PowerLog 6S

Multifunctional Monitor&Logger

User's Manual

Thank you for purchasing the **PowerLog 6S**. Please read the User's Manual completely and attentively as it contains lots of specific operations and safety information.

PowerLog 6S is one compact multifunctional monitoring and logging meter, adopting 32 bit ARM processor, with 12 bit A/D convertor to ensure the accurate measurement.

Specifications

Input voltage range:	4.5 – 60.0VDC
Current measurement range:	-130A – +130A（continuance -40A – +40A）
Cell voltage range:	0.05 – 28.0VDC
External temperature measurement range:	-55℃– +125℃ (-67 °F–+257 °F)
Pulse measurement range:	10us–999999us
Pulse width output range:	0–20ms (0.5us step)
Tachometer measurement range:	0–99999 RPM
Voltage resolution / accuracy:	0.001V / 0.5%
Current resolution / accuracy:	0.01A / 5%
Current loading of test:	12mA
Maximum voltage for alarm port:	50VDC
Current drain for alarm port:	<500mA
Log files storage:	16Mbit (33 hours@2 seconds logging interval)
Sample logging time interval:	0.25 – 3600 seconds
PC connect:	USB port
Weight:	29g
Dimensions (L X W X D):	85X40X13mm (3.34"X1.57"X0.51")

Special features

- **PowerLog 6S** allows bidirectional current sensing, adopting 0.2 mΩ current sampling resistor with low insertion loss.
- 1 channel 0-60V voltage measurement. 6 channels cells voltage measurement (can not only measure 1-6S Li/ NiMH/NiCd/ Pb battery individual voltage, but also measure 6 channels 0.05-28V voltage)
- 4 channels temperature measurement (1 channel internal temperature measurement and 3 channels external temperature measurement)
- Propeller RPM measurement, adopting non-contact optical sensing, user settable blade number.
- PWM signal measurement: frequency, period, pulse width, duty cycle. Applicable to remote control channel signal, measure, and monitor.
- PWM output: manual and auto mode, auto mode is able to break in servos, electronic speed controllers, R/C switches etc.
- Motor KV measurement. The 2-wire mode is suitable for the KV measurement of brushless motor; while 3-wire mode is suitable for the KV measurement of both brushed and brushless motors.
- Small size with multiple functions, backlight 128*64 lattices LCD and Buzzer Tone Reminder; the interface can be operated smoothly.
- It can be set Cells Voltage/Pack Voltage/Timer Over/Current/Power/Capacity/Temperature/RPM/Period and Pulse Alarm. What's more, the extra alarm output can be linkage controlled by the users.
- It has 8 sets default monitor alarm settings, which can be selected for different battery packs.
- **PowerLog 6S** has been 100% calibrated before it enters to the market, at the same time, it supports the calibration by users themselves.
- The logging interval can be set by users' different needs. **PowerLog 6S** has a 16Mbit flash storage, which can log offline data in 33 hours @2 seconds logging interval.
- Support upgrading the hardware program by USB port. Adopting HID protocol, dispense with installing driver from PC, plug and play.
- The **PowerLog 6S** supports the "Logview" software and can display, plot and analyze the data by it. (See detail information about **Logview** in the following website: http://www.logview.info)

Unpack inspection

Standard items:

The following items are included in the package. Contact your supplier if any items are missing.

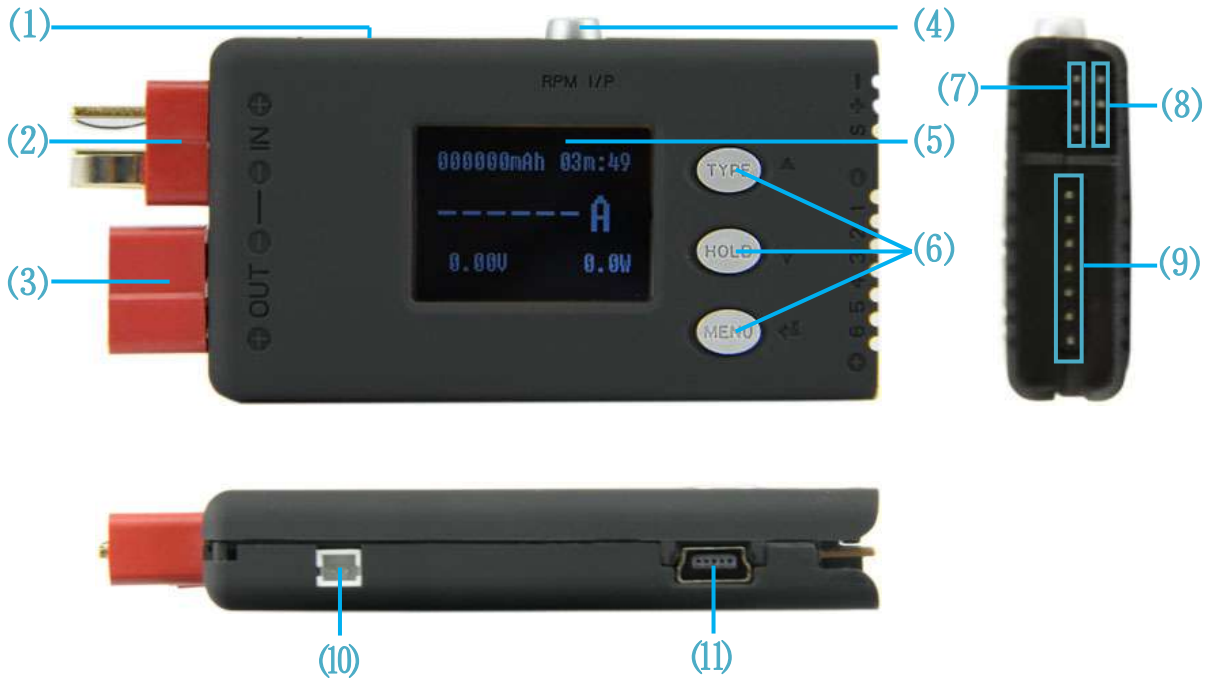
CDROM  85 X 85mm	**CW-USB5**  80mm
One copy of the User's manual on CDROM	**One Mini-USB data line**
CW-P220  20mm	**CW-C220**  20mm
One Alarm output line	**One brushless motor KV measurements line**
CW-T210  10mm 12AWG	**TW-JR1**  35mm
One T-plug input & output line	**One temperature sensor DS18B20**
TPC-1 	
Two T-plug protection cover	

Optional items:

The following items are not included in the package.

