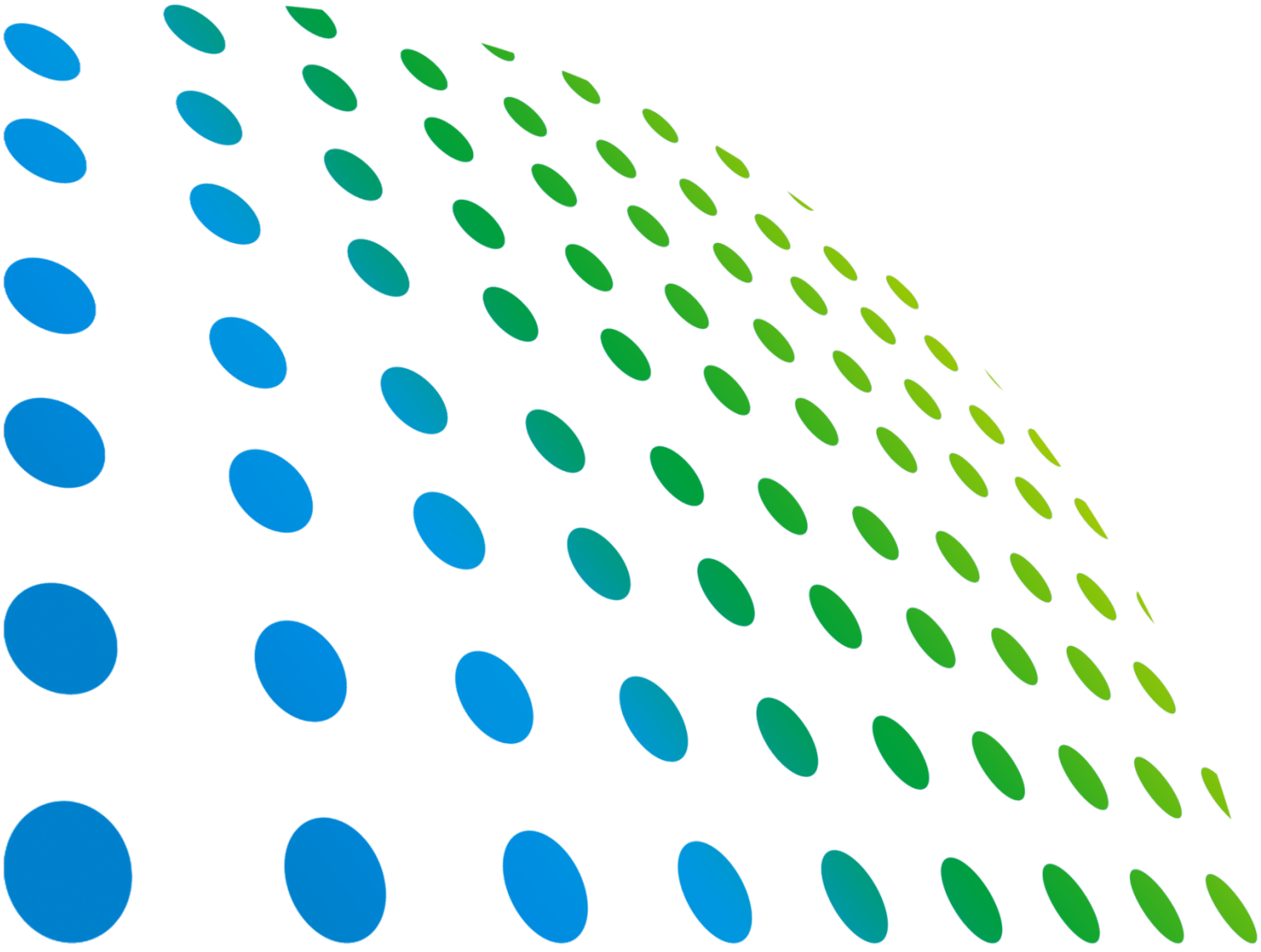
Chroma

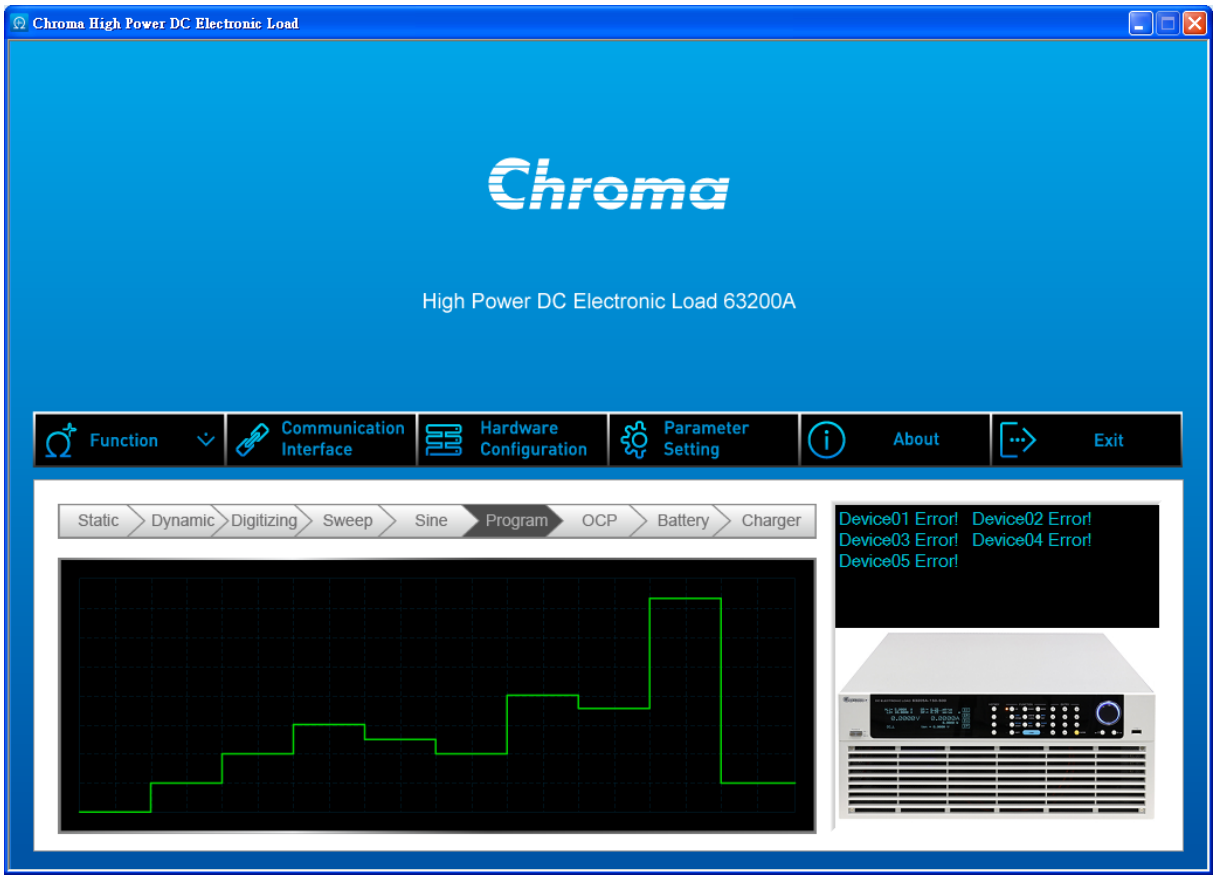
Programmable DC Electronic Load

63200A Series

Soft Panel User's Manual



Programmable
DC Electronic Load
63200A Series
Soft Panel User's Manual



Version 1.2
March 2016

Legal Notices

The information in this document is subject to change without notice.

Chroma ATE INC. makes no warranty of any kind with regard to this manual, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Chroma ATE INC. shall not be held liable for errors contained herein or direct, indirect, special, incidental or consequential damages in connection with the furnishing, performance, or use of this material.

CHROMA ATE INC.
66 Huaya 1st Road, Guishan, Taoyuan 33383, Taiwan

Warranty

All of Chroma's instruments are warranted against defects in material and workmanship for a period of one year from date of shipment. Chroma agrees to repair or replace any assembly or component found to be defective, under normal use during this period. Chroma's obligation under this warranty is limited solely to repairing any such instrument, which in Chroma's sole opinion proves to be defective within the scope of the warranty when returned to the factory or to an authorized service center. Purchaser is responsible for the shipping and cost of the service item to Chroma factory or service center. Shipment should not be made without prior authorization by Chroma.

