



4-Bit Micro-Controller

TM87 series

SZ031_02

LED Clock + Lunar Calendar

Application Note

**Tenx reserves the right to change or
discontinue this product without notice.**

tenx technology inc.

CONTENTS

PRODUCT NAME 2

SZ031_02 2

APPLICATION NOTE 2

1. Basic features : 2

2. LED diagram : 2

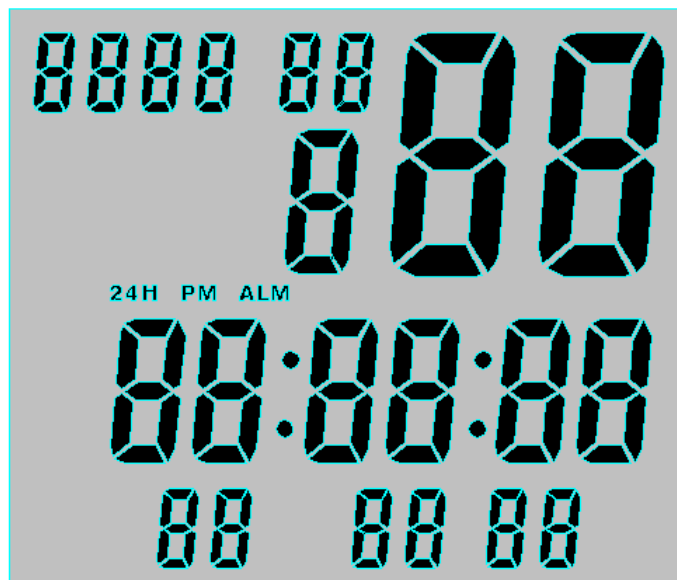
3. Function description : 3

4. SZ031 LED Display and Table..... 7

5. DEMO Program Flow Chart : 8

PRODUCT NAME**SZ031_02****TITLE****LED Clock + Lunar Calendar****APPLICATION NOTE****1. Basic features :**

1. LED display
2. Calendar display function (2000 ~ 2049)
3. Daily alarm function (4 alarms)
4. 12/24 hour clock
5. Celsius temperature display
6. CPU working voltage 5V
7. CPU working frequency (32768HZ and 250KHZ)
8. LED direct drive 1/5DUTY Driving voltage 5.0V
9. Temperature measurement range : -9°C ~ 50°C
10. Temperature measurement accuracy $\pm 1^{\circ}\text{C}$
11. Temperature sampling period : 2 seconds

2. LED diagram :

LED parameters :

DUTY : 1/5

VOL : 5.0V

3. Function description :

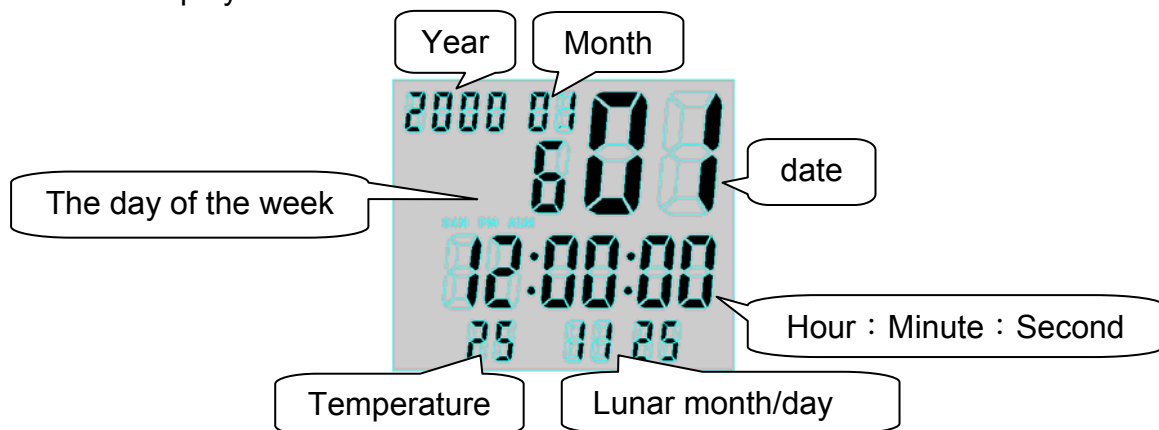
1. Initialization :

- Time : AM12 : 00, 12 hour clock
- Date : January 1, 2000, Saturday
- Alarm : AM12 : 00,
- Temperature : °C, proceed with the temperature measure for the first time

2. Button operation :

- Reset button : stop the set up operation and return to the normal operating display state.
- Moving modification button : modify the settings of the flashing item which will move in sequence.
- Increment/setup alarm button: no function.

