Advanced Charger Technology, Inc

Norcross, Georgia, USA

iCHARGE Battery Analyzing Solution

Model No. i90-100A

Application Software and Instructions

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WARNING:
To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
To avoid electrical shock, do not open. Refer service request to ACT.
Batteries shall not be exposed to excessive heat before charging.

CAUTION:
Dangerous Voltage within the product's enclosure may be of sufficient magnitude to constitute a risk of electric shock to persons.

PRECAUTIONS:
To prevent fire or shock hazard, do not place objects filled with liquids near or above apparatus.
Install this unit so that the AC power cord can be unplugged immediately in the event of malfunction or emergency.

FCC:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions.
(1) This device may not cause harmful interference
(2) This device must NOT accept any interference that may cause undesired operation.

B.Parts Included with Kit:

Part # i90-001A (Application Software CD)

Part #i90-002A (Instruction Manual)

Part #i90-003A (USB-Charger Adapter)

Part #i90-004A (RJ-45 CAT6 Cable)

Part #i90-005A (USB A-B Cable)

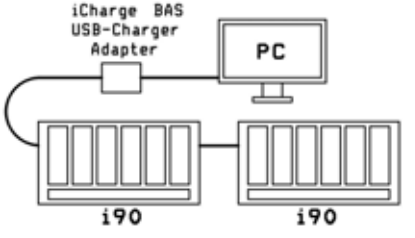
C. Connecting the i90 to your computer:

a. Connect your i90 to a wall AC supply (120VAC or 220VC) and make sure all Red LED`s are blinking (No adaptor installed)

b. Connect cable (supplied) with USB A plug to your PC, connect the plug USB B to the iCHARGE BAS Adapter P/N i90-003A .

Connect the one side of the Network cable (supplied) to iCHARGE BAS Adapter P/N i90-003A , then other end to the RJ45 socket on the left side of the i90.

Note: Additional i90`s could be connected in series using additional Network cables.
Max number of i90`s that could be connected in series is 42 (256 pockets).



E. Software installation

Insert the CD with the Application Software into your CD Drive.

Double click on the icon.

Double click on…..

Copy the iCHARGE software to your Computer.

The screen in picture # 1 will appear after executing the iCHARGE Program

Picture # 1

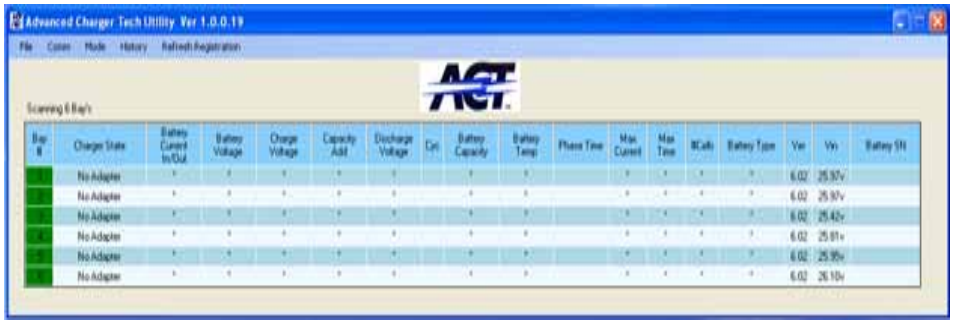
Select the correct com port on the Comm menu bar.

Picture # 2

Note: Adapter's P/N i90-003A Red light blinks when USB connection between your computer and the adaptor is achieved, Green LED will start blinking upon successful communication between your i90 and your computer (see picture # 3)

Picture # 3

Green background will appear on the each of the Bay # software screen indicating that your system is ready.



Picture # 4

An indication "No Battery" will appear under "Charger state "after adding an adaptor and the charger recognizes the adaptor (see Picture #5for 6bay configuration or picture # 6 for 12 bay configuration)

6 bay screen
Picture # 5

12 bay screen
Picture # 6

D. LED Status;

The following are the LED`s statues appearing on the charger during operations.

READY (Green)……...Charge completed.
CHARGE (Yellow)……...Battery is being charged.
FAULT (Red)…….....Defective Battery, Charger Plate not Installed/Rrecognized.
RECONDITION (Yellow)…Blinks amount of recondition cycles 1-6.

E. Finding specific pocket:

In order to find a specific pocket location in a string of i90`s, click on the desire bay # on your computer and click once .All LED`s of the requested bay will blink 10 times allowing you to locate it.

E. The Software Messages and Control

1 . Menu Bar

File, Comm., Mode, History, Refresh:

- **Note:** Selecting the **Refresh** on the menu bar is needed each time additional i90`s are connected or removed from the system!!!!

2. Operation bar

The following Messages will appear during charging process;

1. Charger State

Discharge, battery is in discharge mode during reconditioning and battery analyzing cycle.

Low Bat Current, Faulty Battery.