This warranty does not apply to any products repaired or altered by persons not authorized by Chroma, or not in accordance with instructions furnished by Chroma. If the instrument is defective as a result of misuse, improper repair, or abnormal conditions or operations, repairs will be billed at cost.

Chroma assumes no responsibility for its product being used in a hazardous or dangerous manner either alone or in conjunction with other equipment. High voltage used in some instruments may be dangerous if misused. Special disclaimers apply to these instruments. Chroma assumes no liability for secondary charges or consequential damages and in any event, Chroma's liability for breach of warranty under any contract or otherwise, shall not exceed the purchase price of the specific instrument shipped and against which a claim is made.

Any recommendations made by Chroma regarding the use of its products are based upon tests believed to be reliable; Chroma makes no warranty of the results to be obtained. This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for Chroma any liability in connection with the sale of our products other than set forth herein.

CHROMA ATE INC.
66 Huaya 1st Road, Guishan,
Taoyuan 33383, Taiwan
Tel: 886-3-327-9999
Fax: 886-3-327-8898
e-mail: info@chromaate.com

http://www.chromaate.com

Revision History

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

Date	Version	Revised Sections
Nov. 2015	1.0	Complete this manual.
Jan. 2016	1.1	Add “Current Limit” parameter.
Mar. 2016	1.2	Add “CV Response” parameter.

Table of Contents

1. System Structure

This chapter explains the structure and functions of Chroma DC Load 63200A Soft Panel application. The supported instruments and communication interfaces are listed below for the user to identify the required environment easily.

1.1 Introduction

This software is applicable to Chroma DC Load 63200A only. The remote transmission between PC and the device must be active before using the software in order to communicate by commands.

The software application can perform internal parameter settings and monitor the output measurement. In addition, the software is able to save the parameter settings and create reports so that user can open an existing file for execution from hard disk easily.

1.2 Supported Hardware

The following models of Chroma 63200A Series DC Electronic Load can be programmed for control:

63204A-150-400
63205A-150-500
63206A-150-600

63204A-600-280
63205A-600-350
63206A-600-420

63204A-1200-160
63205A-1200-200
63206A-1200-240

1.3 Communication Interface

There are three types of communication interfaces between PC and 63200A Series Programmable DC Electronic Load.

A. USB
B. GPIB (option)
C. Ethernet (option)

1.4 Operation

Please the mouse pointer along with keyboard input to perform selection and operation.

1.5 Software & Hardware Requirements

The soft panel program is quite large; therefore, the following PC software and hardware environments are suggested.

- Intel CPU 2GHz or above
- Microsoft Windows XP / Win7(32Bits)
- At least 20GB hard disk space
- At least 1GB memory
- VGA or SVGA color monitor
- PS2 mouse

2. Installation

First, install the DC Load 63200A Soft Panel software application to the hard disk on PC before using it. This chapter describes how to install the software on Windows step by step.

Before installation, ensure there is at least 400 MB or above hard disk space on PC. Place the Chroma DC Load 63200A Soft Panel CD into the CD drive.

2.1 Files in CD

The CD contains the files shown in Figure 2-1.

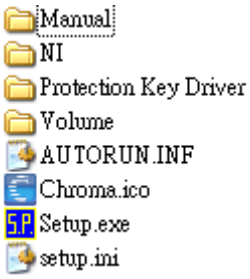


Figure 2-1 Files in CD

2.2 Installing Chroma 63200A Soft Panel

Place the CD into the CD drive and execute “Setup.exe” to start the installation. Follow the steps and instructions listed below to complete the installation.

Step 1
Double-click “Setup.exe” and select “**Chroma 63200A Soft Panel**” in the window appeared as shown below.

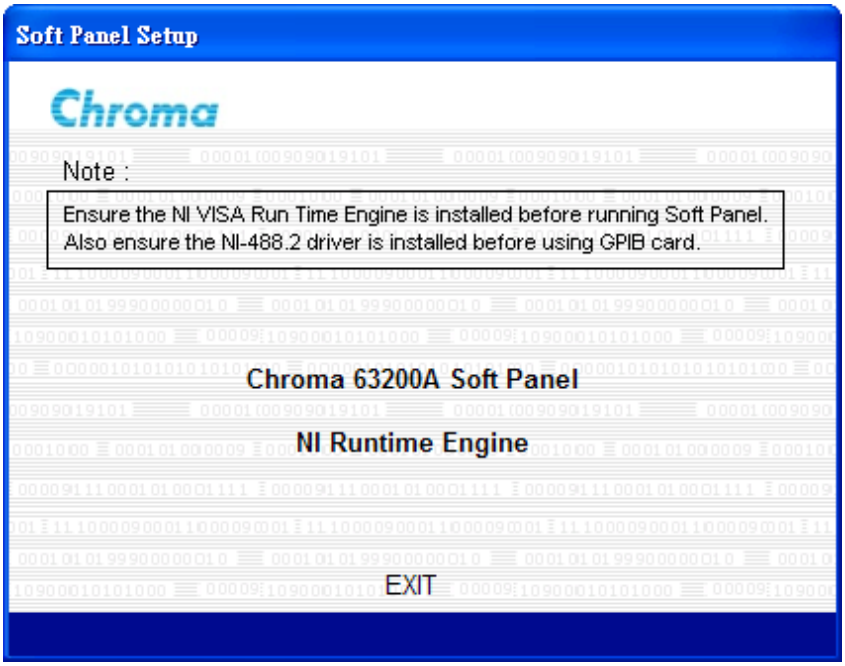


Figure 2-2 Chroma 63200A Soft Panel Setup Window

Step 2

Select the installation path. The program is default installed in `C:\Program Files\Chroma\63200A Soft Panel\` directory. To change it, click **Browse…** to specify the path for installation and click **Next >** to go on.

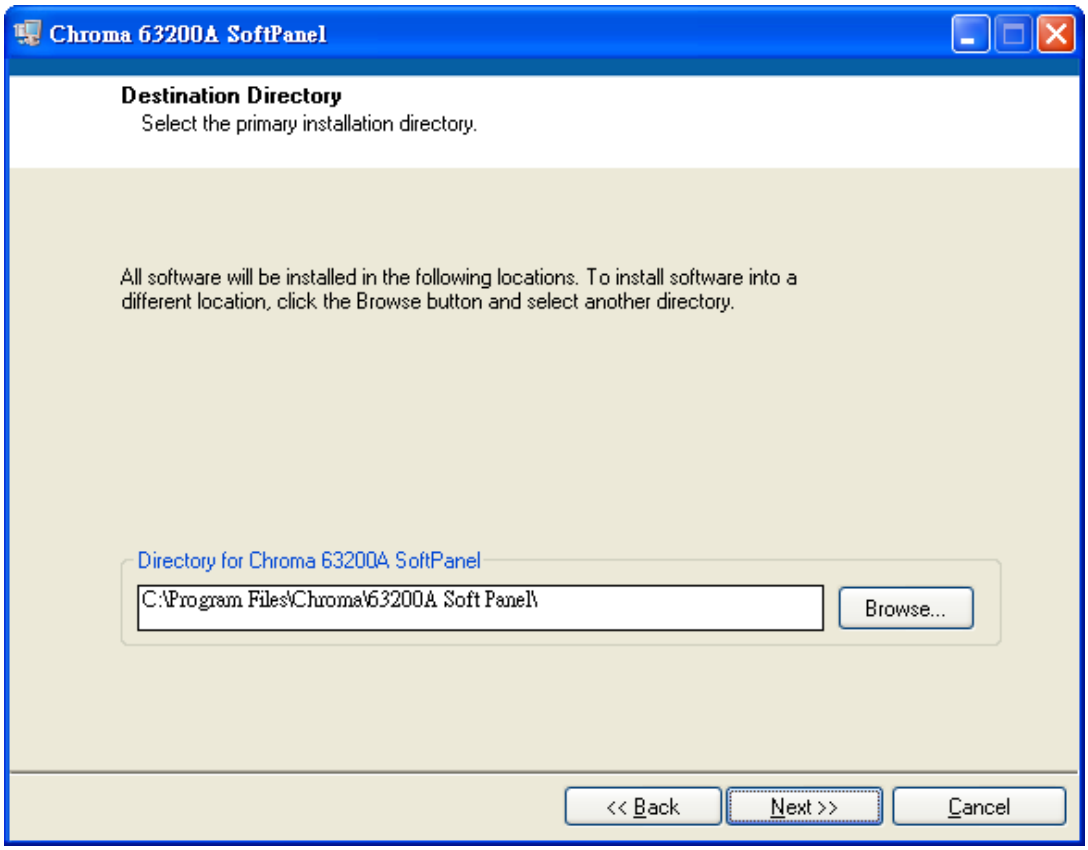


Figure 2-3 Selecting Chroma 63200A Soft Panel Installation Path

It is ready to install the application and click **Next >>** to continue the installation.

