

X2 MINI

2-CHANNEL INTELLIGENT CHARGER

Charge Power: DC 200W / AC 100W
Charge Current: MAX. 10A x 2



HEXFLY

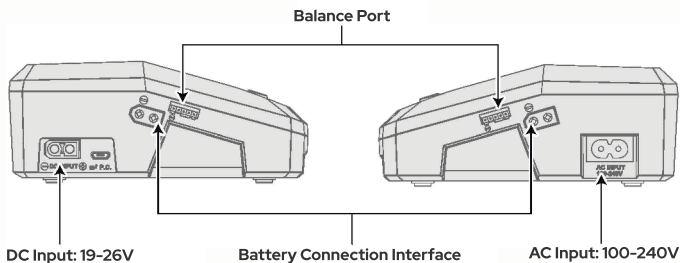
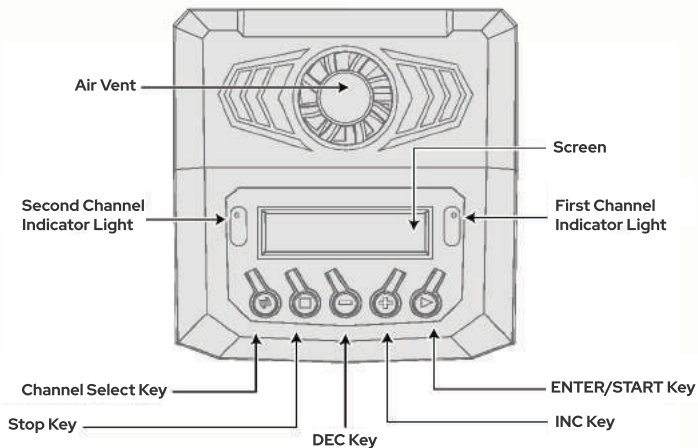
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1. Specifications

Input Voltage	AC.100-240V
	DC.19-26V NOTE: Cannot be powered by a 12V automotive battery. Requires a minimum of 19V DC.
Charge Current	0.1-10.0A*2
Charge Power	AC.Max.100W
	DC.Max.100W*2
Balance Current	500mA
Balance Precision	±0.01V
Charging Capability	LiPo/LiFe/Lilon/LiHv: 1-4cells
	NiMH/NiCd: 1-8cells
	Pb: 2-14V
Weight	554g
Dimensions	137.5*141.5*55.5mm

2. Overview



3. Warnings and Safety Notes

- Never leave the charger unsupervised when it is connected to power. If a malfunction happens, terminate the program immediately and refer to the owners manual for help.
- Keep the charger free from dust and away from moisture, excessive heat, direct sunlight, rain, and vibrations. Be careful when handling the charger, don't mistreat it or drop it.
- This charger must be powered by 100-240V AC or 19-26V DC.

