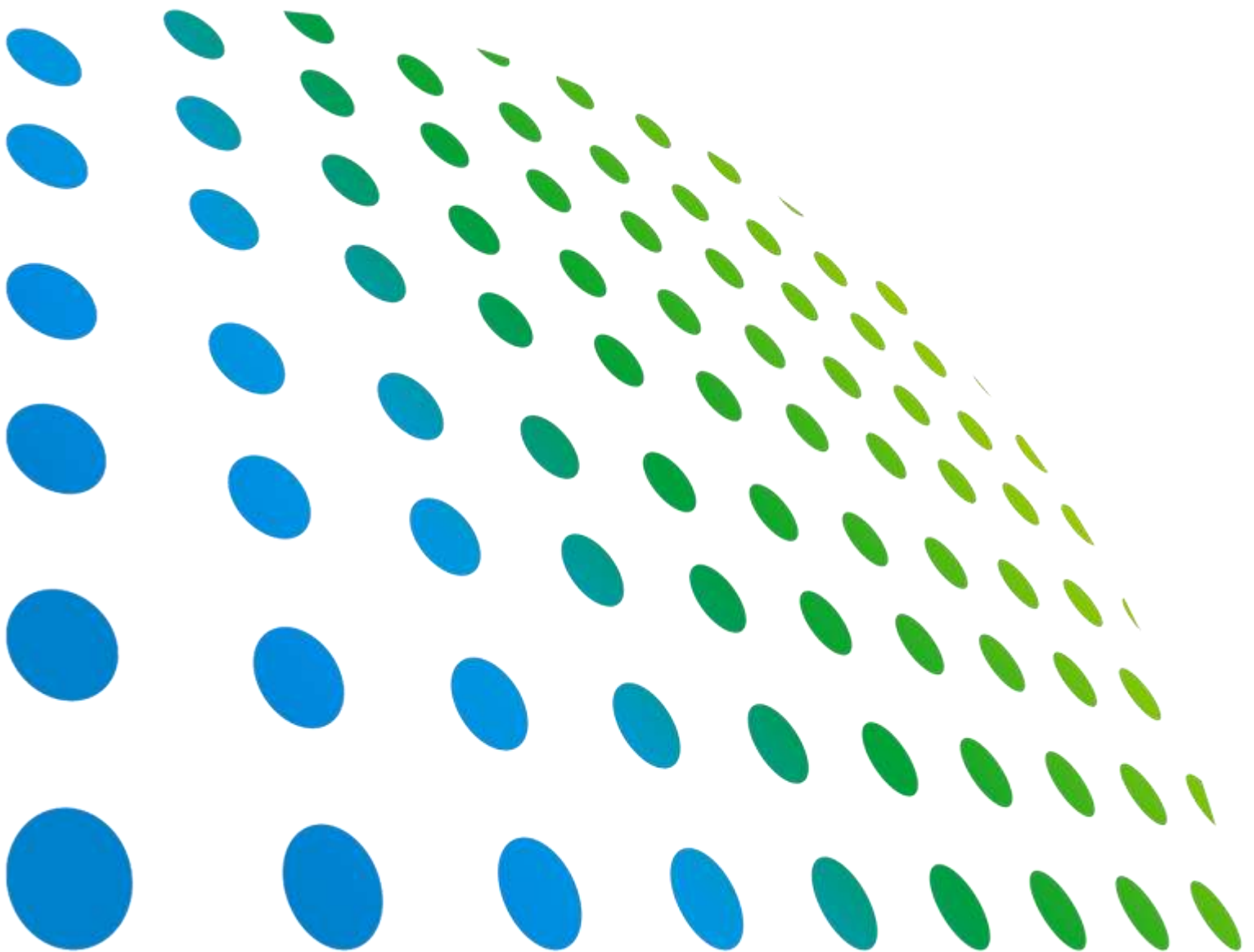




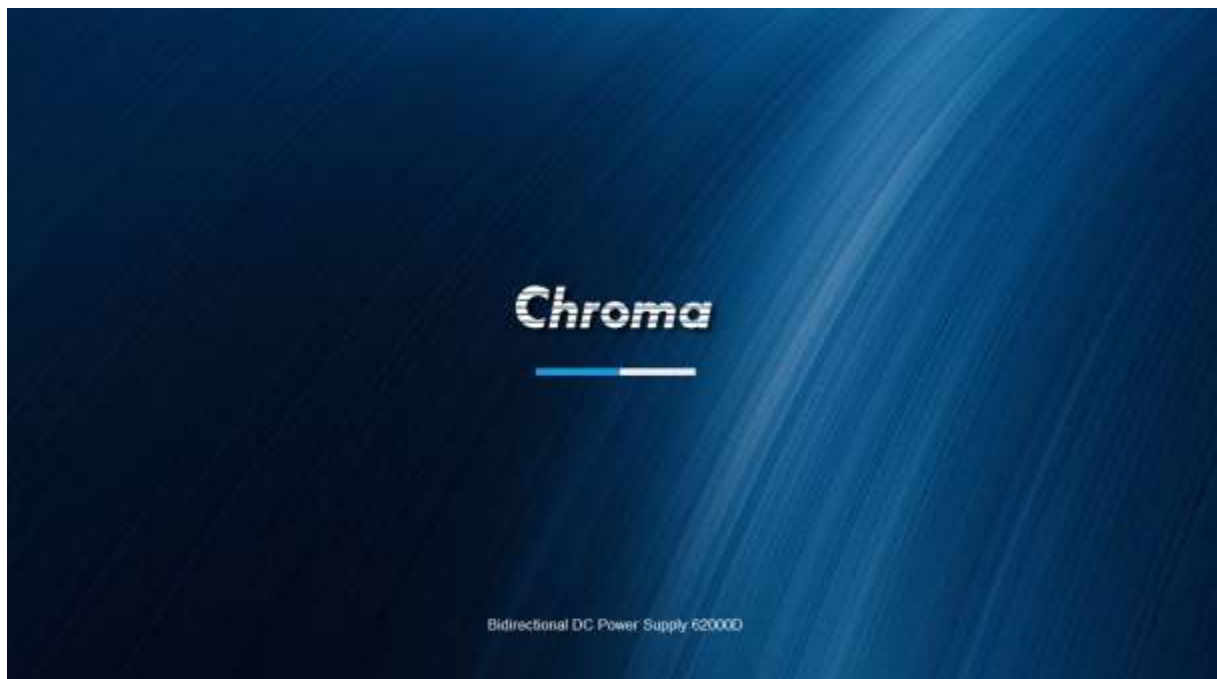
**Programmable Bidirectional
DC Power Supply
62000D Series
Software User's Manual**