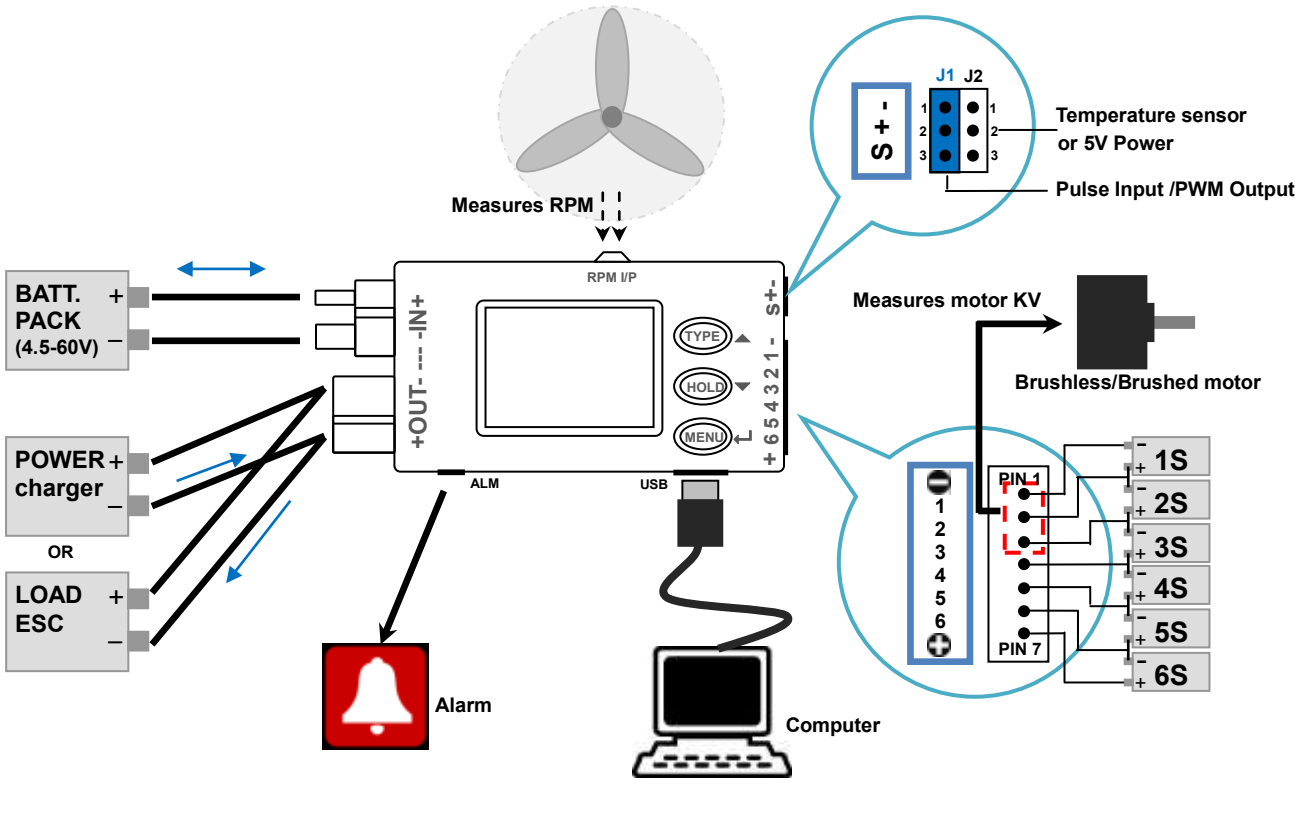
TJR-13  5mm
JR connector 1—3

External controls and connections

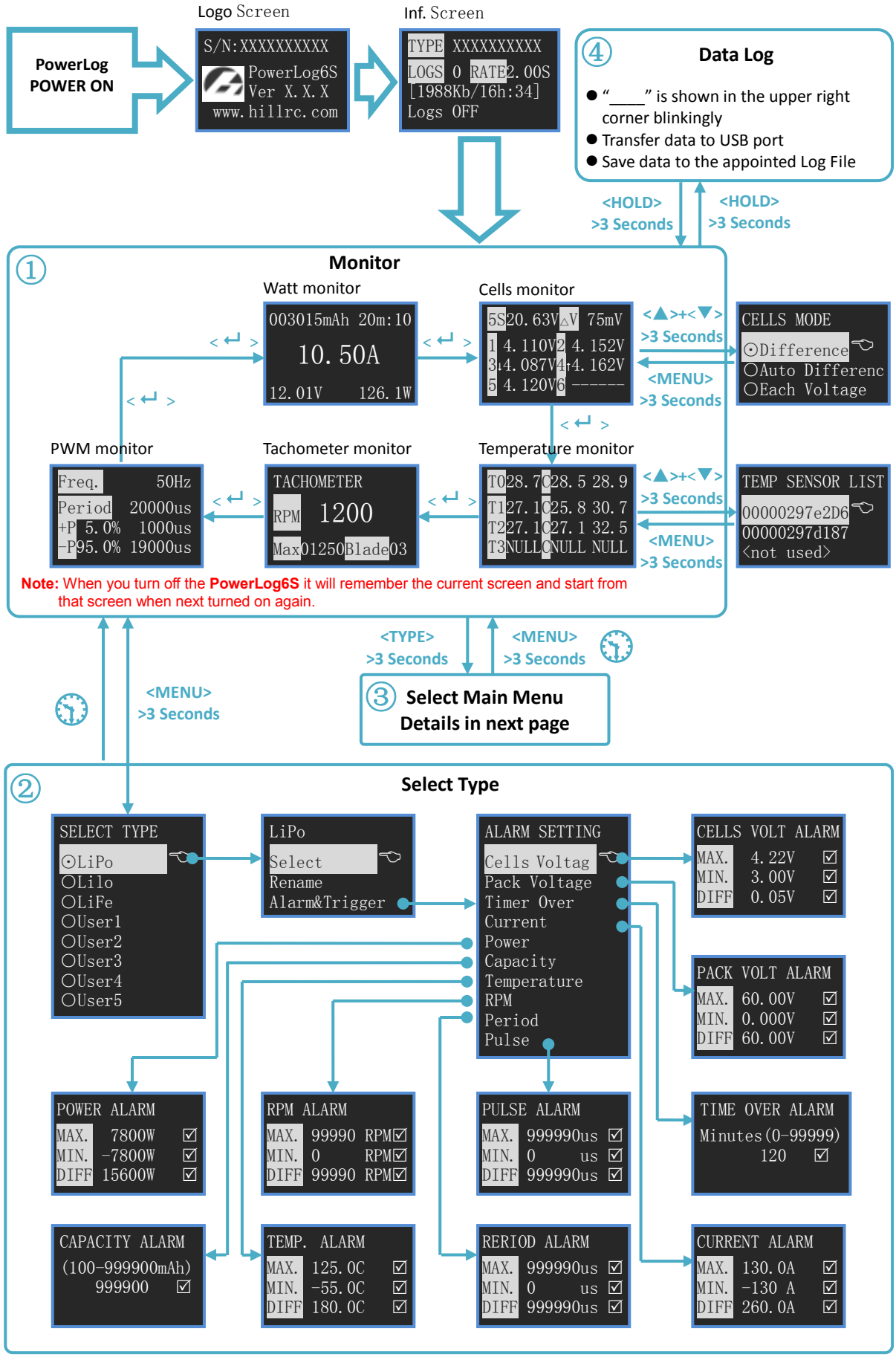


1. Beep
2. Input T-plug(T1)
3. Output T-plug (T2)
4. Tachometer Sensor
5. LCD screen
6. Buttons
7. Pulse I/O (J1)
8. Temperature Sensor Port (J2)
9. Multiple Voltage Input Port(J3)
10. Alarm Port
11. USB Port

PowerLog 6S Connection Diagram



Program flow chart



Note: means if no operation on the button for 3 minutes, the system will return to monitor screen automatically.

① Monitor
Details in previous page

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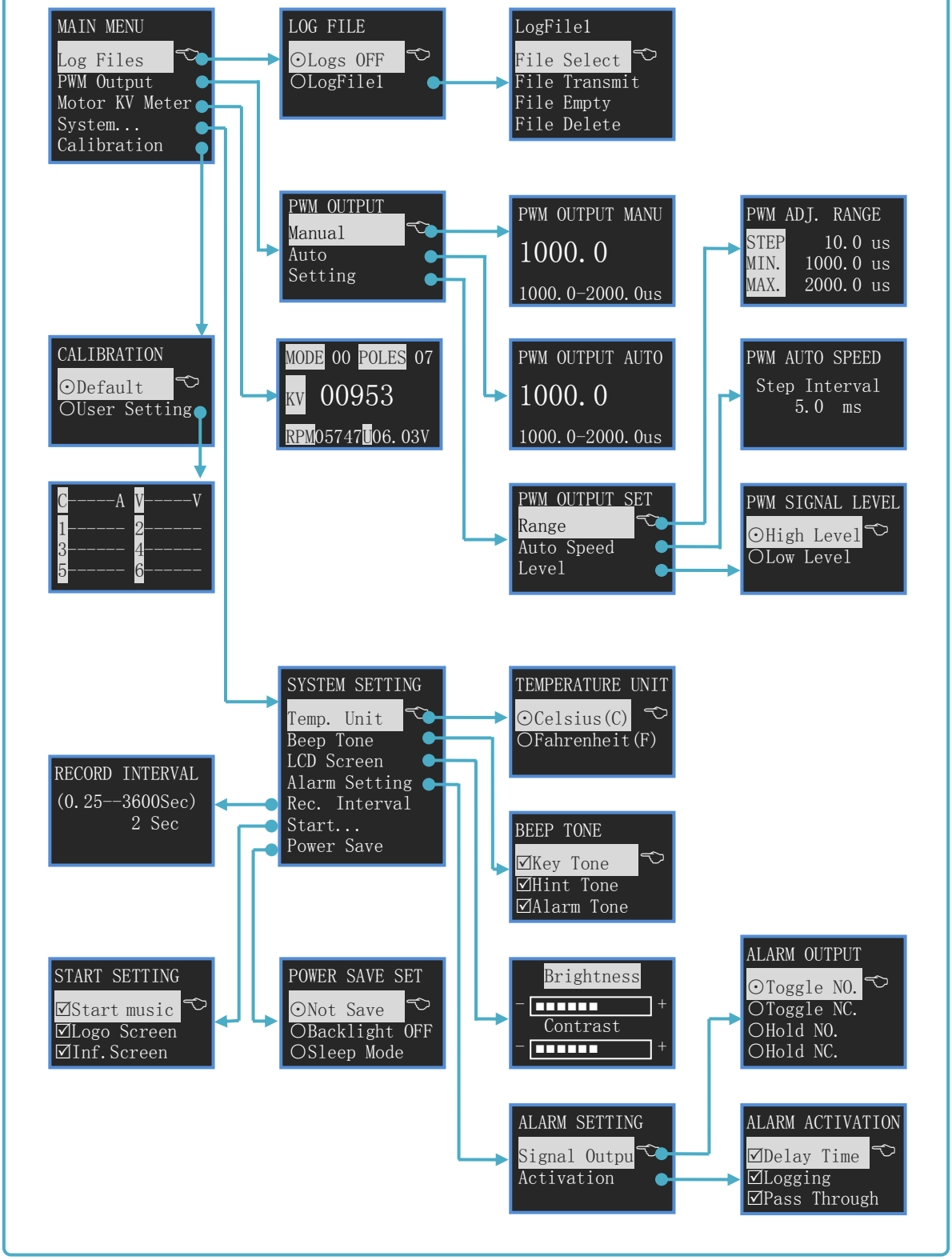
<TYPE> >3 Seconds