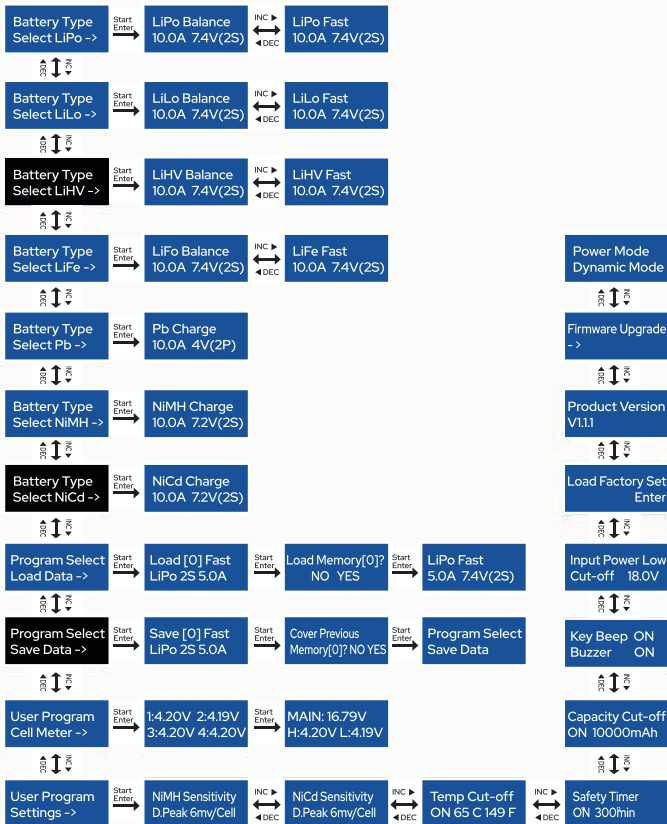
NiCd NiMH	voltage level: allowable fast charge current: discharge voltage cut off level:	1.2V/cell 1C~2C depends on the performance of cell 0.85V/cell(NiCd), 1.0V/cell(NiMH)
Lilon	voltage level: max.charge voltage: allowable fast charge current: min.discharge voltage cut off level:	3.6V/cell 4.1V/cell 1C or less 2.5V/cell or higher
LiPo	voltage level: max.charge voltage: allowable fast charge current: discharge voltage cut off level:	3.7V/cell 4.2V/cell 1C or less 3.0V/cell or higher
LiFe	voltage level: max.charge voltage: allowable fast charge current: discharge voltage cut off level:	3.3V/cell 3.6V/cell 4C or less(e.g. A123M1) 2.0V/cell or higher
LiHV	voltage level: max.charge voltage: allowable fast charge current: min.discharge voltage cut off level:	3.8V/cell 4.35V/cell 1C or less 3.0V/cell or higher
Pb Lead Acid	voltage level: max.charge voltage: allowable fast charge current: discharge voltage cut off level:	2.0V/cell(Lead-acid) 2.46V/cell 0.4C or less 1.50V/cell or higher



- Place both the charger and battery onto a heat-resistant, non-flammable and non-conductive surface. If charging a lithium battery, use a lithium safe charging bag.
- Make sure the fan and vents of the charger are free from any and all obstructions.
- Be sure to read the entire manual and that you understand the correct settings to use for the battery you are charging or discharging. Using the incorrect settings may cause severe damage to the battery, which may include fire and explosion.
- To avoid a short circuit between the charge leads, always connect the charge leads to the charger before plugging them into the battery. When unplugging the battery from the charger, always unplug the charge leads from the battery connector, leaving the leads plugged into the charger until the battery is free and clear from any connections. As a rule, leave the charge leads plugged into the charger unless disassembling for storage.
- When charging lithium batteries, always be sure to observe the actual voltage, capacity and cell arrangement (parallel or series) of the pack. Most packs have their cells arranged in a serial configuration, meaning the voltage of each cell is added together. If a pack uses a parallel configuration, the overall pack voltage is equal to the voltage of a single cell within that pack. It is very important to know the battery pack's overall voltage and capacity so you don't put too much voltage through a battery pack, as this will likely result in a fire or explosion. We recommend **ONLY** charging battery packs in series, as this has become the industry norm.

STOP! Be sure to read the above warnings and safety notes. They are very important and following them will help ensure the safety and well being of you and your property. Improper operation may cause severe damage to charger and batteries, which includes possible fire and explosion.

4. Program Flow Chart



5. Charge Current

Charging a battery pack at a charge rate that exceeds its maximum allowable charge current can damage the battery and lead to fire or explosion while the battery is charging.

The C rating is the battery pack's maximum charging/discharging capability. If a battery pack doesn't list its C rating, you should charge the battery pack at 1C. Use the formula below to determine the amperage that a battery pack should be charged at. Battery packs are usually labeled with a "C" rating, a "mAh" rating, and a "voltage" rating, we'll use the "C" rating and "mAh" rating to find the correct charging current (amps) for the battery pack to be charged.

NOTE: Be sure to always set the charger to the battery's correct voltage, listed on the label (2S LiPo=7.4V, 3S LiPo=11.1V).