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Programmable Bidirectional DC Power Supply 62000D Series Software User's Manual



Version 1.1
March 2021

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Revision History

The following lists the additions, deletions and modifications in this manual at each revision.

Date	Version	Revised Sections
Jul. 2020	1.0	Complete this manual.
Mar. 2021	1.1	Modify the software display screens and delete part of Battery function. Modify “ <i>Hardware and Software Requirements</i> ” section in “ <i>System Architecture</i> ” chapter. Add “ <i>Fuel Cell</i> ” and “ <i>All Page</i> ” sections to “ <i>Using the Soft Panel</i> ” chapter.

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1. System Architecture

This chapter describes the architecture of 62000D Series software, the hardware applied and the functions comprised.

1.1 Introduction

This software allows users to easily operate the 62000D Series models with communication interface varies with model. The supported interfaces include GPIB, USB, and Ethernet that can link to the PC for control.

1.2 Communication Interface

The communication interfaces supported for connecting PC and power supply are:

1. GPIB
2. USB
3. Ethernet

1.3 Hardware and Software Requirements

Since the executive program is large, the recommended hardware and software system requirements for the PC are as follows:

- .Net Framework 3.5, 4.0, 4.5, and 4.6.1 version for installation
- Office 2010 or above
- Intel(R) Core(TM) i5 3.30GHz or above CPU
- 320GB or above storage available hard disk
- At least 8GB memory available
- CD drive with 40x speed or above
- Monitor screen resolution 1920x1080 or 1366*768
- Keyboard
- USB mouse
- At least one USB port for hardware protection key use
- Windows 7 SP1/8/10 or above operating system
- LabVIEW Runtime 18.5 and LabVIEW VISA 18.5

1.4 Software Installation

The NI VISA Run-Time engine must be installed before using the 62000D software. It also needs to install the 488.2 driver if GPIB is in use. The following chapter will introduce how to install the software in Windows environment.

1.5 Installing 62000D Software

1. Place the CD in the CD drive, and a Setup.exe program will execute automatically. If not, you can execute it manually.

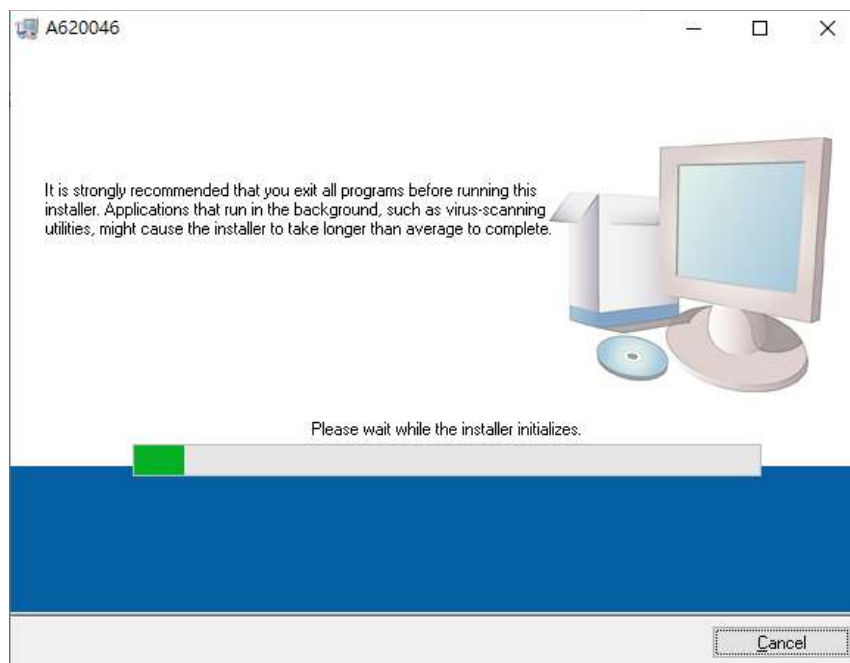


Figure 1-1 Soft Panel Auto Installation

2. Select the installation path
It starts installing the application. The program is default installed in C:\Program Files\Chroma\. If it needs to change the installation path, click **Browse...** and specify the desired path for installation as the figure shown below.