<MENU> >3 Seconds

③ Main Menu



Menu Operation:

1. Select the menu items by **<▲> /<▼>** buttons, the selected item will be shown in white.
2. Press **<↵>** to enter the submenu, and hold **<↵>**for more than 3 seconds, it will return to the superior menu.

Symbol Meanings:

Display Symbols	The meaning of the Symbols	Note
nS	total voltage of the pack	n:0-6, the cell count
△V	the maximum voltage difference between the cells	
mmM:ss **or** hhH:mm **or** ddD:hh	the timer	ss: second, mm: minute, hh: hour dd: days
⊙/○	Single choice Do/Do not	
☑/☐	Multiple choice Do/Do not	
T_OVER	Time over alarm	
LOW	Lower MIN. limit alarm	
OVER	Over MAX. limit alarm	
DIFF	Difference limit alarm	

Button Function

PowerLog has 3 buttons. Each button owns two functions. The first function is to trigger after only one click; the second function is to trigger after holding the button for 3 seconds.

Press button	Condition	Button Function Description
<▲>	Click	1. Turn up the menu item 2. Increase the value 3. Select the input character
	Hold for 3 seconds	Enter alarm type select menu
<▼>	Click	1. Turn down the menu item 2. Decrease the value 3. Delete the character
	Hold for 3 seconds	Trigger Start/Stop logging function
<↵>	Click	Confirmation
	Hold for 3 seconds	Enter system setting menu
<▲>+<▼>	Click	
	Hold for 3 seconds	1. Reset timer @watt monitor 2. Enter cells mode menu @cells monitor 3. Adjust blades @ temperature monitor 4. Save @ user calibration interface
<▲>+<▼>+<↵>	Hold for 3 seconds on watt monitor Interface	Current zero point calibration @watt monitor

Note：<▲>+<▼> means pressing <▲> and <▼> at the same time.

QUICK START

- **PowerLog Power On**

When connecting any of the following power sources, PowerLog will be triggered ON:

1. Connect the USB port of PC
2. Connect power supply(**4.5-60V**) through T-plug T1 or T2
3. Connect J1,J2 with **5V** power supply.
4. Connect power supply trough Multiple Voltage Input Port (J3), PIN1 connect the negative polarity of the power supply, PIN2-PIN7 connect with **4.5-28V** voltage.

System self-check, and then shows the **SN** and **version number**, the displayed information is as below:

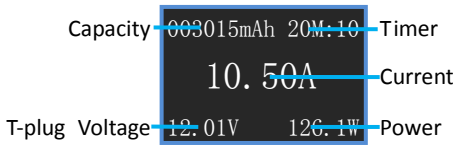
The first line is the current selected **Setting Type** (See details in P11). The second line shows the log file number. And the third line is the available record of capacity and time. The last line shows the current log file name (if no files, it shows "Logs OFF"). 3 seconds later, the system enters voltage monitor status.

- **Monitor**

There are 5 interface choices, which can be shifted by **<↵>** button.

1) Watt Monitor

Monitor the input voltage and current of T-plug



Current zero point calibration:

When there is no current flowing through T-Plug, if the displayed current is not zero, please press **<▲>+<▼>+<↵>** for 3 seconds. (**<▲>+<▼>+<↵>** means pressing **<▲>** and **<▼>+<↵>** at the same time.)

Reset Timer

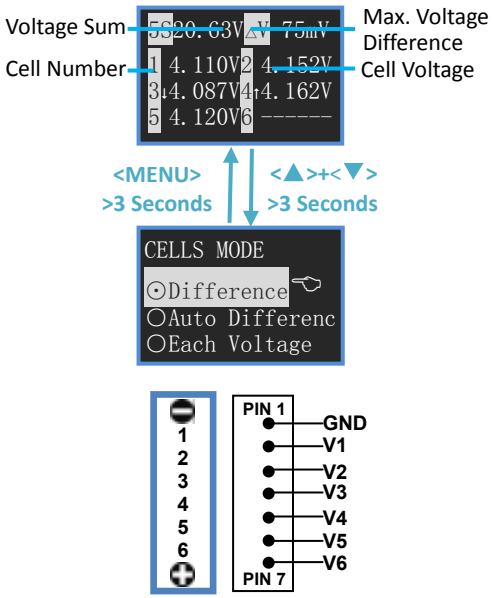
Press **<▲>+<▼>** for 3 seconds, the time on the upper right corner becomes 00m:00 and the capacity on the upper left corner becomes 0mAh.

Setting range

T-plug Voltage: 4.5—60V Current : -130A—+130A
Capacity: 0—999999mAh Power : -7800W—+7800W

2) Cells Monitor

Monitor the input voltage of Multiple Voltage Input Port(J3)



Voltage Sum: the sum voltage of Cell Voltage 1-6

△V = Max. Cell Voltage – Min. Cell Voltage

'↑' is in front of the cell with Max. Cell Voltage, while '↓' is in front of the cell with Min. Cell Voltage.

Setting range

V1-V6: 0.05—28.00V

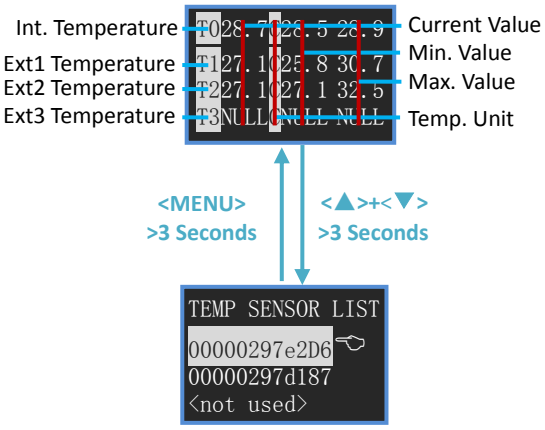
【Difference】Displayed voltage **CellV*n*=V*n*–V*n-1*** (1≤n≤6), under the condition V6>V5>V4>V3>V2>V1>0.

【Auto Difference】

First sorting by ascending numeric sequence between V1-V6, then has Va1-Va6, **CellV*n*=Va*n*–Va*n-1*** (1≤n≤6).

【Each Voltage】Displayed voltage **CellV*n*=V*n*** (1≤n≤6).

3) Temperature Monitor



T0 is constant internal temperature. T1 to T3 are external temperature.