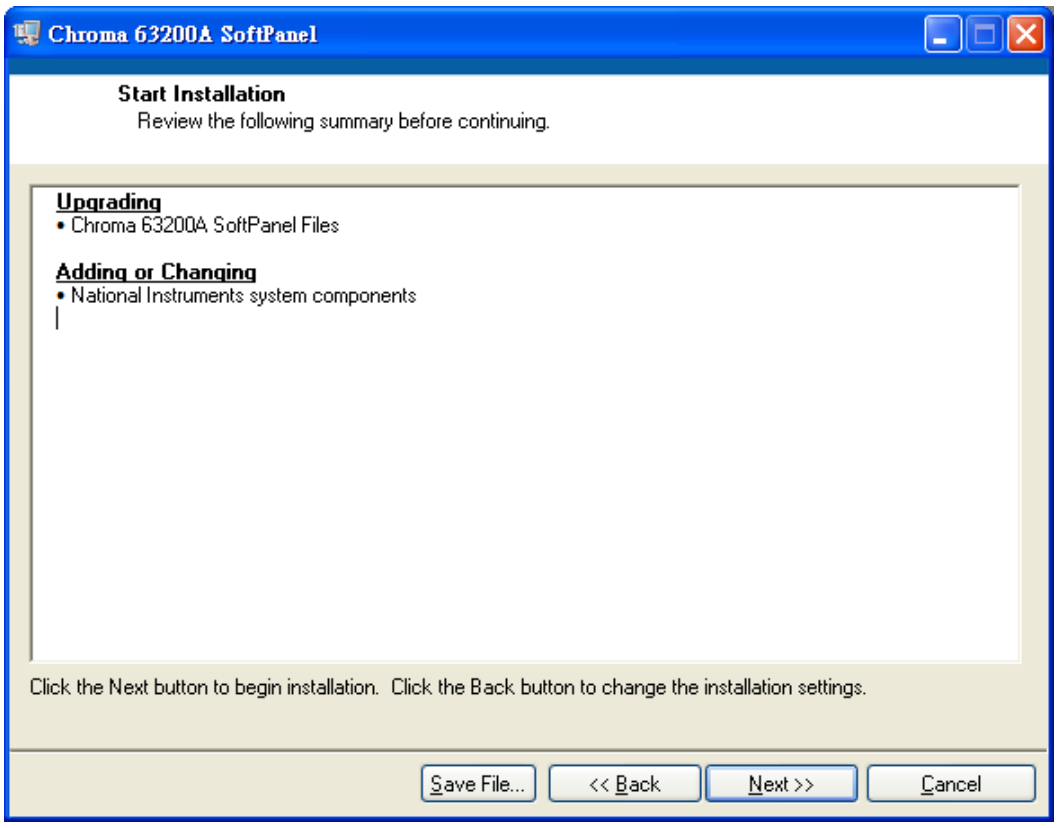


Figure 2-4 Ready to Install Chroma 63200A Soft Panel

The screen shows the installation progress. Click **Cancel** to undo the installation if there is any error.

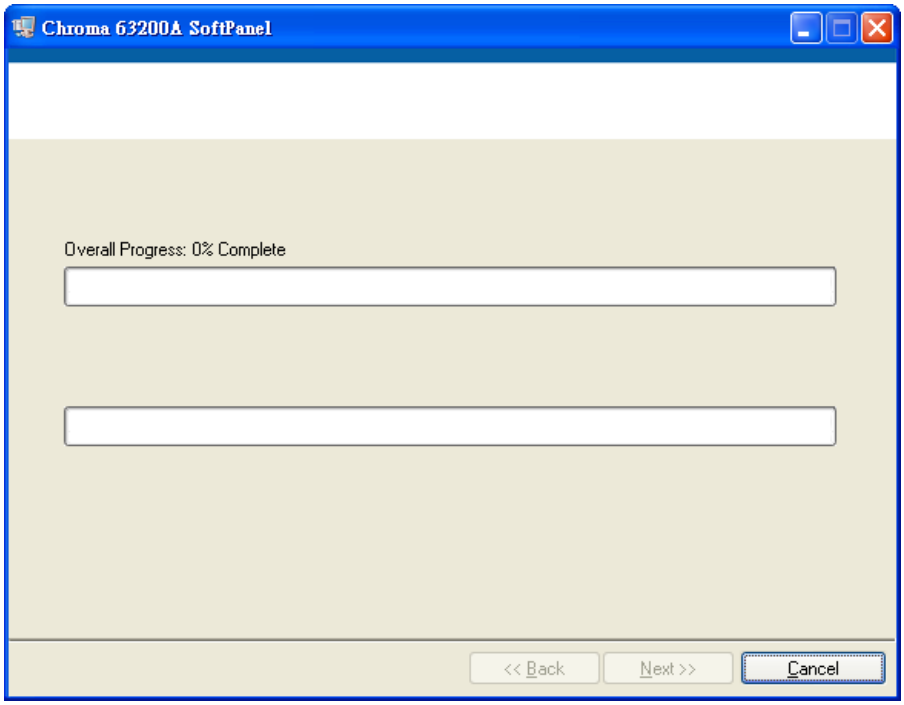


Figure 2-5 Chroma 63200A Soft Panel Installation Progress

The window shows the installation is completed.