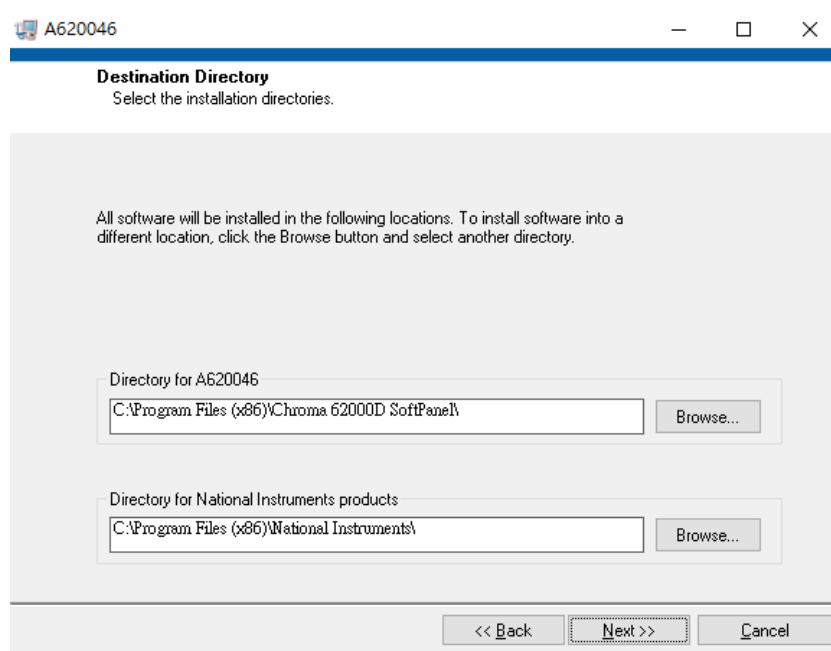


Figure 1-2 A620046 Soft Panel Installation Path

3. Click **Next >>** as indicated by the message to continue the installation.

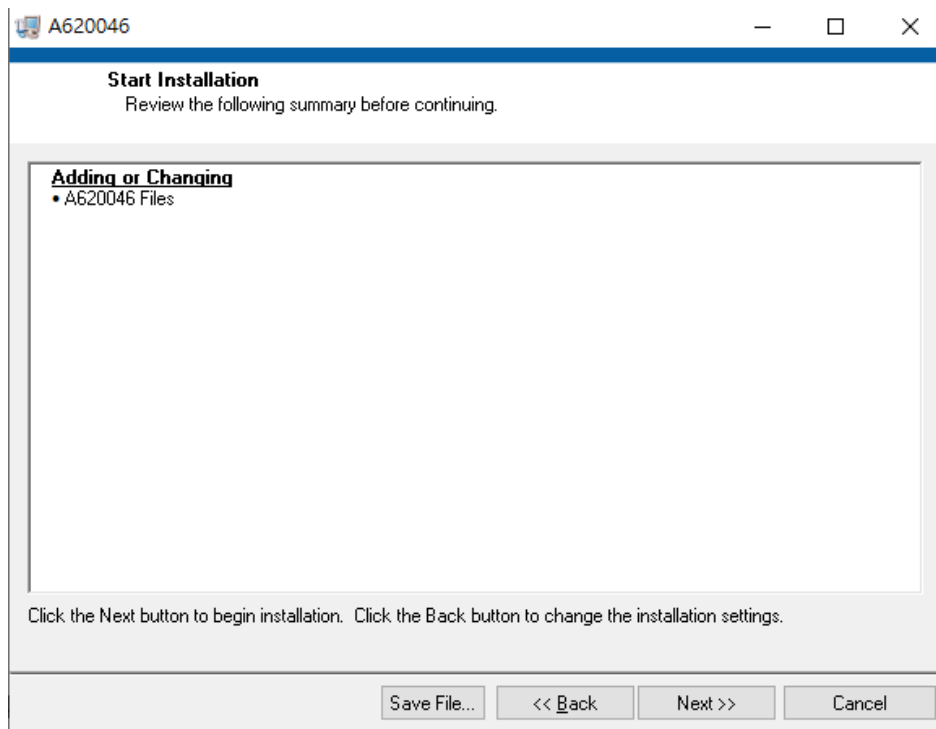


Figure 1-3 Start Installation

4. The installation complete screen appears when it is done.

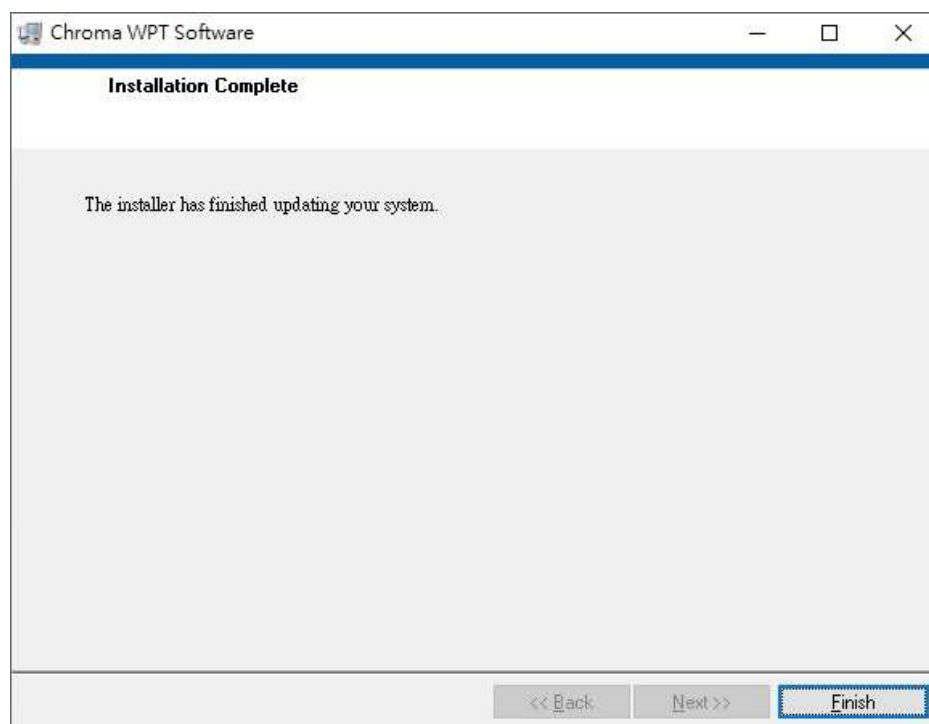


Figure 1-4 Installation Complete

1.6 Executing the Soft Panel

When the installation is done, click Start → Chroma → Chroma 62000D Soft Panel to start the Chroma 62000D Soft Panel application.