Parking, Battery is ready. NiMH and NiCD (battery could stay in this stage indefinitely without any harm, Lithium batteries will re-start the charging process when battery -self discharges to 3.6V/cell.

Rapid Charge comes after "Soft Charge" and runs until charging is terminated.

Soft Charge, come when new battery begins to charge. Usually 4 minutes for NiMH and NiCD battery. If the battery is very weak this interval could be longer.

Waiting, comes after discharging (10min wait for cell balancing).

2. Battery Current In/Out; Charge and Discharge current value.

3. Battery Voltage; Actual battery voltage level.

4. Charge Voltage; Charger Voltage value applied to be able to charge a specific Battery.

5. Capacity add; Current/Capacity added to battery in charge.

6. Discharge Voltage; Charger Voltage value applied to be able to discharge a specific battery.

7. Cyc; Reconditioning cycles (Up to 6 cycles available)

8. Battery Capacity; Total true Capacity in mA

9. Battery Temp; Thermistor Battery temperature in C

10. Phase Time; Cycle time.

11. Max Current; Max default current.
12. Max Time; Predetermined time value allowed before automatic shut off timer.

13.# Cells; Cells within battery.

14. Battery Type; Chemistry (NiCD, NiMH, LiON,Li Polymer)

15.Ver; i90 Firmware Version.

16.Vin; Charger Input DC Voltage.

17. Battery SN; user assigned battery number.

Operation

1. Battery Charging;

Insert battery into its relative pocket on the i90 charger, the following screen (picture #7) will reflect the insertion of 3 batteries and all batteries are in good condition,

Picture # 7

Once the batteries are inserted charge process will be initiated automatically and the Charger State will indicate 'Soft Charge ".
At this point the following options are allowed:

2. Battery History Information.

Double click on the Serial Number (S/N) Field, the below screen will be open (picture # 8)

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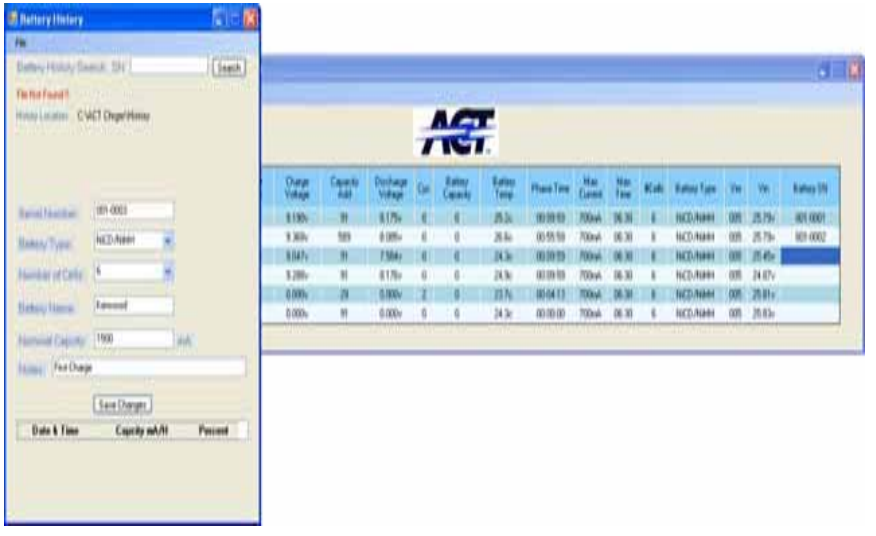


Picture #8

On the Battery History enter the flowing info:

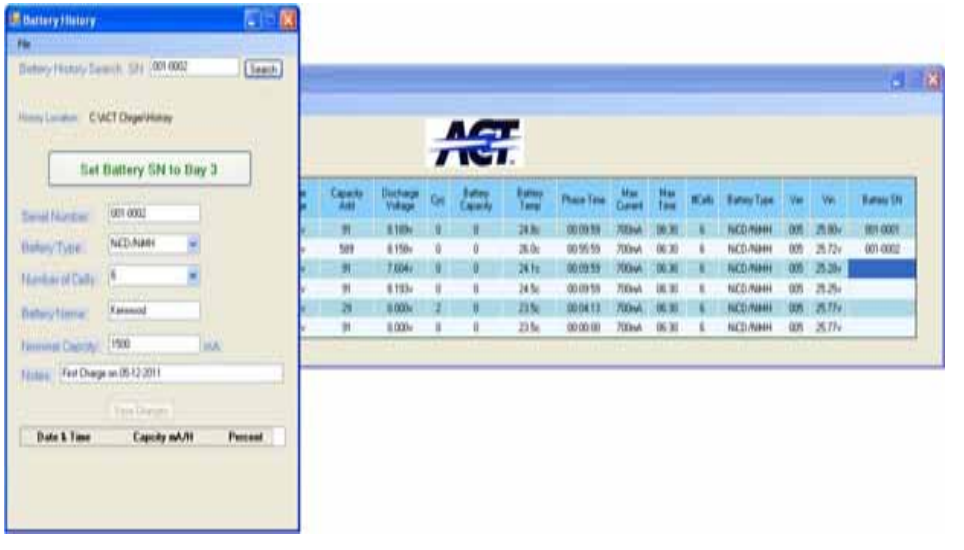
Battery S/N, (**This info could be entered with a use of Bar Code Scanner**)
Battery Type,
Number of Cells,
Battery Name,
Nominal Capacity (Entering the nominal battery capacity will result in an automatic calculation of the percentage of actual capacity compare to the nominal capacity every time an analyzing process was requested **(See picture # 11 below**)
Notes

