ULTRA POWER

UP616 400W

Smart Charger

Instruction Manual

www.ultrapower.hk

Introduction

Thank you for your purchase of Ultra Power's UP616 Compact DC Smart Charger. This charger utilizes advanced synchronous DC power conversion technology to achieve an efficiency rating of over 90%. This means energy savings through efficiency, reduced heat build-up, and the ability to produce a small, compact and conveniently mobile charging device. Furthermore, the UP616 firmware can be updated through a convenient micro-USB port using a PC.

Please be sure to carefully read all INSTRUCTIONS, WARNINGS, and SAFETY NOTES prior to using the UP616.

For more details, please visit: www.ultrapower.hk

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Warnings and Safety Notes

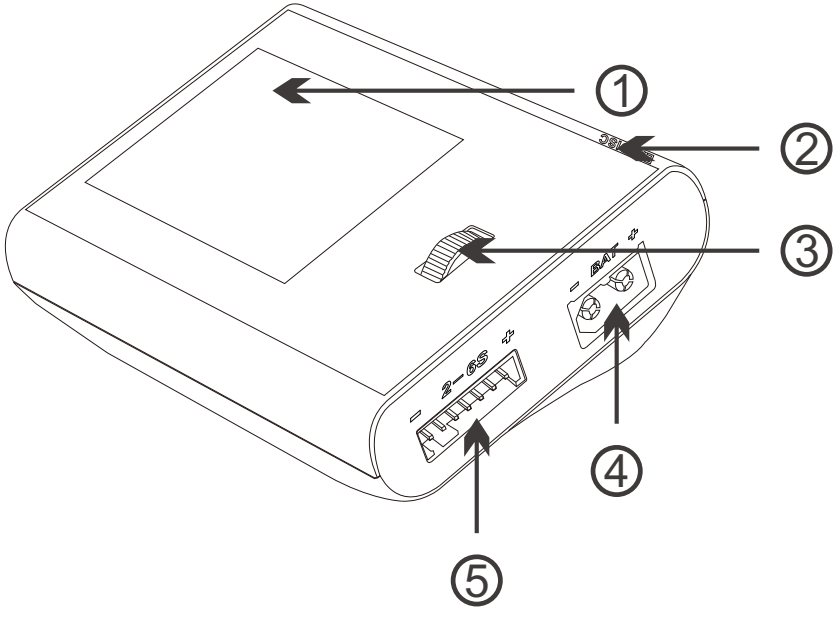
The following warnings and safety notes are for your protection, please refer to all aspects of this instruction manual to ensure proper operation. FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS MAY CAUSE FIRE, PROPERTY DAMAGE AND/OR PERSONAL INJURY!

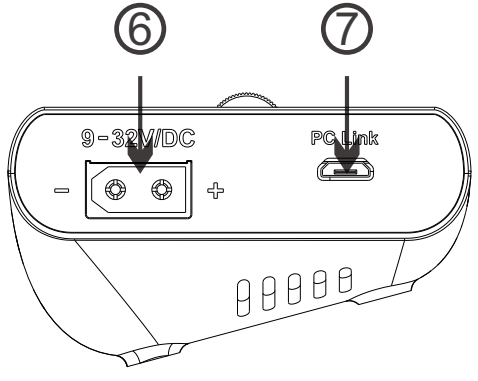
- NEVER leave the battery or charger unattended while in use. In case of any malfunction, immediately discontinue use and refer to this manual for troubleshooting ideas.
- ALWAYS keep your charger away from dust, dirt, moisture, rain, and high temperature. Avoid leaving your charger or battery in direct sunlight or exposing them to intense vibration or shock.
- ALWAYS make certain to observe proper input and output polarity. The UP616 operates safely with input voltage between 9V-32V DC.
- ALWAYS place the charger on a heat-resistant, non-flammable surface when in use. Keep flammable materials away from charger when in use.
- NEVER use the charger while placed on automobile seats, carpeting, or other flammable materials.
- ALWAYS make sure that the vent holes on the bottom of the charger are unobstructed and the cooling fan in operation.