Dividing the pack's "mAh" rating by 1000 is equal the Amperage setting at 1C. The formula used is (mAh/1000)xC. See the examples below.

3000mAh pack at **1C**: $3000\text{mAh}/1000 = \mathbf{3.0\text{Amps}}$

3000mAh pack at **2C**: $3000\text{mAh}/1000 = 3.0\text{A}$. $3.0 \times 2 = \mathbf{6.0\text{Amps}}$

6. Power Allocation

This charger is capable of supplying a total of 200 watts ($100\text{W} \times 2$) of power when plugged into a DC power supply and a total of 100 watts ($100\text{W} \times 1$ or $50\text{W} \times 2$) of power when plugged into an AC power supply. When simultaneously charging two batteries with an AC power supply, each channel will receive 50W. To help speed up AC charge times in this scenario, intelligent power allocation has been developed.

This charger offers two different allocation modes, intelligent and average. While in "intelligent allocation" mode, the charger will charge two connected batteries one at a time. A full charge current will be sent to the first battery pack set to be charged and the second connected battery will temporarily receive a minimum charge current while it awaits its turn. Once the first battery reaches full charge, then the remaining battery will receive the maximum charge current that has been programmed for that battery pack prior to charging.

While in "average allocation" mode, the charger equally distributes the charge current to each of the batteries being charged simultaneously. When plugged into an AC power supply, each channel will receive a maximum current of 50W ($100\text{W}/2 = 50\text{W}$). Intelligent allocation mode may not be beneficial while plugged into a DC power supply, since each channel will already receive a maximum current of 100W ($200\text{W}/2 = 100\text{W}$) in average allocation mode anyway.

7. Lithium Battery (LiLo/LiPo/LiFe/LiHv) Modes

"Balance" charging a lithium battery

The charger balances each of the lithium cells within the battery pack being charged. The charger will monitor each of the cell's individual voltage and adjust the current to each cell to ensure they are all balanced within the pack. You will need to connect the battery to the charger's power output plug as well as the balance port when balance charging.

"Fast" charging a lithium battery

The charger charges the battery pack as quickly as possible without balancing the pack. The charging current decreases as the charging process nears the end. To ensure low charge times, this program eliminates certain CV processes and does not balance the cells. This program drops the current to 1/5 of the initial value to complete the charging process. Even though the charging current is less than the normal charging current, it is still able to charge the battery in less time than in balance mode.

8. Operation Process

This charger has two channels. Each of the two channels operates the same way. We will use the first channel to illustrate the operating process below.

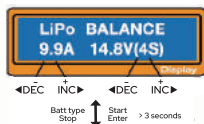
When the channel led is lit constantly, you can switch the channel and system settings program by pressing the CHANNEL/SELECT key.

After the desired channel has been selected, next press the ENTER key followed by the DEC or INC keys to choose a battery type, start a program preset, select a voltage test, or enter into data storage. The battery types include LiPo, LiFe, Lilon, LiHV, NiMH, NiCD and PB batteries.

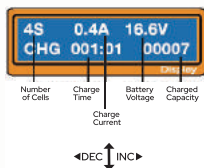
WARNING

LiHV mode only supports 4.35V Lithium batteries. Do NOT charge other batteries with this mode. Charging LiPo/Lilon/LiFe or other batteries with a cell voltage of 4.20V or less in LiHV mode may cause possible fire or explosion.

Press the **STOP** key to go back to the last interface or press the **ENTER** key to go to the next menu.



Choose the correct program (ex. Balance), then press the **ENTER** key to select it and go to the current setting. To go back to the previous setting, press the **STOP** key.



Press the **ENTER** key to set the current setting and to move to the next setting. Repeatedly pressing the **INC/DEC** key cycles through the charge current values, which range from 0.1-10A. Press the **ENTER** key to confirm the value and move to the next setting.

Repeatedly press the **INC/DEC** key to set the battery's cell count: 3.7V(1S) - 14.8V(4S). When finished, long press the **ENTER** key to set the charging program.

