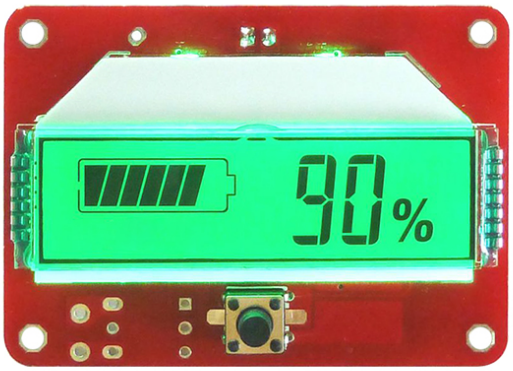
## 1. Overview

LY5 secondary display module for the general section dedicated rechargeable battery remaining capacity for rapid detection of a variety of instruments, measuring devices,
Mobile portable devices, sweeping machines, balanced car, car batteries and other lithium batteries, lead-acid battery capacity. Intuitive battery symbol is displayed together with the percentage
Than accurate display. Using high-contrast LCD screen, can be clearly displayed in the dark for a long time or bright light. Size is fully compatible LYLCD.

Bare board power monitor




Effect after loading panel




## 2. Features

Can set their own battery specifications and features

Can be set to automatically turn off the backlight

Optional sleep function, low power consumption

Backlight automatically turns on the voltage change function

Activation keys can be used to display

Buzzer alarm function (Optional features, Default is no)

Wide input voltage range

Undervoltage shut down output signal (Optional features, Default is no)

Note : This product is factory set to the default Battery: 12V lead-acid or lithium 3 series 12V, please specify before ordering the battery with the specifications

Users can modify to other specifications, see the Advanced Settings page. The default configuration without front buttons, additional buttons please describe the key height.

Special Note : Lithium iron phosphate battery indicator does not recommend using this module, please use our TY5 Coulomb gauge or TF01N Coulomb gauge.

## 3. Battery specifications

Supports the following nominal battery voltage specifications

| Code | | nominal voltage | | Code | | nominal voltage |
|---|---|---|---|---|---|---|
| Pb1 | Lead-acid | 12V | | Pb3 | Lead-acid | 36V |
| Pb2 | Lead-acid | 24V | | Pb4 | Lead-acid | 48V |

| Code | Lithium number of Sells | nominal voltage | | Code | Lithium number of Sells | nominal voltage |
|---|---|---|---|---|---|---|
| Li2 | 2 Sell | 7.2V/7.4V/8.4V | | Li9 | 9 Sell | 33V |
| Li3 | 3 Sell | 10.8V/11.1V/12V | | Li10 | 10 Sell | 36V |
| Li4 | 4 Sell | 14.4V/14.8V/15V | | Li11 | 11 Sell | 41V |
| Li5 | 5 Sell | 18V/19V/20V | | Li12 | 12 Sell | 45V |
| Li6 | 6 Sell | 21.6V/22V | | Li13 | 13 Sell | 48V |
| Li7 | 7 Sell | 24V/25.2V | | Li14 | 14 Sell | 52V |
| Li8 | 8 Sell | 29.6V/30V | | Li15 | 15 Sell | 56V |

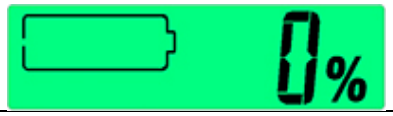
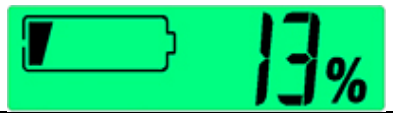
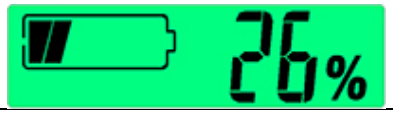
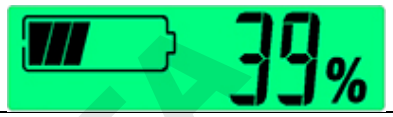
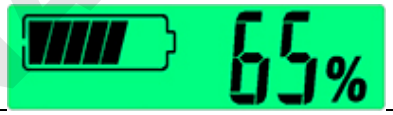
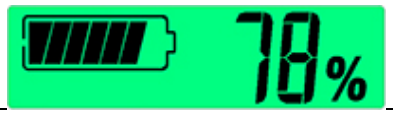
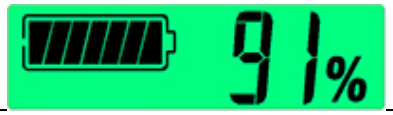
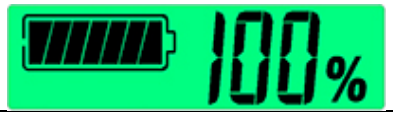
Note :
Nominal voltage of the digital voltage known as the general user, the same battery pack Sells, may have a different name for.
Meaning of "lithium batteries" as ordinary ternary or soft pack / polymer lithium battery, not including phosphate (iron Li) batteries
"Code" means the specifications when selecting the corresponding English character LCD display