3. Normal display as follows :



4. Button function :

- Reset button: no function.
- Moving modification button: enter clock set up state.
- Increment/setup alarm button: no function.

5. Clock set up state :

- Reset button: exit set up.
- Moving modification button: switch set up item:
Year → month → day → hour → minute → second → enter alarm set up.
- Increment/setup alarm button: increment the set up item by 1; will fast increment at 8HZ automatically if holding for more than 2 seconds.
- Set up second: reset to zero.
- Set up hour: will switch between 12/24 hour clock while exceeding 1 day.

- When setting up year, month, and day, the maximum day, week, Lunar month, Lunar day will be adjusted automatically.
- Exit operation automatically if no buttons are pressed within 1 minute.

6. Set up clock display :

- 12 hour clock, AM, the display is as follows :



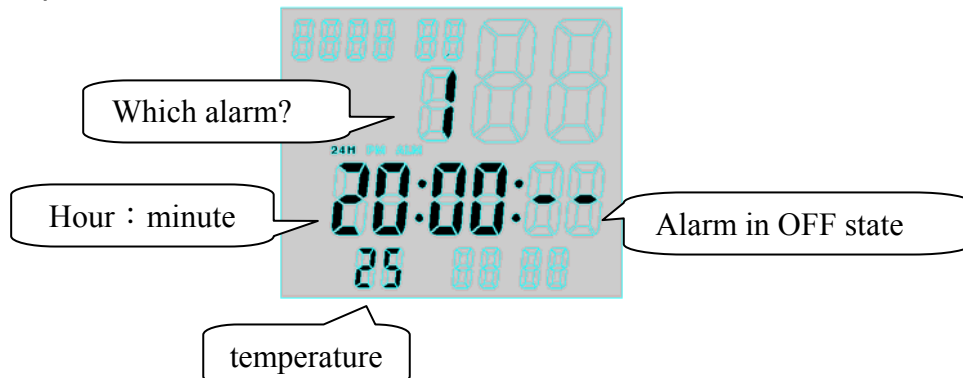
- 12 hour clock, PM, the display is as follows :



- 24 hour clock, the display is as follows :

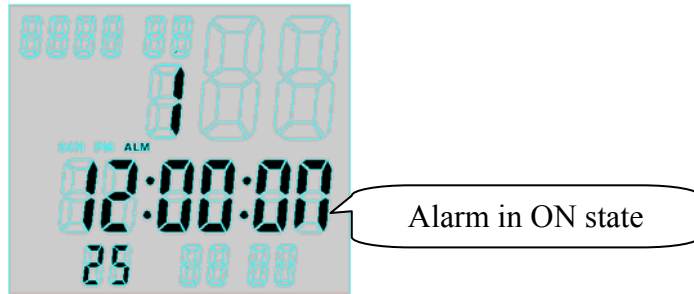


7. Alarm set up state :



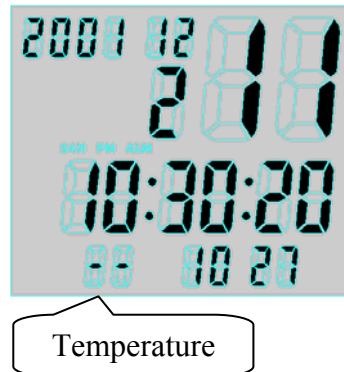
- 12/24 hour depending on clock setting

- Reset button: exit set up and back to normal operation.
- Moving modification button: which alarm -> hour -> minute -> OM/OFF -> exit set up
- The button to set up which alarm as in 1.
- Set ON/OFF ON ↔ OFF
- Press button will increment by 1 during hour or minute setup; will fast increment at 8HZ automatically if holding for more than 2 seconds.
- Exit setup automatically if no buttons are pressed within 1 minute.
- When setting up clock and alarm at the same time, alarm has no effect.
- If alarm sounds during normal operation, press any button to stop it.
- Alarm ON display is as follows :

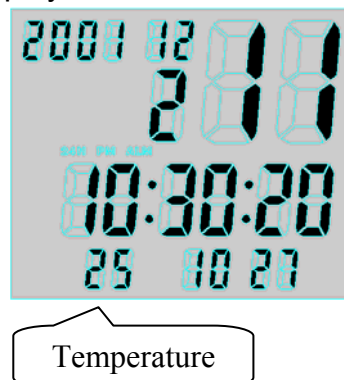


8. Temperature display during normal operation :

- The display for temperature exceeding range is as follows :



