

# SWALLOW AC/DC 2

## INSTRUCTIONS

### Dear Customer

Thank you for purchasing this Swallow AC/DC charger. We are sure you will be pleased with its performance and features. In order to ensure that you obtain the maximum from its operation, please read the following instructions carefully.

### Special Features

- \* Input voltage is 11~15V DC, or AC 100V ~ 240V / 50 ~ 60Hz
- \* Capable of charging and discharging 1 - 14 NiCd or NiMH cells, 1 - 5 Lithium-Ion or Lithium-Polymer cells or 2 ~ 12V lead-acid batteries
- \* Adjustable charge current (0.1A - 5.0A)
- \* Adjustable discharge current (0.1A - 1.0A). Auto limited to maintain 5W maximum.
- \* "Zero Delta V" peak detection for NiCd and NiMH batteries
- \* "Constant Current / Constant Voltage" charge method for Lithium-Ion/Po batteries and Pb batteries.
- \* Pack Cycling( Charge to Discharge / Discharge to Charge )
- \* 2 -line, 16 character, blue backlit, LCD makes the screen extremely clear and legible.
- \* Voltage monitoring feature for individual LiPo cells.
- \* Various warning messages for improper input voltage, wrong connections, unsuitable battery condition and reverse polarity on output.
- \* Packaged in a rugged, extruded aluminum case

### Specification

Input Voltage	11.0-15.0V DC, AC 100V ~ 240V / 50 ~ 60Hz
Battery Type & Cells	1-14 Nickel-Cadmium cells / 1-14 Nickel-Metal Hydride cells 1-5 Lithium-Ion or Lithium-Polymer cells ( type : 3.6V or 3.7V ) 1 - 6 Lead-Acid cells ( 2V per cell )
Battery capacity	100mAh ~ 5000mAh adjustable ONLY for Lithium-Ion and Lithium-Polymer
Charge Current	0.1A ~ 5A in 100mA steps
Discharge Current	0.1A ~ 1A in 10mA steps (auto limited to 5W maximum)
Trickle Charge Current	0 ~ 200mA
Charge Termination	" zero delta V" peak detection for NiCd/NiMH " constant current / constant voltage " for Li-Ion/Po and Pb

Cycling	Charge to Discharge / Discharge to Charge
Display Type	2-line, 16 blue backlit character LCD
Voltage Monitoring	LiPo Cell Balancer Voltage monitoring (using LCB-6C balancer only)

## Safety precautions

- \* Do NOT attempt to charge incompatible types of rechargeable batteries. This charger is designed to only charge and discharge Nickel-Cadmium, Nickel-Metal Hydride, Lithium-Ion, Lithium-Polymer, and Lead-Acid batteries.
  - \* Make sure to place the charger on a firm level surface for charging.
  - \* Do not attempt to charge batteries at excessive fast charge currents. Check with your battery manufacturer for the maximum charge rate applicable to your battery.
  - \* Do not use automotive type battery chargers to power the charger.
  - \* Do not leave the charger unattended while charging. **Disconnect the battery and remove input power from charger immediately if the charger becomes hot.** Allow the charger or battery to cool down before reconnecting.
  - \* Do not allow water, moisture or foreign objects into the charger.
  - \* Do not place the battery or charger on or near a flammable object while in use. Keep away from carpets, cluttered workbenches, etc.
  - \* Do not cover the air intake holes on the charger as this could cause the charger to overheat.
  - \* Connect the input leads to a 12V power supply first, then connect the battery.
  - \* Do not disassemble the charger.
  - \* This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- \* Young children should be supervised to ensure that they do not play with the appliance.
- \* Do not attempt to charge non-rechargeable batteries.
  - \* The battery must be placed in a well ventilated area (for charging lead-acid batteries)
- \* The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, remote from the battery and fuel line. The battery charger is then to be connected to the supply mains;
- \* After charging disconnect the battery charger from the supply mains. Then remove the chassis connection and then the battery connection.

## Input power

A. Connect the charger to the 12V DC power supply.

Connect the charger's red alligator clip to the positive (+) terminal on the power source and the black alligator clip to the negative (-) terminal. The charger will display "Input voltage" error message if the input is below 11V or above 15V. If this happens, please recheck the input power supply to make sure adequate power is present.