Setting range

T0: -20℃– +70℃ (-4℉–+158 ℉)

T1-T3: -55℃– +125℃ (-67 ℉–+257℉)

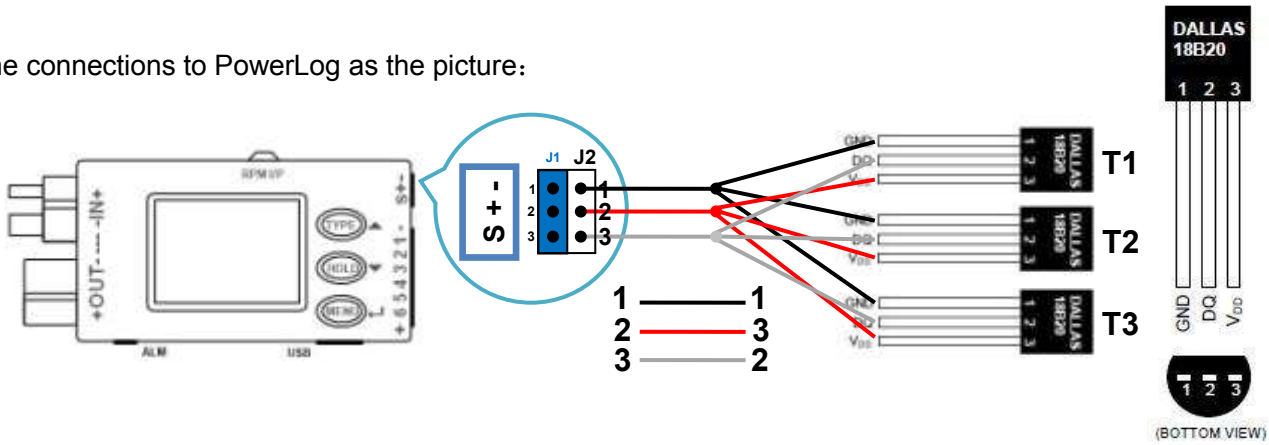
Press **<▲>+<▼>** for 3 seconds and enter the screen below: (Line 2, 3, 4 in the interface correspond to T1, T2, T3 respectively.)

Press **<▲>/<▼>** to choose the needed item, and then press **<▲>** for 3 seconds to cancel the sensor, which becomes <not used>.

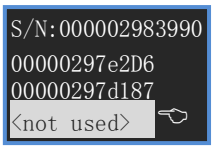
when press **<↵>**, it displays"↓↑" on the right side of the item. Press **<▲>/<▼>** to alter the sequence and press **<↵>** to save it.

Temperature sensor adopts DS18B20 (Programmable Resolution 1-Wire Digital Thermometer), and the details can refer to http://www.maxim-ic.com/datasheet/index.mvp/id/2812.

The connections to PowerLog as the picture：



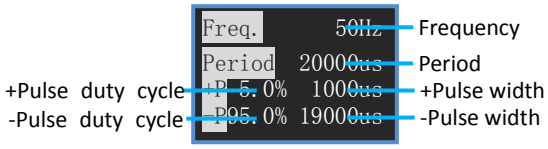
Every DS18B20 has a unique ID number. Under the temperature monitor mode, when a new sensor connects to it, the system will check the ID number of the new sensor automatically, as picture:



Alternatively display "Find new DS18B20"/"S/N:xxxxxxxxxxxx" in the first line, while from the second line to the fourth line it displays the ID number of the present T1—T3 sensors. Press **<▲>/<▼>** to choose the needed Tx, while press **<↵>** and a new temperature sensor will be added in the menu. Press **<↵>** for 3 seconds to cancel the addition. If there are other new sensors in this circuit, the process will continue. The temperature of the added temperature sensor will be displayed in the **Temperature Monitor** Interface.

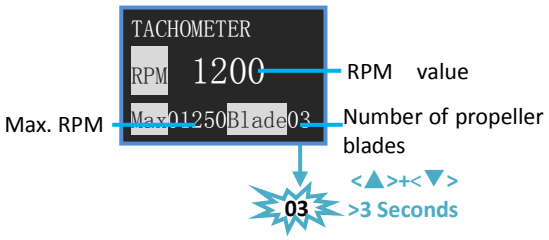
4) PWM Monitor

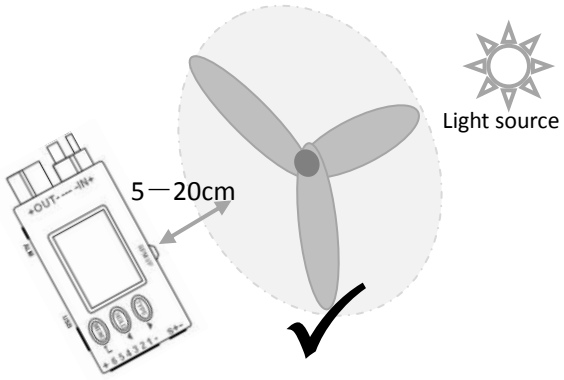
Monitor the input pulse signal from J1



The measurement resolution of PWM is 1us,
Freq. = 1/Period.
The smaller the Period, the bigger measurement deviation of Freq.

5) Tachometer Monitor





Press **<▲>** + **<▼>** for 3 seconds, the number of propeller blades begins blinking, and then press **<▲>** / **<▼>** to adjust the value. Press **<↵>** to confirm and return.

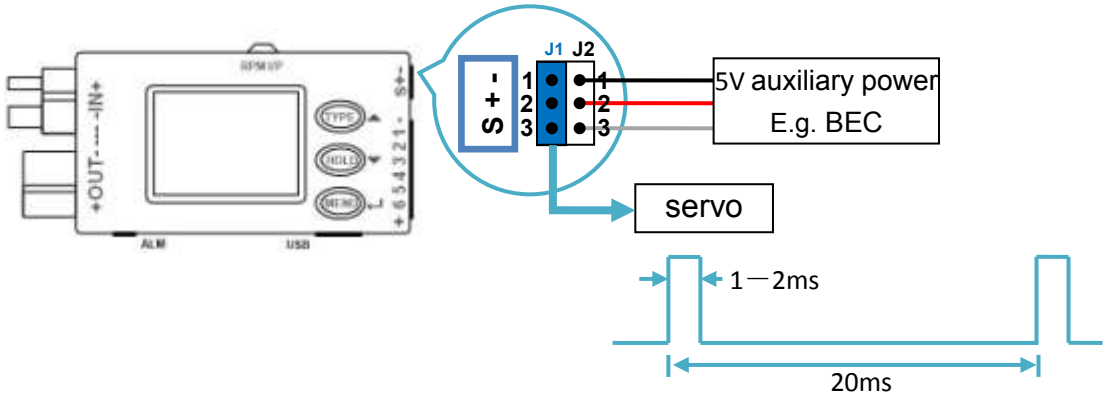
Setting range
RPM: 0– 99999
Blade: 1– 20

Right measuring methods:
Tachometer sensor faces directly to the rotary surface and the light source, making the distance between 5 to 20cm.

Note: Tachometer sensor is easily interfered by the electronic light source (e.g., fluorescent lamp), please keep it far away from these light sources while it is in use.

- **PWM Output**

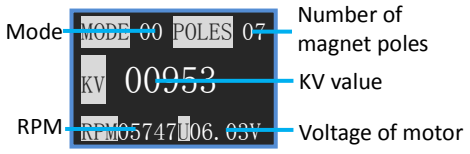
The regular period of PWM output is 20ms, and PWM pulse signal with changeable duty cycle. With regard to servo and throttle signal, the positive pulse width is altering between 1 to 2ms, as picture:



Regarding the specific operations, please refer to ***MAIN MENU*** -> ***PWM Output*** P15

- **Motor KV Meter**

KV as we use it refers to the RPM constant of a motor - it is the number of revolutions per minute that the motor will turn when 1V (one Volt) is applied with no load attached to the motor.

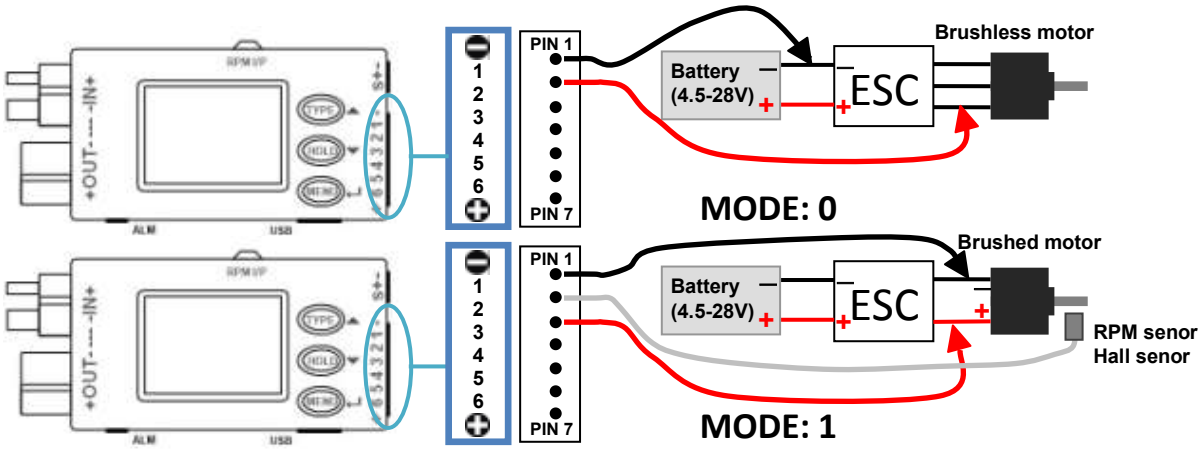


Mode0: It works at the 2-wire mode, suitable for the KV measurement of brushless motor.

