Product Introduction:

The module adopts single-chip microcomputer intelligent control, displays the remaining capacity of the battery the pack through the ten-level color bar, users can know the working status of battery in real time. With intelligent charge control, overcharge protection, over-discharge protection, one-key load control output. Intelligent charging and discharging control functions are realized through external relays.

Product Parameters:

1. **Suitable battery types and series number:**
   - Lithium polymer battery (nominal 3.7V): 1-23 cells
   - Lithium iron battery (nominal 3.2V): 1-26 cells
   - Storage battery (nominal 12V): 1-7 cells

2. **Technical parameters:**
   - Input power supply: 10-90V
   - Detected voltage range: 2-100V
   - Working current: 50-100mA
   - Working temperature: 0-60°C

Factory Default 4 cells Lithium polymer battery, please set parameters according to actual needs before using.

Menu Setting: (refer to Menu Description)

1. Long press the parameter setting button S1 for 3 seconds to enter menu 1 (battery type selection), light 1 flashes, short press S1 select.
2. After selecting, long press S1 for 3 seconds to enter the battery serial number selection, the light 2 will flash, short press to select the actual number of battery serial connection, the battery serial reference table see the menu description table.
3. After selecting, press S1 for 3 seconds to enter the display mode selection. The light 3 is flashing. Short press to select linear light or single light.

**Description:**
1) Linear light: the remaining lights are all on.
2) Single light: only the current battery light is on, the rest of the lights are off.

In both modes, when the measured voltage is lower than 0%, light 1 and light 2 flicker. When it is lower than the prescribed over-discharge voltage value, the 10 lights are all on and flash in 0.5 seconds, indicating that the battery is about to be overcharged. (polymer battery 3.2V, lithium iron battery 2.8V, storage battery 10.8V)

4. After selecting, long press S1 for 3 seconds to enter the key mode selection, light 4 flashes, short press to select the key mode 1 or key mode 2.

**Description:**
- **Key mode 1:** short press, displays the present capacity for 3 seconds then display is off, enter the low power consumption mode, the standby current is about 7μA. The intelligent charge and discharge function cannot be used in this mode, only the capacity display function.
- **Key mode 2:** the capacity indicator light is on, the present capacity status is displayed in real time, and short press S1 controls the load on/off. Intelligent charge/discharge and one-key load control functions can be used in this mode.

5. After selecting, long press S1 for 3 seconds to enter the output level selection. The light 5 is flashing, short press to select the three types of the level statues of control output.
   - Light on--represents output 1 (high level), light doesn't on--represents output 0 (low level), each time press the button, the light changes in hexadecimal, (000, 001, 010, 011, 100, 101, 111) please choose according to the actual control needs.

6. After selecting, long press S1 for 3 seconds to enter range selection, there are 20V, 50V, 100V three ranges available, short press select range.

**Note:** Please select the proper range according to the highest battery voltage for practical application, and get the highest accuracy of measurement. The range selection jumper on the module must also be consistent with the selection in the menu. If the range selection in the menu is inconsistent with the range selection on the PCB, the measurement will be inaccurate.

7. Long press S1 for 3 seconds after selecting, save all setting parameters and exit.

Menu Description:

1. **Battery type selection**
   - Lithium polymer battery
     - Nominal: 3.7V MAX 4.2V
   - Lithium iron battery
     - Nominal: 3.2V MAX 3.6V
   - Storage battery
     - Nominal: 12V MAX 13.8V

2. **Battery cells selection**
   - 1S
   - 2S
   - 3S
   - 4S
   - 5S
   - 6S
   - 7S
   - 8S
   - 9S
   - 10S
   - 11S
   - 12S
   - 13S
   - 14S
   - 15S
   - 16S
   - 17S
   - 18S
   - 19S
   - 20S
   - 21S
   - 22S
   - 23S
   - 24S
   - 25S
   - 26S

   Support different battery serial numbers as follows:
   a. Lithium polymer battery: 1-23 cells
   b. Lithium iron battery: 1-26 cells
   c. Storage battery: 1-7 cells

3. **Display method selection**
   - 1) Light up linearly: Remaining capacity lights all is on
   - 2) Single light up: Only show the present capacity light

   When the measured capacity is 0%, 1 and 2 lights flash. Lower than the specified over-discharge voltage, all lights flash for 0.5 second periods. (Polymer battery 32V, Lithium Iron battery 28V, storage battery 10.8V)
4. Key selection

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<td>1) Short press to show the present capacity. After a delay of 3 seconds, turn off the display, enter the low power consumption mode, current is 7uA.</td>
<td>2) Lights are always on. Intelligent charge and discharge function can only be used in this mode.</td>
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5. Output level selection

The output level state is corresponding to the 1, 2, 3 lights in the figure. 0 means the light is off, output low level; 1 means the light is on, output high level; all 3 way can be set individually. 1 light 1 is one-key load control, light 2 is over-discharge protection, and light 3 is overcharge protection. Each time the button is pressed, the light changes in hexadecimal, (000 001 011 100 101 110 111).

6. Range selection (select the appropriate range according to the measured battery voltage, you can get the highest accuracy of measurement. The span selection jumper on the PCB must also be the same as the one selected in the menu. Otherwise, will cause inaccurate measurement.)

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<td>a. 20V</td>
<td>Measure battery within 20V</td>
<td>b. 50V</td>
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**Output Control Description:** (The control function is effective when it is selected 2 in key mode selection menu)

1. OUT1 is one-key load control signal, using S1 can control the load on and off.
2. OUT2 is the over-discharge protection control signal. The output level is reversed when the voltage is lower than the specified minimum voltage (2.5V for polymer lithium batteries, 2.2V for iron-lithium batteries, and 10.6V for storage batteries).
3. OUT3 is intelligent charge control signal, which can automatically turn off the charge when the battery is fully charged. When the battery discharge value is lower than the specified voltage value, it will start charging automatically and complete the automatic charge/discharge control cycle.

   1) Output level is reversed when the voltage is higher than the specified voltage and the charger stops charging (4.25V for polymer lithium batteries, 3.65V for iron-lithium batteries, and 14V for storage batteries).
   2) Output level is turned over again when the voltage is lower than the specified voltage, and the charger is automatically charged to the battery (3.2V for polymer lithium batteries, 3.0V for iron-lithium batteries, and 10.8V for storage batteries).

**Wiring Description:**

1. Charging control current within 15A, main load control current within 30A, load 2 control current within 15A.
2. When the module power supply and the measured voltage are the same power supply or battery, please directly connect the red wire and the yellow wire together.
3. This module is suitable for storage battery, polymer lithium battery, iron lithium battery within 100V, intelligent charge and discharge melectrode load control.

**Range Selection Instruction:**

There are three range selection jumpers in the box, please select one. Please short-circuit the corresponding jumper according to the actual test. At the same time, the range selection in the menu must be consistent with the jumper selection. The factory default is selected at the 20V range.