OR

B. Connect the AC plug to a regular AC100~240V wall outlet.

**Note : If AC power is being used for input power, do NOT try to connect the 12V DC power as well !**

## Output battery connections

Two 4mm banana sockets are located on the right side of the charger. Connect the battery charge lead to these sockets with the positive (+) lead connected to the red socket and the negative (-) lead to the black socket. The "No battery" error message will be displayed if trying to start to charge without connecting a battery. The "Open circuit" error message will be displayed if a battery becomes disconnected from the charger while a function is in progress. A "Reverse polarity" error message will be displayed if a battery is connected to the charger in reverse.

## Operation

When the charger is connected to the power supply the charger will show the battery mode that has been last used.

If the battery TYPE button is briefly pressed, the present battery type (NiCd, NiMH, Lithium, or Pb ) will blink.

While the existing battery type is blinking, every time the battery TYPE button is pressed, the following modes are shown in order. NiCd→ NiMH→ Lilo→ Pb→ NiCd

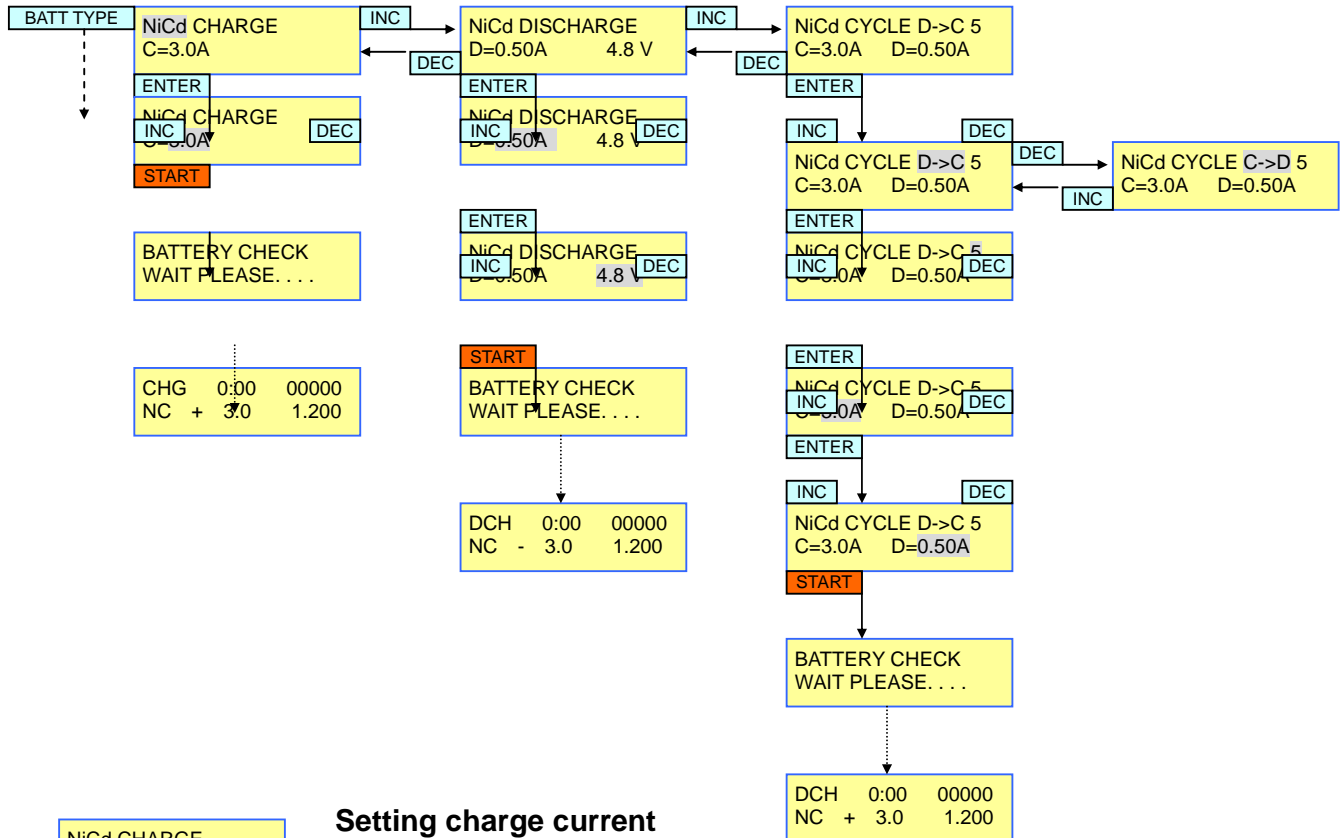
. If the other buttons are pressed, or nothing is pressed, the present battery type stops blinking.

