



Universal Digital Charger UDC-20 INSTRUCTION MANUAL

SPECIFICATION

Nicad / NiMh – 1 to 14 cells
LiPo / LiLo – 1 to 5 cells
Lead Acid (Pb) – 6v, 12v
Input Voltage – DC11-18v
Charge Rate – 0.1 to 5 Amp
Balance Charge Rate – 200mAh/Cell
Max Power – 50W

SAFTY NOTES

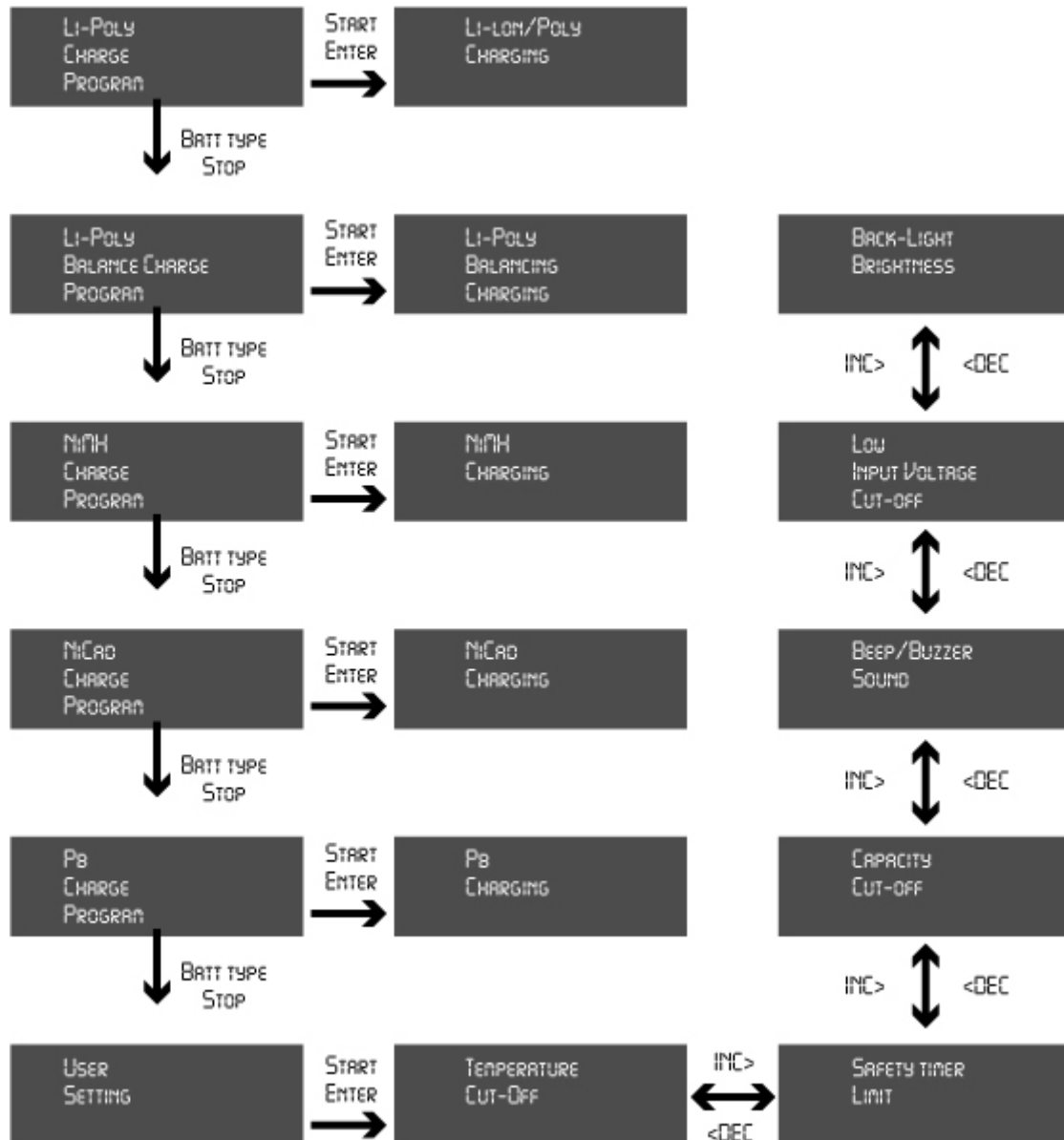
Please follow the safety notes below. Otherwise the charger and battery could cause considerable damage to property or person if used incorrectly.

