolonged storage under unfavorable conditions (eg outdoors or in moist environments)

Watch for correct voltage and connection of the device voltage and / or connection mistakes are beyond our control. Thus we can not assume any liability for damages arising out of it.

Hidden dangers

DANGER
following hazards may arise in case of wrong construction of the circuit and wrong handling of device:

- If the permissible mains voltage is exceeded, the insulation can be shunted and a dangerous voltage can be applied to the housing!
- If the device is overloaded, smoke may develop. This contains possibly toxic substances, which must not be inhaled! Ventilate the room.
- Overloading the device may cause a hot surface on the device or other component in the circuit.
  - There is a risk of burns when touching.
  - And highly flammable materials e.g. Paper can catch fire.
- Despite careful inspection, parts of the case may still be sharp and sharp! Therefore, they can cause wounds if handled incorrectly.

Check the technical condition
If necessary, check all housing parts and cables for damage. This applies in particular to parts which come into direct contact (eg mains supply) or indirectly with mains voltage.

What you should note is under section "Safety Notes".

Application and Function description

Function description

This countdown timer is completely constructed and calibrated as a device.

The time can be read and adjusted via the display.

The module has as heart an IC of the family SPM110X.

The IC SPM110X ... is a digital mono-flop IC with display and buttons for setup.It has a buzzer output for Sound notification that the time has expired and an output forswitching a load via relay, transistor, etc..

The IC is a programmed microcontroller of the AVR family by Atmel.The circuit can be used for different purposes, because the target file is free for download, thecircuit can be arbitrarily Modified.

This IC has the standard **OnChip display technology** and is suitable for small displays. These can be connected directly to the IC and require only 4 additional resistors.

Functions

- Adjustable digital timer ranges from 1 second to 99 minutes and 59 seconds.
  - The set time is stored in the internal EEPROM
  - Easy to start, with just one button press
  - Pause function interrupts the countdown
  - Signal sounds after the time, for a preset time or upto press the button start-stop.
- This IC has the Classic Screen display and the new default view, the differences are seen to www.stefpro.biz as gif video.
- Low power consumption. Requires a power below 1.0W

Application

- For second exact exposure of PCBs, screen printing templates ...
- Precisely timed Baking of plastics
- Timed bonding
- Timed flow control

Functional states

The START button is to press for the state start and stop.

With button DOWN in state "Setting Wait" the time can be lowered in seconds. In state "Pause" the countdown can be stopped by this key.

With button UP in state "Setting Wait" the time can be increased in seconds. In state â€œstartâ€ and "pause" this key functions as start / pause button.

The functional states can be seen in Figure 1.

