Landt Instruments

Battery Test Systems Quick Start Guide

Model CT3001A/B/C/D
Model CT3002A/B/C/D

Read this guide first.
Please read this guide before operating this equipment. The remarks for detailed instructions are described in the Instruction Manual. After you finish reading the Start Guide, store it in a safe place for future reference.

Checking the supplied accessories

- CT3001/3002 Tester Unit
- Desk Computer Set
- Communication cable (long)
- Communication cable (short)
- 8 sets of Connection Cables with Clamps (alligator clips and coin cell clips)
- Starter Guide
- Instruction Manual

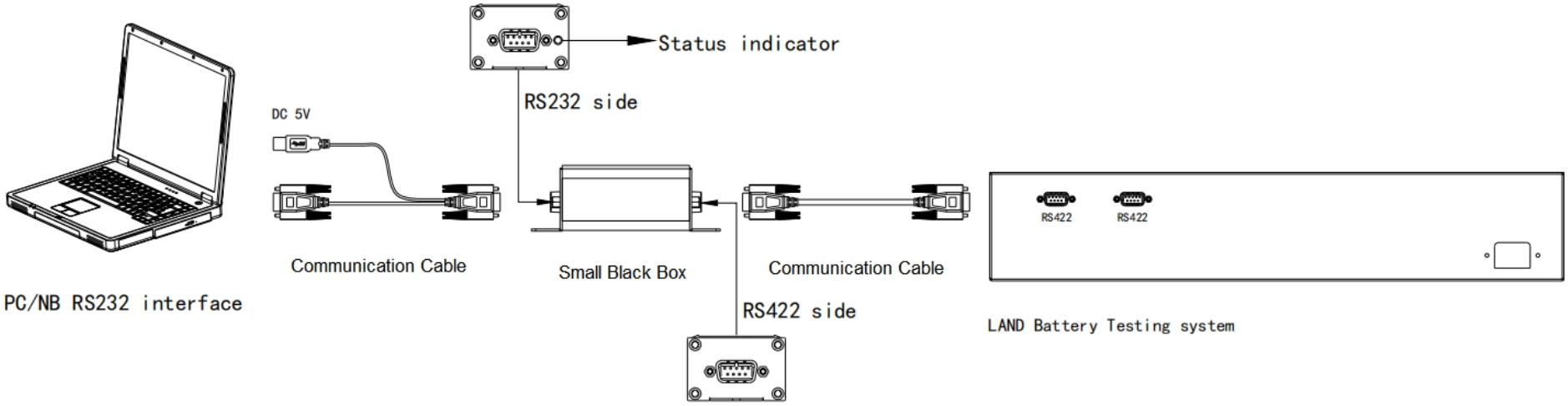
Connecting

- Set-up the computer
  - Make sure there is at least one 9-pin serial port on the computer, if not, obtain a PCI/PCI-e to serial port adapter card and install it on the computer (or use a USB to Serial Port Converter).
  - Install battery test software which can be downloaded at www.landtinst.com

PCI Express to serial adapter card

Connecting

- Connect the equipment to the desktop with cables

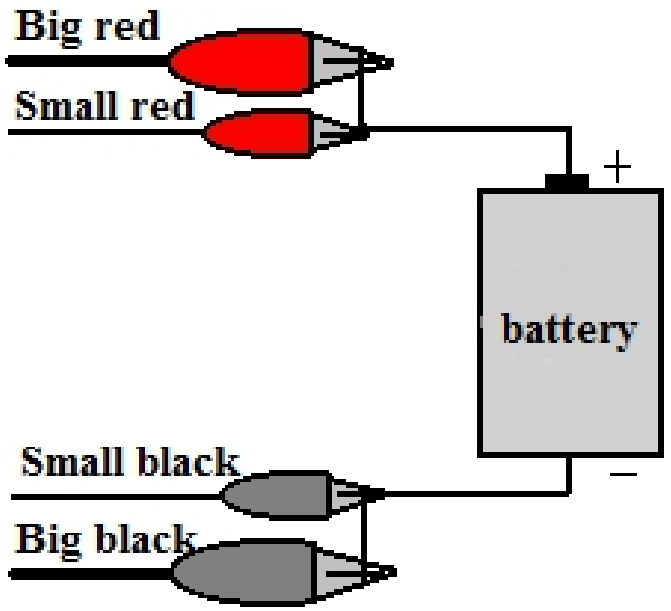


- If you have more than one testers, connect them **in series** with communication cables, and have the last one connect to the computer.

