Dear Customer,

　　Thanks for purchasing MTI's product, once you receive the shipping package form us, please carefully check the Packing list:

Item	Qty.	Description
Main Machine	1	Battery Analyzer
Software Disc	1	Driver, testing and calibration software
RS232	1	Connecting PC to main machine
USB to RS232 Converter	1	Convert RS232 to USB if no serial port on the PC
Cable with clamp	8	Clamp the battery for testing
Power Cable	1	Plug to power

Please call us at 1-510-525-3070 or email info@mtixtl.com if you are lack of any item above.

Make sure you have installed MS Excel and Access in your computer.

Pre-testing

（Only for customer not purchasing computer from MTI. Customer which purchased battery analyzer with computer directly go to page 4 section Testing）

1. Download the "Battery Analyzer" from MTIXTL.com website. Uncompress the "Battery Analyzer . rar" to get these three files as shown in this picture.

📁 RS232-USB Driver		File folder	2015-04-27 17:11
📁 TC53		File folder	2015-04-27 17:11
📄 Manual for Battery Analyzer.pdf	3.8 MB	2.4 MB PDF Document	2015-04-27 17:13

After you install the RS232Driver, you can find two main application in folder "TC53".
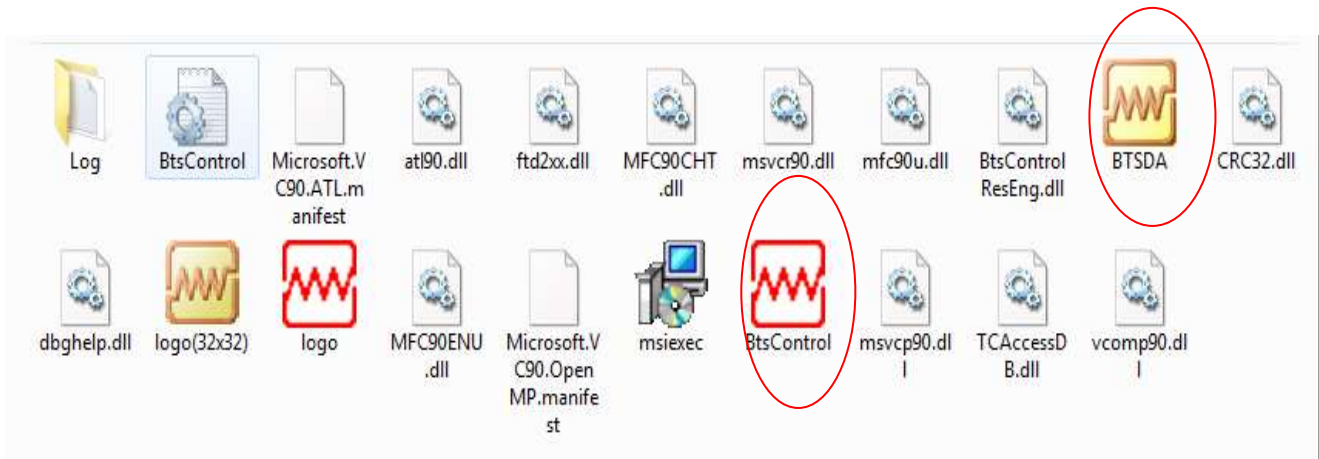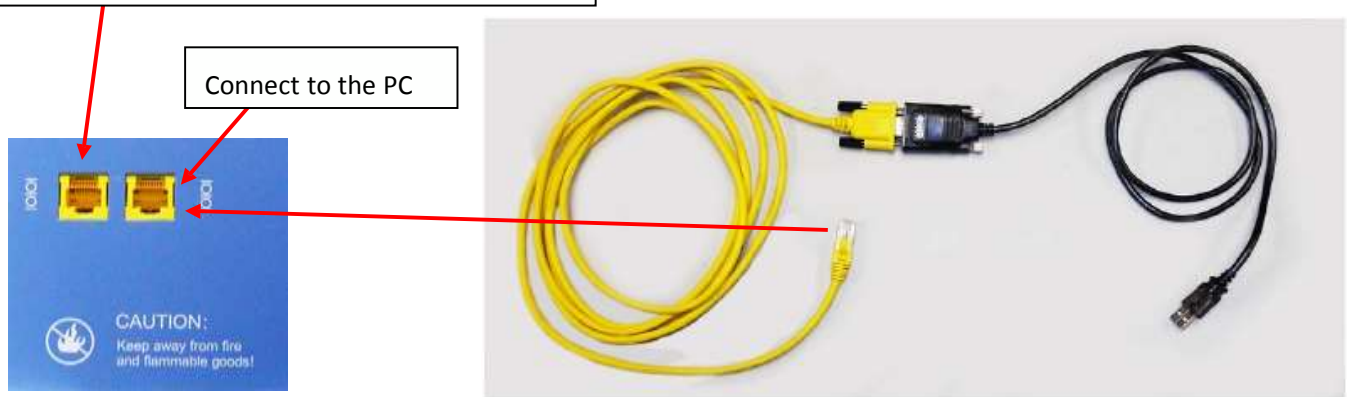
Tips: Please delete/uninstall the older version of TC before installing the new one.

2-1. Use RS232 to connect the device to your computer if it has a serial port.
2-2. If no serial port in PC, please use the RS232 to USB adaptor to connect with PC.

Connect to another battery analyzer with the Ethernet cable included in the standard accessory.

Connect to the PC

2-2-1. when you done the step in 2-2, please now plug the USB port to your computer, here, we give you an example for installing the driver in Vista/Win7 OS (XP is nearly the same):
a. First, a prompt would pop up, however, close or cancel it:

