



D2 Smart Charger

Operating Instructions Ver 1.1.1706

Introduction

D2, a built in PSU AC-DC dual smart charger, designed by ISDT

Please visit : www.isdt.co for more details on the functions of this smart charger, as well as purchase various accessories.

Functions of products will be kept on upgrading, the manual in your hand may be different from the actual operation; please refer to the actual functions.

This user guide update date is June 20, 2017.



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Warnings and Safety Tips

The following safety tips are essentially important. Please strictly follow the manual's instructions in operation to guarantee safety. Improper operation or incorrect working parameter settings may cause damages to the charger and battery and/or result to a fire.

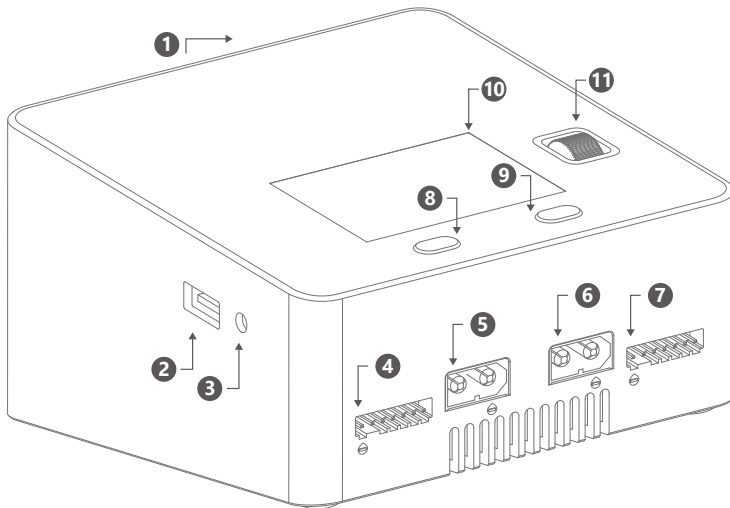
- Do not use the charger in an unattended manner; in case of any functional abnormality, please stop using it and refer to the manual.
- Keep the charger away from dust, humidity, rain and high temperature, as well as avoid direct exposure to the sun and intense vibration.
- Make sure input voltage for D2 is AC 100-240V.
- Please place the charger on a heat-resisting, non-flammable and insulating surface. Do not use it by placing it on the car's seats, carpet or other similar places. Keep inflammable and explosive objects away from operation areas of the charger.
- Make sure the heat emission hole at the bottom of the charger is uncovered while in use, and ensure the cooling fan smoothly extracts heat.
- Please fully understand the charging and discharging characteristics as well as the battery's specifications. Additionally, set up proper charging parameters in the charger. Incorrect setting of parameters can cause damage to the charger and battery and/or result to disastrous consequences such as fire or explosion.
- When charging or discharging is completed, please press the speed shuttle key to terminate current task, and remove the battery when the charger shows the standby screen.

Product Parameters and Characteristics

Thank you for purchasing the ISDT D2 Charger.

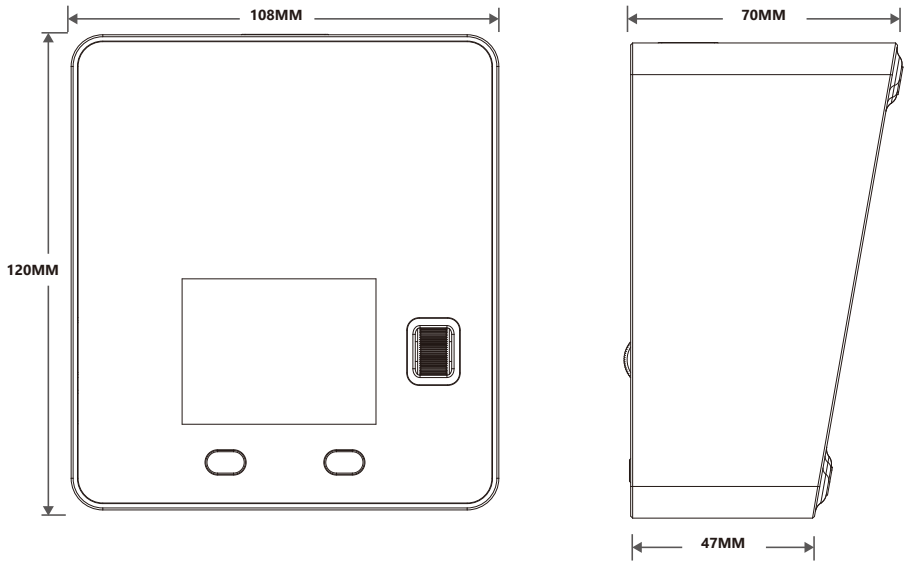
This Manual will guide you how to use D2 and its important functions.