Mode1: It works at the 3-wire mode, suitable for the KV measurement of both brushed and brushless motors.

Regarding the specific operations, please refer to ***MAIN MENU*** -> ***Motor KV Meter*** P16

Wire Connection Methods of Mode0 and Mode1 as the picture below:



Notes: 1. When measuring KV on the **Mode0**, the throttle settings of ESC needs to be set at the Max. value.
2. If the tested voltage is lower than 4.5V, **PowerLog** needs auxiliary power supply.

- **Data Logging**

When in **Monitor** status, press **<▼>** button for 3 seconds, after it shows "Start logging…", the "____" will be shown alternatively at the upper right corner of the LCD screen. In this status, the system will transmit the data to USB port every X seconds(this interval time X can be set by user himself, details you can see **Record Interval Time Settings** in P17), and save these data to the current Log file（See **Log File Management** in P14. If 【Logs OFF】, the system will not log file.）

Press **<▼>** for 3 seconds again, the screen will show "Stop logging! " and then exit.

- **Alarm Remind**

If **PowerLog** detect the alarm events (See **Alarm Parameters Settings** in P12), it will remind as below:

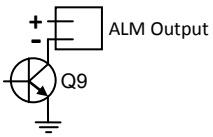
1. The buzzer beeps every 4 seconds (See **Beep Tone Settings** in P16, 【Alarm Tone】is selected ☑).
2. The corresponding value and alarm remind show alternatively.
   Alarm Remind Information: "**LOW**" — Lower MIN. limit alarm "**OVER**" — Over MAX. limit alarm
   "**DIFF**" — Difference alarm "**T_OVER**" — Time over alarm
3. ALM port will output the presetting signal.

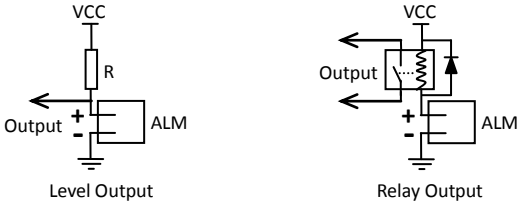
ALM port signal information:

ALM output port signal is open collector signal, as showed below.

Please pay attention to the port voltage and current limit when you use（<50V,<500mA）

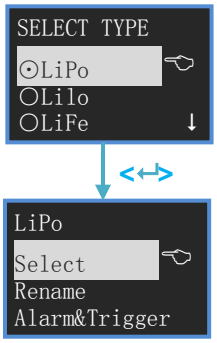
The following are ALM Output typical application.





Monitor Alarm Settings

The system can have 8 sets alarm settings, press **<▲>** for 3 seconds to enter ***SELECT TYPE*** menu.

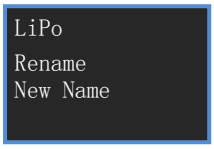


The item with ⊙ is the current setting.
<▲> or **<▼>** to select items and press **<↵>** button to confirm.
Defaulted TYPEs are: LiPo, Lilo, LiFe, User1--5

Operate the selected type settings
<▲> or **<▼>** to select the items, press **<↵>** to enter the next step.
See details below.

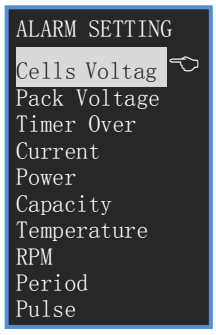
- **Change Present Alarm Type**: Select【Select】, Press **<↵>** then the item will be with ⊙, and the settings come into effect.

- **Rename Alarm Type**: Select【Rename】, press **<↵>** and the screen shows:



New Name Input Method: **<▲>** to select characters, hold it to trigger continuously until you get the character you need, the second cycle of 26 characters will be capital letter; **<▼>** to delete the current character; **<↵>** to confirm the selected character; press **<↵>** for 2 times to confirm the amendment and return; press **<↵>** for 3 seconds to cancel and return.

- **Alarm Parameters Settings**: Select【Alarm&Trigger】, press **<↵>** and the screen shows:

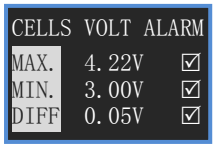


<▲> or <▼> to select items, press **<↵>** enter the submenu. While press **<↵>** for 3 seconds to return.
See details below.

When setting the alarm items, **<▲> or <▼>** to increase/decrease value, press **<↵>** and then☑ will be blinking, press **<▲>** or **<▼>** to choose☑ /not choose☐ the alarm item, and press **<↵>** again to shift setting items. Only when it is ☑, the item and set value will take into effect. Press **<↵>** for 3 seconds to confirm the amendment and return.

【MAX.】the upper limit value
【MIN.】the lower limit value
【DIFF】the max measuring difference fluctuation range＝ measured MAX. value－measured Min. value

1. **Individual Cell Voltage Alarm Settings**: Select【Cells Voltage】, press **<↵>** and the screen shows:

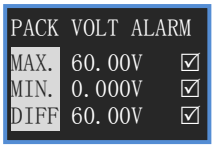


CELL VOLT ALARM applies to the cell voltage in the **Cells Monitor** interface.

Setting range

MAX. 0.06V—28.0V MIN. 0.05V—27.99V DIFF 0.01—27.95V

2. **Pack Voltage Alarm Settings**: Select【Pack Voltage】, press **<↵>** and the screen shows:

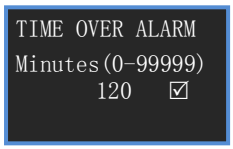


PACK VOLT ALARM applies to the T-plug voltage of **Watt Monitor** interface.

Setting range

MAX. 0.05V—60.00V MIN. 0.00V—59.95V DIFF 0.05V—60.00V

3. **Monitor Time Over Settings**: Select【Timer Over】, press **<↵>** and the screen shows:

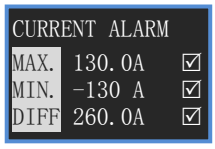


TIME OVER ALARM applies to the Timer of **Watt Monitor** interface. When monitor time is over the set value, it alarms. T-OVER

Setting range

0－99999 minutes

4. **Current Alarm Settings**: Select【Current】, press **<↵>** and the screen shows:

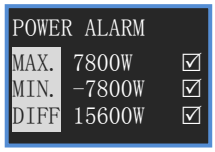


CURRENT ALARM applies to the Current of **Watt Monitor** interface.

Setting range

MAX. -129.0A—130.0A MIN. -130.0A—129.5A DIFF 0.5A—260.0A

5. **Power Alarm Settings**: Select【Power】, press **<↵>** and the screen shows:

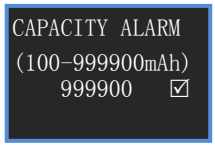


POWER ALARM applies to the Power of **Watt Monitor** interface.

Setting range

MAX. -7799W—7800W MIN. -7800W—7799W DIFF 1W—15600W

6. **Capacity Alarm Settings**: Select【Capacity】, press **<↵>** and the screen shows:



CAPACITY ALARM applies to the Capacity of **Watt Monitor** interface.

When measured capacity is over the set value, it alarms.

Setting range: 100－999900mAh

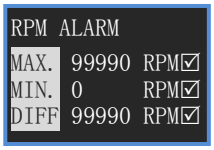
7. **Temperature Alarm Settings**: Select【Temperature】, press **<↵>** and the screen shows:

TEMP. ALARM applies to the Temperature of **Temperature Monitor** interface.

Setting range

MAX. -54.9C—125C MIN. -55C—124.9C DIFF 0.1C—180C

8. **RPM Alarm Settings**: Select【RPM】, press **<↵>** and the screen shows:



RPM ALARM applies to the RPM value of **Tachometer Monitor** interface.

Setting range

MAX. 10—99990RMP MIN. 0—99980RMP DIFF 10—99990RPM

9. **Period Alarm Settings**: Select【Period】, press **<↵>** and the screen shows:

PERIOD ALARM applies to the Period of **PWM Monitor** interface.