b. Right click "Computer" on the desktop---"Properties"---"Device Manager"---"Other Devices"---"USB-Serial Controller".
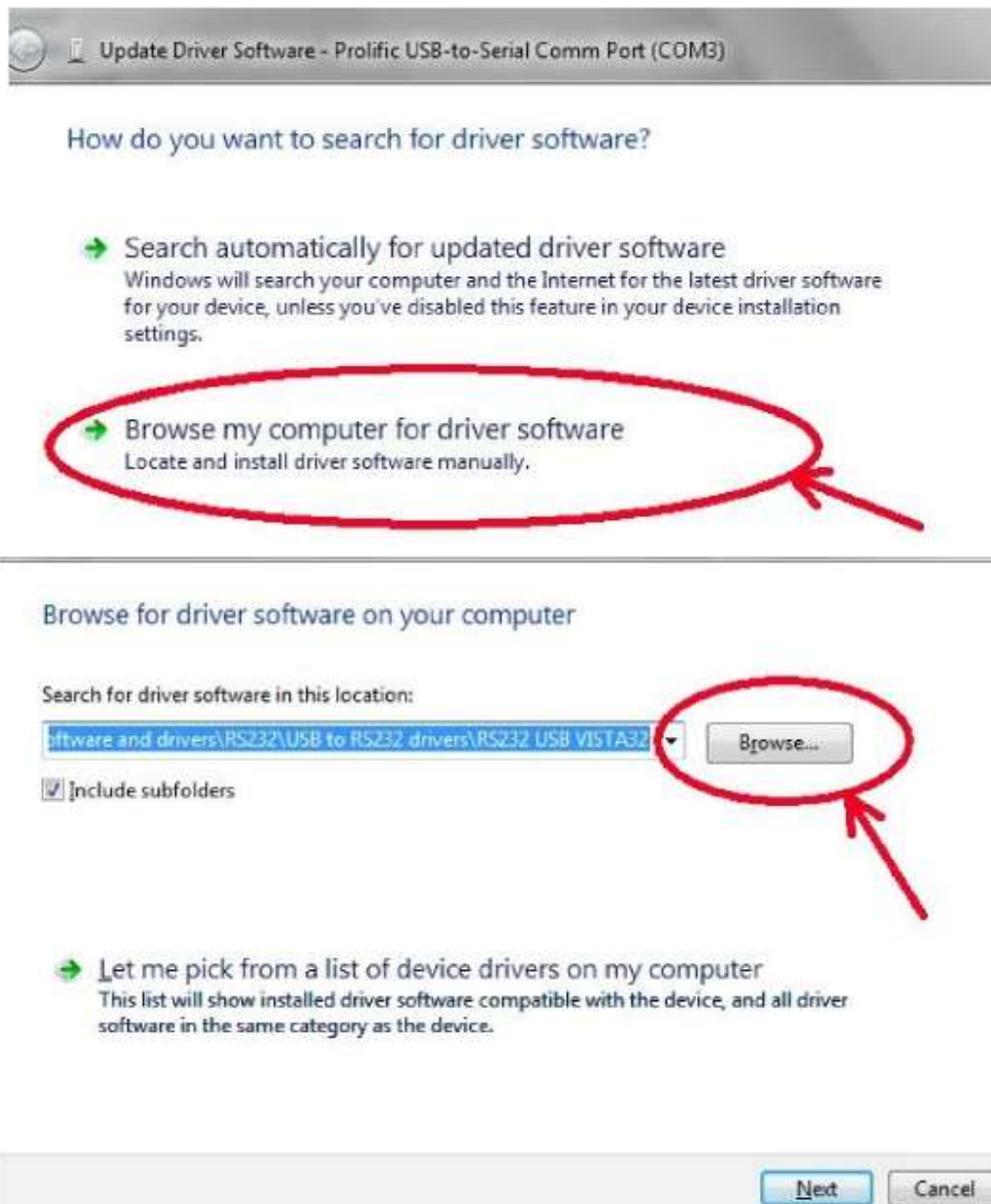c. Right click "USB-Serial Controller" to "Update Driver Software":
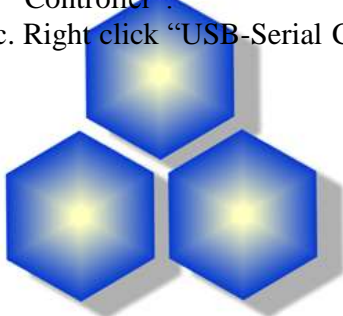
c. Choose "Browse my computer for driver software" and click "Browse" to find the folder "RS232 USB VISTA32" in "MTI-TC" and choose the item "Include subfolders".

d. Click "OK"---"Next" to finish the installation and then you will see a new device in "device manager" like below, please memorize your own COM number:

e. Installation is done.

Testing

1. MTI's battery analyzer provide two ways to test your sample in terms of different battery type, they are:

1-1. Cylinder Channel:

a. Test cylinder battery
b. Height adjustable by set screw
c. 8 independent channels in total
d. Upper to positive and lower to negative
e. Protection mode if poles reverse connection

1-2. Clamp Cable Channel:

a. Test other type battery
b. 8 independent channels in total
c. Red to positive and black to negative, big for current and small for voltage
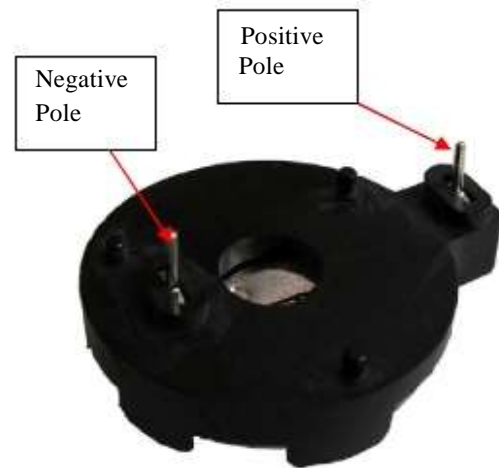d. Protection mode if poles reverse connection