Warnings and Safety Notes

- ALWAYS fully read all warnings and instructions on both charger and battery prior to use. Be aware of battery safety warnings. Make sure that all charging parameters are correctly setup prior to charging any battery. INCORRECT SETTINGS MAY CAUSE FIRE, PROPERTY DAMAGE AND/OR PERSONAL INJURY!
- ALWAYS press the roller wheel to terminate charge completely when battery is fully charged, and return to the standby screen on the LCD display.

Product Features and Component Layout





1. 2.4” IPS LCD Display Screen
2. External Discharger Port
3. Roller Wheel
4. Battery Output
5. Universal Balance Port
6. DC Power Input
7. PC Link

Roller Wheel

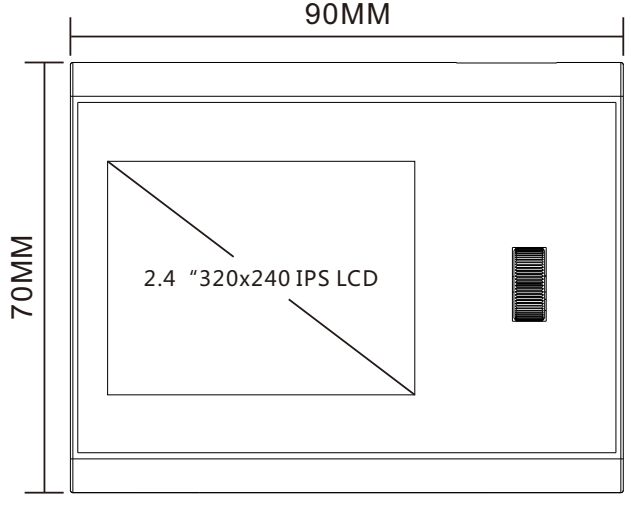
Long Press: Enter system settings/ terminate current task

Short Press: Enter system settings/ confirm current setting

Product Parameters and Characteristics

SPECIFICATIONS :

Input Voltage:	DC 9-32V	Dimensions: 90x70x42mm
Output Voltage:	0.1-30V	Weight: 130g
Charging Current:	0.1-16.0A	
Discharge Current:	0.1-3.0A/0.1-15.0A (External Discharge Mode)	
Max Charge Power:	400W	
Max Discharge Power:	8W/200W (External Discharge Mode)	
Balance Current:	1000mA/cell	
Balance Cells:	6S	
Support Battery	LiFe/LiIon/LiPo/LiHV (1-6S)	
Types:	NiMH/NiCd (1-16S)	
	Pb (1-12S)	
Display Type:	2.4“320x240 IPS LCD	
Use Temperature:	0-40℃	
Storage Temperature:	-20-60℃	



Default Battery Types and Settings

	NiCd/NiMH	Pb	LiFe	Lilon	LiPo	LiHV
Rated Voltage	1.20V	2.00V	3.20V	3.60V	3.70V	3.80V
Full Charge Voltage	1.40V	2.40V	3.60V	4.10V	4.20V	4.35V
Storage Voltage	Not supported	Not supported	3.30V	3.70V	3.80V	3.90V
Discharge Voltage	0.5-1.10V	1.80-2.00V	2.60-2.90V	2.90-3.20V	3.00-3.30V	3.10-3.40V
Pre-charge Voltage	/	2.00V	2.90V	3.10V	3.20V	3.20V
Balance Charge	Not supported	Not supported	supported	supported	supported	supported
Unbalanced Charge	supported	supported	supported	supported	supported	supported
Support Cells	1-16S	1-12S	1-6S	1-6S	1-6S	1-6S
Max Charge Current	16.0A	16.0A	16.0A	16.0A	16.0A	16.0A

Be EXTREMELY careful to choose the correct voltage settings based on the cells and chemistry of the battery being charged. Failure to do so may result in battery damage, explosion, or fire!