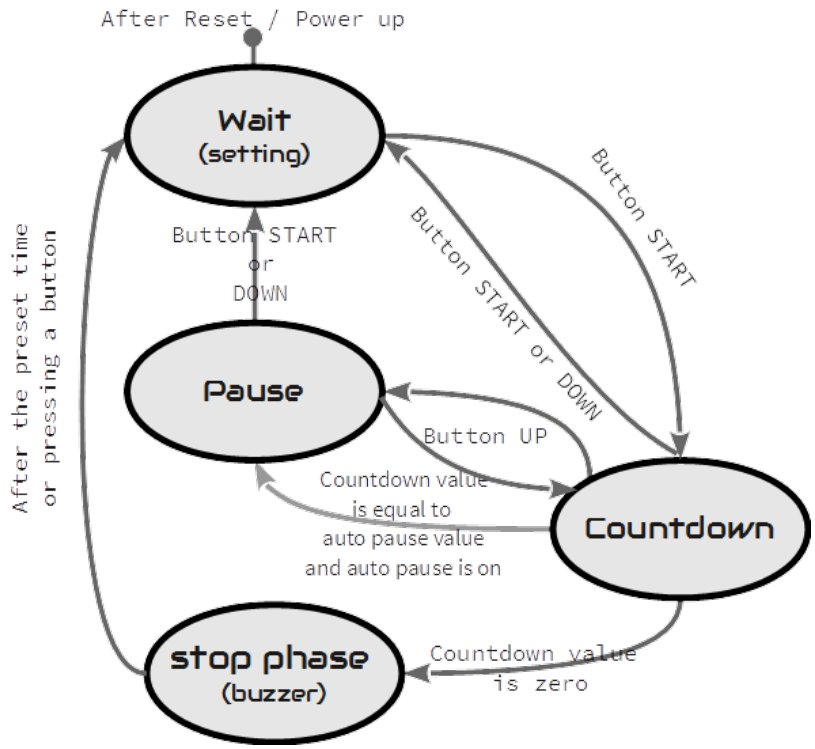


Abbildung 1: State diagram countdown mode

After reset / power up: Entry point after the reset and initialization.
Wait (setting): Setting the time is available, the time displayed on the screen is used as the next count down time. The Pin TiRe has a 0 (GND) at the output.
Countdown: In this operation, the time counted down in seconds and the decimal point (/SEGDP) flashes every second. Pin the TiRe has a 1 at the output so VCC potential.
Pause: The countdown is interrupted and the whole display flashes. Pin TiRe has a 0 (GND) at the output.
Stop phase (buzzer): In this state, the TiRe pin is reset to 0 (GND) and the buzzer pin is up for 3 seconds (or set time) or upto pressing the button Start to 0 (GND).

Technical data

- Minimum input and switchable voltage (V-IN min): 220 Volt AC
- Normal input and switchable voltage (V-IN): 230 Volt AC
- Maximum input and switchable voltage (V-IN max): 240 Volt AC
- Own consumption of current: approximately 0.01 (at 230 volts)
- Own consumption of power: 1.0W (at 230 volts)
- Maximum switchable power: 900W (at 230 volts)
- Maximum fuse power: 4A mtr. 240 Volt AC
- Type of allowable loads: Resistive or comparable
- Appliance classes: I
- IP Code: IP40 (with closed sockets cover)
- Volume level of the buzzer: approx. 85 to 90 DB

Construction description

Setup of the device

Figure 1:Setup description for device SPH1115.0

Place the device on a level and stable surface.

1. On / off switch
2. Fuse
3. Socket for loads
4. Display
5. Keyboard
6. Connecting cable

Button description

Overview of buttons

Button functions

Button functions

Menu	Opens the menu, next setting
Plus	Function key, in general + or on
Minus	Function key, in general - or off

To open the menu you have to press the menu or StartStop button for a long time.Use the menu button to navigate forward.

The double button for the menu and StartStop must be pressed for about 2 seconds for the menu.

Menu+	Opens the menu, next setting
Menu-	Opens the menu, previus setting
Plus	Function key, in general + or on
Minus	Function key, in general - or off

To open the menu you have to press one the menu buttons.Use the menu+ button to navigate forward and the menu- button to navigate backward.

The double button for the menu and StartStop must be pressed for about 2 seconds for the menu.

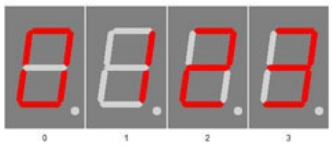
Menu

Level 1	Level 2
Using the Countdown Timer - Outside of menu⇓	
Buzzer setting⇓	

Auto pause⇓ Enable auto pause ➡Set auto pause ➡Exit auto pause ↻
Count direction⇓
Display mode setting⇓
Info section⇓
IC number⇓
Firmware version⇓

⇓: Next step in main menu. ➡: Next step in sub menu. ↻: The submenu starts again.

Using the Countdown Timer - Outside of menu



The countdown timer is operated by 3 buttons.

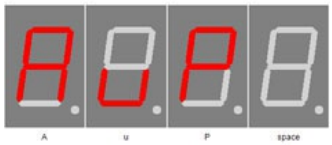
- S1 is the start and stop button. If the countdown timer in the pause mode, the timer can be restart with this button.
- S3 is the plus key, it increments the time. If the countdown timer is running, this button paused the countdown.
- S4 is the minus key, it decrements the time. If the countdown timer is running, this button stops the countdown.