Tip: For button cell, customer could separately order holder fro m MTI at

http://www.mtixtl.com/index.asp?PageAction=VIEWCATS&Category=919 to put the cell inside and then use clamp to test:
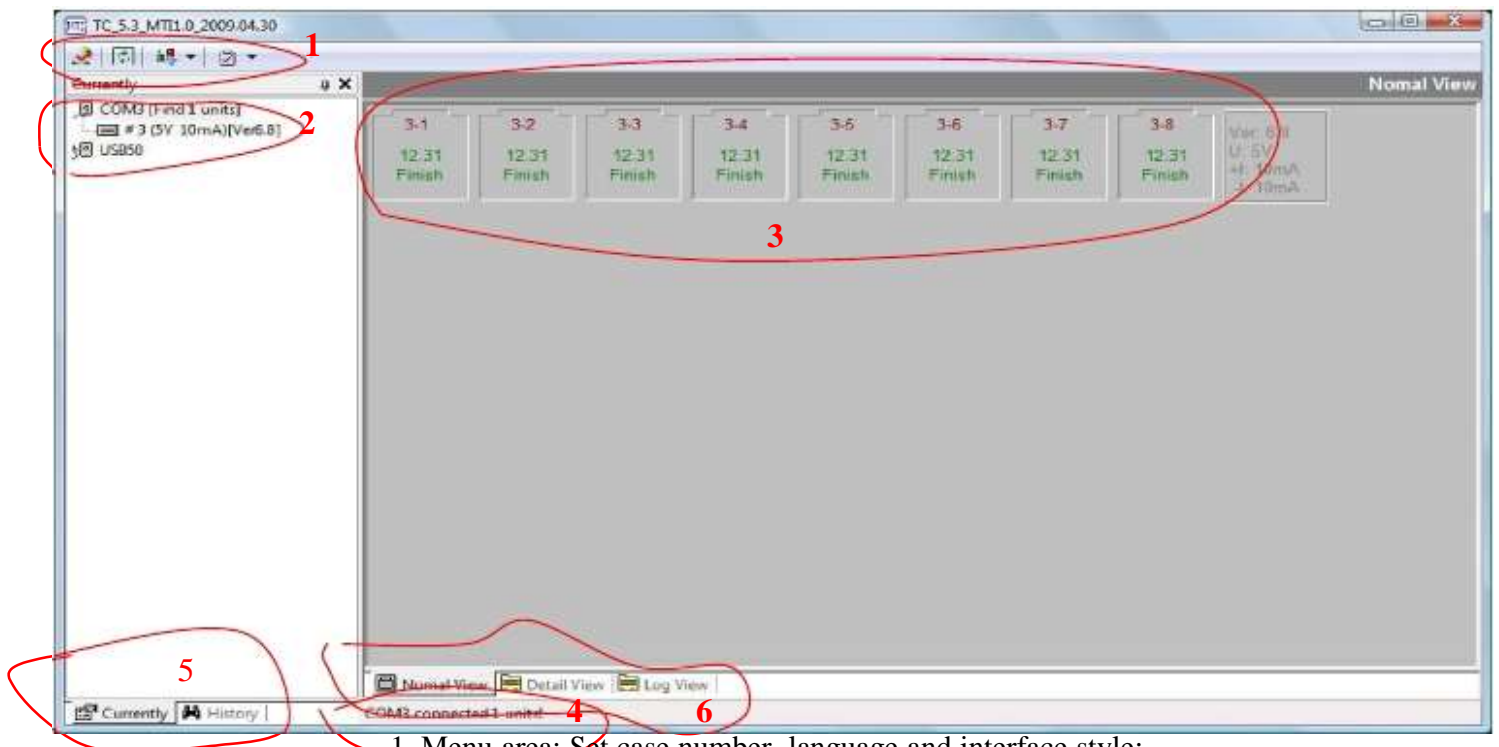

Upper Side   **Lower Side**

2. When get everything ready, please power on the machine, unzip file Battery Analyzer, then open the folder "TC53" to execute the file named "BtsControl.exe", a GUI would pop up:


1. Menu area: Set case number, language and interface style;
2. Port area: Indicate the COM port which is for testing;
3. Unit area: Show the status of the eight channels accordingly
4. Prompt area: Indicate if the COM port connects to the device
5. Check the current testing or history testing
6. Normal view/ Detail View/ Log View

- If the software can not find the unit within 1 minute, check cable connection, power failure and driver installation, if problem still, click the COM port in port area and then button "set" on the menu are and set the unit number to 90, and then, click "search" to find out the device:
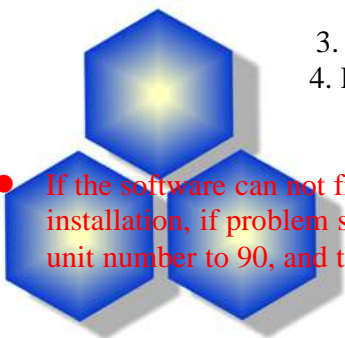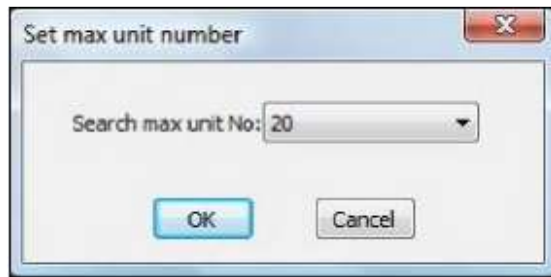
Please order multi-port cable with 11 rs232 terminals at http://www.mtixtl.com/index.asp?PageAction=VIEWPROD&ProdID=1719, which means the customer can use only one computer to control as many as 10 sets battery analyzer in one GUI:

3. Setting

3-1. Choose a channel you need to test and make sure the battery is well connected.

3-2. Right click the block representing the channel and you will see a menu as below:

a. Startup

Startup is used for setting the testing step such as **Constant_Current Discharge, Constant_Voltage Charge, Constant_Current Charge, Constant_Power Discharge, Constant_Resistance Charge, Constant_Current &Voltage Charge, Cycle and etc.** and also, the limiting condition (or cut-off condition) **Time, Voltage, Current,-$\triangle$V, Power, Resistance, Jump to, Cycles and Curr ent-Stop.**

Item	Description
Constant_Current Discharge	Limiting condition **Current** is required, others as optional
Constant_Voltage Charge	Limiting condition **Voltage** is required, others as optional
Constant_Current Charge	Limiting condition **Current** is required, others as optional
Constant_Power Discharge	Limiting condition **Power** is required and at least one in others as discharge cut-off condition.
Constant_Current &Voltage Charge	Limiting condition **Current, Voltage and Current-stop** are required, others as optional
Constant_Resistance Discharge	Limiting condition **Resistant** is required and at least one in others as discharge cut-off condition.
Cycle	Limiting condition **Cycles (cycle times, 9999 at max) and Jump-to (cycle starting step number)** is required
Pause	Temporarily stop the testing
Rest	Limiting condition **Time** is required
Stop	Stop as the last step

- For every procedure, the maximum step number is 64 and "stop" as the last step.
- For limiting condition (or cut-off) in one step, they are in **Logic OR Operation**, no value means not in use.

Here, we take 3000mAH Lithium Ion battery for example to set the process as described in the below picture.

Step-1. Constant Current Discharge at 1000mA and cut-off this step at 2.75V.
Step-2. Rest for 1 minute.
Step-3. Constant Current Charge at 1500mA and cut-off this step at 4.2V.
Step-4. Constant Voltage Charge at 4.2v and cut-off when the charging current down to 25.
Step-5. Rest for 5 minutes.
Step-6. Do cycle from step 1 to step 5 and total for 9999 times.
Step-7. Stop when testing procedure is done.