## 4. Electrical parameters

| Parameters | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Operating Voltage Range 1 (General) | 8.0 | 12.0 | 63.0 | VDC |
| Operating Voltage Range 2 (low pressure type) | 8.0 | 7.2 | 12.0 | VDC |
| Working power consumption (back light, LCD) | / | 4.0 | 5.0 | mA |
| Standby Power Consumption (backlight off, the liquid crystal display) | / | 100 | 120 | μA |
| Sleep Power Consumption (backlight off, the LCD does not display) | / | 10 | 20 | uA |
| Voltage Accuracy | | ±1.0 | ±2.0 | % |
| Backlit trigger voltage (F2 mode) | | 100 | 300 | mV |
| Ambient temperature range | 10.0 | 25 | +40 | ℃ |

## 5. Voltage parameters

| 12V Lead-acid | 24V Lead-acid | 36V Lead-acid | 3 Sell Lithium | 4 Sell Lithium | 7 Sell Lithium | Screen display | Description |
|---|---|---|---|---|---|---|---|
| 10.5V | 21.0V | 31.5V | 10.2V | 13.6V | 23.8V |  | Low |
| 10.9V | 21.7V | 32.6V | 10.5V | 14.0V | 24.5V |  | 13% |
| 11.2V | 22.4V | 33.6V | 10.8V | 14.4V | 25.2V |  | 26% |
| 11.6V | 23.1V | 34.7V | 11.1V | 14.8V | 25.8V |  | 39% |
| 11.9V | 23.8V | 35.7V | 11.4V | 15.2V | 26.5V |  | 52% |
| 12.3V | 24.5V | 36.8V | 11.7V | 15.6V | 27.2V |  | 65% |
| 12.6V | 25.2V | 37.8V | 12.0V | 15.9V | 27.9V |  | 78% |
| 13.0V | 25.9V | 38.9V | 12.2V | 16.3V | 28.6V |  | 91% |
| 13.2V | 26.4V | 39.6V | 12.5V | 16.6V | 29.1V |  | Fully charged |

1. Input voltage is above the theoretical value of the parameter, the actual product may be biased, the maximum absolute deviation range: ± 2.0%, between each file relative
   Deviation range of 0.5%

2. Large volume users can customize special battery specifications, please provide the battery charge and discharge characteristic curve, or the battery voltage and percentage of
   Correspondence table

## 6. Instructions for use

1. Attached two-core cable (red and black wires) head welded to the use of positive and negative ends of the device's battery, connect the positive red, black negative connection
   Pole; Note shall be reversed, reverse voltage greater than 15V may burn electricity board!

2. Power display module has two pin socket on the back of the white terminal 2 core cable into the socket, pay attention to the direction of Jack; At this power display mode
   Blocks should be working properly, backlit display lights. If you can not check off the display should immediately eliminate the problem; After such as power always show 0%
   Or 100%, make sure that the battery used in the specifications and power display module specifications matching set

3. Power display module LCD cell battery icon on the left seven representatives from low to high battery capacity; while the right side shows the percentage value

4. When the voltage drops below the minimum value, the percentage of 0%, while the backlight is off, a low-power state to conserve power

5. Buzzer alarm function, when the battery is less than 5% of the buzzer on the back of the module will be intermittent beeping, and the percentage of the more
   Low sounds more rapidly, until less than 0% backlight off, stop the alarm buzzer. (This feature is optional feature)

6. Undervoltage output off function when the battery capacity> 10% output of a signal, the output terminal when no signal is below 0%. The output signal needs
   Connect the relay or other power devices for power expansion. (This feature is optional feature)

7. Check the battery to accurately display the load that is not connected under load conditions. If the battery charge and discharge current is large or larger resistance, power display
   Remaining capacity indication may display module and the actual battery capacity is inconsistent.