1. Never leave the charger unsupervised when it is connected to its power supply. If any malfunction is observed stop and refer to the manual.
2. Keep charger away from dust, damp, rain, heat, direct sunlight and vibration.
3. The circuit of this charger is designed to be powered by a 12v DC only.
4. The charger and battery that it is charging should always be used on a heat resistant, non-inflammable surface. NEVER USE ON A CAR SEAT, CARPET OR SIMILAR.
5. Never use near inflammable materials.
6. Be sure to understand the information of the battery to be charged accurately. If the program is set up incorrectly the battery can be severely damaged.
7. To avoid short circuits between the charger leads, always connect the 12v cable first and only then to the battery to be charged. Reverse this sequence when disconnecting.
8. DO NOT connect more than one battery at any time.
9. DO NOT attempt to charge any of the following;
 - ◆ A battery pack that consists of different types of cell (including different manufacturers).
 - ◆ A battery pack which is already fully charged or just slightly discharged.
 - ◆ Non-rechargeable batteries.
 - ◆ Batteries that require a different charge technique from NiCad, NiMH, Li-Poly or Pb.
 - ◆ A faulty or damaged battery.
 - ◆ A battery with an integral charge circuit or a protection circuit.
 - ◆ Batteries installed in a device, or which are electrically linked to other components.
 - ◆ Batteries that are not expressly stated by the manufacturer to be suitable for the currents the charger delivers during the charge process.
10. Please check the following before charging;
 - ◆ Select the appropriate program which is suitable for the type of battery.
 - ◆ Set up adequate current for charging.
 - ◆ Lithium battery packs can be comprised with parallel and series cells mixed. Check the composition carefully before charging.
 - ◆ Be sure all connections are firm and safe.



Universal Digital Charger UDC-20

Program Flow Chart





Universal Digital Charger UDC-20

Initial Parameter Set Up

The CORE R/C UDC-20 will be operated with the default value of the essential user settings when it is connected to a 12v battery for the first time. The screen displays the following information in sequence and the user can change the value of each parameter on each screen. When you are ready to alter the parameter value in the program, press the **Start/Enter** button to make it blink, then change the value with the **DEC** or **INC** buttons. The value will be stored by pressing the **Start/Enter** button once.



This informs you of its designation.

An optional feature using a temperature probe contacting the surface of the battery, the temperature cut-off can be on or off. If it is on, set the maximum temperature at which the charger should allow the battery to reach when charging. Once the battery reaches this temperature the charge process will stop.

When you start a charge process, the integral safety timer automatically starts running at the same time. This is programmed to prevent overcharging of the battery, if it proves to be faulty, or if the termination circuit cannot detect if the battery is full. The value for the safety timer should be generous enough to allow a full charge.

This program sets the maximum charge capacity that will be supplied to the battery during charge. If the delta peak voltage is not detected nor the safety timer has expired for any reason, this feature will automatically stop charging at the selected capacity value.

The beep sounds at every time a button is pressed to confirm your action. The beep or melody will sound at various times during operation to alert different mode changes. These audible sounds can be turned on or off.

This program monitors the voltage of the input battery. If the voltage drops below the value you have set the operation is stopped. This protects the input battery.

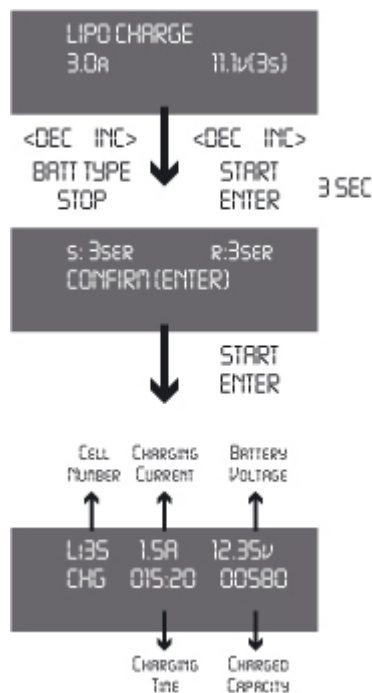
You can adjust the brightness of the LCD panel.



Universal Digital Charger UDC-20

Programming for the Li-Po Battery

These programs are only suitable for charging LI-PO batteries. These batteries need to use a different charge technique. It is termed a constant voltage (CV) and constant current (CC) method. The charge current varies according to the battery capacity, and is usually C/2 rate (half capacity as a charge current). The final voltage of the charge process is also very important; it should be 4.2v/cell for the nominal voltage of 3.7v/cell. If the final voltage exceeds by more than 1% during charge the battery will explode. The charge current and nominal voltage as for cell count set on the charge program must always be correct for the battery to be charged. When you are ready to alter the parameter value with the DEC or INC buttons. The value will be stored by pressing the Start/Enter button once.