Start the equipment

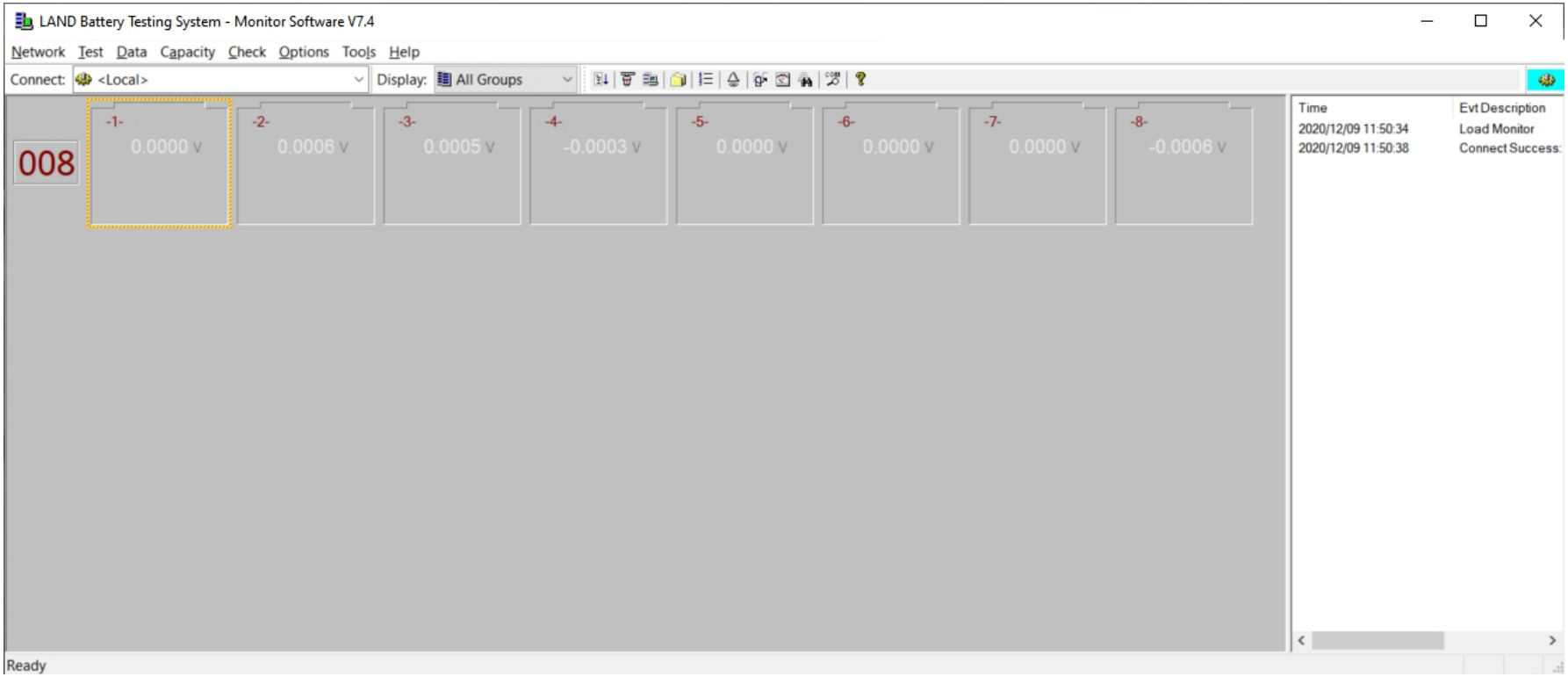
- Plug in the battery connecting cables into the channel slots
- Plug in the power cable for the equipment
- Turn on the computer
- Turn on the test machine
- Double click the “LANDMon” to start the data sampling program.
- If all connection is correct, the software will show all the test channels

Connecting the battery



- Big clips for current output/input, little clips for voltage measurement,
- Red clips connecting the positive of a battery, black clips connecting the negative.