8. There are some current consumption when working under steady state, when the battery capacity is less than 30Ah, or shut down the power consumption of the device current and pending
   Machine power are required, not recommended long-term power display module is turned, the keys can be used to view the product functions, namely by pressing the front
   Shows the power key values, see F1/F2 function.

9. In nominal voltage greater than 30V applications, such as long battery module is powered micro heat back is normal. Such as the use of
   The event of ignition or burning smell occurs, discontinue use and identify the cause of the problem

10. To prevent damage to the device leakage PCB board components, with particular attention being metal chassis mounted instrument or device can not come into contact with the PCB
    On any metal part, including LCD pin. Another power display module is powered back after not touching any metal parts, in order to avoid short
    Road; element contacts the PCB try not to hand

11. With battery capacity and standby time relational tables (ignoring other power, separate electricity connection available time after the battery is fully displayed)

| Battery capacity | 10Ah | 20Ah | 30Ah | 50Ah | 100Ah | 200Ah |
|---|---|---|---|---|---|---|
| Hour | 2500 | 5000 | 7500 | 12500 | 25000 | 50000 |
| Days | 104 | 208 | 312 | 520 | 1040 | 2080 |

## 7. Advanced Settings

1. Key Description

   i. Power module to the front of the button OK button, used to illuminate the backlight or sleep to wake up. Note that the keys have a different height, such as the installation of the panel, Require heightened 2mm. The default configuration is no such switch.

   ii. Battery indicator on the back of the module were two white buttons ↑ Kup and ↓ Kdn used to select the battery type.

2. Model Selection

   i. First power display module power off, press and hold the back Kdn key, to give power display module power, release Kdn button on the right display
   Symbols are shown in English: "Pbx" or "Lix" (Pb behalf of lead-acid, Li on behalf of lithium, x is the number of battery Sells), according to press key Kup or Kdn
   Times following models

   Pb1 : Pb12V lead-acid batteries

   Pb2 : Pb24V lead-acid batteries

   Pb3 : Pb36V lead-acid batteries

   Pb4 : Pb48V lead-acid batteries

   Li2 : 2 Series lithium battery pack

   Li3 : 3 Series lithium battery pack

   Li4 : 4 Series lithium battery pack

   Li5 : 5 Series lithium battery pack

   Li6 : 6 Series lithium battery pack

   ...

   Li9 : 9 Series lithium battery pack

   Li A : 10 Series lithium battery pack

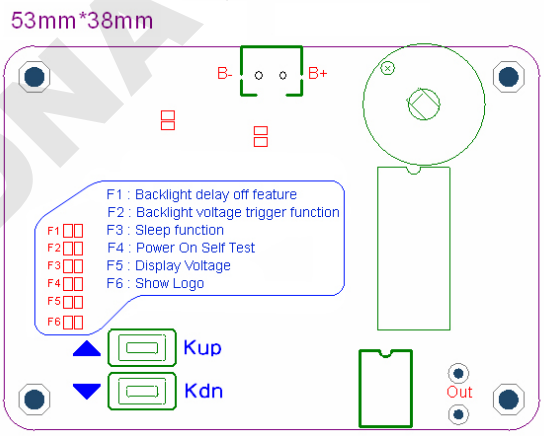
   Li B : 11 Series lithium battery pack

   Li C : 12 Series lithium battery pack

   Li D : 13 Series lithium battery pack

   Li E: 14Series lithium battery pack

   Li F: 15Series lithium battery pack




   ii. Find the corresponding model after turning off power supply module and re-energized normal use

3. Preferences

i. Function settings to use 20W soldering iron tip will correspond to F1-F6 junction with solder connections, the power required to operate under closed conditions,
On the need to re-adjust the power to take effect.

ii. When shipped from the factory default back all not connected, the function is: backlight lit, the percentage displayed, no sleep, no self, no Logo

iii. Following functions F1-F6 is connected to various points after

F1 : Backlight delay off function; power display 10 seconds after entering a low-power state (100uA), at this time there is an LCD display, but the backlight off.
Press OK again to close the back light 10 seconds. This mode requires the OK button

F2 : Backlight voltage triggering; displayed for 10 seconds after the power to enter a low-power state (100uA), at this time there is an LCD display, but the backlight off.
When the voltage changes automatically turn on the backlight for 10 seconds, or press the OK button to turn off the back light 10 seconds again. This mode requires the OK button