Confirming Charge Current

It is critically important to understand the maximum charging current for the battery pack to be charged. Excessive charge current can significantly reduce the life of a battery, or in severe cases a fire or explosion.

The charge and discharge current of a lithium battery is determined by its “C” rating. Most batteries indicate the C rating of the pack on the main label. Multiply the C rating of the battery pack by the capacity to determine the safe and proper charge current. For example, a 1000mAh battery with a 5C rating means that the maximum charge rate should be 1000 (capacity in milliamps) X 5 (C rating) = 5,000 mAh. Therefore, the maximum charge rate for a 1000mAh 5C lithium battery should be 5A (5,000mAh).

If it is not possible to determine the C rating, please assume that the pack is 1C and use that value to calculate a safe charge rate. Keep in mind that batteries vary, and therefore charging times will vary.

System Settings

Connect the UP616 to a 24V DC power supply or use an appropriate LiPo battery as an input power source. Connect the battery to be charged, then short press the roller wheel to activate the program setting menu. The items in the menu are as follows:

Battery	Select battery chemistry
Cells	Select number of battery pack cells
Mode	Work mode: Charge / Discharge / Storage / Ext.DISC
Current	Select desired charge current (0.1-16.0A) , discharge current (0.1-3.0A)/Ext.discharge(0.1-15.0A)
TVC	Terminal voltage control
Start	Begin process
Back	Return to previous screen or function

The default mode of the UP616 is series charging, therefore you must connect the output wires to the battery pack that you wish to charge. For lithium packs, it is highly recommended to ALWAYS connect the balance leads and utilize balance charging. Although the UP616 will charge without the balance function, a warning tone will sound to alert you that the balance connector is not in use.

System Settings

- **Storage**

  When selecting the storage function, the UP616 will automatically begin charging if the battery pack voltage is below the ideal storage voltage. Likewise, the UP616 will automatically enter the discharge mode if the battery pack voltage is higher than the ideal storage voltage.