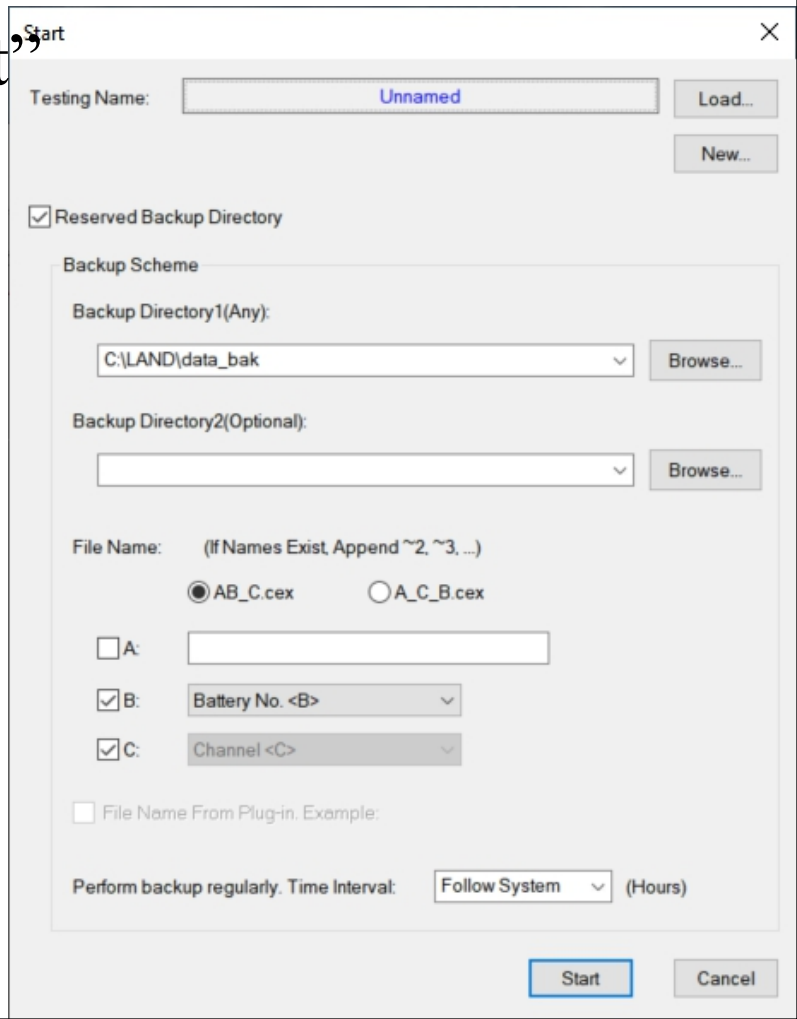
LAND Battery Testing System Software



- LandMon_V7 software comes with the hardware for free.
- Monitor software is for control and data sampling

Select a Channel

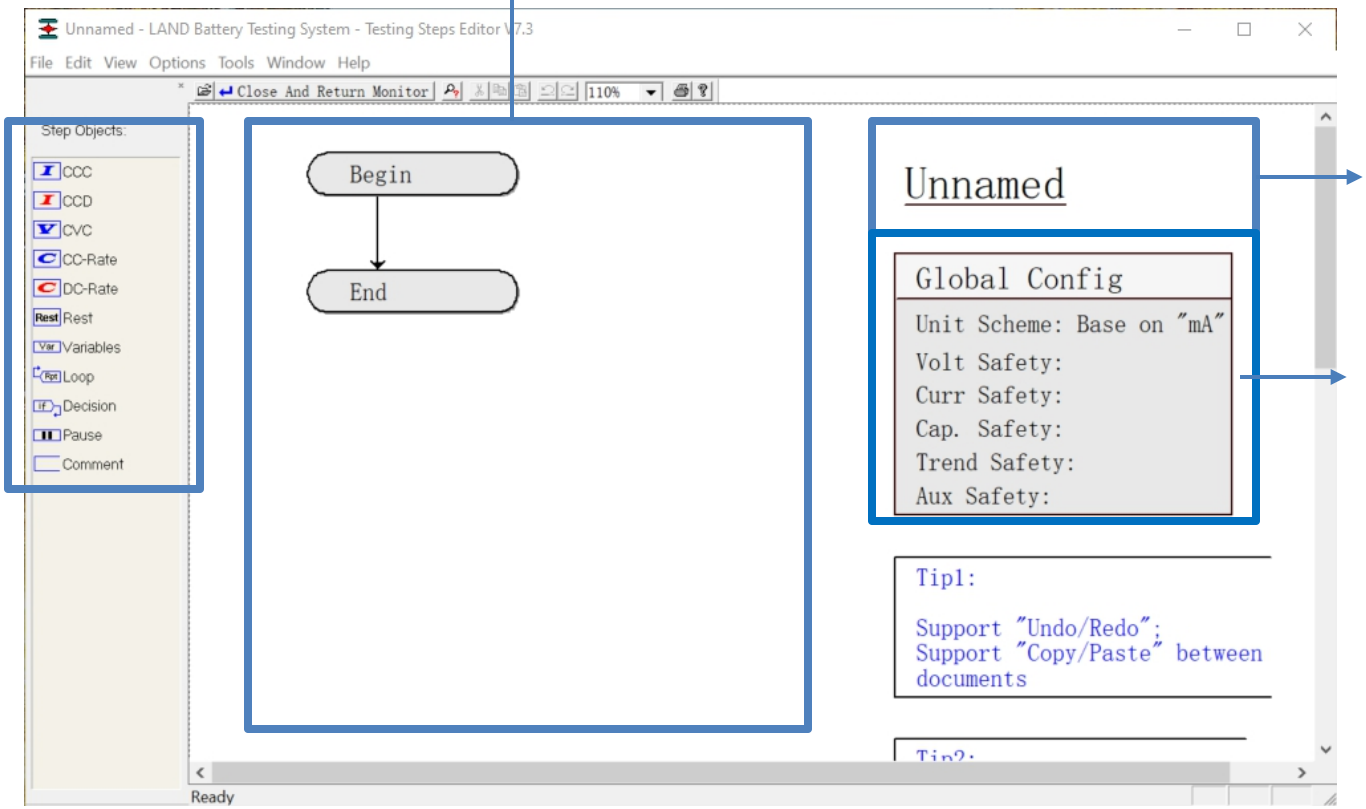
- Select a channel: Right click the channel number → Click “Start”
- Click test name to set up a test



Test Setup

Main procedure, with working steps dragged here to form a flow chart

Working Steps



Test name

Safety protection

Testing Steps Editor is independent program to schedule different cahrge/discharge tests. The file can be saved and loaded into the LANDMon.