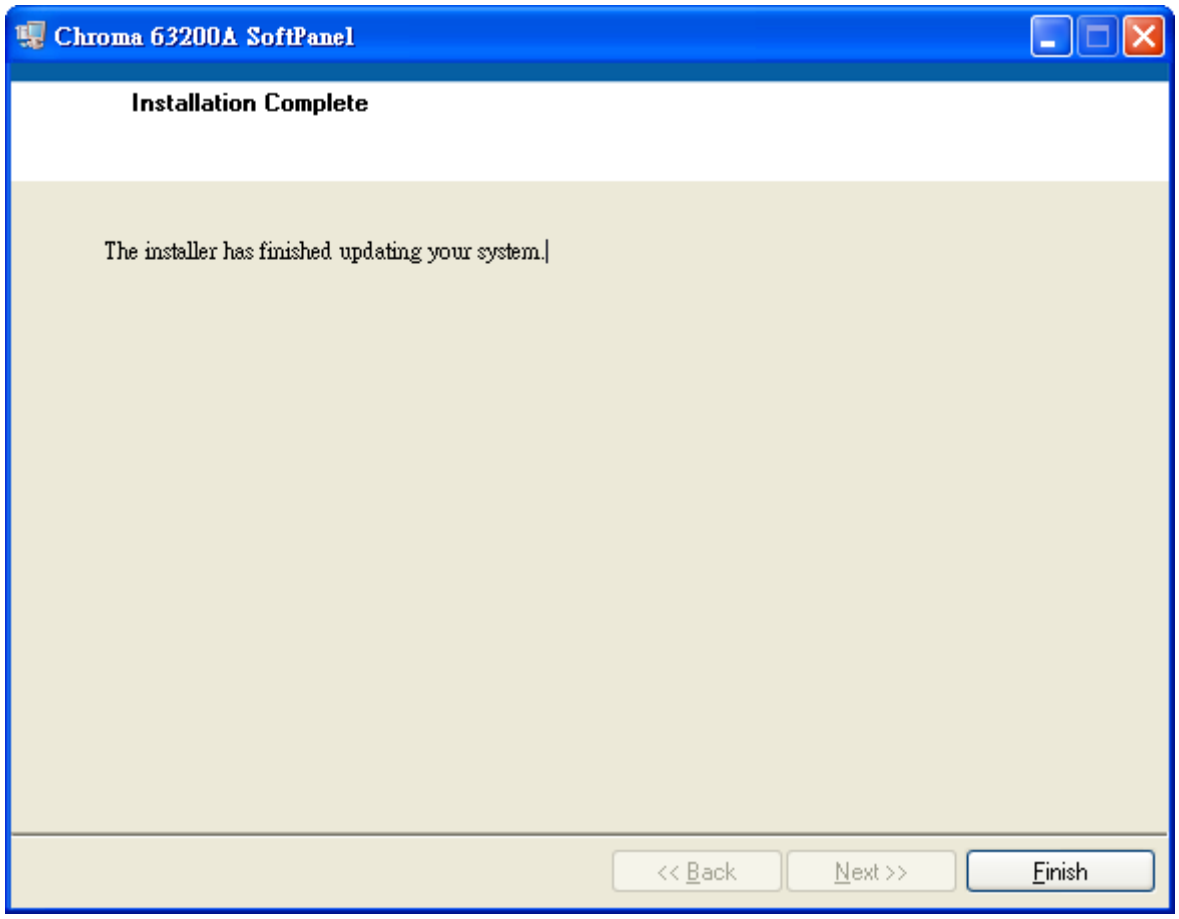


Figure 2-6 Chroma 63200A Soft Panel Installation Completed

2.3 Installing NI Runtime Engine

NI Runtime Engine is required software. There are two files in NI Runtime Engine for installation - LabVIEW Runtime Engine and NI VISA Runtime Engine. Skip this section if your PC already has LabVIEW Runtime Engine 2014 and VISA Runtime Engine 14.0 (or above) installed.

Step 1
Double-click "Setup.exe" and select "NI Runtime Engine".

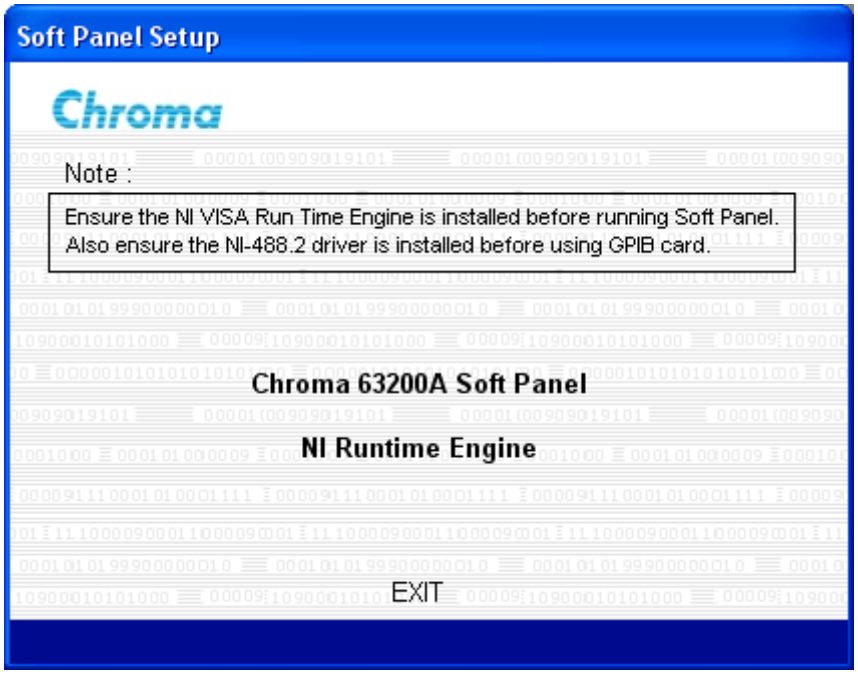


Figure 2-7

Step 2

Wait for the installation program to complete initialization and click **Next** to go to next step.

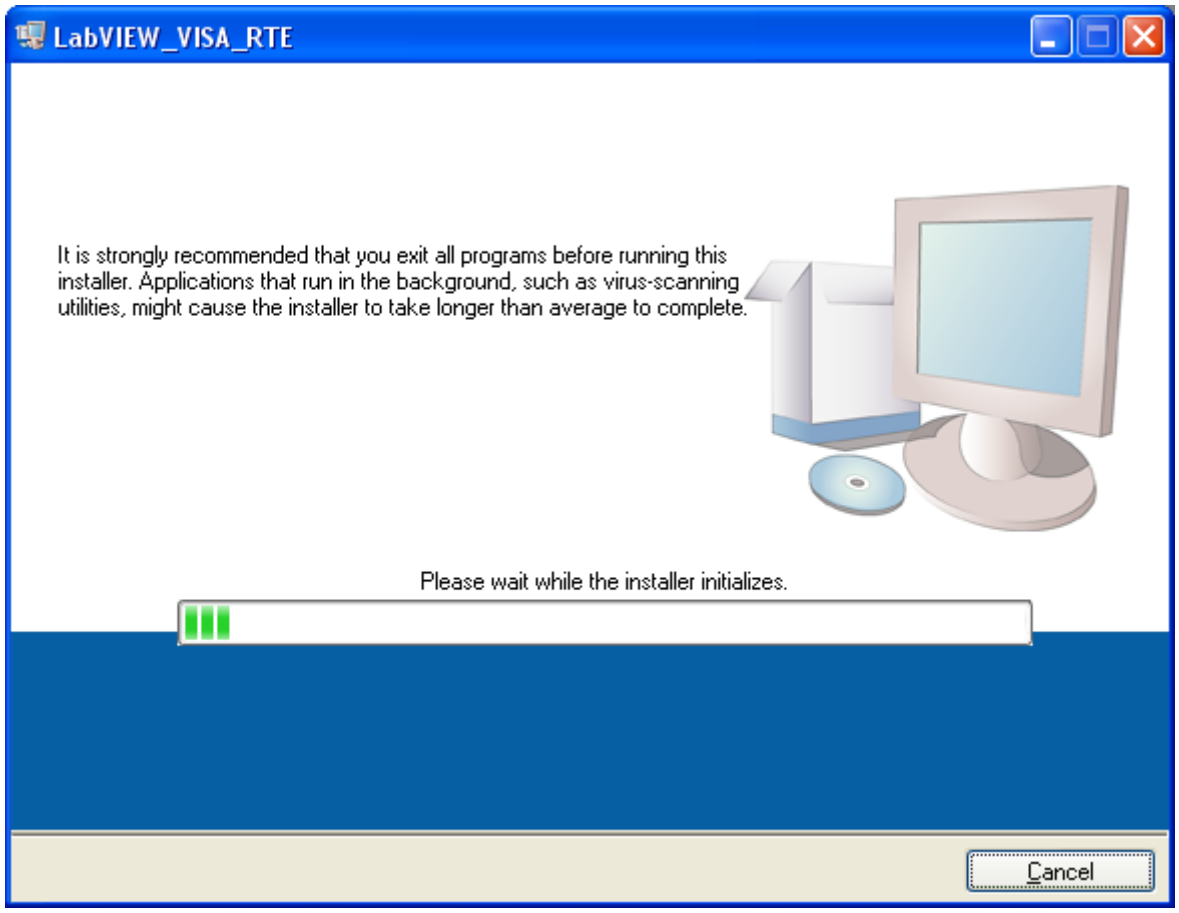


Figure 2-8

Step 3
The default NI Runtime Engine installation path is under `C:\Program Files` as shown in the window below. To change the installation path, click **Browse…** to specify the directory and click **Next >>** to carry on the installation.