- **Restoring an excessively discharged lithium battery pack**

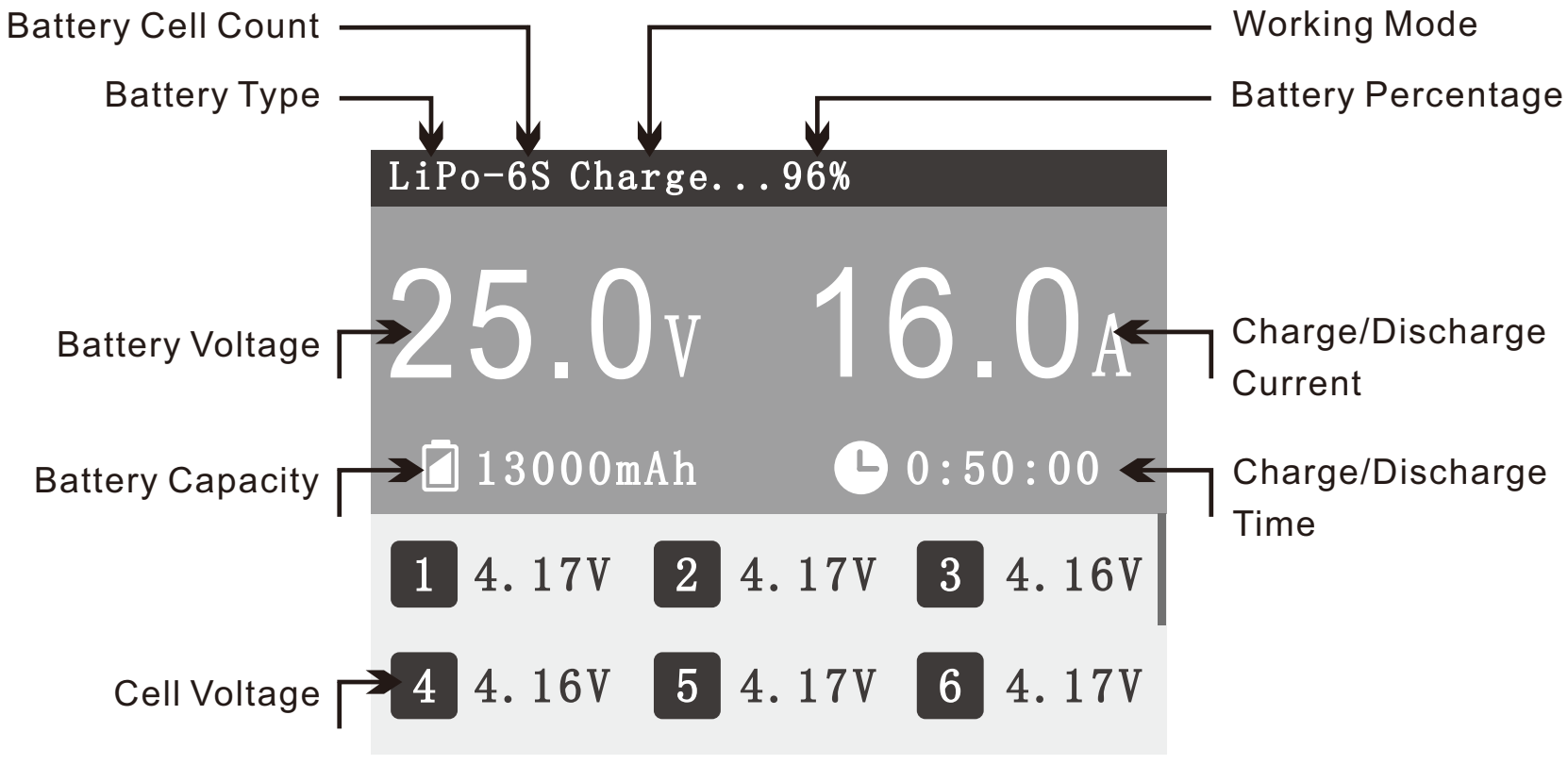
  If the UP616 detects internal cell voltages that are too low to safely begin the charging process, it will automatically default to a 0.1A charge rate until the voltage has risen to a level that allows it to safely accept a fast charge rate.

- **Measuring Internal Resistance**

  The UP616 features the ability to monitor the internal resistance of each cell in a lithium battery pack. This feature is only operational when in the balance charging mode. Internal resistance can be useful to determine the overall “health” and performance of a lithium battery, the closer the IR values are between the cells in the battery pack, the better that the battery will deliver its energy.

NOTE: The process of charging a lithium battery is dynamic, therefore you will notice fluctuations in both charge current and IR during the charging process.

Working Parameters Display



Rotating the roller wheel up or down during charging will switch the information displayed on the lower half of the LCD screen between cell voltage, cell IR and working parameters. Cell voltage and IR can only be displayed during the balance charging process.