Click on "Save Changes"

Whenever you need to access history for the S/N previously assigned to batteries entered, press on file and you will see the complete list for all batteries entered in this menu.

3. Pre-assigned battery info.

Two options are available (Clicking on the battery S/N field (Color will change into Blue, reflecting proper selection.) or clicking on the History icon on the menu bar)
The history window will open. (see below picture # 9)
In the search box, enter the Battery S/N requested. (This operation can be done with a use of BAR Code Scanner.)
The correct battery info will fill the appropriate tables.



Picture #9

After assuring that you found the correct battery info, a Green window will be open with ,"Set Battery SN to Bay #", and click on it and the battery info will be assigned to the pre-selected Bay #

4. Locating battery History information file

Battery history file can be located in many places on your computer system (your own computer or any location on your server.
Open the Battery history window and click on “File “ on the upper left side.
A widow with your operating system will be opened and you can assign the desire location where all info for your batteries will be located.

5. Battery Reconditioning (CYC);

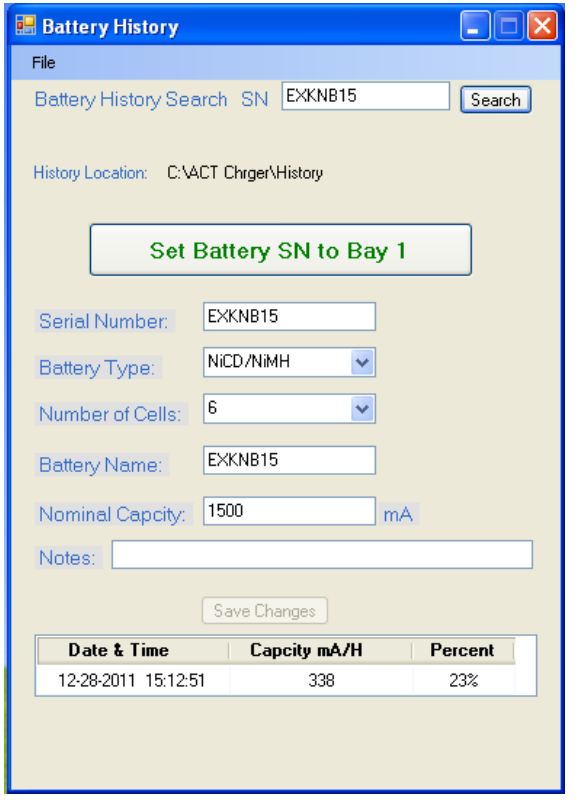
Picture #10

This operation will allow the user to select up to 6 consecutive charge and discharge cycles on a specific battery and to record the battery capacity into the battery history memory if battery info was selected.
If Nominal battery capacity in mA was entered in the battery history info then after each cycle date , time ,capacity and percentage compare to the nominal capacity will be entered automatically into the battery history (see picture below)

To Select the number of battery cycles:

1. Right Click on the CYC field for the desired battery to select Reconditioning cycles.
2. Select how many cycles of charge and discharge would you like to perform.
   The Recondition Led will blink the number of cycles selected.
   Note: Reconditioning offers a choice of 1 thru 6 cycles.

After selecting the number of cycles the charger will bring the battery to its full capacity and then will discharge the battery to 1V /cell and repeat this process until the selected number of cycles is reached.
Battery capacity value will be shown in the appropriate field for the active cycle and recorded in battery history.
The discharged LED will blink according to the number of cycles selected and will reduced by one each time a full cycle has been finished.



Picture #11

6. <u>Capacity Add and Battery Capacity</u>;

******Capacity Add is the current (capacity)added to the battery from a specific battery state.**

This number will be equal to the battery capacity after a full analyzing cycle****

If battery " Cyc " was selected then right click (after all analyzing cycles finished) on "Battery Capacity " box will result in showing the battery capacity measured for each cycle .

Picture #12

In parking mode, the charger will slow the charging pulse rate from one pulse per second to one pulse every 30 seconds (this assures that batteries are always at peak condition).

Note: It is perfectly safe for batteries to remain on unit indefinitely in this mode. All bays are fully independent of each other.

5500 Oakbrook Parkway
Norcross, GA 30093
Tel:770-263-6337

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