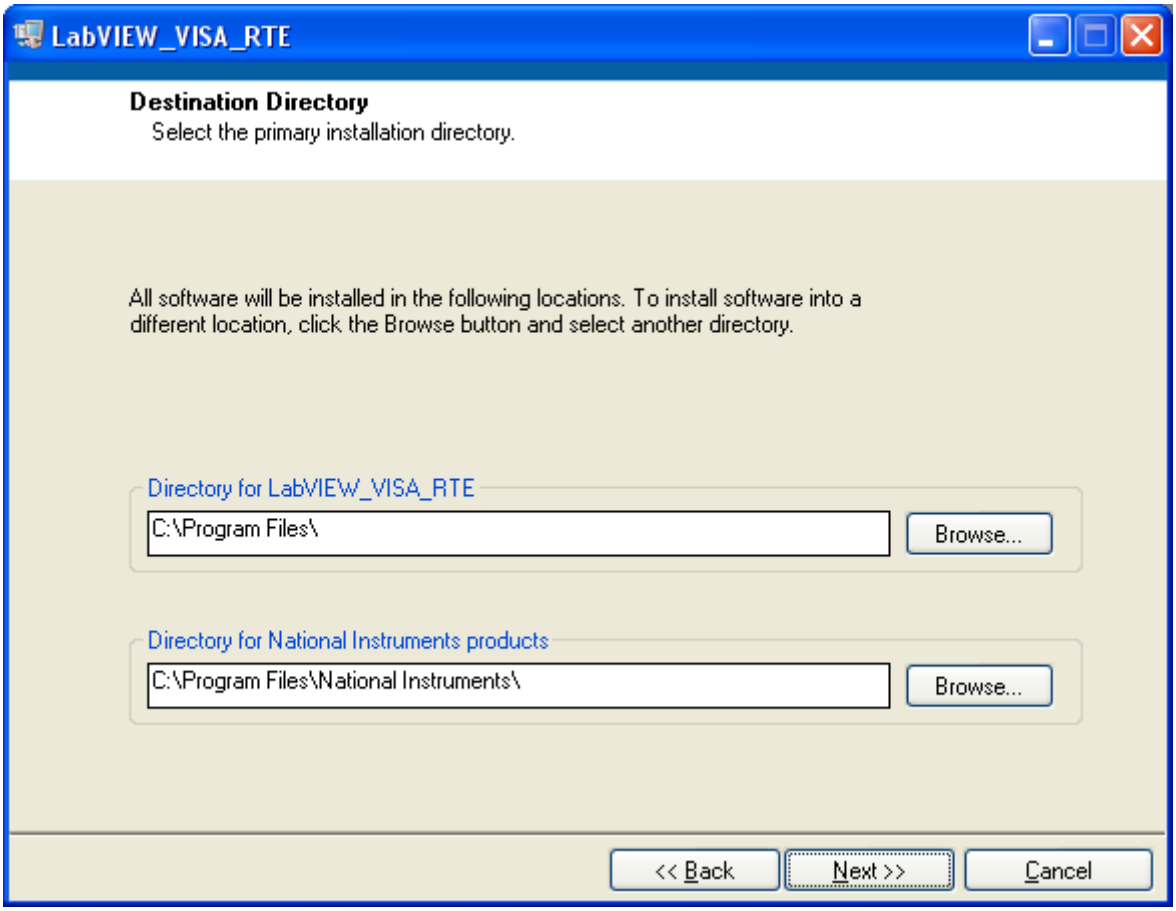


Figure 2-9 Selecting NI Runtime Engine Installation Path

Step 4
When the NI Runtime Engine license agreement window appears, click “I accept the above 2 License Agreement(s)” and **Next >>**.

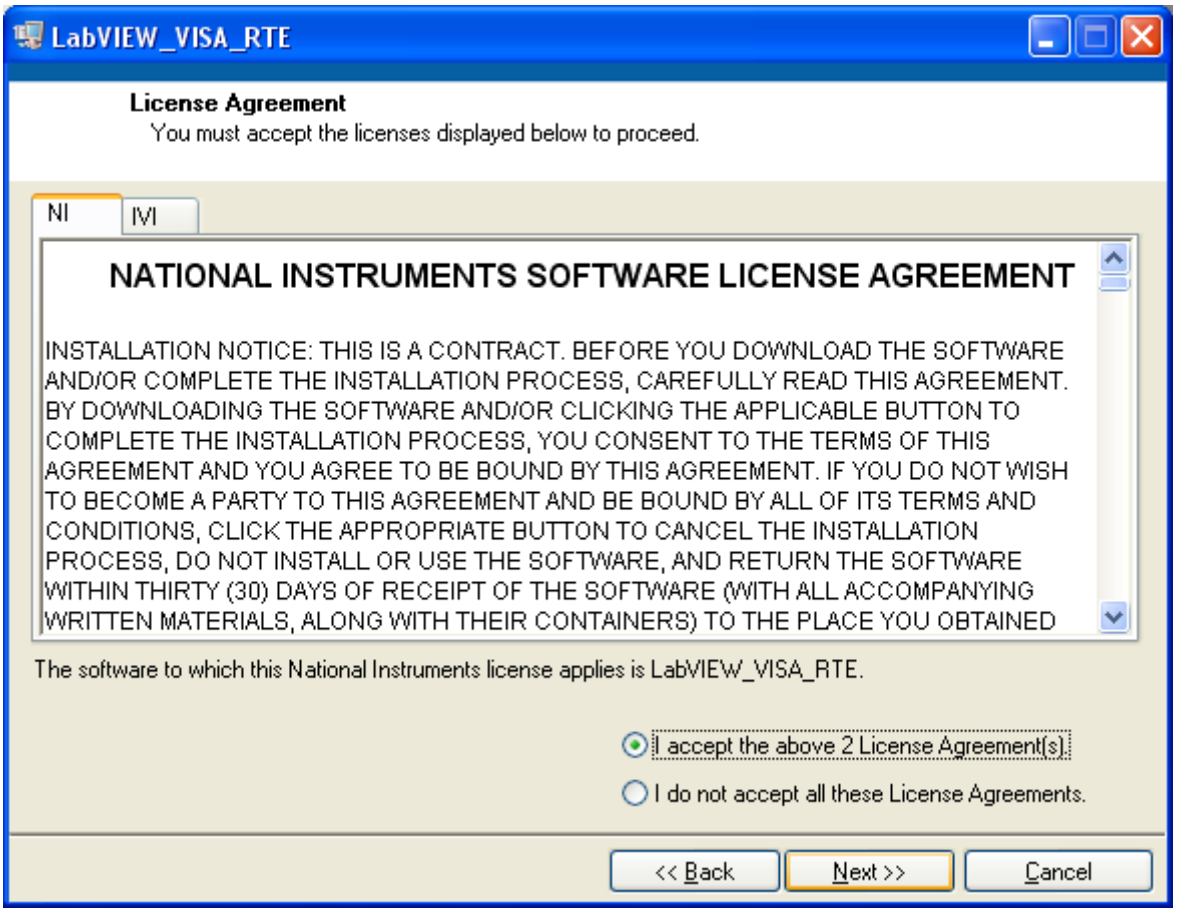


Figure 2-10 NI Runtime Engine License Agreement Window

Step 5
The NI Runtime Engine is ready for installation. Chick **Next >>** to begin.