From 1 Startup: This procedure will be startup from step 1.
Delay Prot: If protection mode occurs, delay for xxx seconds (usually set as 0 for safety).
CapPerVal: Set to calculate specific capacity, here is 20 mg for the weight.
Record Condition: Record the data by time interval, current interval and voltage interval, if choose all, they are in **Logic OR Operation**, here records the data every 5 seconds.
Protect Param: **Hi Voltage** is upper limit of voltage in whole procedure; here is 4.25V, whenever it is beyond 4.25, protection mode actives.
   Low Voltage is lower limit of voltage in whole procedure; here is 2.5V, whenever it goes lower than 2.5, protection mode actives.
   Current Range upper limit of current in whole procedure; here is 2500mA, whenever it is beyond 2500, protection mode actives.
Base Information: Create the information you can easily memorize and search from history data.
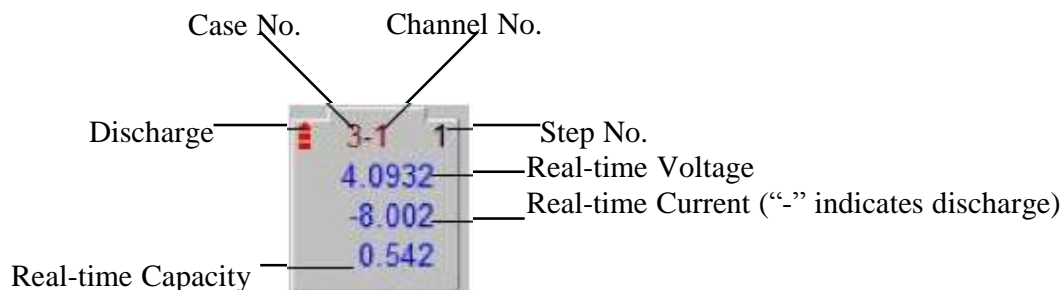**Bak Setting**: Backup the current working step.
NDB Setting: Record all the working step.
Clear Step: Clear the step you set.
Save File: Save the setting.
Open File: Open a file you saved before for fast setting.

When get everything ready, you can click "OK" to start the testing and the normal view would go to:


And when charging, it would be:

b. Batch Startup: Similar to Startup but you can add battery batch number for easily recognize and search.
c. Stop: Stop the testing procedure.
d. Continue: Recover the testing from stop.
e. Jump: If you need to change the working step, you could use "Jump":

Fill the step number you need to jump to and then click "OK".
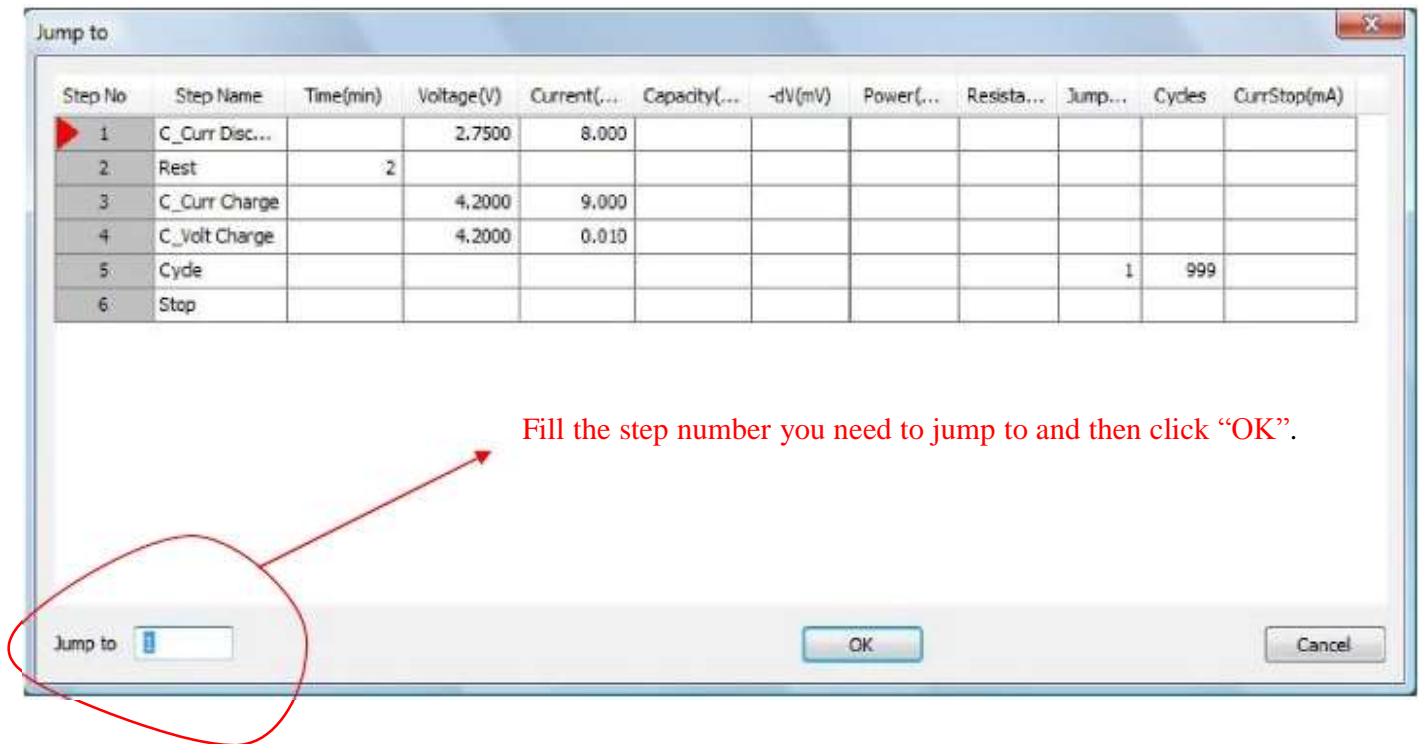
f. Move: To move this testing to another channel, please use this function, the original channel will stop after move.