Test Setup – Working Steps

- CCC: Constant Current Charge
- CCD: Constant Current Discharge
- CVC: Constant Voltage Charge
- CC-Rate: Constant C-Rate Charge
- DC-Rate: Constant C-Rate Discharge
- Rest: no current/voltage applied
- Variables: for complicated program
- Loop: cycling loop
- Decision: Decide what to do if a condition is met
- Pause: pause
- Comment: take notes

Test Setup – Working Steps

- Prime Parameter

  Define parameter for the step, e.g. current value for CCC & CCD, voltage for CVC, C-rate for CC/DC-rate.

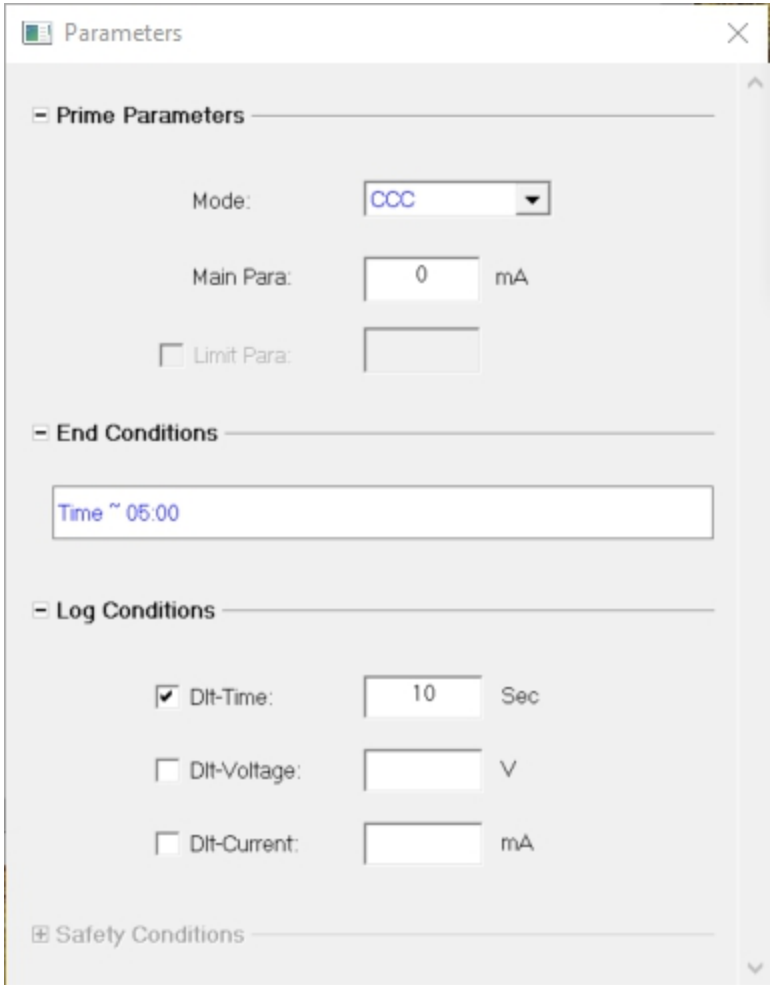
- End conditions

  Cut-off condition, e.g “Time ~ 05:00” (when step time reaches 5 min), “Voltage>=4.2V” (when voltage reaches 4.2V).

- Log Condition

  How to record the data, Dlt-Time (ΔT, every xx seconds), Dlt-Voltage (ΔV, very xx volt), Dlt-Current(ΔI, every xx mA)

- Steps can be cut, copied or deleted with right click the mouse

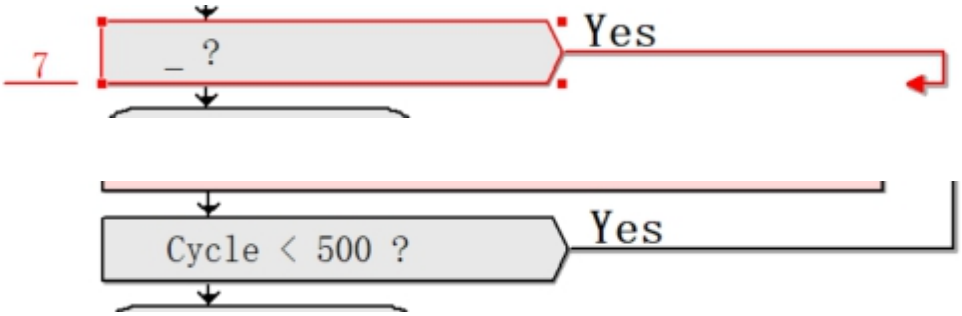


Test Setup – Schedule a Cycling Test

Several ways to do a cycling test

- Use “Loop”, drag the “Loop” into the flow chart. Move the red arrow to a previous step. This previous step can also be defined in the parameter window

- Use “Decision”, drag the “Decision” to a step, define it as “if cycle < 500 times then go to Step x”



Test Setup - Variables

Variables are only used for complicated tests

- 0→t1, define time variable t1=0, then timer t1 starts
- 0→C1, define capacity variable C1=0 mAh, then it starts to accumulate
- 0→N1, define counter variable N1=1
- N1+1→N1, variable N1 increases by 1
- 0→N2, define counter variable N2=1
- N2+1→N2, variable N1 increases by 1