The PDF files of Chinese and English software user's manuals are available in the CD shipped with the power supply under Manual directory for you to use.

1.7 Uninstalling 62000D Soft Panel

To remove the Chroma 62000D Soft Panel, it is suggested to click Start → Setup → Control Panel → Adding/Removing Program to uninstall the software related item.

2. Using the Soft Panel

2.1 Functions Description

There are five major units available for control and operation including Fixed Mode, List Mode, Step Mode, Automotive Test System, and Battery Simulator as described below.

2.1.1 Fixed Mode

This panel provides the related settings of Fixed Mode as shown in Figure 2-1.



Figure 2-1 Fixed Mode

- Vset: It sets the voltage.
- Load Current: It sets the Load Current (A).
- Load Power: It sets the Load Power (W).
- Source Current: It sets the Source Current (A).
- Source Power: It sets the Source Power (W).
- Output: It turns the output on or off.
- Point: It sets the points for displaying in the graph below.
- Sample rate (Sec): It sets the time interval of each point in the graph below.
- Measurement Voltage: It displays the measured voltage (V).
- Measurement Current: It displays the measured current (A).
- Measurement Power: It displays the measured power (W).
- Measurement Graph: It displays the measured time interval set in Sample rate.
- CC/CV Display: It shows the present mode to be CC or CV.
- Source & Load: It shows the present function to be Source or Load.

2.1.2 List Mode

This panel provides the related setting of List Mode as shown in



Figure 2-2.



Figure 2-2 List Mode

- Table: It can edit the sequence parameters of selected Program NO.
- Program NO.: It sets the present Table to Program NO_X. When switching to different Program NO, the sequence, Program Chain and Run Count listed in the table will change as well.
- Program Chain: When the sequences and Run Count of the Program NO are all executed, it follows the Program Chain set to change to next Program NO for output.
- Run Count: It sets the number of times for the Program NO to repeat.
- Output Status: It turns the power output on or off (derived from Fixed Mode).

- Trigger: It follows the edited sequence to execute the program for output.
- Point: It sets the points for displaying in the graph below.
- Sample rate (Sec): It sets the time interval of each point in the graph below.
- Measurement Voltage: It displays the measured voltage (V).
- Measurement Current: It displays the measured current (A).
- Measurement Power: It displays the measured power (W).
- Measurement Graph: It displays the measured time interval set in Sample rate.
- Preview Chart: When the table is edited, it will show a preview chart informing you the output waveform. It will indicate the present output voltage on the chart when the Trigger is ON.
- Total Time: It shows the total time of present and chained programs (EX: Assuming 20 seconds for Program NO1 and 40 seconds for Program NO2, the time will show 60 seconds when ProgramNO1 is chained to ProgramNO2.)
- Current Time: It shows the program executed time.
- Source & Load: It shows the present function is Source or Load.

2.1.3 Step Mode

This panel provides the related setting of Step Mode as shown in Figure 2-3.



Figure 2-3 DC Load

- Output Status: It turns the power output on or off (derived from Fixed Mode).
- Trigger: It follows the edited sequence to execute the program for output.
- Point: It sets the points for displaying in the chart below.
- Sample rate (Sec): It sets the time interval of each point in the chart below.
- Measurement Voltage: It displays the measured voltage (V).
- Measurement Current: It displays the measured current (A).
- Measurement Power: It displays the measured power (W).
- Measurement Graph: It displays the measured time interval set in Sample rate.
- Preview Chart: When the table is edited, it will show a preview chart informing you the output waveform. It will indicate the present output voltage on the chart when the Trigger is ON.

- Start Voltage: It sets the start voltage (V) in Step mode.
- End Voltage: It sets the end voltage (V) in Step mode.
- Run Time: It sets the run time (sec) in Step mode.
- Source & Load: It shows the present function is Source or Load.
- Total time: It shows the set total time.
- Current Time: It shows the program executed time.

2.1.4 Automotive Test Standard

This panel provides the related setting of Automotive Test Standard as shown in



Figure 2-4.



Figure 2-4 Automotive Test Standard

- Test Item: There are LV123 and LV148 test standards available for selection.
- Graph: It shows the preview chart of executed standard.
- Parameter: It shows the preview chart.
- Parameter Example: It shows the chart of standard and the parameters represented in the chart of standard.
- Test Condition Select: It selects the test conditions. There is a User Define test condition; however, in order to comply with the standard not all parameters are valid for editing.

- Table: It displays the parameters under different test items. The one with blue background is valid for user editing.
- Count Now: It shows number of times the standard executed.
- Total Time: It shows the total time of present test.
- Time Count: It shows the time elapsed for the standard test at present.
- Start Voltage: It sets the start voltage for the power supply output before performing standard test.
- CC Limit: It sets the current maximum output limit.
- Count: It sets the number of time for the standard to repeat.
- Output Status: It turns the power output on or off.
- Trigger: It turns the standard test on or off.

2.1.5 Battery Simulator


This panel provides the related setting of Battery Simulator.

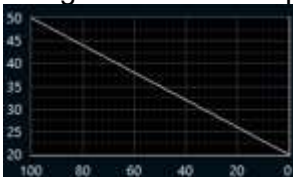


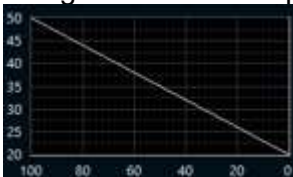
Figure 2-5 Battery Simulator Panel

- SOC: The SOC (%) calculated by the software.