Select the channel you need to jump to then "OK"
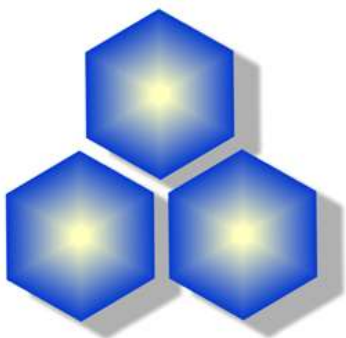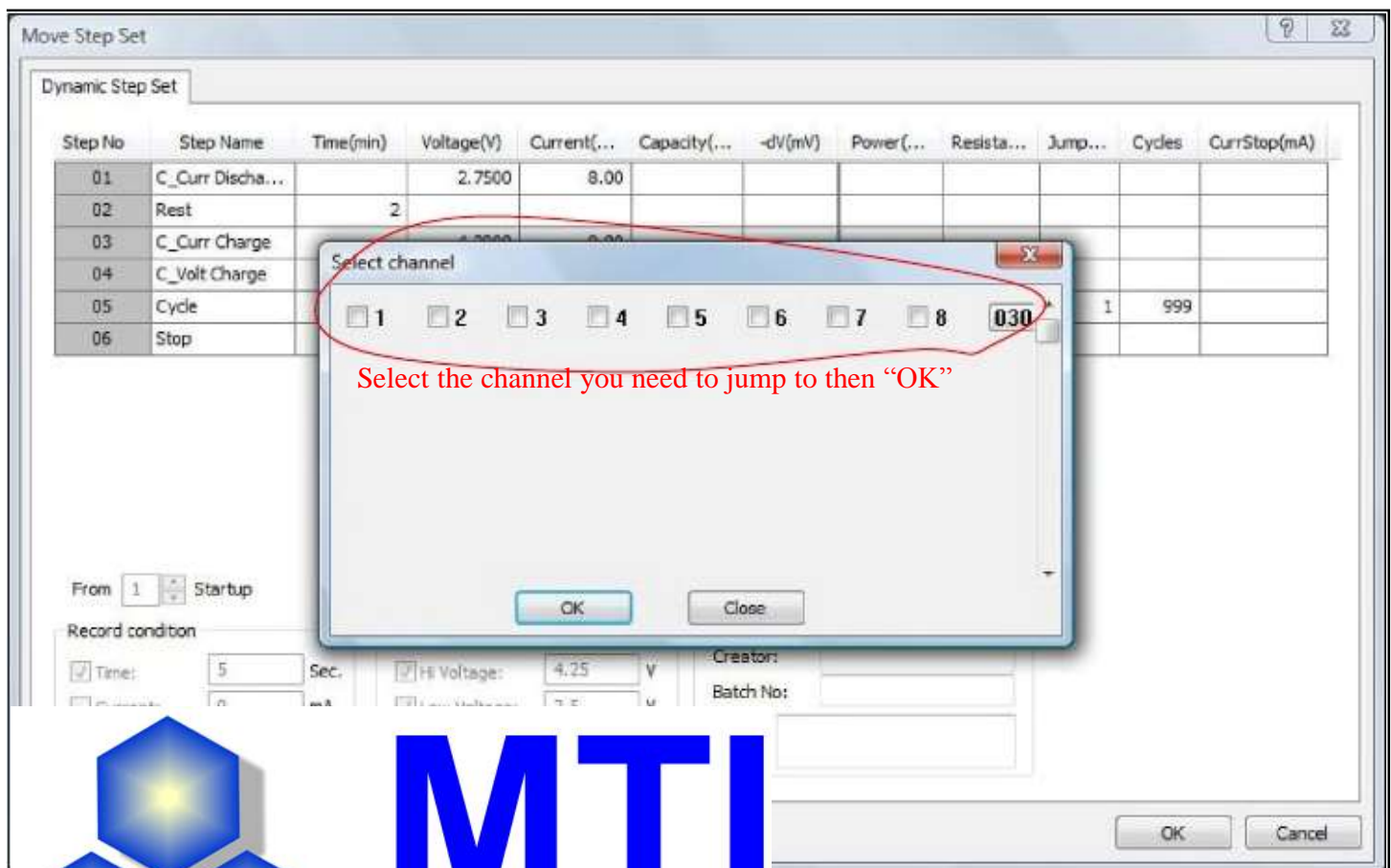
lo it without disturbing the testing status.
l will keep working.

j. Backup: To backup the data of the working step.
k. Open data: To execute Battery Data Analyzing software to analyze the data recorded, please go to BTSDA discussed later to get details.

4. History data search
Click "history" at left bottom of the interface to search the data you need:
1. Find the right folder for storing data.
2. Input the Unit No. and Channel No. if you can remember.
3. Select the time if you can remember.
4. Click "Search" to get the data which will display on the right.
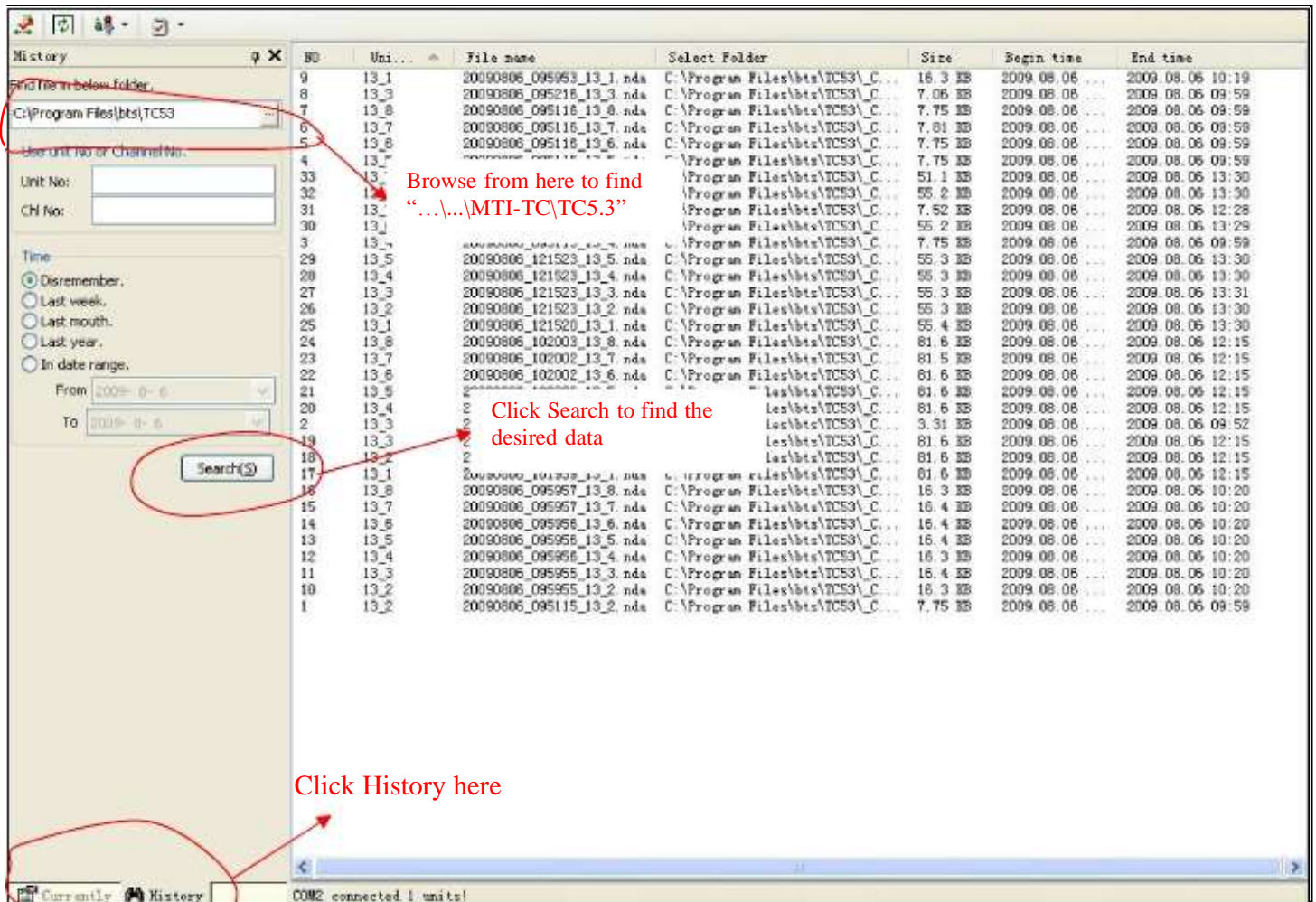
BTSDA