Setting range

MAX. 10—999990us MIN. 0—999980us DIFF 10—999990us

10. **Pulse Alarm Settings**: Select【Pulse】, press **<↵>** and the screen shows:

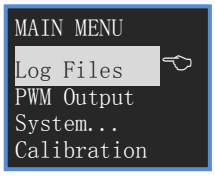
PULSE ALARM applies to the +Pulse width of **PWM Monitor** interface.

Setting range

MAX. 10—999990us MIN. 0—999980us DIFF 10—999990us

Parameter Setup

Press **<↵>** for 3 seconds, and enter the ***MAIN MENU***, Monitor status.



<▲> or <▼> to select items, press **<↵>** button to confirm. Press **<↵>** for more than 3 seconds to return.
See details below.

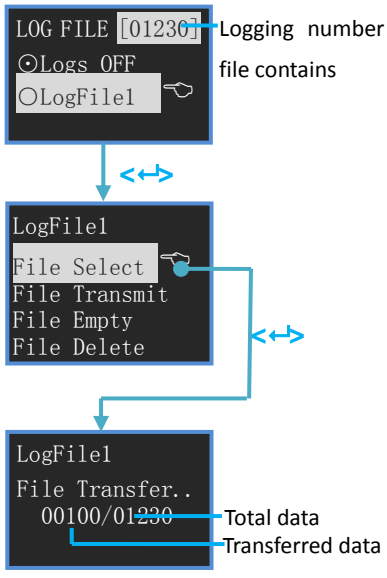
- **Log File Management**: Select【Log Files】, press **<↵>** and the screen shows:

The first item is【Logs OFF】,if it is chosen, LOG function is close.

Press **<▲>** for 3 seconds to **create new Log files**.

Log file name input method:
<▲> to select characters, hold it to trigger continuously; **<▼>** to delete the current character; **<↵>** to confirm the selected character; press **<↵ >** for 2 times to confirm the amendment and return; press**<↵>** for 3 seconds to cancel and return.

The operation to the existing files:



<▲> or <▼> to select items, press **<↵>** to have a selected item and the item will be with⊙, press **<↵>** for more than 3 seconds to return.

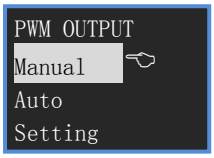
【File Select】The selected file is the current log file

【File Transmit】Transmit the selected log file to the USB port, it can be received by "LogView"（See details in P20）

【File Empty】Empty all selected log files. Press**<↵>**, the screen shows "Are you sure you want to empty?", and press **<↵>** to confirm, and press any other button to cancel.

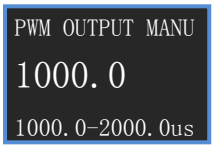
【File Delete】Delete the selected file. Press**<↵>**, the screen shows "Are you sure you want to delete?", and press **<↵>** to confirm, and press any other button to cancel.

- **PWM Output**: Select【PWM Output】, and press **<↵>** and the screen shows:



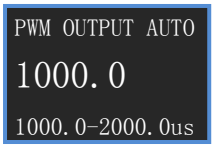
<▲> or <▼> to select items, press **<↵>** button to confirm, press **<↵>** for more than 3 seconds to return.
See details below.

1. **PWM Output Manual :** Select【Manual】, press **<↵>** and the screen shows:



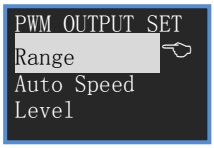
<▲> or <▼> to increase/decrease value, press **<↵>** button to confirm, press **<↵>** for more than 3 seconds to return.
The fourth line displays the value setting range. If adjust range, see details as:**PWM SETTING**-> **PWM Adjustable Range Settings**

2. **PWM Output Auto :** Select【Auto】, press **<↵>** and the screen shows:



Pulse width increases automatically. When reaching the Max. value, it shifts to the Min. value. This process goes round and round. Press any button to start/stop the process of automatic pulse increase.
The fourth line displays the value setting range. If adjust range, see details as:**PWM SETTING**-> **PWM Adjustable Range Settings**

3. **PWM Settings:** Select【Setting】, and press **<↵>** and the screen shows:



<▲> or <▼> to select items, press **<↵>** button to confirm, press **<↵>** for more than 3 seconds to return.
See details below.

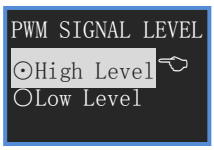
a) PWM Adjustable Range Settings: Select【Range】, and press **<↵>** and the screen shows:

Pulse width adjustable range settings
Setting range
STEP 0.5—10000us MIN. 0—20000us MAX. 0—20000us

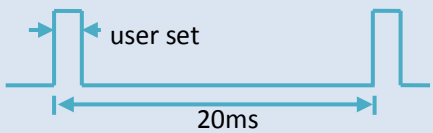
b) PWM Auto Speed Settings: Select【Auto Speed】, and press **<↵>** and the screen shows:

The interval time settings of pulse width increment in PWM Output AUTO mode
Setting range
5.0-5000.0ms

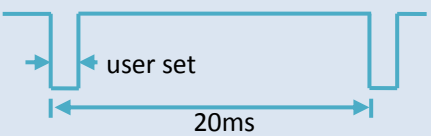
c) PWM Level Settings: Select【Level】, and press **<↵>** and the screen shows:



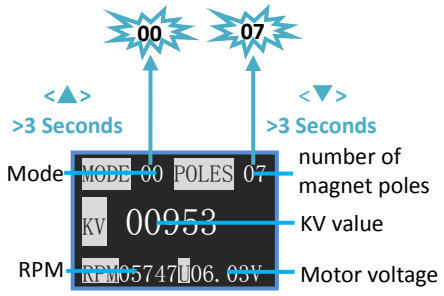
【High Level】



【Low Level】



- **Motor KV Meter**: Select【Motor KV Meter】, press <↵> and the screen shows:



Press <▲> for 3 seconds, the number of mode begins blinking, and then press <▲> / <▼> to adjust the value. Press <↵> to confirm and return.

Press <▼> for 3 seconds, the number of magnet poles begins blinking, and then press <▲> / <▼> to adjust the value. Press <↵> to confirm and return.

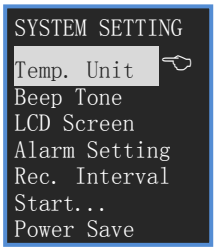
Setting range

MODE: 0,1

POLES:2-30

Motor voltage:0.05-28V

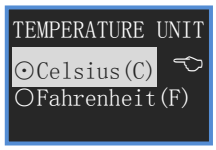
- **System Settings**: Select【System…】, press <↵> and the screen shows:



<▲> or <▼> to select items, press <↵> button to confirm, press <↵> for more than 3 seconds to return.

See details below.

1. **Temperature Unit Settings:** Select 【Temp. Unit】, press <↵> and the screen shows:



<▲> or <▼> to select the items , press <↵> button to confirm and the item will be with ⊙, press <↵> for more than 3 seconds to confirm the amendment and return.

Select【Celsius(C)】, the temperature unit is Celsius (℃.)

Select【Fahrenheit(F)】, the temperature unit is Fahrenheit(°F).

2. **Beep Tone Settings**: Select【Beep Tone】, press <↵> and the screen shows:

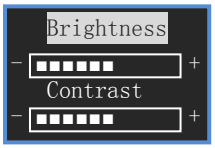
<▲> or <▼> to select the items, and press <↵> to shift select ☑/☐, press <↵> for 3 seconds to confirm the amendment and then return.

Select【Key Tone】,the buttons tone open.

Select【Hint Tone】,the status tone open.

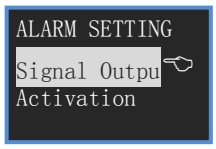
Select【Alarm Tone】,the alarm tone open. （have a “Do” every 4 seconds）

3. **LCD Brightness & Contrast Settings** : Select【LCD Screen】, press <↵> and the screen shows:

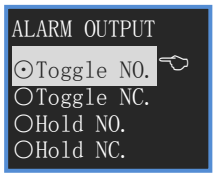


<▲> increase, **<▼>** decrease, and press **<↵>** to shift Brightness/Contrast, press **<↵>** for 3 seconds to confirm the amendment and then return.

4. Alarm Settings: Select【Alarm setting】, press **<↵>** and the screen shows:



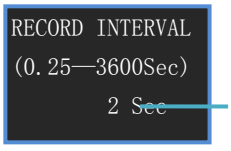
<▲> or <▼> to select items, press **<↵>** button to confirm, press **<↵>** for more than 3 seconds to return.
See details below.