- : It shows the battery SOC that increases when charged and decreases discharged.
- Charge SOC: It shows the SOC during charge. It will not update during discharge but remain displaying the last data.
- Charge Capacity (Ah): It shows the charged capacity. It will not update during discharge but remain displaying the last data.
- Charge Energy (kWh): It shows the charged energy. It will not update during discharge but remain displaying the last data.
- Discharge SOC: It shows the SOC during discharge. It will not update during charge but remain displaying the last data.
- Discharge Capacity (Ah): It shows the discharged capacity. It will not update during charge but remain displaying the last data.
- Discharge Energy (kWh): It shows the discharged energy. It will not update during charge but remain displaying the last data.



- : It simulates the curve of battery voltage vs. SOC
- OCV: It shows the output OCV value.
- DCR: It shows the output DCR value.
- SOC (%): It shows the output SOC value.




: There are three battery models for editing as shown below.

Basic:

- Voltage on 100% SOC (V): It sets the voltage for 100% SOC.
- Voltage on 0% SOC (V): It set the voltage for 0%SOC.
- DCR (Ω): It sets the resistance.
- Total Capacity: It sets the total capacity.

OCV VS Capacity:

- Sheet: It sets the worksheet to be loaded.
- Column (V): It sets the column of loaded worksheet to be the voltage parameters.
- Column (AH): It sets the column of loaded worksheet to be the Ampere-hour parameters.
- DCR (Ω): It sets the resistance of DCR.
- Current (A): It sets the current.
- Data Number Start: It sets the column number to start testing.
- Data Number End: It sets the column number to end testing.
- Total Capacity (AH): It sets the total capacity.
- : It sets the path for file download.
- Download: It downloads the data of specified file.

OCV VS SOC:

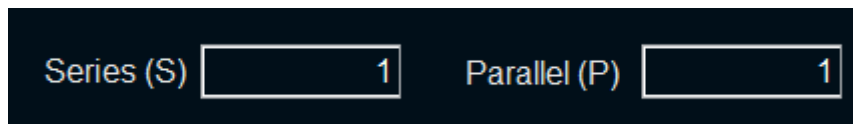
- Sheet: It sets the worksheet to be loaded.
- Column (V): It sets the column of loaded worksheet to be the voltage parameters.
- Column (SOC): It sets the column of loaded worksheet to be the SOC parameters.
- DCR (Ω): It sets the resistance of DCR.
- Current (A): It sets the current.
- Data Number Start: It sets the column number to start testing.
- Data Number End: It sets the column number to end testing.
- Total Capacity (AH): It sets the total capacity.



- : It sets the path for file download.
- Download: It downloads the data of specified file.



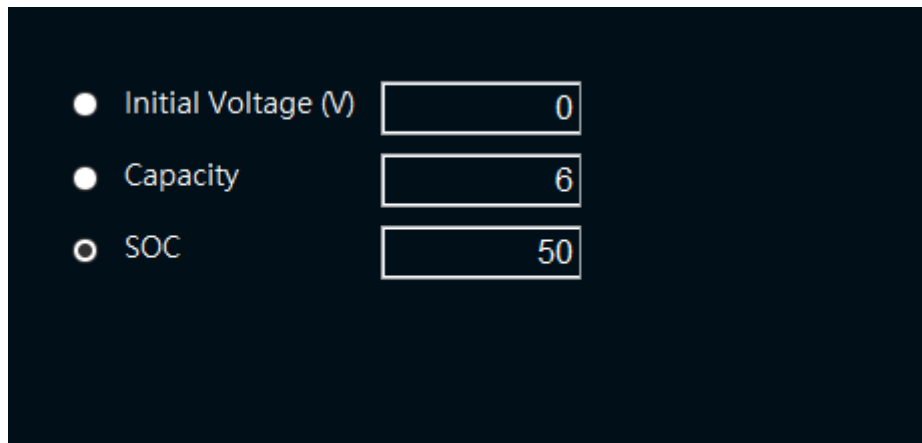
: It sets the battery numbers connected in series or parallel.



- Series (S): It sets the numbers connected in series.
- Parallel (P): It sets the numbers connected in parallel.



: It sets the initial state.



- Initial Voltage (V): It sets the initial voltage after output.
- Capacity: It sets the initial capacity for output.
- SOC: It sets the initial SOC for output.

2.1.6 Fuel Cell



Figure 2-6 Fuel Cell Panel

- **Basic**: The graph is drawn by fixed voltage and current.
- **Cell Number**: Sets the number of cells to be connected in series or parallel. The voltage varies with this setting.
- **Area**: Sets the parallel number and the current varies with the setting.
- **Output**: Performs the output of fuel cell.
- **Measurement Voltage**: Displays the measured voltage.
- **Measurement Current**: Displays the measured current.
- **Measurement Power**: Displays the measured power.
- **Chart**: Displays the current value preview of the curve based on the set Cell Number and Area variables.