BTSDA stands for battery testing system data analyzer which isused for analyzing the data recorded by the device. You can use "Open data" function we introduced above to openthis software or directly execute it from the folder "TC5.3".

1. When open it from the "open data" function, you will see a window as below, the curve is on the left and data on the right:
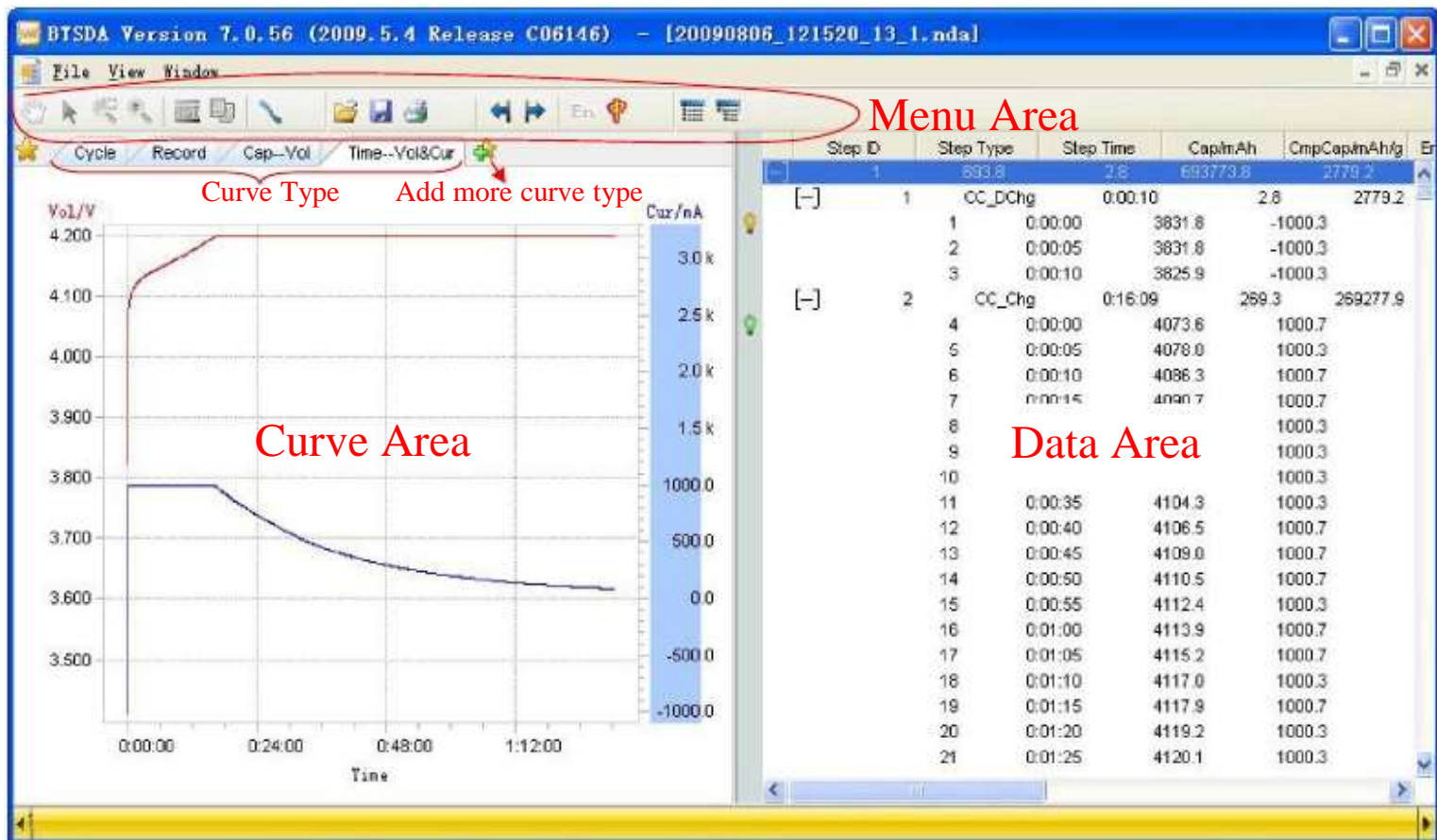
2. Use the items from "Menu area" to change the setting of the curve/data display.
3. Click the "Curve Type" on the curve to get different curve in terms of the X-axis and Y-axis such as Cycle-Time, Capacity-Voltage, and Voltage & Current-Time.
4. Click the "add curve" to add more curve type, please customize the both X and Y axis:
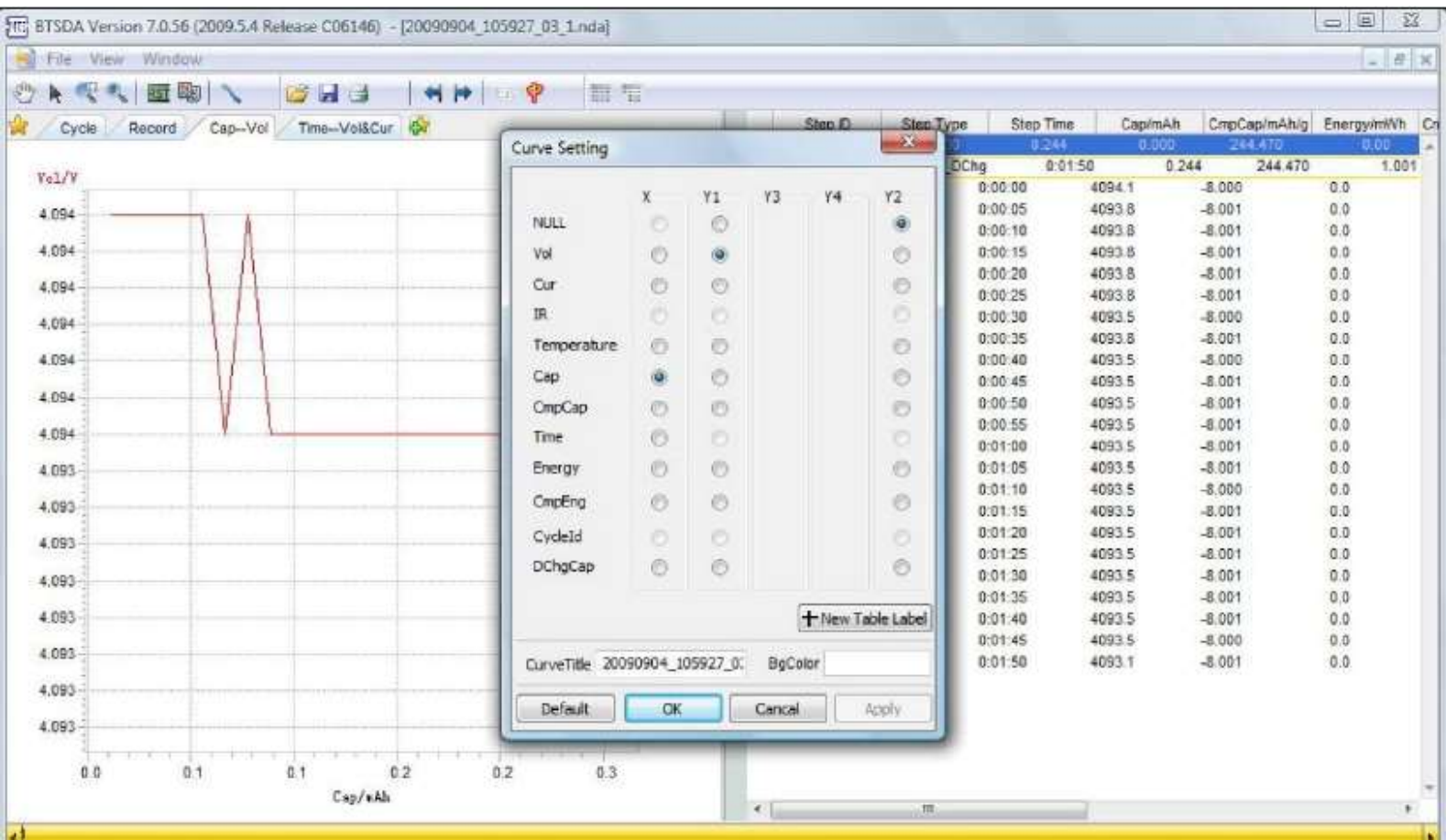
5. Go to "Data area", you can see the data are recoded every 5 seconds which was set at "Record Condition", right click this area, you will see as below, customize the setting by your preference, and the export function could really help you get EXCEL or TXT file as a report :
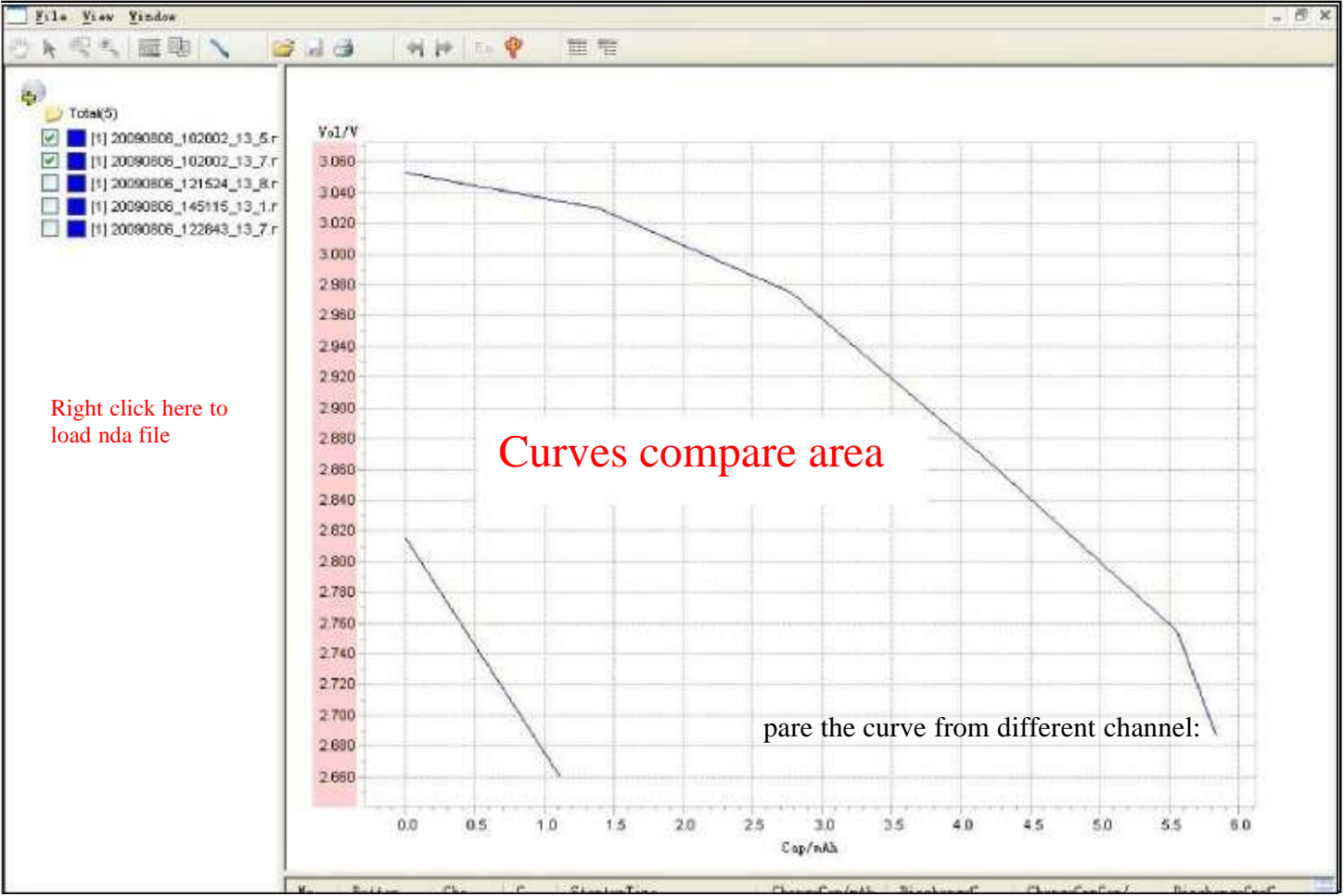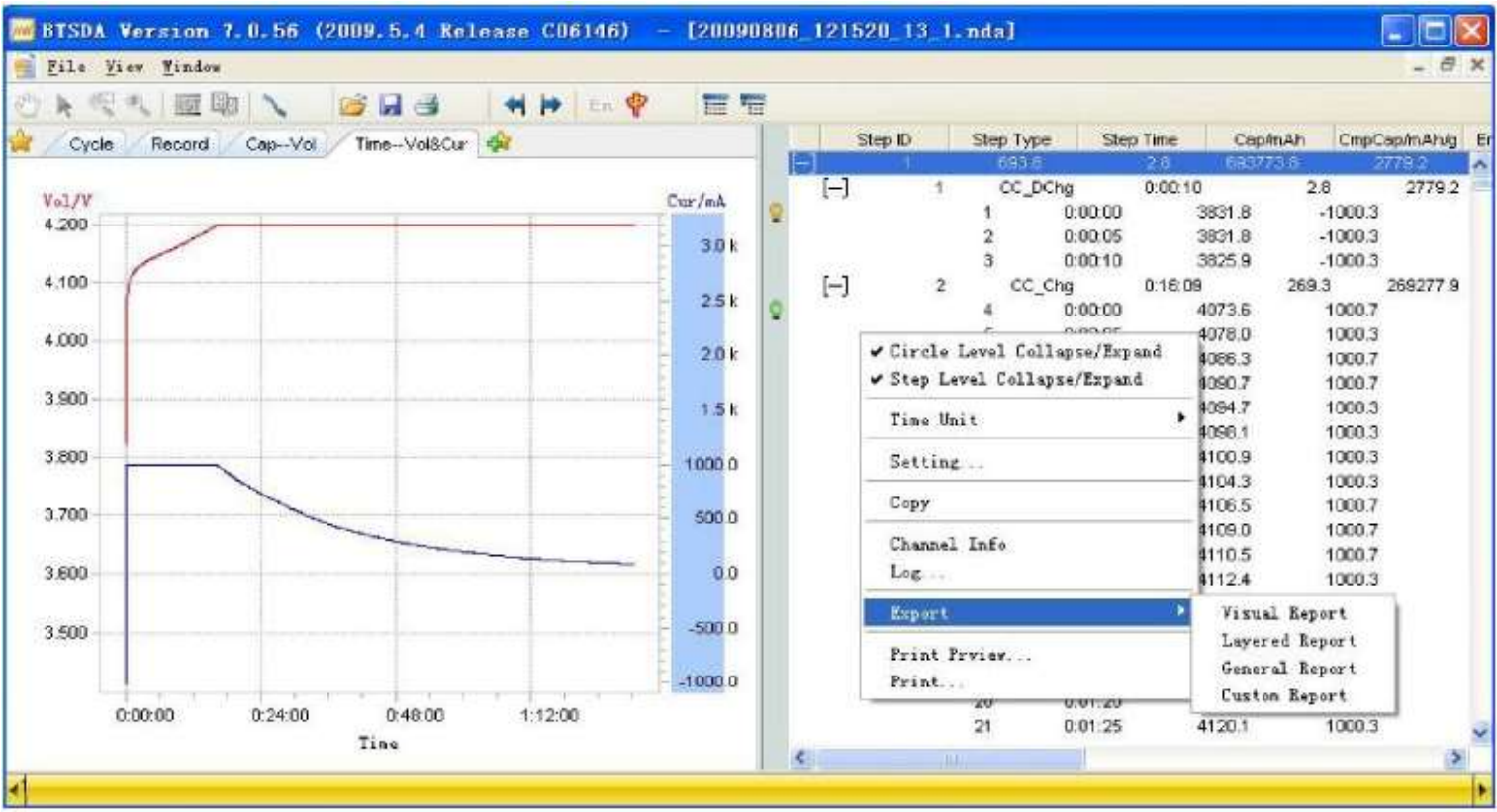
- NDA file is used for storing the testing information of a certain channel with name format: "year_month_day_hour_minute_second_unit number_channel number" suffixed with .nda, note that the time part of the name changes frequently along with the channel testing going by, you can find it in the path "TC5.3/COM3/data", "data" is default folder to automatically save the information.

Maintenance

1. Place this device in a ventilated, dry, dustless, non-explosive/flammable environment.
2. Regularly clean the surface and check channel wire connection.
3. Use calibration software and related tools to calibrate the device every year.
4. Termly backup the data in the folder named "data" we discussed above.
5. Uninstall/delete the old version when you are about to install/copy new one to your PC.
6. Often visit MTI's web www.mtixtl.com to get the latest version of the software.

If you have any questions please call or email us, MTI's engineer will help you within 24 hours.

MTI Corporation

860 South 19th Street, Richmond, CA 94804, USA

Tel: 510-525-3070   Fax: 510-525-4705

E-mail: info@mtixtl.com   Web site: www.mtixtl.com