Press the **STOP** key to go back to last menu, then press the **ENTER** key to start the program.

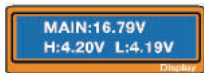


While charging, press the **INC** key to show each of the battery cell's progress.

While charging, press the **DEC** key to show the charge level, battery capacity and the charger's inner temperature.

To stop the current charge process and go back to last menu, press the **STOP** key and confirm that you want to exit.

9. Cell Meter Test Program



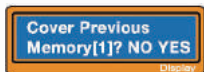
This charger is equipped with a built-in micro-processor and can show the voltage of each cell, total battery pack voltage and the highest/lowest voltage.

Choose the cell meter program interface and press the **START** key to enter.

Press the **START** key to show the highest/lowest voltage of a single cell and the total voltage of the battery pack.

Press the **START** key to show the voltage of 1-4 cells. Press the **STOP** key to go back to main menu.

10. Data Save Program

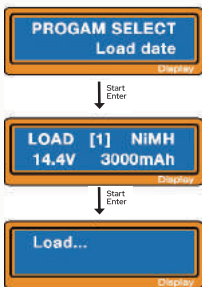


The data storage and load program can store the individual specifications up to 10 batteries. Each battery is stored by number and can be called back for charging or discharging without having to re-enter the specifications each time.

First set the battery parameters in the battery type program you need to save. Using a 4S Lipo battery as an example, Choose the LiPo charge program first, then set the LiPo battery parameters. After the parameters have been set, exit this program and select the data saving program. Select the shortcut number that you want to save the battery settings to, then press the **ENTER** key to enter into the data saving interface.

Press the **ENTER** key to save the data.

11. Load Data Settings



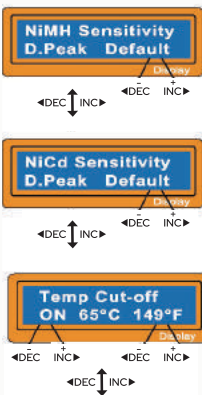
This program calls back the data that was stored in the 'Save Data' program.

To load the data, press the **Start/Enter** key once to highlight the data number field. Using the **INC/DEC** key, select the number you want to load and then press the **Start/Enter** key for more than 3 seconds.

As indicated, choosing [01] NiMH, will show the corresponded values of 14.4V and 3000mAh.

12. User Settings

When using for the first time, the charger will operate according to preset values. You can modify the parameters in the Settings column for future use.

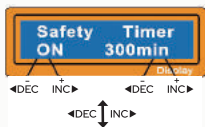


Automatic Peak detection charging

This charger uses automatic Peak detection to determine when a NiMH or NiCd battery pack is fully charged. After the battery pack reaches full charge, the charger will automatically stop charging. Peak detection works by monitoring the battery pack's voltage, detecting the point where a battery pack "peaks". During "peak" the pack's voltage will slightly drop, triggering the charger to end the charge cycle. If the peak voltage value is set too high, there is a danger of over-charging the pack and if set too low, it may stop charging prematurely. Please refer to the specifications of the battery (NiCd default voltage: 12mv, NiMH default voltage: 7mv).

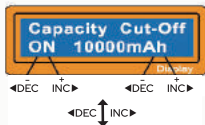
Temp cut-off program

Temp cut-off program is used to protect the charger from overheating. If the temperature gets too high, the charger will automatically turn off. The temperature cut off value can be set from 60° - 80° Celsius, 140° - 176° Fahrenheit.



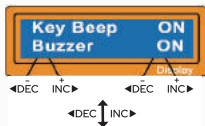
Safety timer setting

If you turn the safety timer on, the charger will stop the charge cycle when the specified amount of time has passed. While this charger uses other methods of determining when a battery is fully charged, the safety timer is a failsafe in the event the charger is unable to detect a fully charged battery from battery failure or system fault. The safety time should not be set shorter than the time the battery typically takes to fully charge, usually from 10-120min.