Setting

Table Mode Download

Sheet Sheet1 Data Number start 1

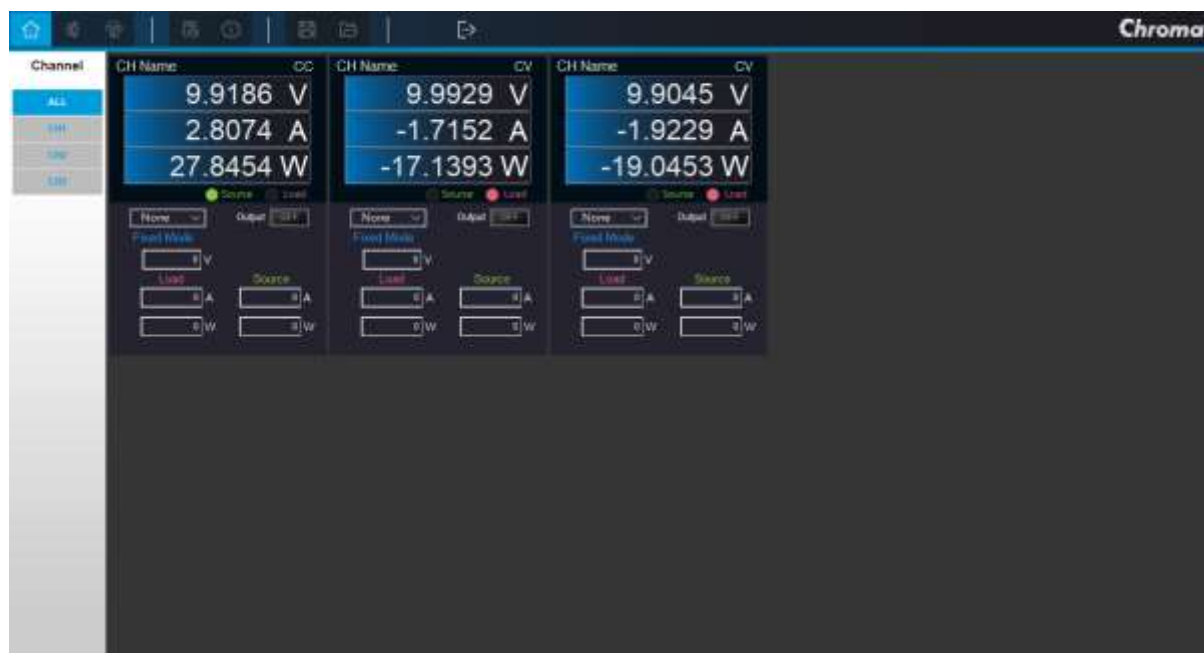
Voltage Column A Data Number end 1

Current Column E

Cell Number 1

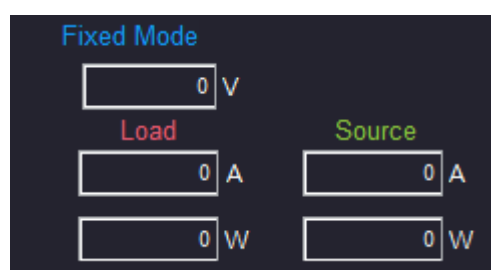
- Table Mode: Loads the customized curve mode of Excel.
- Sheet: Sets the sheet to be loaded.
- Voltage Column: Sets the column of voltage from the loaded worksheet.
- Current Column: Sets the column of current from the loaded worksheet.
- Data Number Start: Sets the data number from the specified line to start testing.
- Data Number End: Sets the data number from the specified line to end testing.

2.1.7 ALL Pages

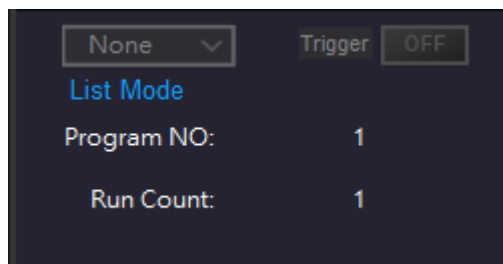


It displays the total channel number set at present, including the CC/CV mode, measured voltage, current, power and mode it is in for each channel. Except Fixed function, all power supply parameters cannot be set but only output in Fixed and Step mode. Since the battery simulator does not support ALL pages, do not enter into it when in Battery mode.

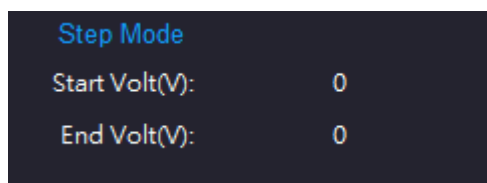
- Measurement Voltage: Displays the measured voltage.
- Measurement Current: Displays the measured current.
- Measurement Power: Displays the measured power.
- Output/Trigger: Outputs or executes the Program mode.



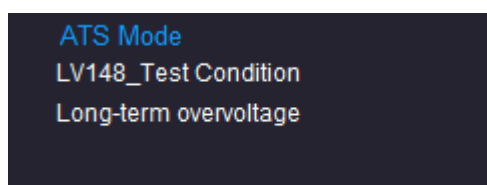
- : Sets the Fixed Mode voltage, Load current, Load power, Source current and Source power.



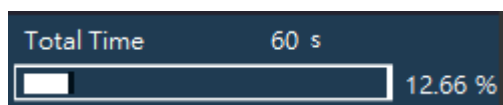
- : Displays the program beginning number and run count in List mode.



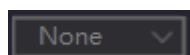
- : Displays the program beginning and end voltage in Step mode.



- : Displays the name, item and parameter of regulation to be executed in ATS mode.



- : Displays the total time and progress bar along with percentage executed in Program mode.



- : In Fixed mode, this function can be used to copy parameters and write to the channel. For example, CH1 has set the parameter, and CH2 wants to use the same parameter, clicking =CH1 in this function, the parameter of CH2 will be overwritten by CH1 parameter. Be aware not to produce infinite loops when using this function (Ex: CH1=CH2, CH2=CH1).

2.2 Toolbar Description

2.2.1 System Setup

This panel provides setting parameters for connection as shown in Figure 2-7.