  These buttons are available only when the menu is not open, otherwise the keys are used by the menu.

Buzzer setting

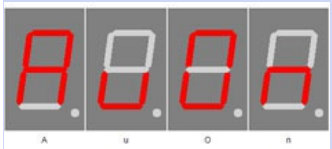
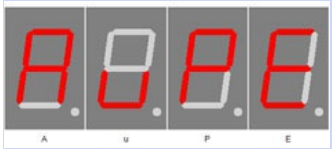
With the button plus and minus the buzzer settings can be select.
0: No tone
1: 3 seconds after the counter ends
2: 9 seconds after the counter ends
3: infinitely until keystroke after the counter ends

Auto pause

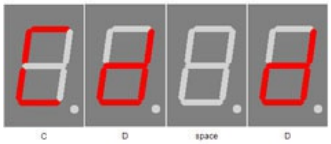


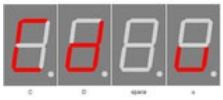
With + you enter the sub-menu auto pause.

Auto pause

Enable auto pause  	Enables the auto pause function.
Set auto pause 	Sets the time for auto pause.
Exit auto pause 	With + you exit the sub-menu auto pause.

Count direction





With plus key is counted up and with minus key down.
The direction does not change if the timer is already started, this take over until a restart.

Display mode setting

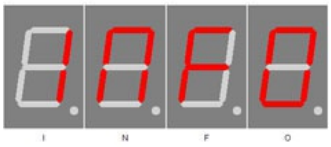
Display Classic

Display Standard

With keys plus and minus display mode setting Select

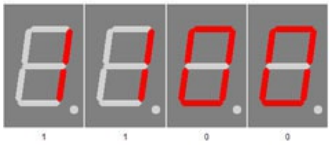
- C: Classic, buzzer beeps continuously
- S: Standard, the buzzer beeps with interruptions

Info section



This indicates the start the information area

IC number



Chip number

IC / device type

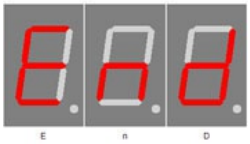
Firmware version

Firmware version

Firmware version

Example, it might be something else at this point.