- Normal temperature display is as follows :



9. Temperature display during alarm set up :

- The display for temperature exceeding range is as follows :



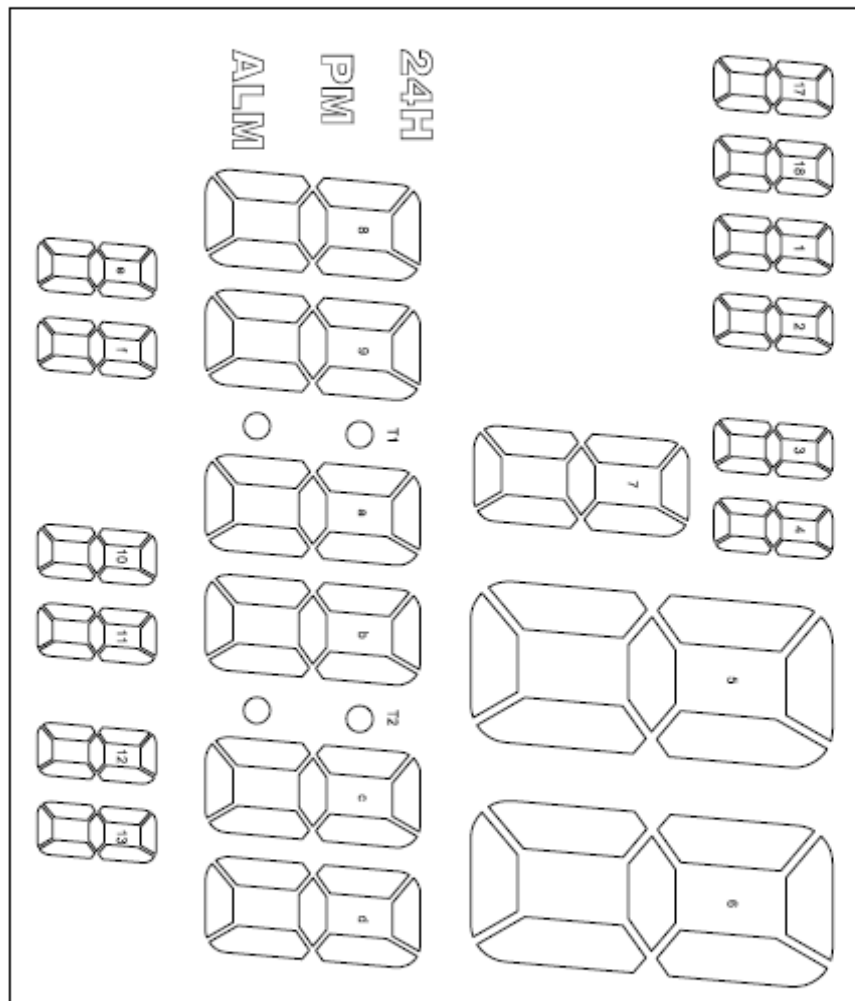
Temperature

- Normal temperature display is as follows :



Temperature

4. SZ031 LED Display and Table



SEG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	27	28	29	30	35
COM	1a	1b	1c	1d	1e	1f	1g	1h	1i	1j	1k	1l	1m	1n	1o	1p	1q	1r	1s	1t	1u	1v	1w	1x	1y	1z	1aa	1ab
2	2a	2b	2c	2d	2e	2f	2g	2h	2i	2j	2k	2l	2m	2n	2o	2p	2q	2r	2s	2t	2u	2v	2w	2x	2y	2z	2aa	2ab
3	3a	3b	3c	3d	3e	3f	3g	3h	3i	3j	3k	3l	3m	3n	3o	3p	3q	3r	3s	3t	3u	3v	3w	3x	3y	3z	3aa	3ab
4	4a	4b	4c	4d	4e	4f	4g	4h	4i	4j	4k	4l	4m	4n	4o	4p	4q	4r	4s	4t	4u	4v	4w	4x	4y	4z	4aa	4ab
5	5a	5b	5c	5d	5e	5f	5g	5h	5i	5j	5k	5l	5m	5n	5o	5p	5q	5r	5s	5t	5u	5v	5w	5x	5y	5z	5aa	5ab

5. DEMO Program Flow Chart :