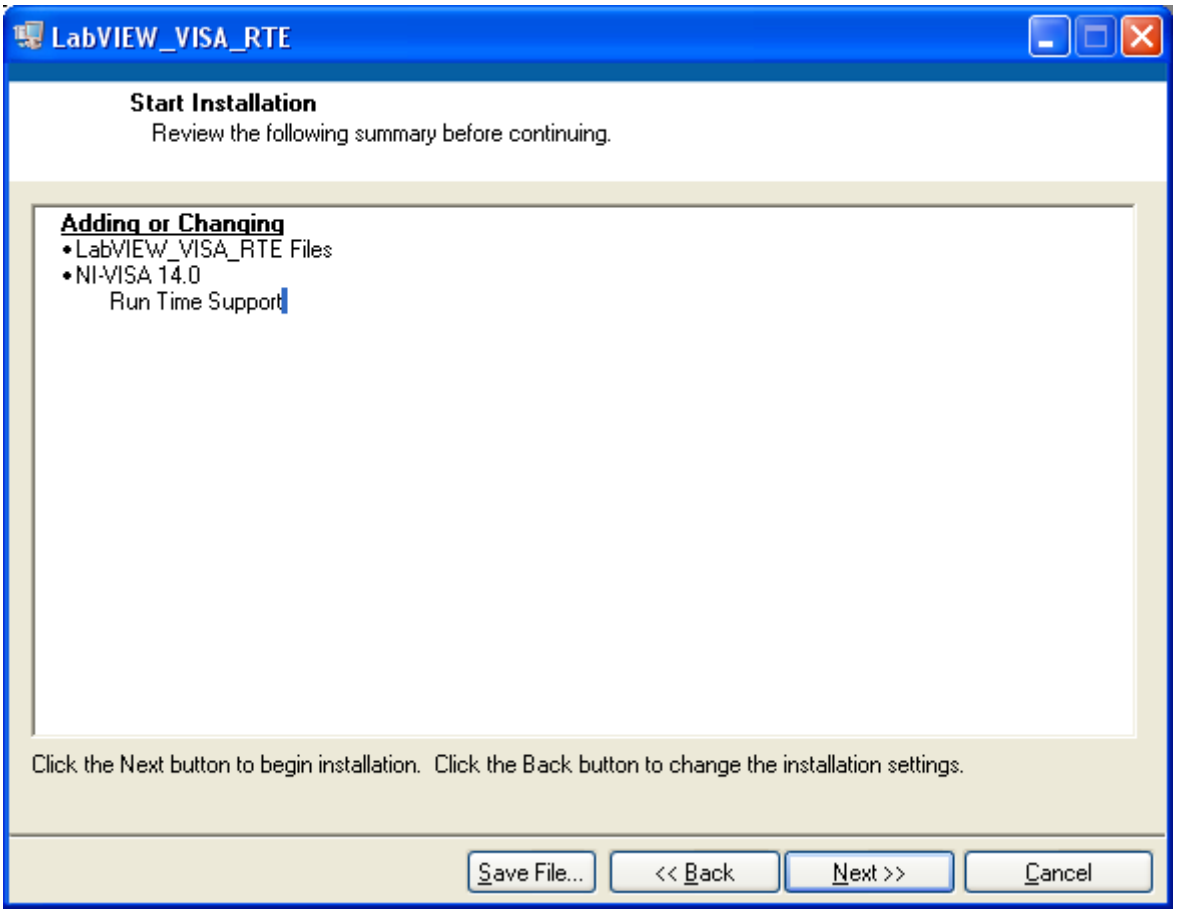


Figure 2-11 NI Runtime Engine Ready for Installation

Step 6
When the installation is done, be sure to reboot the PC.

2.4 Installing GPIB Interface Driver

Please follow the steps listed in the user's manual of GPIB Interface Driver for installation. The driver is not required if using RS232 interface.

2.5 Installing Protection Key Driver

Open the Protection Key Driver folder in the CD and execute "HASPUserSetup.exe" by double-clicking it. Follow the instructions listed below to complete the installation.

Step 1
It initializes for installation. Click **Next >** to go on.

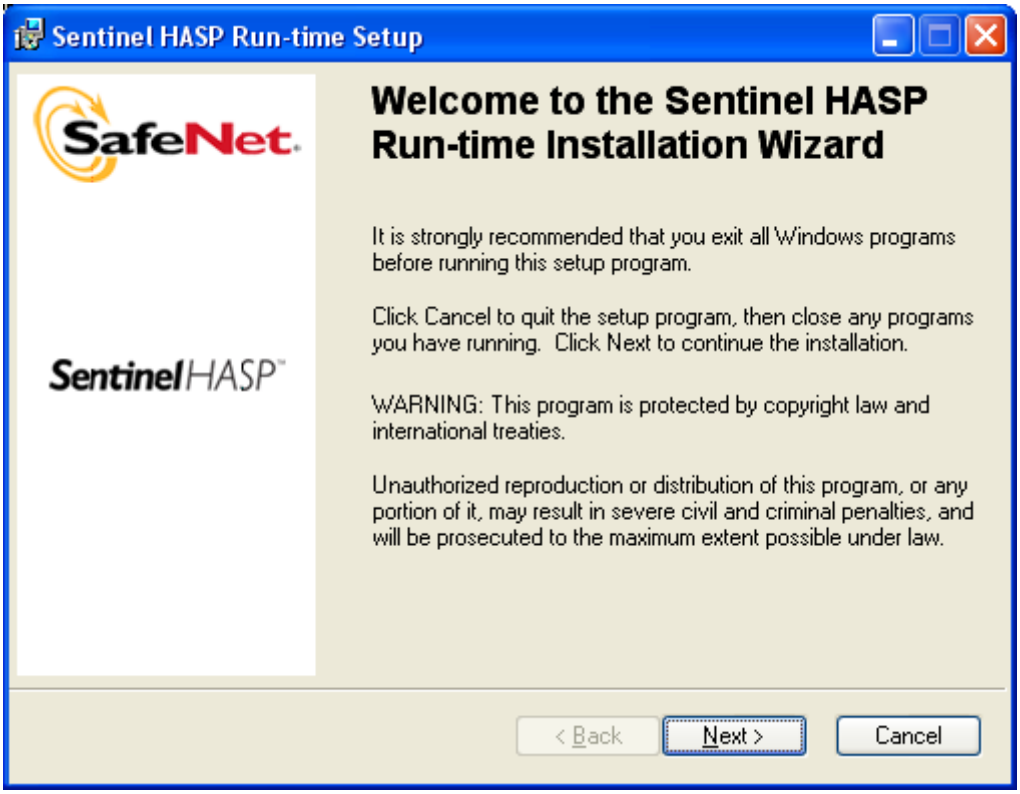


Figure 2-12

Step 2

When license agreement window appears, read it clearly and click "I accept the license agreement" and **Next >** to continue the installation.

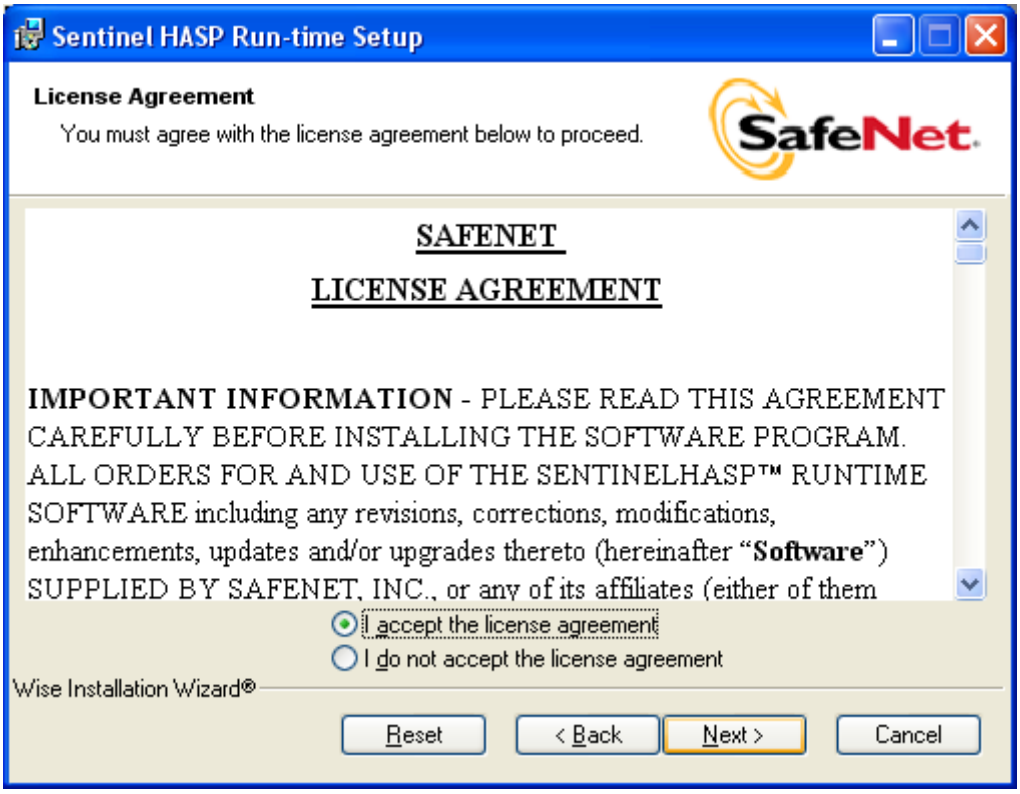


Figure 2-13

Step 3
The application is ready for installation. Click **Next >** to begin.