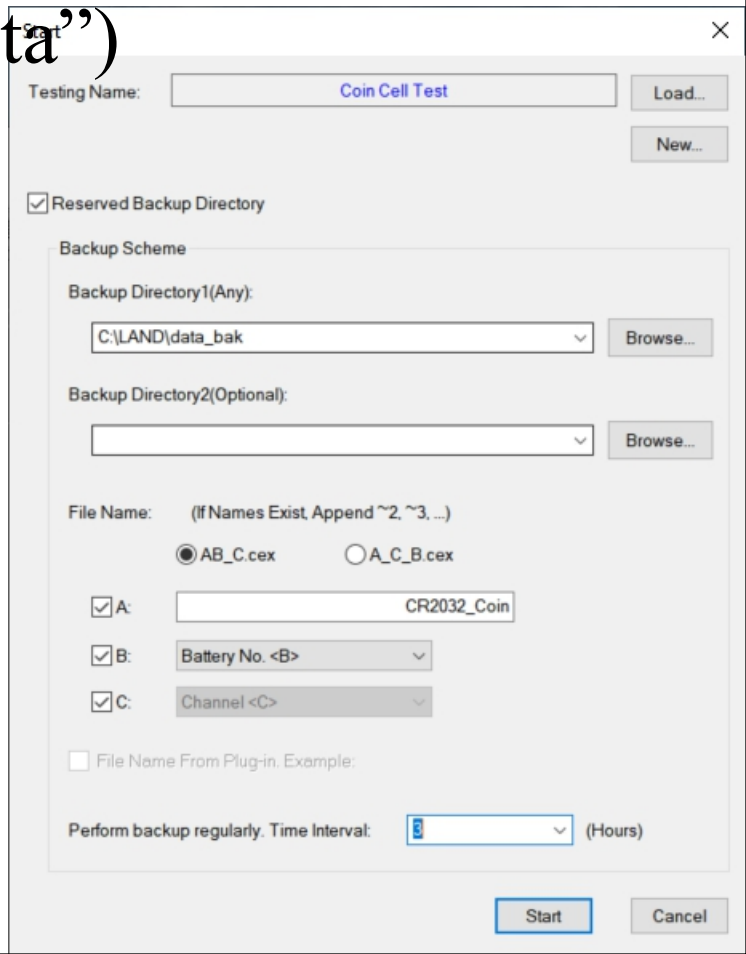
- Variables t1, C1, N1, & N2 are independent from each other
- The software does the accumulations for t1 and C1, but not for N1/N2

Start the Test

- The schedule is loaded in the channel
- Click “Start”, the system will start the test and collect data
- Data will be automatically saved in the folder “DATA_NOW” in the directory where the software was installed.
- Data is automatically named “_unit #_channel #”

Backup the Data

- Before/during the test, the data backup can be set. (if you already started, right click the channel number and choose “Backup Data”)
- In “Backup Directory” you can define how the data is backed up.
- The name can be defined as “AB_C”
  - A: whatever you want to name
  - B: Test start date
  - C: Channel number