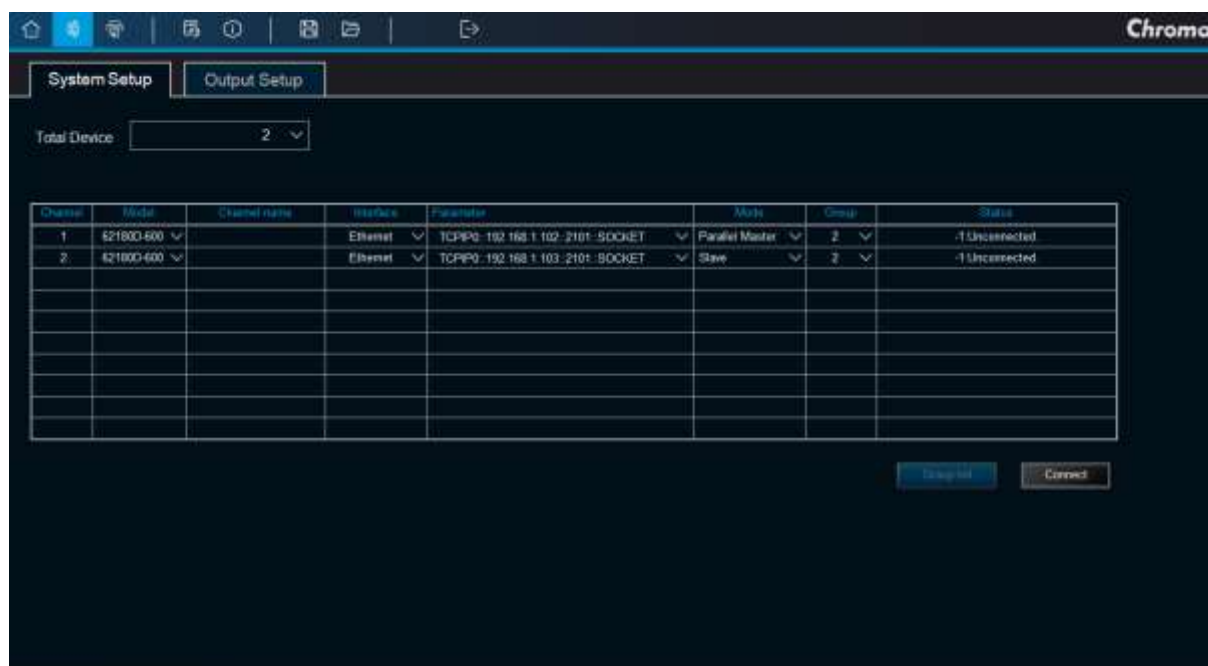


Figure 2-7

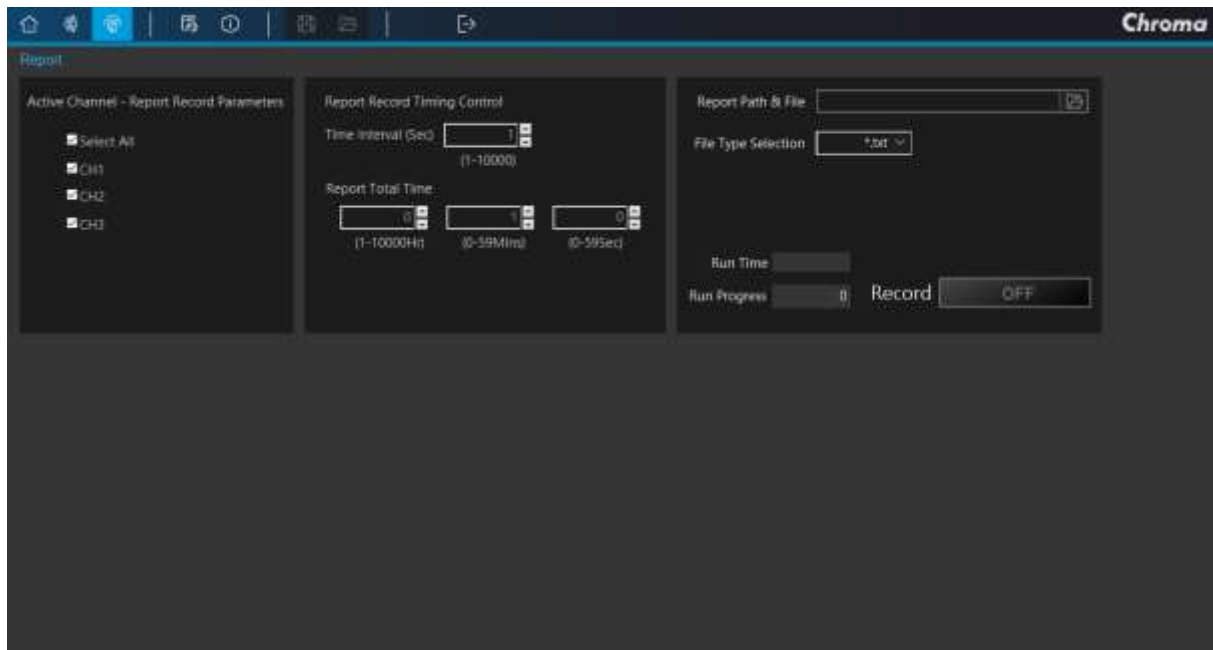
- Total Device: It is the estimated total number of connected devices.
- Channel: It shows the channel number of each device.
- Model: It sets the model number to be connected. It is unable to connect if the model no. does not match.
- Channel name: You can set the channel name for recording.
- Interface: It selects the communication interface to be used.
- Parameter: You can select or set the communication address. (The USB/GPIB will auto scan the connected device; however, the Ethernet has to be set for use.)
- Mode: It sets the Master/Slave/Standalone usage.
- Group: Both Master and Slave should to be in the same group and no other Master is in the group when using the Master/Slave function.
- Status: It shows the connecting status to power supply.
- Group Init: Click it to initialize the set Master/Slave for grouping.
- Connect: It connects the device.