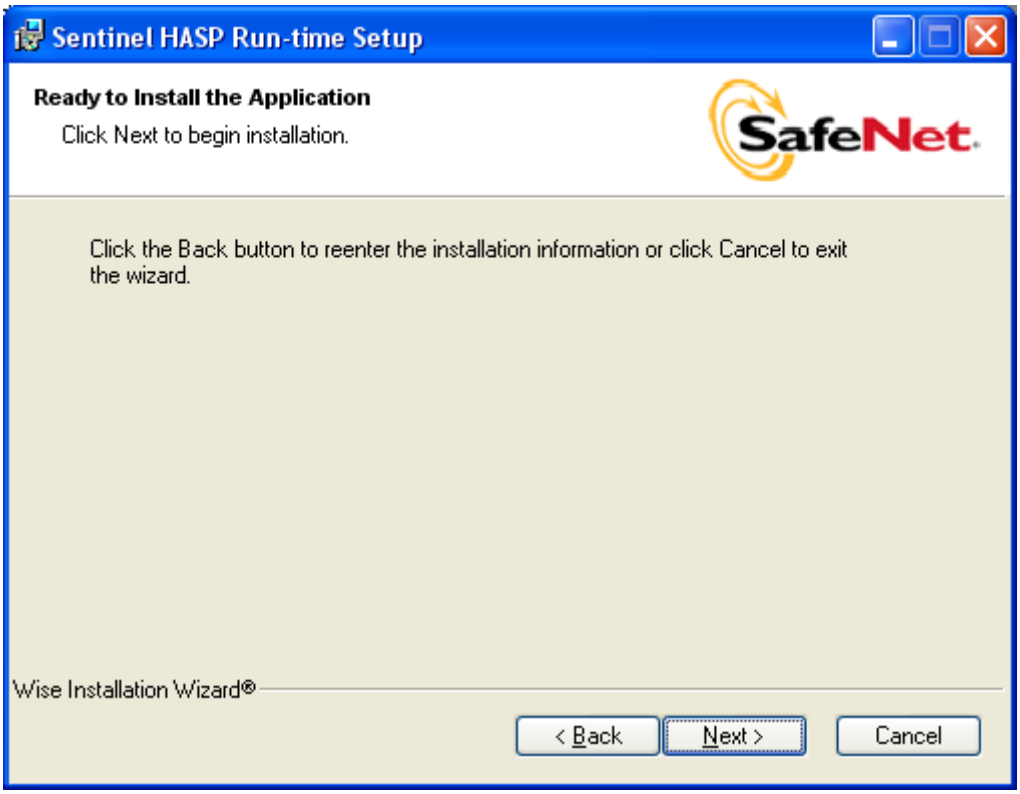


Figure 2-14

Step 4
Click **Finish** to exit the installation when the application is successfully installed.

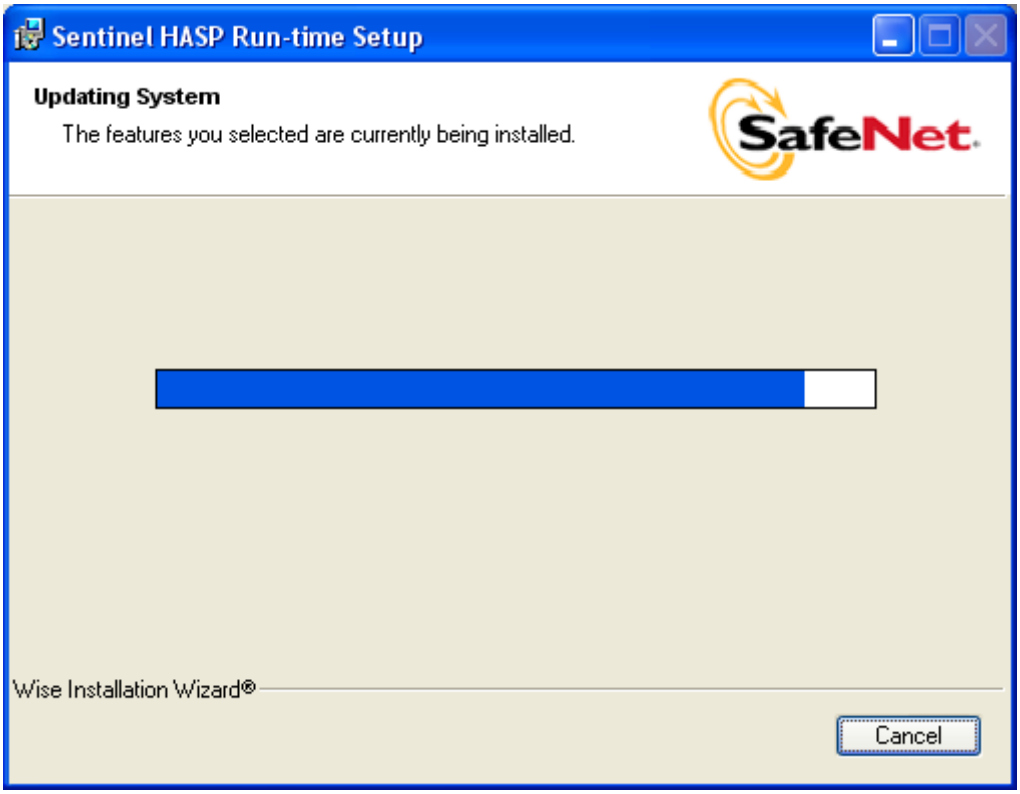


Figure 2-15

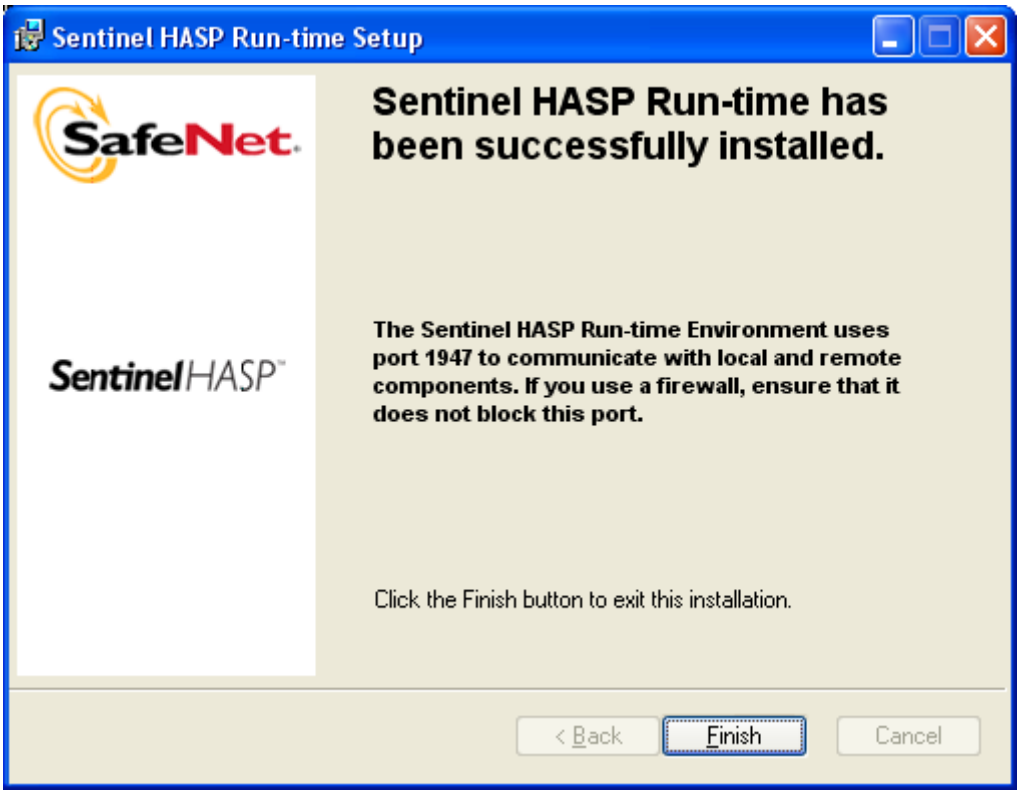


Figure 2-16

2.6 Uninstalling Chroma 63200A Soft Panel

To remove the Chroma 63200A Soft Panel, click **Control** → **Add or Remove Program** on Windows. Find "Chroma 63200A Soft Panel" from the list and follow the instruction to remove it.

3. Starting Chroma 63200A Soft Panel

When the installation is completed, click **Start → Programs → ChromaATE 63200A SoftPanel**.