Menu end



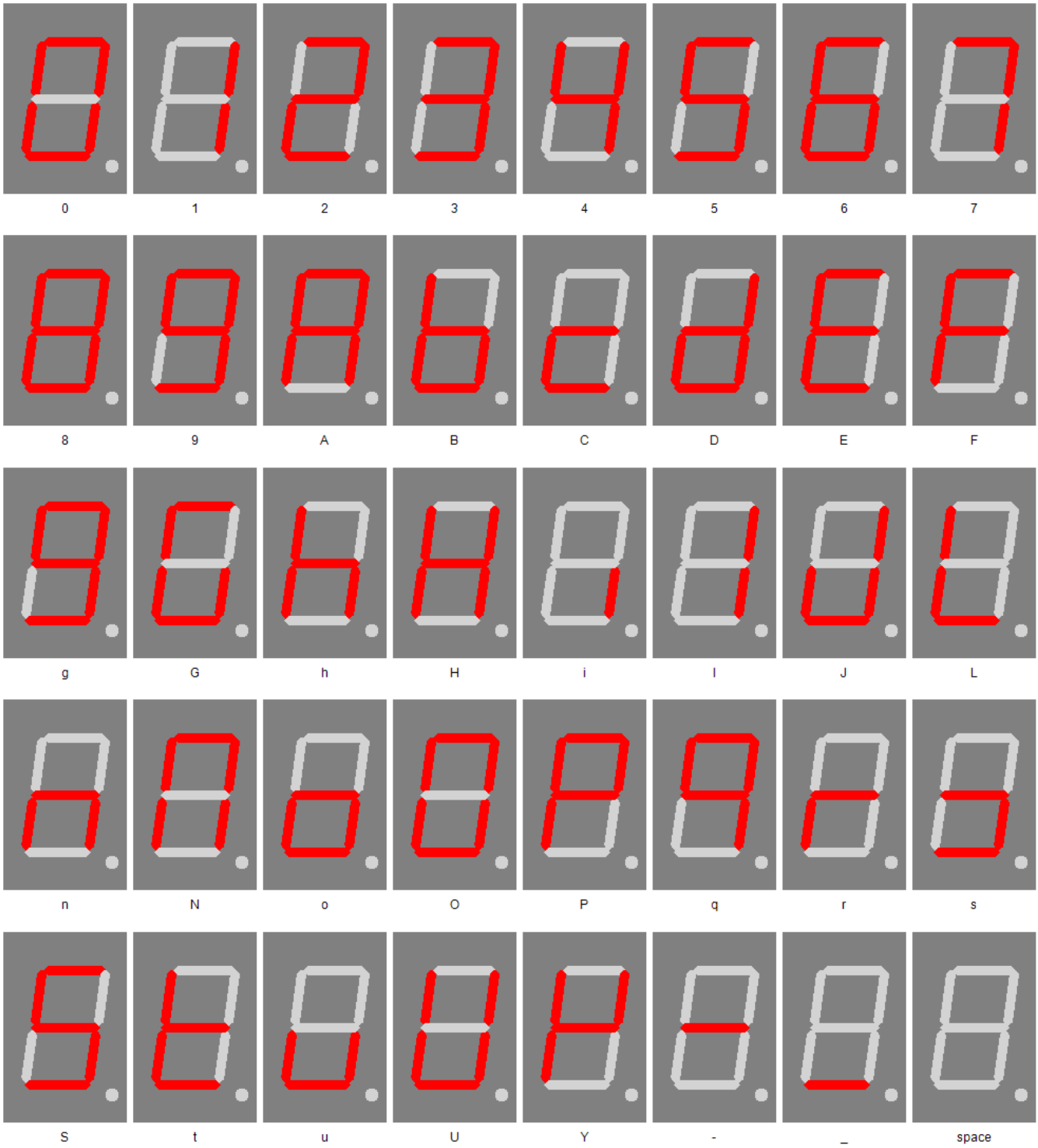
End

End of the menu, hide automatically after 2 seconds.

Attachment

7 segment characters

The symbolism of each character:



Change log

Safety

20.02.2019 - 1.0.3 - ADD
Add Safty class I

Liability, warranty and copyright notice

Definitions

- "Device": A product that can be operated by simple connection to the home power net.

Liability

- Although the information contained in this document has been checked very carefully for accuracy and completeness, for errors and omissions can not be held liable. StefPro reserves the right to any time change any portion of the described hardware and software features.
- There is no liability for damages incurred directly by or in the application of the "module", as well as for damage caused by chemical or electrochemical effects of water or generally from abnormal environmental conditions.
- "Device" by StefPro should not be used in critical areas."

  These include:

  - medical devices for implanting or life obtained.
  - Critical equipment for space, aerospace and traffic.
  - Other important life components or systems, where an error is fatal.

Warranty

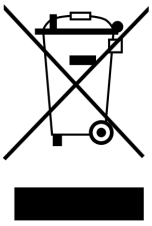
- StefPro only warrants the device and its firmware. The warranty is limited to the exchange of the device within the warranty period in case of obviousdefects of the hardware, as well as faulty programming.
- Warranty does not extend the warranty period or starts a new period again.
- Additional or deviating claims are excluded, especially claims for damages arising out of the product for damage. This will not affect claims based on inalienable rules under the product liability law.

Copyright notice

Status of the information 20.02.2019.

Disposal information

Do not dispose devices in household garbage!
This modules or devices comply with the EU directive on electronic and electrical equipment (WEEE regulation)and therefore may not be disposed of with household waste. Dispose of the device over your local collection center for electronic equipment!



WEEE-Reg.-Nr.:

DE 58929072 (StefPro UG (haftungsbeschränkt) & Co. KG)

DE 78089358 (StefPro Einzellunternehmen bis zum 01.01.2015)

Impress

StefPro™ UG (haftungsbeschränkt) & Co. KG
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