. If the Battery type button is pressed and briefly held, the recent & previous data will be shown for 3 seconds.

. If the Enter button is briefly pressed, a parameter which can be adjusted starts to blink and if the Enter button is pressed again, the next parameter starts to blink. If nothing is pressed for 3 seconds, the parameter stops blinking.

. Once the Enter button is pressed and briefly held, the charger starts to charge or discharge according to the selected parameters.

# NiCd MODE



NiCd CHARGE  
C=3.0A

## Setting charge current

Adjust and find the desired charge current which ranges from 0.1A to 5.0A with the INC & DEC buttons. Press the ENTER button to confirm the setting.

NiCd DISCHARGE  
D=0.50A 4.8 V

## Setting discharge current

Adjust and find the desired discharge current which ranges from 0.1A to 1A with the INC & DEC buttons. Press the ENTER button to confirm the setting.

NiCd DISCHARGE  
D=0.50A 4.8 V

## Setting discharge cutoff voltage

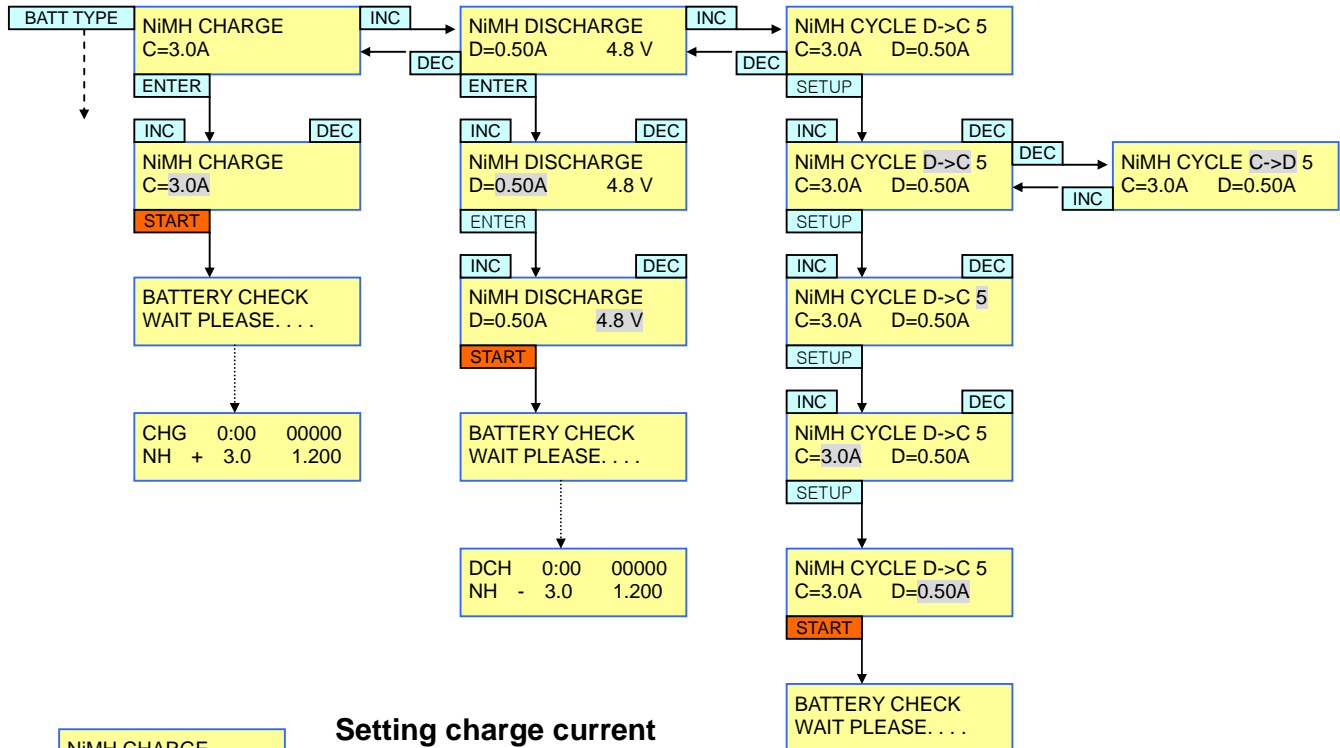
This is the voltage that the charger should stop discharging the battery. Adjust and find total discharge cutoff voltages to be discharged from 0.1V to 16.8V with the INC & DEC buttons. Press the ENTER button to confirm the setting.