You can know more about relevant information of IDST products by following this link: www.isdt.co



- | | |
|-------------------------------|-------------------------------|
| 1. AC input | 7. Balance port for channel 2 |
| 2. USB port | 8. Channel 1 select button |
| 3. Update port | 9. Channel 2 select button |
| 4. Balance port for channel 1 | 10. 2.4" IPS display |
| 5. Battery port for channel 1 | 11. Speed shuttle key |
| 6. Battery port for channel 2 | |

Product Parameters and Characteristics



Specifications:

Input Voltage: AC 100-240V	Supported Batt. Type: LiFe/Lilon/LiPo/LiHv (1-6S)
Charge Current: 0.1-12.0A *2	NiMH/Cd(1-16S)
Discharge Current: 0.1-3.0A *2	Pb(1-12S)
Max Charge Power: 200W	Display: 2.4" 320x240 IPS LCD
Max Discharge Power: 5W *2	Operating Temperature: 0-40 °C
Balance Current: 1A/cell *2	Storage Temperature: -20-60 °C
Balance Cells: 1-6S *2	Dimensions: 120x108x70 mm
	Weight: 510g

Default Battery Type of Charger and Task Parameters

	NiCd/NiMH	Pb	LiFe	LiIon	LiPo	LiHv
Rated Voltage	1.20V	2.00V	3.20V	3.60V	3.70V	3.80V
Full Charge Voltage	1.40V	2.46V	3.65V	4.10V	4.20V	4.35V
Storage Voltage	Not supported	Not supported	3.30V	3.70V	3.80V	3.85V
Discharge Voltage	1.10V	1.90V	2.90V	3.20V	3.30V	3.40V
Pre-charge Voltage	0.90V	1.80V	2.60V	2.90V	3.00V	3.10V
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	12.0A	12.0A	12.0A	12.0A	12.0A	12.0A

Please be cautious when selecting the charging parameters for different types of batteries; otherwise, the batteries may be damaged. Incorrect setting can result to fire and/or explosion.

How to Confirm Charging Current


It is very important to know the maximum charging current of the battery as excessive current could influence the life span of battery and/or cause damages. In addition, excessive current can cause heating and/or explosion of the battery during the charging process.

The charging and discharging capacity of battery is usually marked with C value. Multiplying the charging C value and battery capacity equals to the maximum charging current supported by the battery. For example, for a 1000 mAh battery with a charging capacity of 5C, the maximum charging current would be $1000 \times 5 = 5000\text{mA}$; therefore, the maximum charging current is 5A.

For a lithium battery, if it is impossible to confirm the supported charging C value, please set the charging current below 1C for the sake of its (lithium battery) safety.

The reference relation between C value and charging time: charging time ≥ 60 minutes / charging C value (it therefore needs around 60~70 minutes to complete charging with 1C). Due to differences in battery conversion efficiency, the period to complete the charging might be extended.