<▲> or <▼> to select items, press **<↵>** button to confirm and the item will be with ⊙, press **<↵>** for more than 3 seconds to confirm the amendment and return.
When the measured value exceeds the set alarm limit value, the alarm triggers, sends out signal. When the measured value goes back to the normal status, if set "Toggle", the alarm output recovers to normal; if set "Hold", the alarm output remains.
【Toggle NO.】 Toggle mode, normal open
【Toggle NC.】Toggle mode, normal close
【Hold NO.】Hold mode, normal open
【Hold NC.】Hold mode, normal close

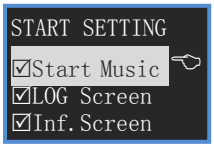
<▲> or <▼> to select the items, and press **<↵>** to shift select ☑/☐, press **<↵>** for 3 seconds to confirm the amendment and return.
【Delay Time】Delay a period of time after powering on and then begins to monitor alarm cases.
【Logging】After entering "Start logging…" status, it begins to monitor alarm cases.
【Pass Through】 The measured value is between the normal value range, and then it begins to monitor alarm cases.
For example, the normal working current of one machine is 25A, set current alarm **MIN.** = 20A **MAX.** = 30A. If powering on PowerLog first and then the machine, since C=0 during this period, it will trigger MIN alarm. If set【Pass Through】, it will avoid this undesirable alarm.

5. Record Interval Time Settings: Select【Rec. Interval】, press **<↵>** and the screen shows:



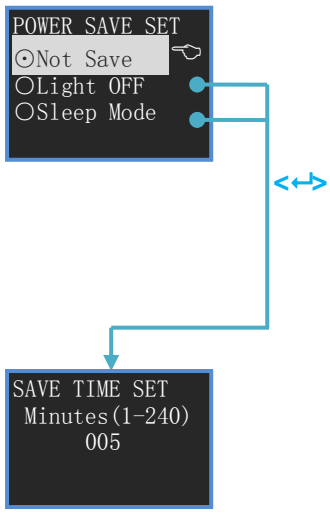
<▲> or <▼> to increase/decrease, press **<↵>** to confirm amendment and return. Press **<↵>** for 3 seconds to cancel amendment and return.
Setting range 0.25—3600 Seconds

6. Start-up Settings: Select【Start…】, press **<↵>** and the screen shows:



<▲> or <▼> to select the items, and press **<↵>** to shift select ☑/☐, press **<↵>** for 3 seconds to confirm the amendment and return.
Select【Start Music】, there will be a start music if you turn on.
Select【LOG Screen】, it will display Logo Screen if you turn on.
Select【Inf. Screen】, it will display Information Screen if you turn on

7. **Power Management:** Select【Power Save】, press **<↵>** and the screen shows:



<▲> or <▼> to select the items, press **<↵>** button to confirm and the item will be with⊙, press **<↵>** for more than 3 seconds to return.

【Not Save】: it will work as usual.

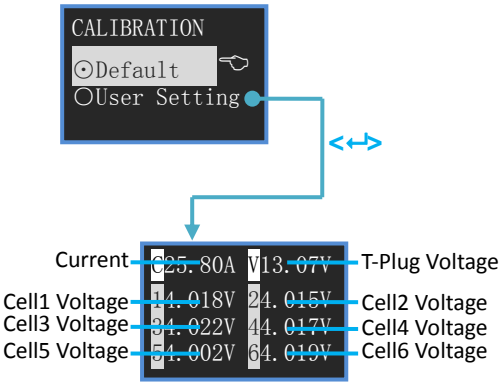
【Light Off】, it will turn off the backlight after minutes not working with any key, the time can be set by the users. Press any key to return to the normal status. Press **<↵>** to enter to **SAVE TIME SET**.

【Sleep Mode】, it will turn to Sleep Mode after minutes not working with any key for more than 1 seconds, the time can be set by the users. Press any key to return to the normal status. Press **<↵>** to enter to **SAVE TIME SET**.

<▲> or <▼> to increase/decrease, press **<↵>** to confirm amendment and return. Press**<↵>** for 3 seconds to cancel amendment and return.

Setting range: 1—240 Minutes

- **Calibration Settings**: Select【Calibration】, and press **<↵>** and the screen shows:



【Default】: Calibration Default. (calibration made by the manufacturer before delivery)

【User Setting】: Calibration by users. When it is ⊙, press **<↵>** to enter User Calibration menu.

The current need-to-be calibrated item begins to blink. If the displayed value is more than the actual value, please press **<▼>** to decrease the displayed value to the actual value; vice versa, please press **<▲>** to increase the displayed value to the actual value. Press **<↵>** and shift to the next item. In this way to get all the calibration.

Press <▲> and <▼> for 3 seconds to save the amendment and exit. Press **<↵>** for 3 seconds to cancel the amendment and exit.

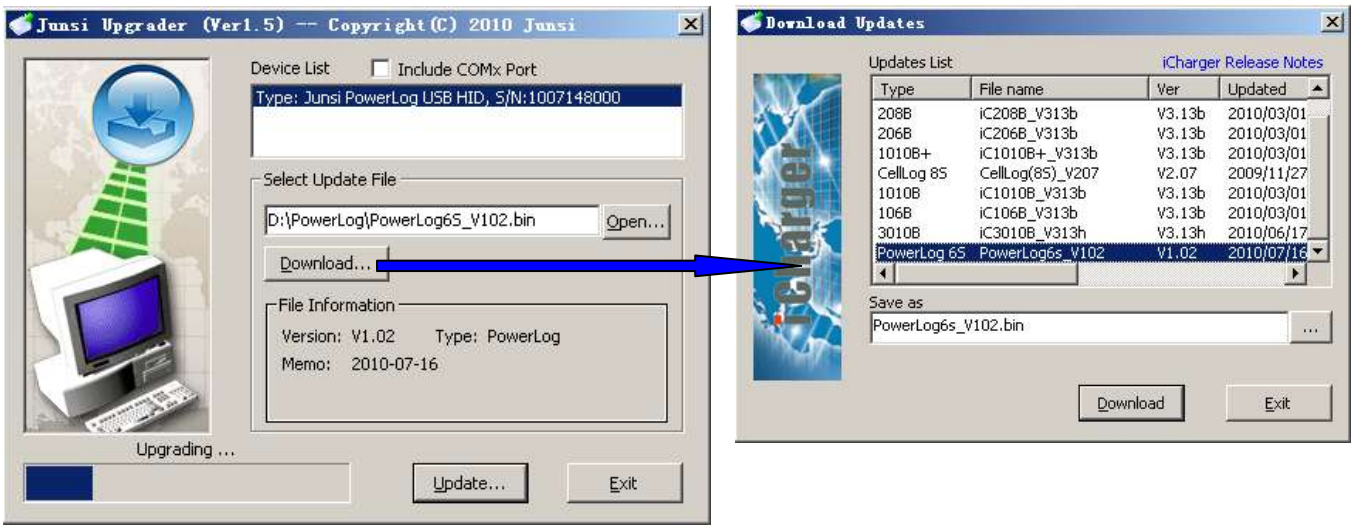
Note:

- **If the user calibrates it in a wrong way, which damage the battery or cause other serious danger, our company will be of no responsibility.**
- **In order to have more exact actual current and voltage value, we suggest using $4\frac{1}{2}$ Digit Multimeter.**
- **The users' calibrated value will not affect the value calibrated the manufacturer. It can be selected by CALIBRATION--【User Setting】or【Default】.**

PowerLog Firmware Upgrade Steps

- Run the program **X:\Upgrader\Upgrader.exe** (you can download the **Upgrader.exe** software from the following website: http://www.jun-si.com/UploadFiles/Upgrader.rar).