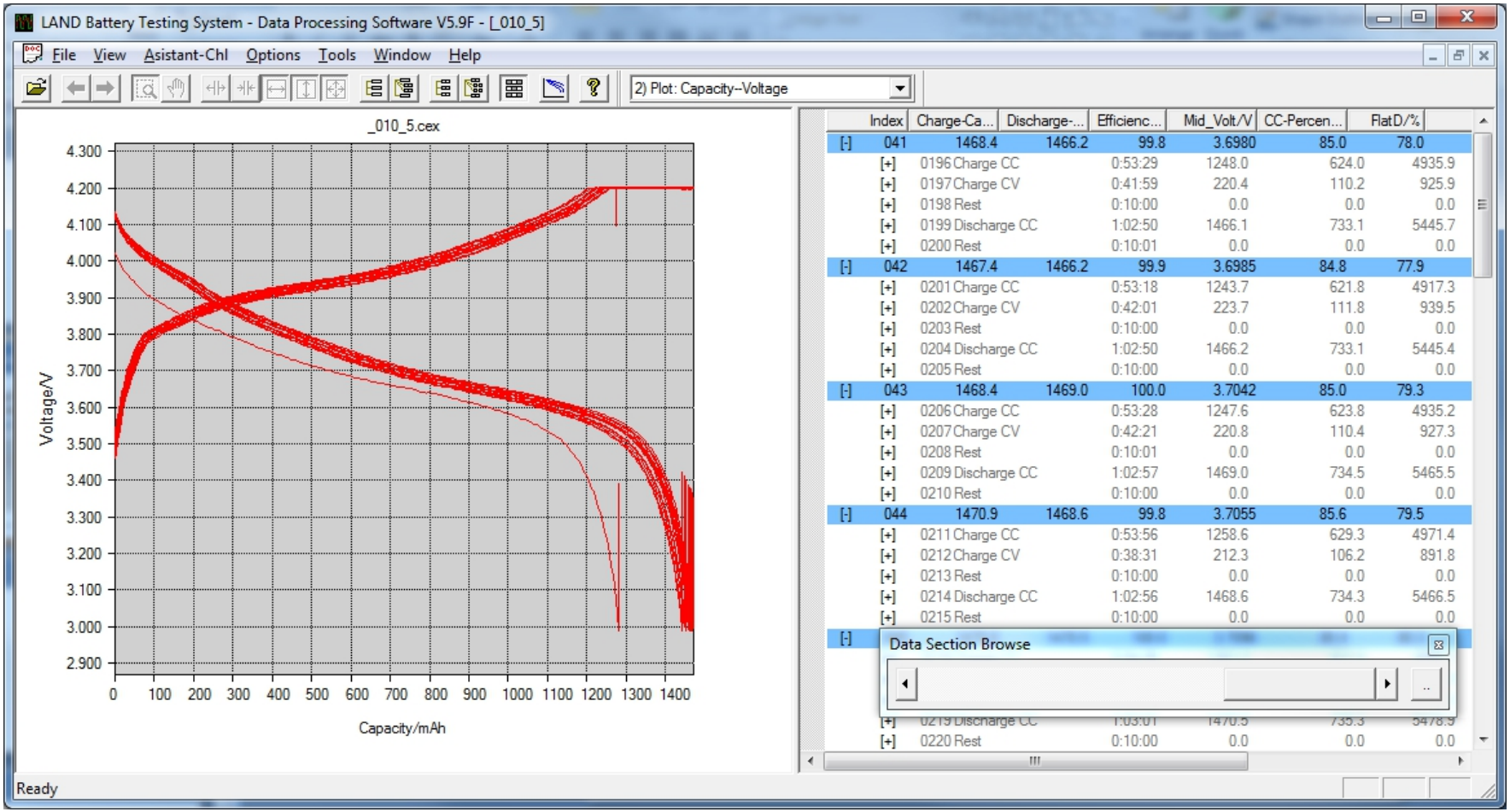
During the Test

- During the test, you can watch the data. Right click the channel and choose “Open Data”. The data will be opened.
- The testing parameters can also be modified. Right click → ‘Modify Parameters”. Click the test name. The parameters can be modified in the Editor.
- You can also skip some steps. Right click → “Jump”. Choose the step which you want the channel to jump to.