Task Setting

CH1 Task Setting	
Select task	4.18V
Battery type	4.19V
<input checked="" type="checkbox"/> Cell Voltage	 4.20V
Cell count	4.21V
<input checked="" type="checkbox"/> Current setting	4.22V
▶ Start task	4.23V

← Recommended Voltage

End-voltage setting

Connect the charger to the power supply and wait for the system to complete the self testing. Connect the battery to the charger under standby interface, and short press the shuttle key to make the task setting menu to pop up. The items in the menu are as follows:

Task	Select task contents: Charge, Discharge, Storage
Battery type	Select battery types
Cells voltage	End-voltage slight adjustment, range $\pm 0.05V$
Cells count	Select batteries' strings, and the item processes automatic test and needs no setting if inserted in balanced interface
Current setting	Select current, charge 0.1 - 12 A, discharge/storage 0.1 - 3.0 A
Start task	Start to execute tasks
Back	back

Task Setting

The working mode of the charger is series charging; you must therefore connect it to the output line of the battery while charging. For a lithium battery, it is highly suggested that the balanced interface should be connected to carry out balanced charging to accurately monitor the voltage of each cell and balance the ones with bad consistency.

● Storage functions

If battery voltage is lower than storage voltage, charger will charge battery to storage voltage. If battery voltage is higher than storage voltage, charger will discharge battery to storage voltage. In order to save storage time, battery might not be accurately balanced, this is normal and there will not do any harm to battery.

● Activation and restoration functions of excessive discharged battery

Activation and restoration functions of excessive discharged battery

When the charging task begins, one tenth of the setting current should be applied to activate and restore the battery if the cell voltage is tested to be lower than the pre-charge voltage; on the other hand, it should be adjusted to a rated voltage for charging when the cell voltage is higher than the pre-charge voltage. This design can protect excessively discharged batteries, as well as conduct activation and restoration.

● Internal resistance measurement function

The charger is equipped with a function of measuring the cells' internal resistance, which is only applied when conducting balanced charging. The cell voltage should be measured and calculated within 2 to 3 minutes after the charging task has been initiated. The battery internal resistance can slightly vary under different electric quantities while the measured resistance value is usually relatively low as the electric quantity is large.

The charging current should be adjusted instantly as the charger measures the internal resistance of the battery; therefore, it is normal phenomenon for acute change of current to occur during charging.

Task Setting

Since the way of internal resistance measurement varies, it cannot be realized to measure the absolute value as professional internal resistance tester does. Therefore, the internal resistance value can only be referred to when conducting horizontal comparisons, such as judging the consistency of the cells' performance or making comparisons of the performance of different cells. The charging current is an influential factor for measuring internal resistance; batteries with large capacity and small internal resistance would relatively need large charging currents to accurately measure the internal resistance.

● Charging completed

During the charging process, the screen displays an orange marking which turns into green or blue as the charging is completed. When the charging completes, the cells' voltage difference should be smaller than 20mV, while the screen marking turns into green. Therefore, if the battery is in urgent use, it's okay to stop charging. The charger should continue to balance the battery if the charging process is not terminated, and the screen light turns blue, since the voltage difference is smaller than 10mV. Additionally, the charger should continue to carry out accurate balancing of the battery after the light turns blue. If the consistency of the cells is excellent, the screen light should skip color green to become blue as the charging is complete.

After the charging is complete, it is normal for voltage decline to occur due to different performances. As the number of the charge cycle grows, the performance decreases, and the voltage decline phenomenon becomes obvious. To charge the battery with a larger current would also cause a more obvious voltage decline after the charging is complete.

NB: When charging the battery in a hurry in outdoors, it is okay to stop charging when the screen light turns green. If there is enough time and the cells are assumed to be well balanced, it is better to stop charging when the screen light turns blue; alternatively, wait a little longer after that to gain more accurate balance effects.

Task Setting

● Simultaneously charging in both channels

While two batteries are the same type and same cells, complete charging setting. press bothselect button to initiate task.

Both channels operate under same parameters and would be assigned 50/50 from total power.