NiCd CYCLE C->D 5  
C=3.0A D=0.50A

## Setting cycle

This is to set cycling with two options (Charge to Discharge / Discharge to Charge). Set cycling with the INC & DEC buttons and press the ENTER button to confirm the setting.

# NiMH MODE



NiMH CHARGE  
C=3.0A

## Setting charge current

Adjust and find the desired charge current which ranges from 0.1A to 5.0A with the INC & DEC buttons. Press the ENTER button to confirm the setting.

DCH 0:00 00000  
NH - 3.0 1.200

NiMH DISCHARGE  
D=0.50A 4.8 V

## Setting discharge current

Adjust and find the desired discharge current which ranges from 0.1A to 1A with the INC & DEC buttons. Press the ENTER button to confirm the setting.

NiMH DISCHARGE  
D=0.50A 4.8 V

## Setting discharge cutoff voltage

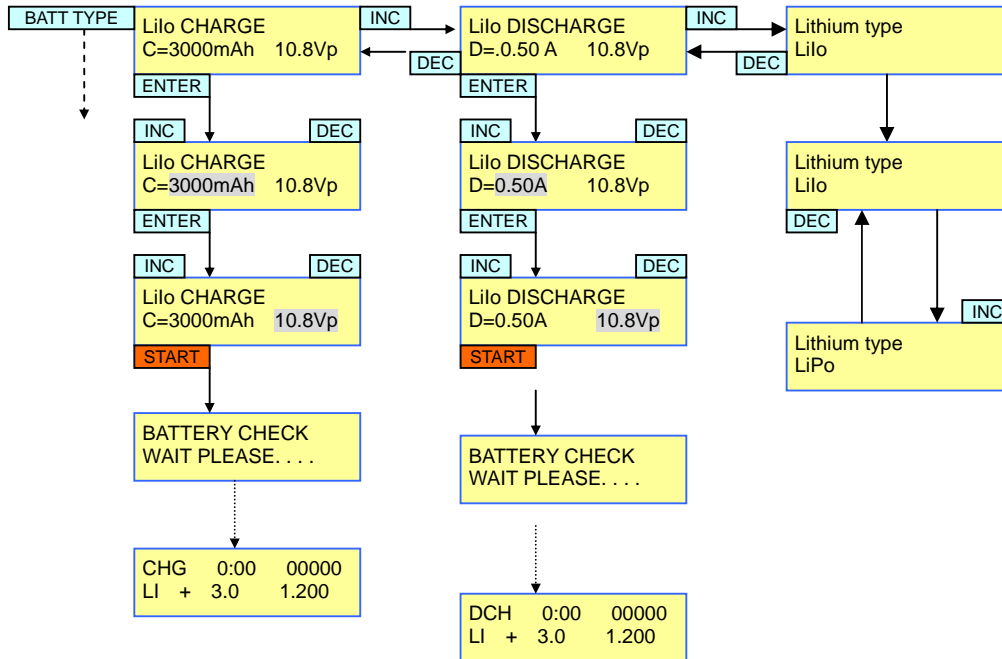
This is the voltage that the charger should stop discharging the battery. Adjust and find total discharge cutoff voltages to be discharged from 0.1V to 16.8V with the INC & DEC buttons. Press the ENTER button to confirm the setting.

NiMH CYCLE C->D 5  
C=3.0A D=0.50A

## Setting cycle

This is to set cycling with two options ( Charge to Discharge / Discharge to Charge). Set cycling with the INC & DEC buttons, and press the ENTER button to confirm the setting.