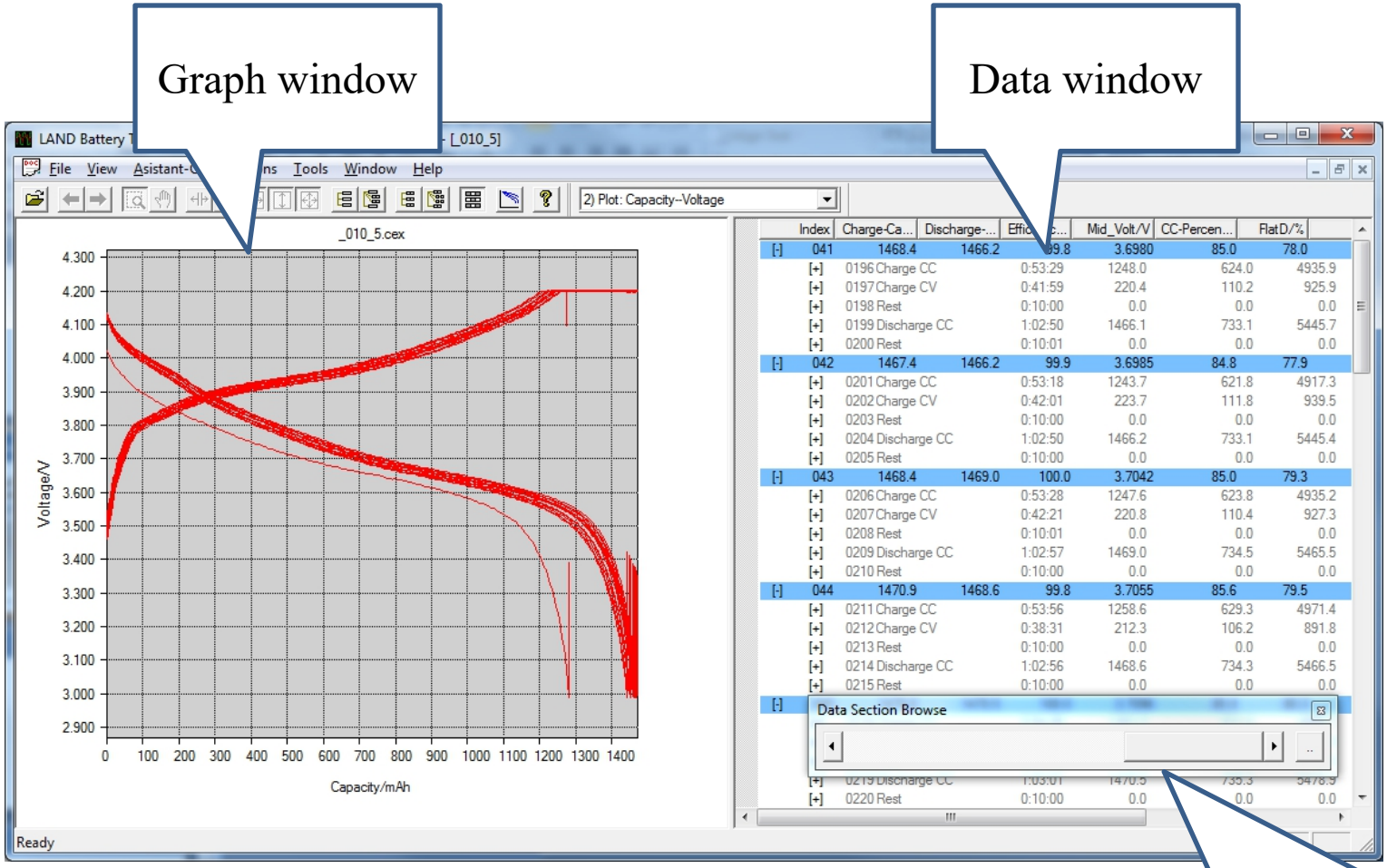
Data Process

Data Processing Software

- The Data Processing Software is to open, process and export the data



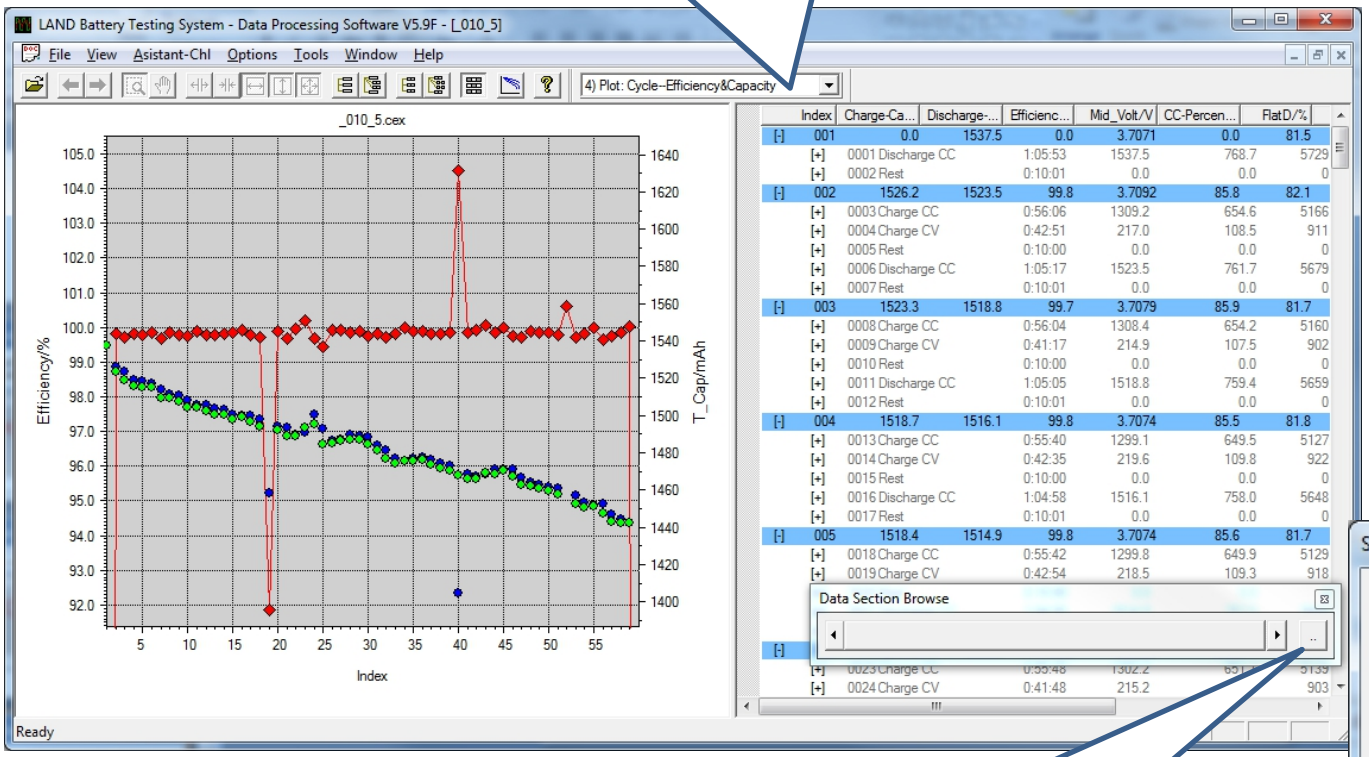
The interface

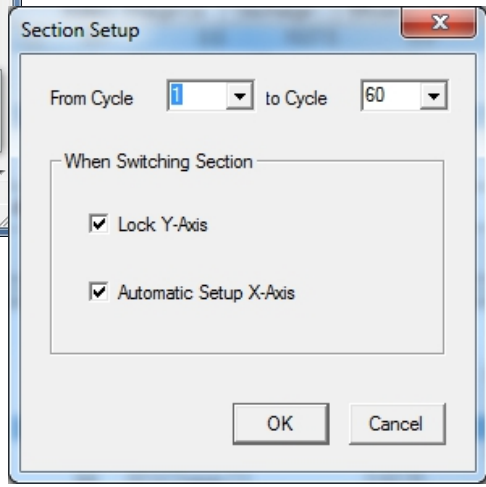


Data Section Browser: Select the cycle data that will show. Click the Box on the right to define.