The value on the left side of the second line sets the charge current and the value on the right side of the second line sets the voltage of the battery pack. After setting the current and voltage press the Start/Enter button for more than 3 seconds to start the process. (Charge current: 0.1 to 5A. Voltage: 1 to 5 series).

This shows the number of cells you set up and the processor detects. "R:" shows the number of cells found by the charger and "S:" is the number of cells selected by you at the previous screen. If both numbers are identical you can start charging by pressing the Start/Enter button. If not, press the Batt/Stop button to go back to the previous screen. Then carefully check the number of cells of the battery pack to charge again.

The screen shows the present situation during the charge process. To stop charging press the Batt Type/Stop button once.

We recommend using the AUTO VOLTAGE setting. In this mode the number of LiPo cells flashes for one minute until the charger confirms the battery voltage matches this setting. If all is ok the charge process begins at the current selected.

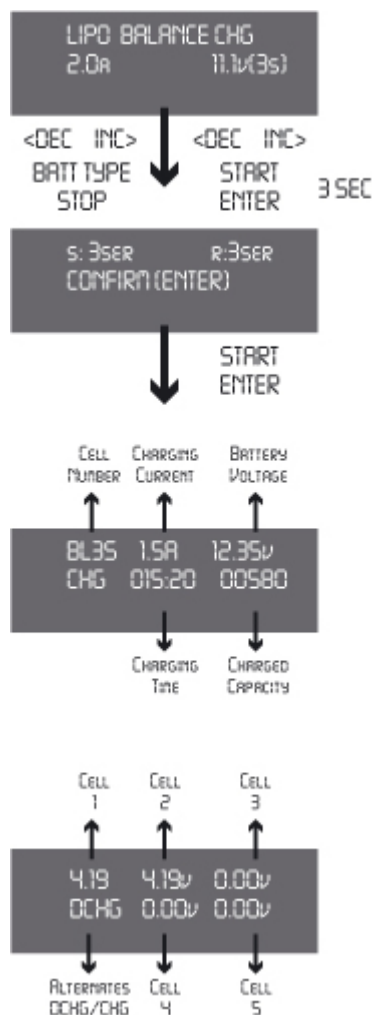
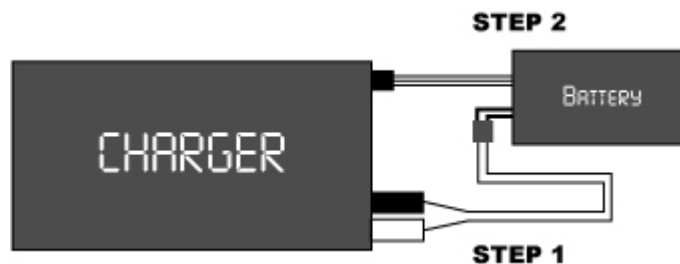


Universal Digital Charger UDC-20

Programming for the Li-Po Battery (Balancing)

How to connect:

- Step 1: Put the DC power cable into the input of the charger, and then connect the DC cable to the power connector of the battery.
- Step 2: Put the balance connector of the battery into the balance socket of the charger.



The value on the left side of the second line sets the charge current and the value on the right side of the second line sets the voltage of the pack. After setting the current and voltage press the Start/Enter button for more than 3 seconds to start the process. (Charge current: 0.1 to 5A, voltage: 1 to 5 series).

This shows the number of cells you set up and the number the processor detects. "R:" shows the number of cells found by the charger and "S:" is the number of cells selected by you at the previous screen. If both numbers are identical you can start charging by pressing the Start/Enter button. If not, press the Batt type/Stop button to go back to the previous screen. Then carefully check the number of cells of the battery pack to charge again.

The screen shows the present situation during the charge process. To stop charging press the Batt type/Stop button once.

Voltage inquiry of individual cells

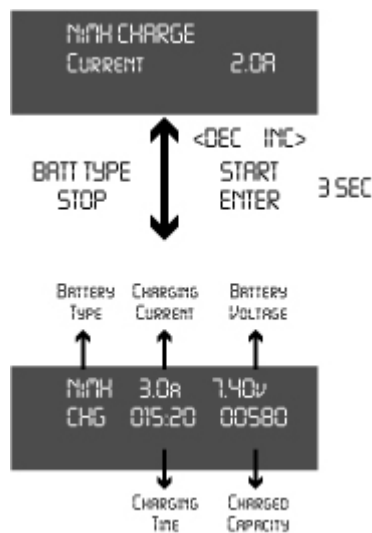
When you press the INC button, the screen will show the present voltage of Cell No's 1-5. When you press the DEC button, the screen will show Input Voltage. Press it again and it will show temperature settings.