# Li-Ion & Li-Po MODE



This charger is capable of charging Lithium-Ion and Lithium-Polymer batteries up to 5 cells. This charger uses “constant current / constant voltage“ in order to fully charge Lithium-Ion & Lithium-Polymer batteries. Constant current is delivered during the fast charge. When the voltage of the Li-Ion or Li-Po battery reaches approx 4.0V per cell, the charger starts to change its charge method from “constant current” to “constant voltage “. The “constant voltage“ allows the battery to dictate how much current the charger should deliver for safe, full charges. When the current drops below approx 100mA, the charger will stop charging as the battery is fully charged.

## Setting battery capacity

LiIo CHARGE  
C=3000mAh 10.8Vp

Adjust and set the desired battery capacity from 100mAh to 5000mAh (50mAh per step) with the INC & DEC buttons. Press the ENTER button to confirm the setting.

## Setting battery voltages for Li-Ion battery pack

LiIo CHARGE  
C=3000mAh 10.8Vp

Select the proper total battery voltages to be charged or discharged with the INC & DEC buttons – 3.6V, 7.2V, 10.8V, 14.4V, and 18.0V [Vpack]

## Setting battery voltages for Li-Po battery pack

LiPo CHARGE  
C=3000mAh 11.1Vp

Select the correct total battery voltages to be charged or discharged with the INC & DEC buttons – 3.7V, 7.4V, 11.1V, 14.8V, and 18.5V [Vpack]

LiIo DISCHARGE  
D=0.50A 10.8Vp

### Setting discharge current

Adjust and find the desired discharge current from 0.10A to 1.00A (0.01A per step) with the INC & DEC buttons. Press the ENTER button to confirm the setting.

Lithium type  
LiPo

### Setting battery type

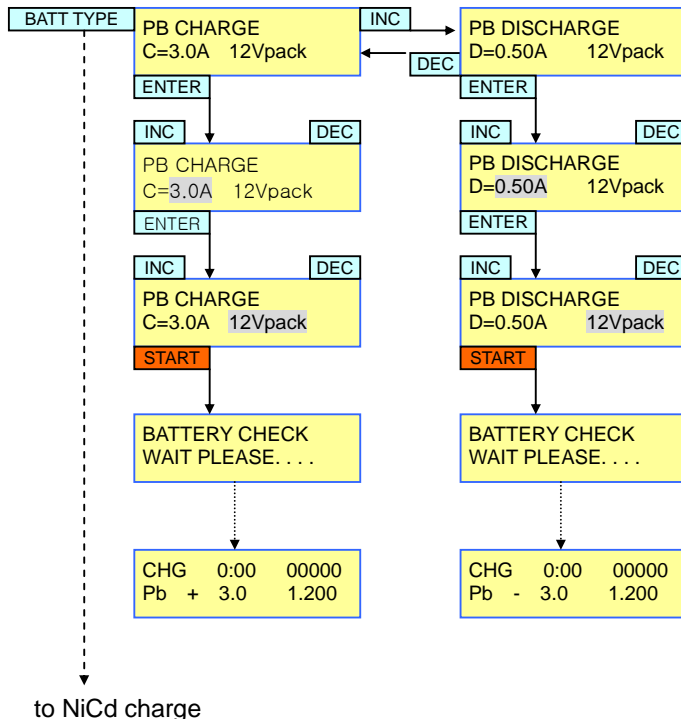
Choose the desired battery type (either Li-Ion or Li-Po ) with the INC & DEC buttons. Press the ENTER button to confirm the setting.

For safety purposes, this charger is designed to automatically deliver a 1C charge rate to batteries of either Li-Ion or Li-Po, based on the user selected battery capacity.

Example: Li-Po cell of 1500mAh capacity : 1C = 1500mAh ( = 1.5A ) charge current.

**Note : The maximum voltage for Li-Ion batteries is 4.1V per cell, and 4.2V per cell for Li-Po batteries. Therefore, it is extremely important to choose the proper battery type to be charged, as Li-Ion and Li-Po batteries have the different voltage level. Otherwise, it may cause very serious damage to the batteries and increase the risk of a fire !**

## Pb MODE



PB CHARGE  
C=3.0A 12Vpack

### Setting charge current

Adjust and find the desired charge current which ranges from 0.1A to 5.0A with the INC & DEC buttons. Press the ENTER button to confirm the setting