Example (1): Export Capacity Cycling Data

Choose 4): Cycle-Efficiency& Capacity



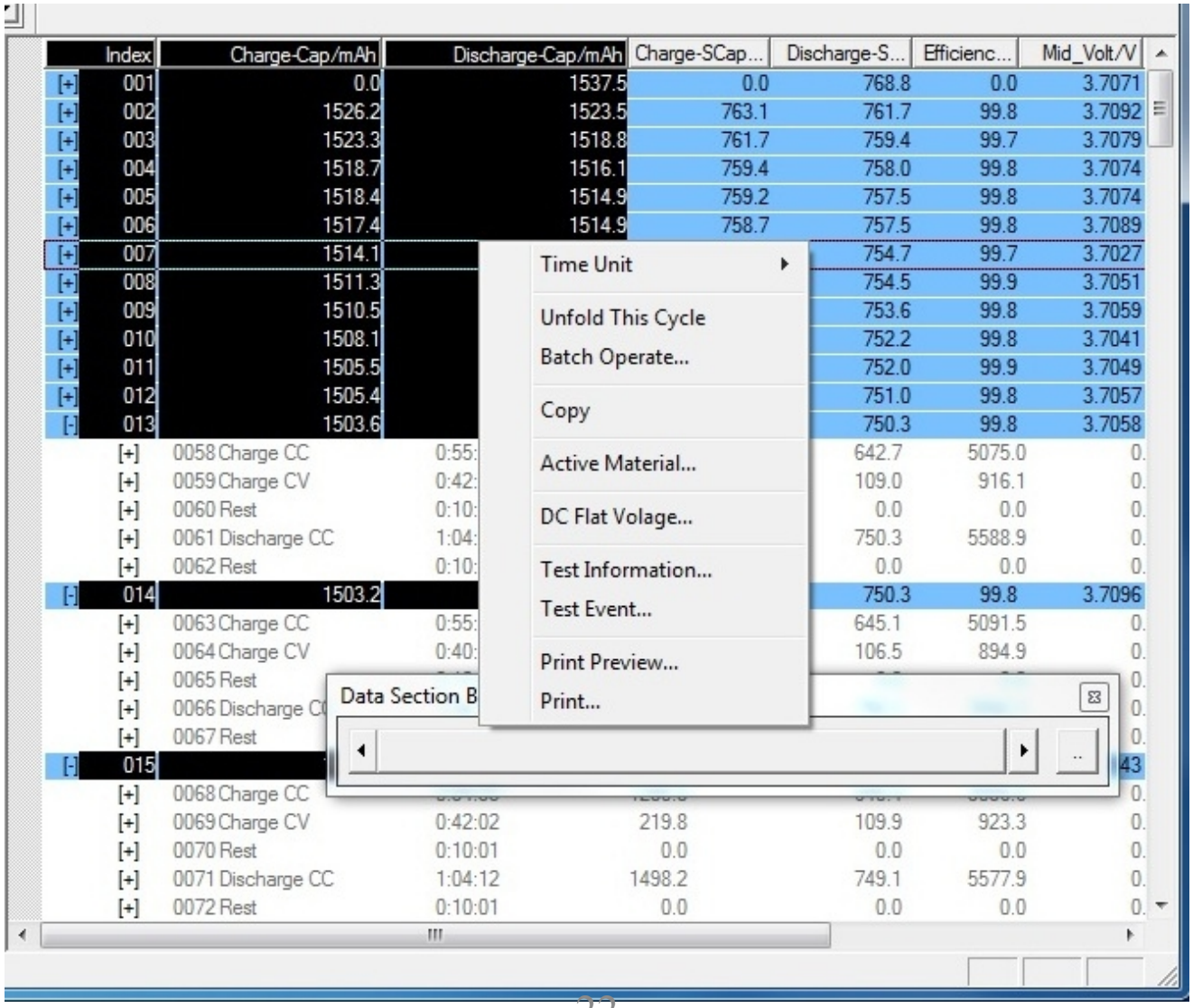


Click to define the cycle numbers

Example (1): Export Capacity Cycling Data

- Click [-] in the Index column to unfold the data for one cycle.
- Right click one row which has the cycle number
- Click the column title ‘Index”, Charge Cap”, and “Discharge-Cap” to select. (first click to select, second click to un-select).
- Right click the select data.
- Copy.
- Paste in Excel.

Example (1): Export Capacity Cycling Data



Example (2) Export the Data for One Cycle

- Click [+] before the cycle index to unfold the data for that cycle.
- Click [+] before the step number (0xxx Charge CC, 0xxx Charge CV or Discharge CC) to unfold the data
- Click any row of the data in that step. (note that the change of the column name).
- Click “Voltage/V” and “Capacity/mAh” to select.
- Copy and Paste.

Should you have any questions

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