● Power distribution

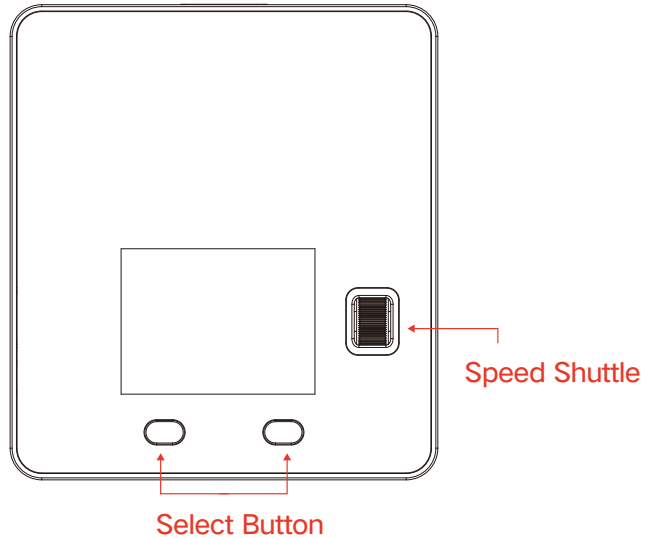
single channels operation can reach 200w

both channels simultaneously initiate task would get 100w for each

both channels non-simultaneous initiate task, the channel which initiate later will get 150w, if task needs less than 150w, remaining power will go into the other channel automatically.

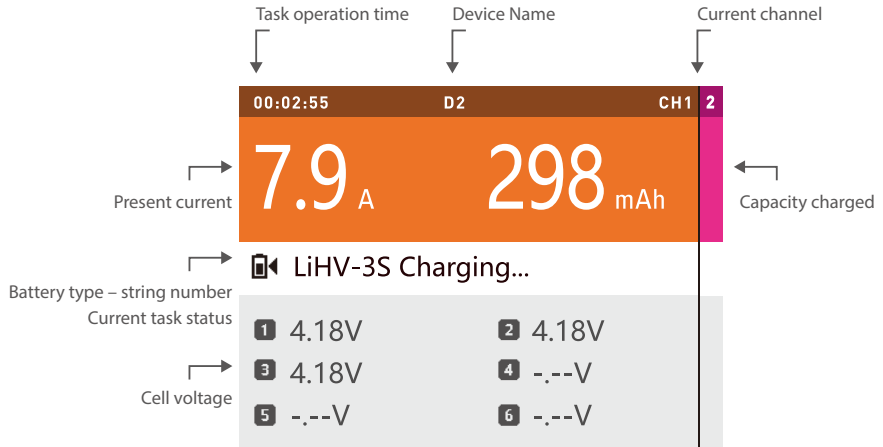
During dual Charging operation, current adjust in a channel will get that channel 150w priority, if task needs less than 150w, remaining power will go into the other channel automatically.

Operative Skills



- 1. during operation, short press select-button to adjust charging/discharging current;
- 2. long press select-button, to quick stop current operation or to enter setting menu for corresponding channel;
- 3. While two batteries are the same type and same cells, complete charging setting. press both select-button simultaneously to initiate task. Both channels operate under same parameters and would be assigned 50/50 from total power.