## Setting battery voltages for Li-Ion battery pack

PB CHARGE  
C=3.0A 12Vpack

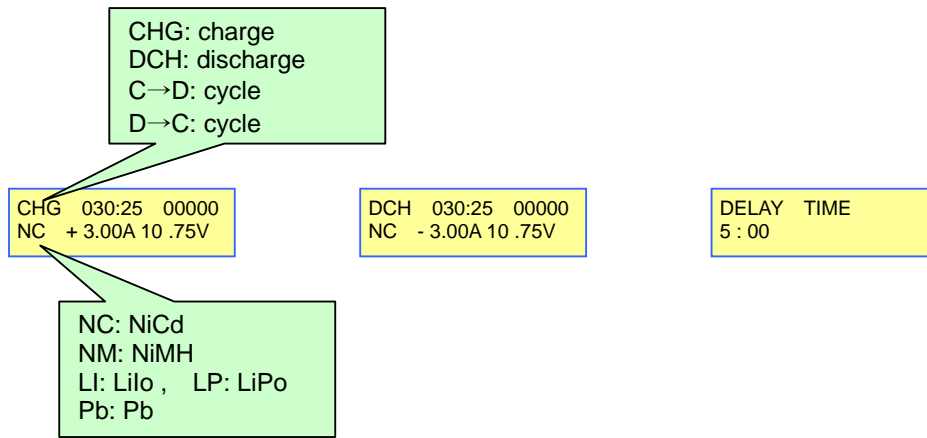
Select the proper total battery voltages to be charged or discharged with the INC & DEC buttons – 2V, 4V, 6V, 8V, 10V, and 12V [Vpack]

## Setting discharge current

PB DISCHARGE  
D=0.50A 12Vpack

Adjust and find the desired discharge current from 0.10A to 1.00A (0.01A per step) with the INC & DEC buttons. Press the ENTER button to confirm the setting.

## Displays during charge, discharge, and cycle



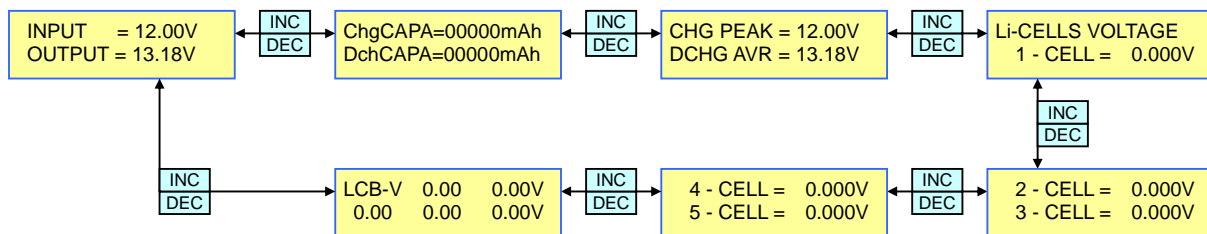
If the Enter button is pressed, the charge or discharge can be terminated.

## Completion display

END 030:00 00000  
NC 100mA 10.75V

In order to move to the main display, press the Enter button.

## Data display



\* If the Battery type button is pressed for over 3 seconds, the Data view will be displayed as above.

Data displays can be scrolled left and right by INC & DEC buttons.

If nothing is pressed for 3 seconds, this display will disappear.

### **\* Voltage monitoring feature**

If an LCB-6C (LiPo cell balancer) has been connected to the charger via an interface cable, each cell voltage will be shown on the screens above while the LCB-6C is balancing the battery pack.

While the charger is being operated, if the Battery Type button is pressed, this Data display will also show.

**Note : The voltage monitoring feature is ONLY designed to show LiPo cell voltage which has 3.7V nominal voltage per cell !**

## **Error messages**

INPUT BATTERY  
VOLTAGE ERROR

. When input voltage is below 11.0V or exceeds 15V.

NO BATTERY

. When a battery is not connected to the charger's output

OUTPUT BATTERY  
REVERSE POLARITY

. When a battery is connected to the output in reverse

OUTPUT CIRCUIT  
PROBLEM

When the circuit of the charger has a problem

CHECK THE BATT.  
OPEN CIRCUIT

. When a battery becomes disconnected during an operation

CHECK THE BATT.  
OVER VOLTAGE

If wrong voltages are set while charging lithium or Pb batteries.

CHECK THE BATT.  
LOW VOLTAGE

If wrong voltages are set, or batteries are over discharged, while charging Lithium or Pb batteries.