Universal Digital Charger UDC-20

Programming for the NiMH/NiCd Battery

These programs are for charging NiMH/NiCd battery commonly used for R/C models. To change current, press the Start/Enter button to make it blink, then change the value using the DEC or INC button. The value will be stored by pressing the Start/Enter button once. To start charging, press the Start/Enter button for more than 3 seconds.

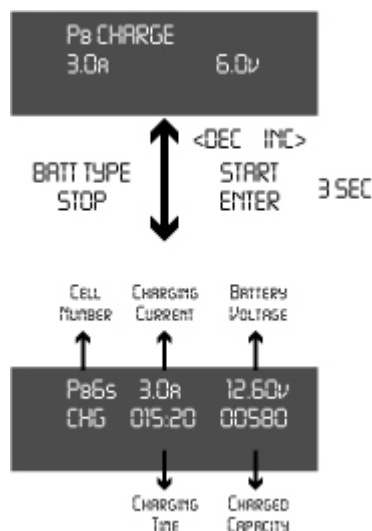


This program simply charges the battery using the current set. The charge current ranges from 0.1A to 5A.

The screen displays the current state of charging. To stop the process, press the Batt/Stop button once. The audible sound indicates you have ended the process.

Programming for a Lead Acid (Pb) Battery

These programs are for charging a Pb battery with a nominal voltage from 2 to 12volt. Pb batteries are totally different from NiCad or NiMH batteries. They can only deliver lower current compared to their capacity, and similar restrictions apply when charging. So the optimal charge current will $1/10^{\text{th}}$ of the capacity. Pb batteries must not be charged rapidly. Always follow the instructions supplied by the battery manufacturer.



Set up the charge current on the left and the nominal voltage of the battery on the right. The charge current ranges from 0.1A to 5.0A and the voltage should match with the battery you are charging. Start the charge process by pressing the Start/Enter button for more than 3 seconds.

The screen displays the state of the charging process. To stop the charging process, press the Batt type/Stop button once. The audible sound indicates you have stopped charging.



Universal Digital Charger UDC-20

Warning and Error Messages

These programs are for charging NiMH/NiCd battery commonly used for R/C models. To change current, press the Start/Enter button to make it blink, then change the value using the DEC or INC button. The value will be stored by

REVERSED POLARITY	The output is connected to a battery with incorrect polarity.
CONNECTION BREAK	Bad connection between battery and output. Or voluntarily disconnecting the charge lead during charging.
SHOT ERR	There was a shot-circuit at output.
IN VOLTAGE ERR	The voltage of input is lower than the limit.
VOL SELECT ERR	The voltage of the Lithium battery pack was selected incorrectly.
BREAK DOWN	There has been a malfunction in the unit.
BATTERY CHECK LOW VOLTAGE	The processor has detected that the voltage is too low during charging.
BATTERY CHECK OVER VOLTAGE	The processor has detected that the voltage is too high during charging.
BATTERY VOL ERR	The voltage of one of the cells in the Li-Po battery is over the limit.



Universal Digital Charger UDC-20

Repair and Warranty

All products from CORE R/C are manufactured to the highest quality standards. CORE R/C guarantees this product to be free from defects in materials or workmanship for 30 days from the original purchase date verified by a sales receipt. This limited warranty does not cover defects, which are a result of normal wear, misuse or improper maintenance. This applies among other things on:

- Cut off/changed original input, and/or output wires.
- Mechanical damage of the case.
- Humidity/Water inside the case.
- Mechanical damage of electronic components/PCB.
- Solder on the PCB.

By sending in this product, you assign CORE R/C to repair the product. The original sales receipt must be included or no warranty can be granted. As we have no control over the use of this product we cannot accept any liability for any damages resulting from using this product. Therefore using this product is at the owners' risk. The limited warranty liability shall be limited to repairing the unit to its original specifications. In no case shall the liability exceed the original cost of the unit. By using this product the user accepts all resulting liability.

All specifications should be seen as guide values. Due to ongoing technical improvements, which are done in the interest of the product. CORE R/C accepts no responsibility for the accuracy of these specifications.

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