2.2.2 Output Setup

[illegible]

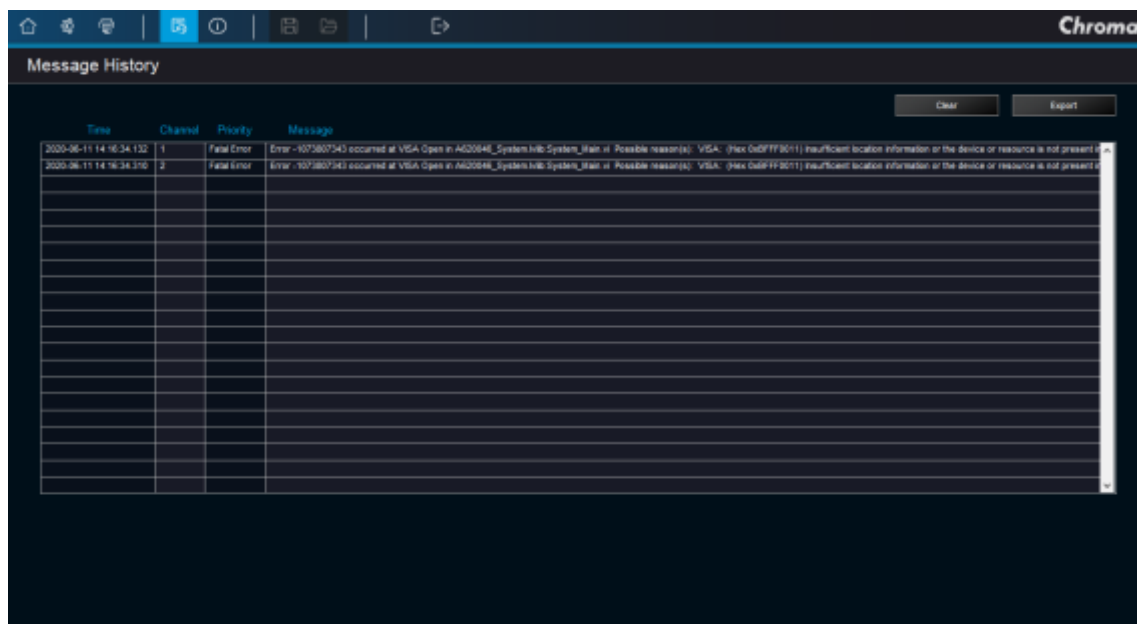
- Channel: It shows the channel number.
- Priority: It sets the priority of CC and CV modes.
- V Limit Max (V): It sets the maximum limit of channel voltage.
- V Limit Min (V): It sets the minimum limit of channel voltage.
- I Limit Max (A): It sets the maximum limit of channel current.
- I Limit Min (A): It sets the minimum limit of channel current.
- VSR (V/ms): It sets the maximum slew rate of channel voltage.
- ISR (A/ms): It sets the maximum slew rate of channel current.
- OVP (V): The OVP value will automatically bring in when the power supply is connected.
- OCP Source (A): The OCP Source value will automatically bring in when the power supply is connected.
- OCP Sink (A): The OCP Sink value will automatically bring in when the power supply is connected.
- OPP Source (W): The OPP Source value will automatically bring in when the power supply is connected.
- OPP Sink (W): The OPP Sink value will automatically bring in when the power supply is connected.

2.2.3 Report



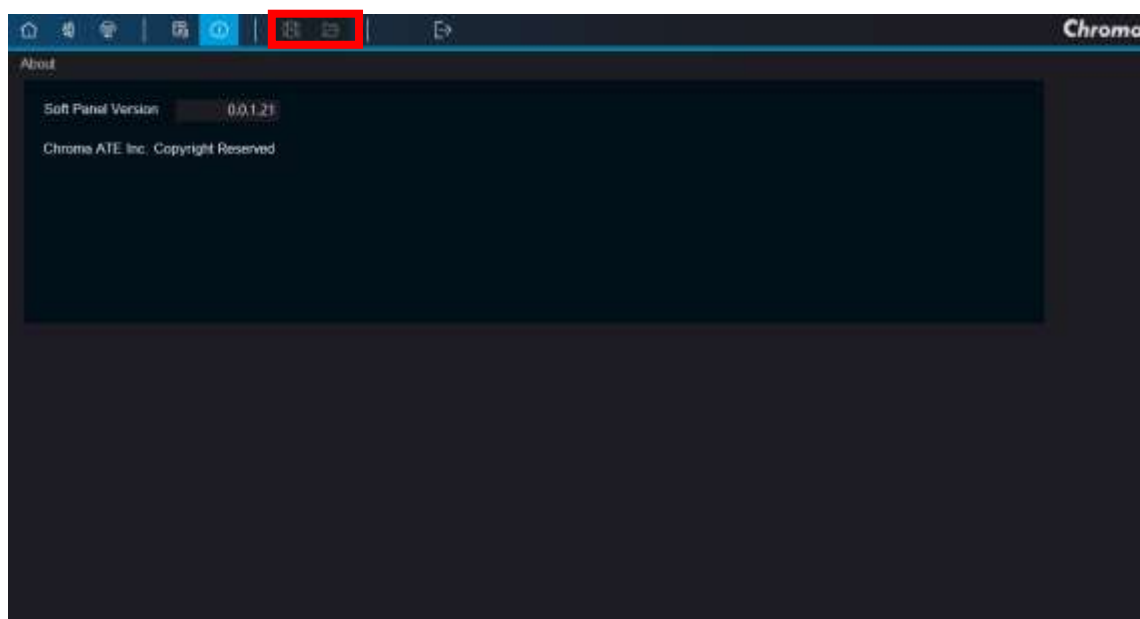
- Active Channel: It selects the channel to generate a report.
- Time Interval (Sec): It sets the time interval of each recording entry.
- Report Total Time: It sets the total time for generating a report.
- Report Path & File: It sets the path for report generation.
- File Type Selection: It sets the file saving format.
- Run Time: It displays the time spent for recording.
- Run Progress: It shows the executing percentage.
- Record: It turns recording on or off.

2.2.4 Message History



- Time: It shows the error generated date and time.
- Channel: It shows the channel number with error.
- Priority: It shows the severity of error message.
- Message: It shows the content of error message.
- Clear: It clears the displayed error message.
- Export: It outputs the error report.

2.2.5 About



It shows the soft panel version number.

Save/Open: It saves the present panel or opens a file (be sure the imported file matches the connected model.)

2.2.6 Exit

It exits the soft panel.





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