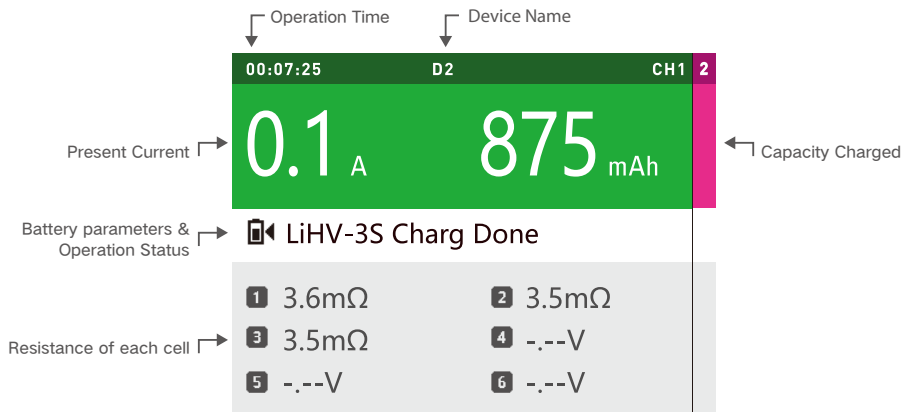
Working Parameters Display



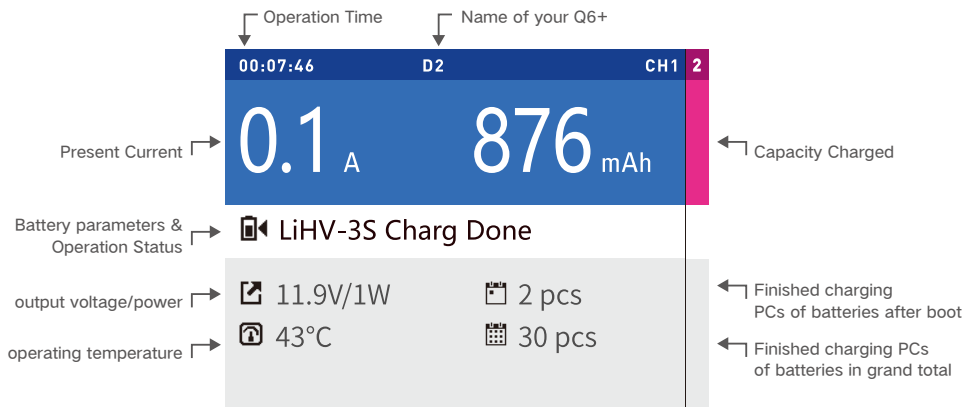
Fast Charging

Scroll the shuttle key during operation can switch the display information in the lower half of the screen, which are cell voltage, cell internal resistance and working parameter. The cell voltage and internal resistance can only be displayed in the mode of balance charging (3 minutes).

Working Parameters Display












Fast charging complete



Precise Balance Charging

System Default

System Setting	
 Backlight	High
 Volume	High
 Completion Tone	Repeat
 Split Display	Manual
 Language	English
 Firmware Sharing	
 System Information	
 System Self-checking	
 Back	

Long press the shuttle key in standby interface to make the system default menu pop up, and the items are as follows:

Backlight	Backlight adjustment:High,Middle,Low and Auto
Volume	Buzzer volume adjustment:High, Middle ,Low&OFF
Completion Tone	Completion Tone:Single time and Repeatable time
Split Display	Main page dual channel display Manual and Auto
Language	System language setting
Firmware Sharing	share firmware with another device
System Information	System information, Firmly version
System Self-checking	System self-checking
Back	Save all setting and exit System setting

Buzzer volume: the default is OFF, the operation sound would be blocked, but not the sound of error warning.

Troubleshoot

- Error in power on self-testing: the charger can automatically carry out a self-testing when connected to a power supply. A self-testing error warning sound should be heard when the charger is connected to the battery; power on after removing the battery for 5 minutes.
- Error for abnormal battery connection: pull out and plug in the battery again to ensure all connections are reliably contacted; if the error reminder continues, please check whether the metal parts on the battery interface are oxidized or burned resulting in unreliable connection.

Product Qualification Declaration

D2 smart charger conforms to relevant EC command and relevant commands in B: 2010, CHAPTER 15, FCC

Testing standards	Result
EN 61000-6-3:2007 + A1:2011	YES
EN 61000-6-3:2007	YES



For electronic products with this marking in their manuals, please separately dispose them with family garbage. When a charger gets spoilt and cannot be used anymore, please take it to a nearby garbage station or recycle center.



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Changes in specifications and data will not be further noticed.