F3 : Sleep function; power display 10 seconds after entering the ultra-low power (<20uA) state, both the LCD and backlight off, press the OK button to positive
Often displayed for 10 seconds. This mode requires the OK button

F4 : Power On Self Test; each time power module is powered LCD display 2 seconds turns strokes, and then displays the selected battery type 1 second, final
Normal display power

F5 : Display voltage; right side shows only the current battery voltage, battery symbol on the left are still displayed in the selected model

F6 : Lower left corner of the LCD display Logo

F1-F3 Feature requires a positive key switch module, the default is no such press
If you do not bring a positive OK key, the power of positive and negative two wires connected to the device behind the switch, turn on the device after the power switch is always working;
If they bring a positive OK button, the power of positive and negative two wires directly to the battery positive and negative, and then in the back of the power of choice F1/F2
Or F3 function to automatically turn off the backlight or automatic sleep function.



## 8. Precautions

1. LCD screen surface with a protective film before mounting, it should be torn off, so as not to affect the contrast and appearance of the liquid crystal display

2. LCD screen surface of the glass material for fragile items, and therefore may not be subject to the impact of sharp objects!

3. UV-sensitive LCD screen, it is not long in the sun or ultraviolet ray radiation to produce large quantities of the environment (such as welding
Machines, welding), otherwise it will shorten the life of the LCD screen.

4. Use or storage conditions, power display module can not be long-term exposure to outdoor sunlight or other ultraviolet stronger occasion, special
Do not lower in the winter (below -20 ℃) and summer (above 60 ℃) extreme temperatures will

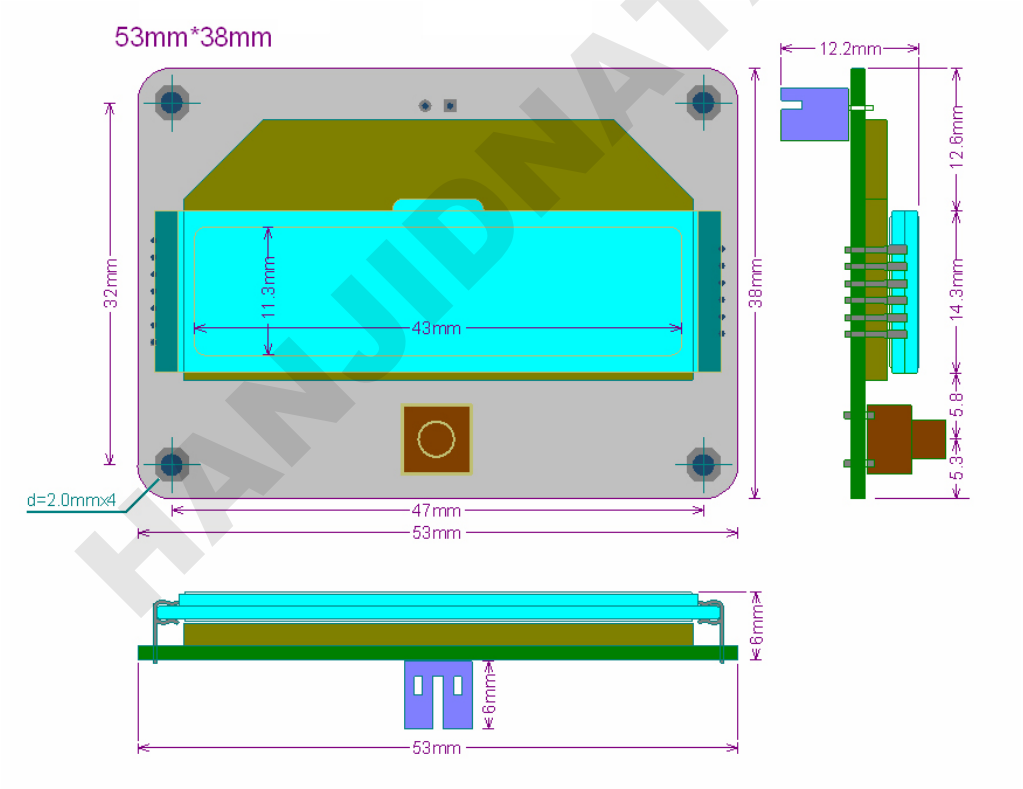
shorten the life of the LCD screen

5. LCD screen by using the ambient temperature changes more obvious, when used at low temperature (10 ℃) or less, may reduce the display contrast lighter,
   At high temperatures (above 50 ℃) may occur deep, but the temperature returns to normal, the display is self-healing