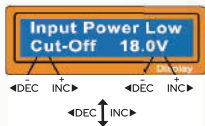
Capacity cut-off program

Capacity cut-off program sets the maximum charging capacity. The charger will stop the charge cycle once the maximum capacity has been reached. This is another failsafe in the event the charger fails to automatically detect peak or capacity. You can set the maximum charging capacity within the range of 10mAh to 5000mAh.



Sound setting

Beep sound: on/off; Buzzer sound: on/off.



Input power low cut-off

The acceptable DC input power is 19-26V, the program sets the lowest cut-off input voltage value from 19-26V. If the input voltage is lower than the set voltage level, the active procedure will be forced to stop.



Load factory set

Resume to the default factory settings.



Product version

This is used to check product version.



Firmware upgrade

Press the ENTER key to perform a firmware upgrade

Power allocation

While using an AC power supply, you can choose a power allocation mode, intelligent allocation or average allocation.

First priority: intelligent allocation.

Dynamic Mode: average allocation.

13. Warning and Error Messages

If the case of an error, this charger will emit a beep sound. The number of beeps (1-9) indicates the error. See the possible errors below.

1. {"BATTERY CONNECT ERROR"}

Interruption in the battery connection. Check that the charge lead is fully connected.

2. {"INPUT VOLTAGE FLUCTUATION"}

Input voltage fluctuated more than 1V. Plug the charger into a reliable power source.

3. {"BATTERY VOL ERR CELL CONNECT"}

Battery voltage error. Check the voltage of each cell one by one.

4. {"TEMP OVER ERR "}

The internal temperature of the unit is too high. Unplug the charger, move it to a cooler area and allow it to cool before resuming.

5. {"SHORT CIRCUIT ERROR"}

Short circuit. Check all wires, connections and batteries to ensure there are no short circuits.

6. {"CAP OUT"}

Over the charger's capacity protection set value. Check and reset the capacity protection value.

7. {"INPUT VOLTAGE ERROR"}

Input voltage error. Check the input power to make sure the input power is correct.

8. {"REVERSE POLARITY"}

Battery output polarity connection is wrong. Check and possibly reverse the connected battery polarity.

9. {"SAFETY TIME OUT!"}

Reset the safety charge times to ensure there are no short circuits.

14. Warranty and Service

We warrant this product for a period of one year (12 months) from the date of purchase. The guarantee applies only to such material or operational defects, which are present at the time of purchasing the product. During that period, we will replace, without service charge, any product deemed defective due to those causes. You will be required to present proof of purchase (invoice or receipt) and ship the possibly-defective item back to Redcat at your cost if instructed to do so. This warranty does not cover any damage due to wear, overloading, incompetent handling or use of incorrect accessories.

CONFORMITY DECLARATION

Hexfly X2 Mini satisfies all relevant and mandatory CE directives and FCC Part 15 Subpart B. The product has been tested to meet the following technical standards:

	Test Standards	Title	Result
CE-LVD	EN60335-2-29	Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers.	Conform
	EN 60335-1	Household and similar electrical appliances - Safety - Part 1: General requirements	Conform
CE-EMC	EN55014-1	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission	Conform
	EN55014-2	Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity Product Family Standard	Conform
	EN61000-3-2	Electromagnetic compatibility (EMC) – Part 3-2: – Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)	Conform
	EN61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limitation of voltage supply systems for equipment with rated current ≤ 16A.	Conform
FCC-VOC	FCC Part 15B	Title 47 Telecommunication PART 15 - RADIO FREQUENCY DEVICES Subpart B - Unintentional Radiators	Conform



WARNING!



FIRE HAZARD!

NEVER USE CHARGER UNSUPERVISED!

- Batteries pose a SEVERE risk of fire if not properly handled.
- Read Entire operation manual before using charger.
- This unit may emit heat during use.
- Only operate this device in a cool ventilated area away from flammable objects
- Failure to observe safety procedures may cause damages to property or injury

The logo for HexFly features a stylized black and white hexagonal graphic on the left, followed by the word "HEXFY" in a bold, italicized, red-outlined font.

FC

CE