- Connect the **PowerLog 6S** to the PC using the supplied USB cable, choose “Device” in “Device List”, then select the upgrade file (you can download the latest file). The progress bar will appear after you click “Update…”



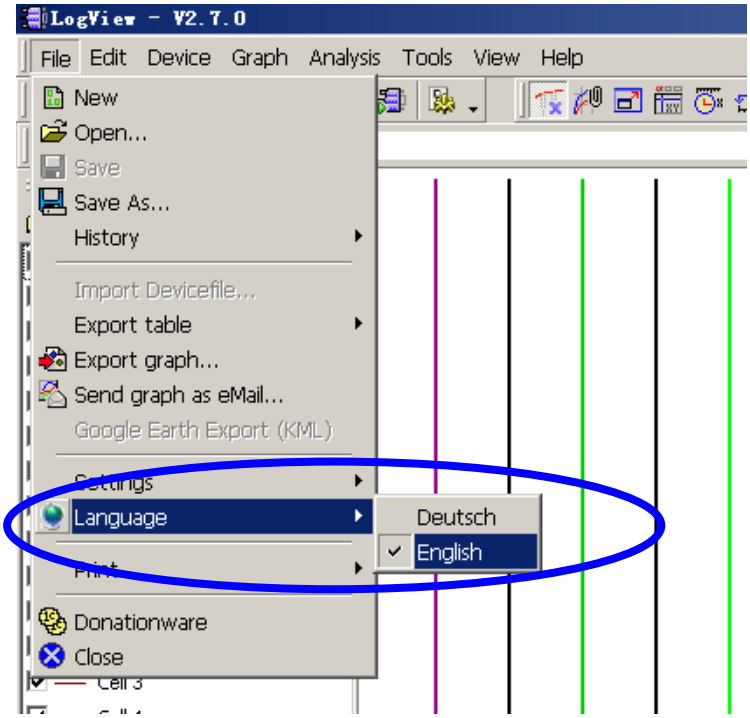
Using LogView for PowerLog 6S

First, our sincere gratitude to the LogView development team: http://www.logview.info

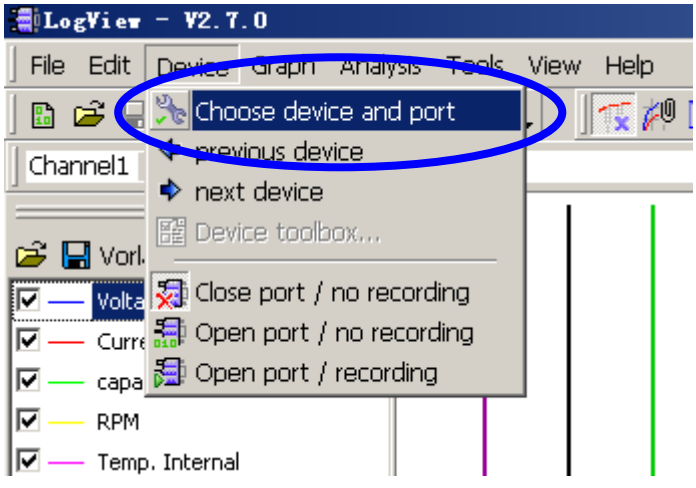
Communication steps:

- To install **LogView**, run the program **X:\ logview \ LogViewInstaller.exe** (where **X** is the drive letter designator for you **CD-ROM** drive.)
- Connect the **PowerLog 6S** to the PC using the supplied USB cable
- Start **LogView**, then follow the illustrated instructions below:

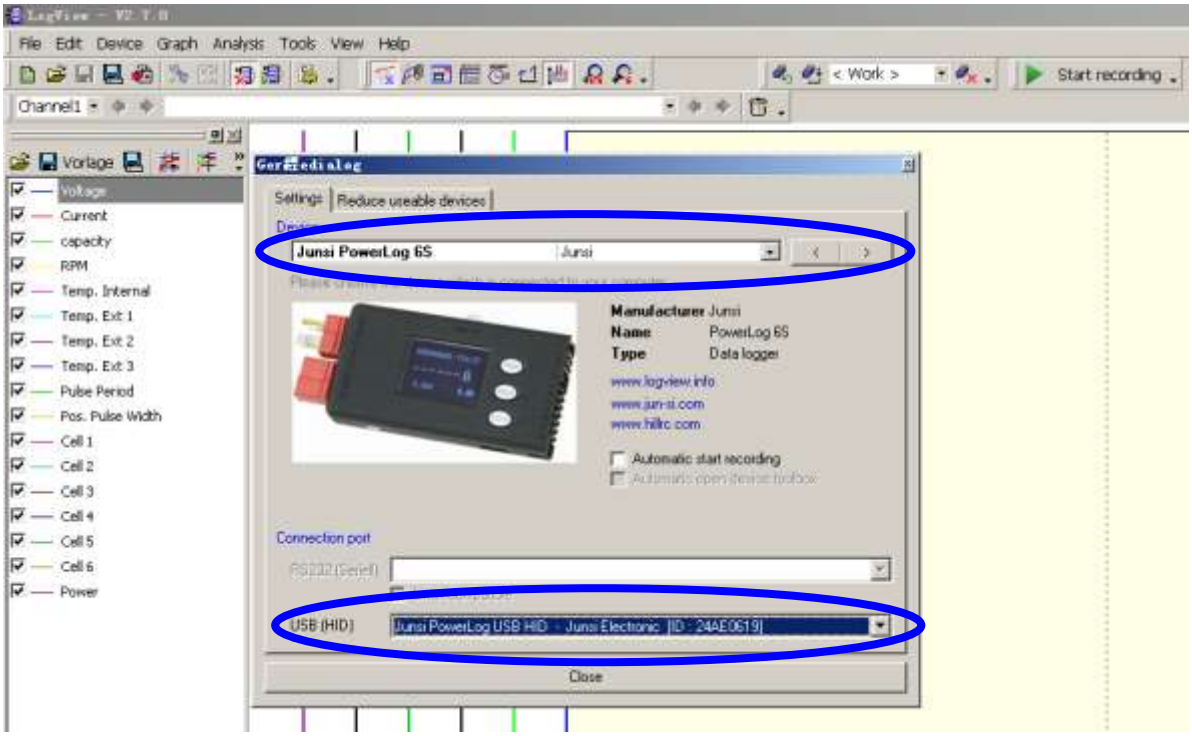
1) Please choose language first, since the default language is German.



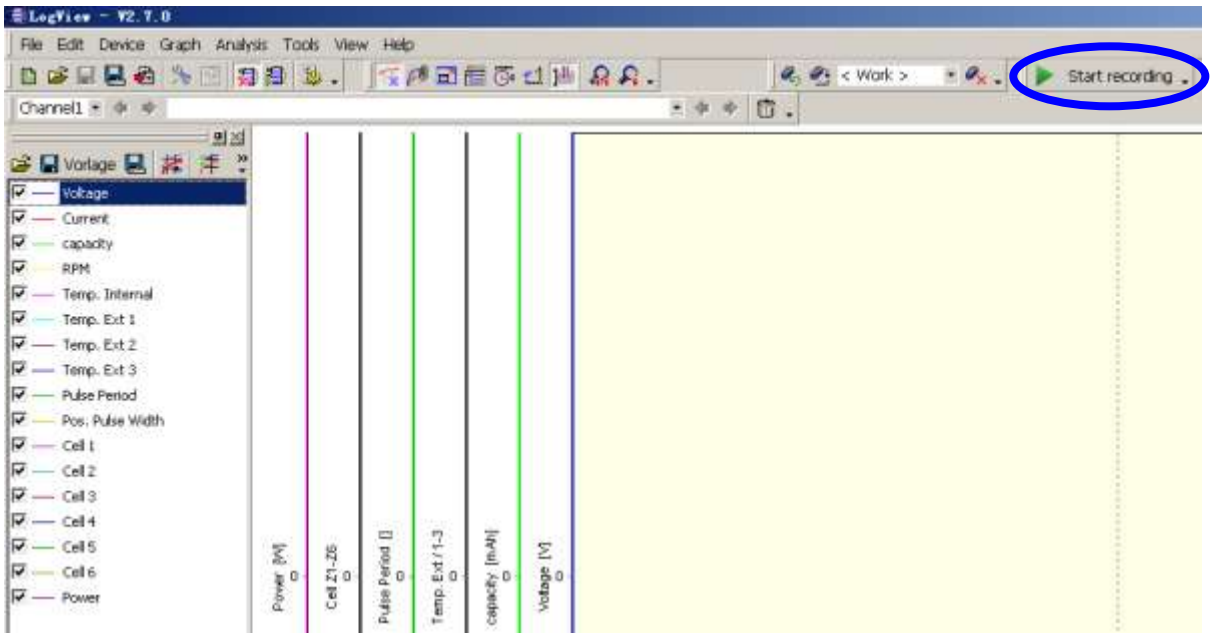
2) Click **Device→Choose device and port**.



3) Choose **Junsi PowerLog 6S** from the list and then choose the correct communication Port.



4) Click "**Start recording**" to record data.



5) Start the logging function of PowerLog, see P11; or enter the menu of Log Files【File Transmit】, see P14.

Refer to the **LogView** online help for more information about its features and operation.