6. During use, if any problems found, please Division I with a detailed written (e-mail) in the form of instructions or conditions when the problem occurred
   And those specific process conditions, so that we make accurate judgments to resolve the problem

## 9. Electricity board Dimensions

1. PCB Dimensions (mm)
2. LCD surface to the PCB height 6.0mm
3. Total thickness of the front panel is not installed : 9mm
4. Total thickness of the mounting panel bracket : 13mm



## 10. Plexiglass panel

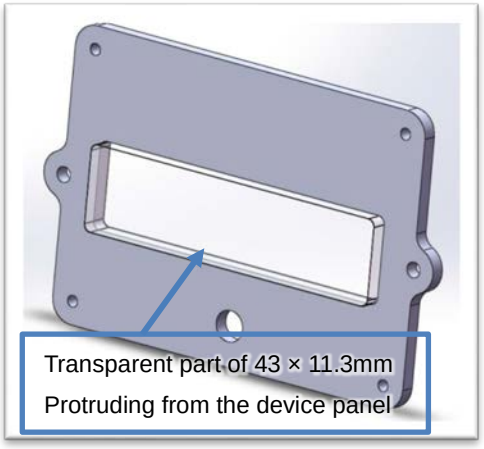
1. panel is optional, I offer the following parts by the customer

   Self-install

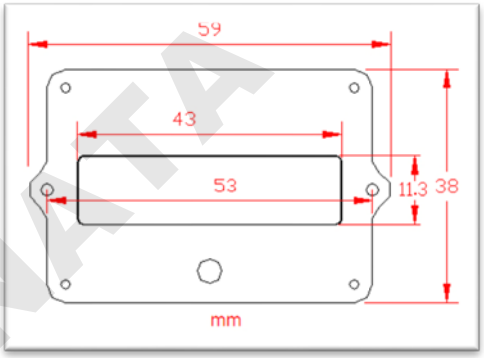
   Panel 1

   Screw 4

   Four 1




2. Panel bracket shape of a right,
   such as the right figure specific dimensions

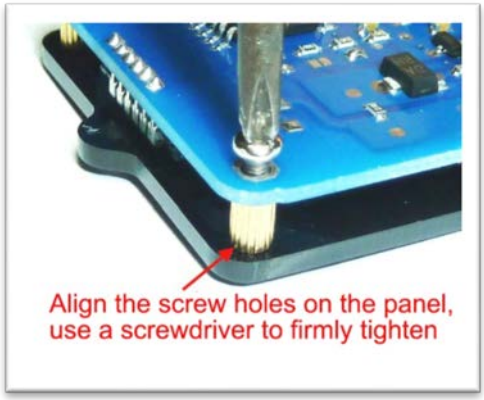



3. To highlight the middle 43 * 11.3mm transparent window, when installed in the design
   The preparation of this size opening panel, the transparent display window exposed to


4. Plexiglass panel bracket for the material, both sides covered with protective paper film, the transparent protective film flat side windows and black-rimmed are strippable, will face intermediate plate bracket transparent convex side flat on the desktop would with four 2.0mm four corners of the module small screw holes in the wear plate from the power display however, tighten the nut on the pillars; (Note that at this time do not tighten)

5. Attention to the need to be in front of the key switch on the front panel before installing this button switch assembled

6. Will tighten the screws and nuts pillars of electricity plate upside down already strippable protective on the membrane panel bracket, align the screw holes in the corners, use a screwdriver tighten firmly, if found not tight twist, turn and then tighten the nut studs



Panel after installation results: (after the installation of the overall thickness: 13mm) slightly higher than the height of the panel buttons, such as the need to highlight the panel, select the co-Highly appropriate keys

## 11. Between fixed electricity panels and instrument panel

1. Glue fixation: Between panel bracket and equipment panel with glue combined fixed

2. Screw fixation: 53mm pitch two solid panel holder holes with a diameter of 2.2 mm; may use self-tapping screws into the 2.5mm fixed line and note the length of the screw; If you want to tighten the screws 3mm, use 2.4-2.7mm drill reaming after installation