System Default Settings Menu

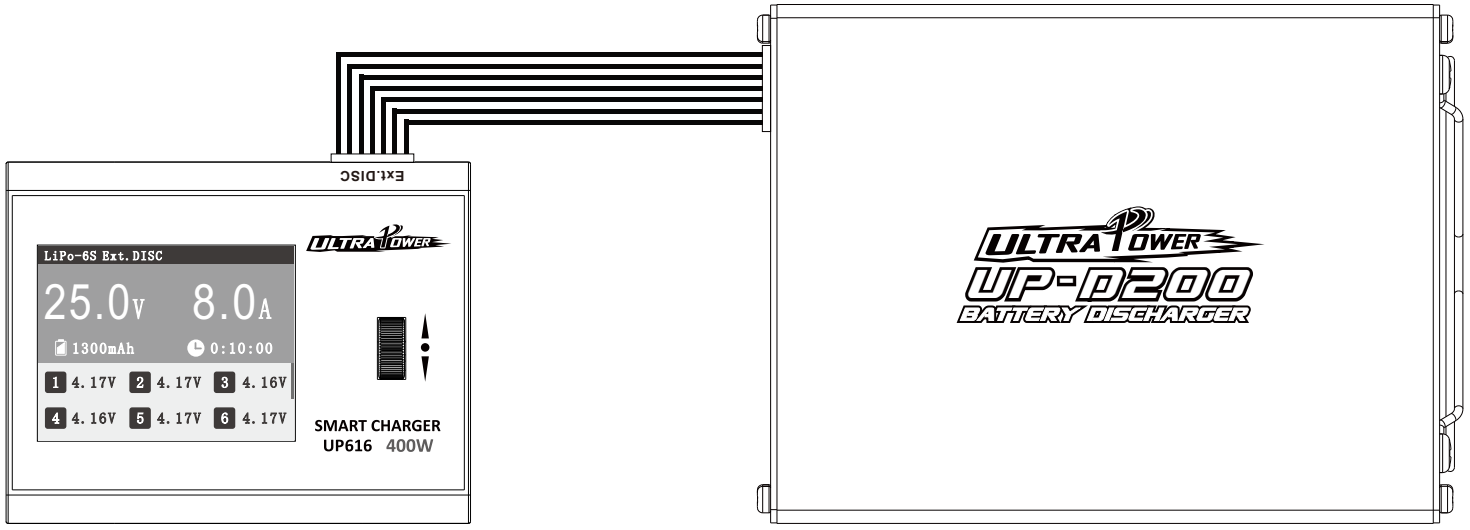
Long press the roller wheel to activate the system default menu.

Language	English
MAX Input Power	Adjustable from 50W-450W
MIN Input Voltage	Adjustable from 9V-24V
Capacity Cut	Terminates charge process when reach this value Maximum capacity can be adjusted by user
Time Cut	Terminates charge process when exceeding time set by user
Backlight	Three options-High, Medium, Low
Volume	Four options- High, Medium, Low and Off
About	Software version and information
Factory Reset	Returns all settings to factory default values
Back	Return to last program or menu

A note about Max Input Power: To insure stable and safe operation of the UP616, this value should be adjusted according to the input power source used for the charger. For example, when using a 24V/10A DC power supply, this value should be set to 240W (V x A=W)

External Discharge Function

UP616 increases the function of external discharge to meet the users' demand for high-power discharge of batteries, UP616 connect a external discharger UP-D200 can achieve 200W discharge power, greatly improving the battery discharge speed and saving time. Meanwhile, compared with the traditional discharger, the UP616 has a balancing discharge function, which can effectively avoid single cell over discharge, which will be more safely and reliable.



UP616 CHARGER

UP-D200 EXTERNAL DISCHARGER

A note about Min Input Voltage: This setting helps to protect excessive discharge of a source battery used as input power. For example, if a 6S LiPo is used as an input source, the value should be set to 21V to guard against over-discharging the source battery. When the UP616 senses input voltage lower than required for the battery being charged, a warning will appear and all operations are terminated.

Warnings and Error Messages

- **Error Message for Abnormal Battery Connection**
  Unplug and re-connect all plugs to ensure proper connection and polarity. Check to make sure that all connectors are free of dirt, grease, or oxidation.

- **Error Message for Unstable Input Voltage**
  Make certain that the battery socket is free from dirt or oxidation. Make sure that the Max Input Voltage is set correctly in the System menu.

Conformity Declaration

The UP616 satisfy all relevant and mandatory CE directives and FCC Part 15 Subpart B: 2017.

For EC directive:

The product has been tested to meet the following technical standards:

Testing standards	Result
EN 55014-1: 2006+A1:2009+A2:2011	YES
EN 55014-2: 2015	YES

This symbol means that you must dispose of electrical from the general household waste when it reaches the end of its useful life. Take your charger to your local waste collection point or recycling centre.This applies to all countries of the European Union, and to other European countries with a separate waste collection system.

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