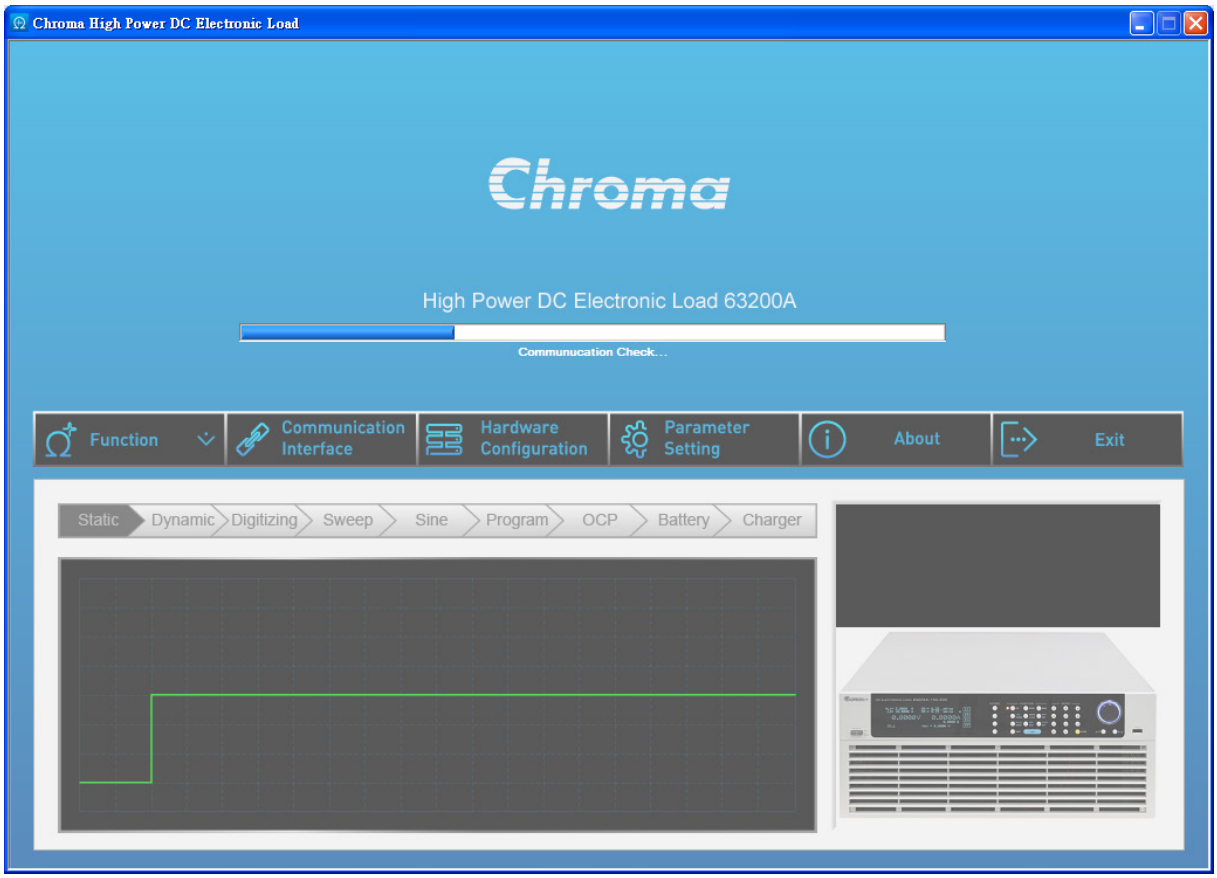


Figure 3-1 Chroma DC Load 63200A Soft Panel Startup Window

Description:

The Chroma DC Load 63200A Soft Panel will automatically read the online settings that successfully connected before and perform initialization when it starts. A progress bar will appear to show the initialization status. When initialization is done, the user interface will be unlocked and the progress bar will disappear for operation.

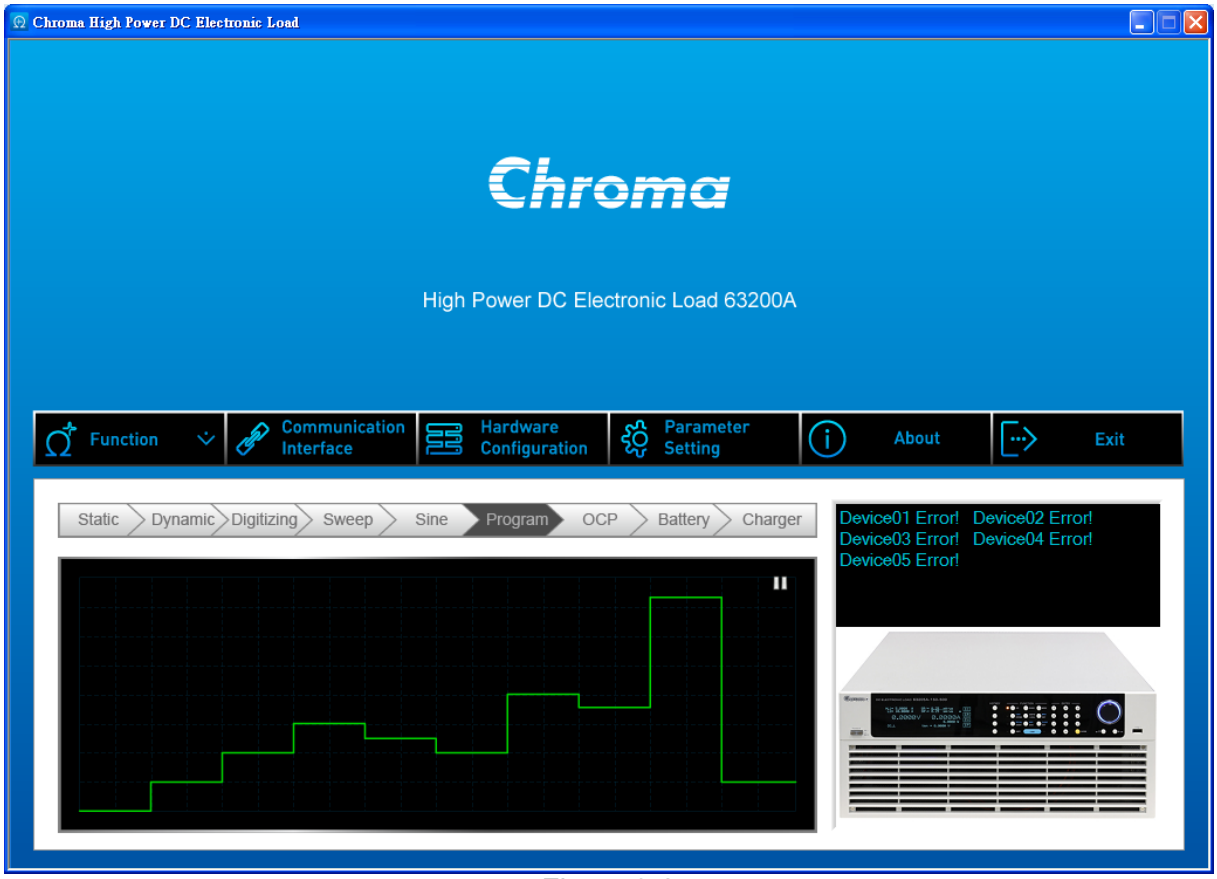


Figure 3-2

A. The lower left part is a cycle plugin of 63200A DC Load functions diagram. It switches to next function in sequence per second. Click any of it and it will switch to different diagram and stop the carousel function. Click the button again to restore carousel function.
B. The lower right text block shows the connection status and hardware device appearance.
C. The functions menu bar in the middle is the main operating interface of 63200A SoftPanel. The detailed descriptions are explained in Chapter 4.

4. Menu Bar

The menu bar is a core element of 63200A Soft Panel. All functions and associate settings can be performed using this menu bar. The functions in each page are described below.

4.1 Home Page Menu Bar

Figure 4-1

- **Function menu**

Figure 4-2

Click **[Function]** to show a function menu.

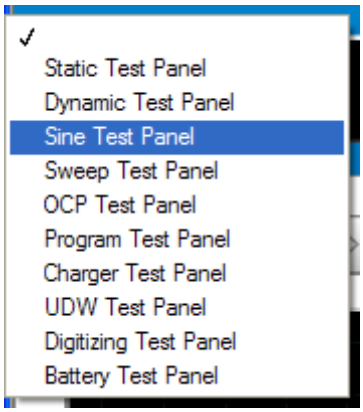


Figure 4-3

Select a desired test function and switch to the test panel.

- **Communication Interface**

Figure 4-4

Click **[Communication Interface]** to enter into communication interface setup page to change and confirm the online settings.

- **Hardware Configuration**

Figure 4-5

Click **[Hardware Configuration]** to enter into the configuration page for setting up the parallel and synchronization functions.

- **Parameter Setting**

Figure 4-6

Click [Parameter Setting] to enter into the parameter setup page for changing the settings like start voltage, cutoff voltage, buzzer on/off and GONG range, etc.

- **About**

Figure 4-7

Click **[About]** and it will prompt the 63200A Soft Panel version. This function is only valid in home page.

- **Exit**

Figure 4-8

Click **[Exit]** to end the program and the online setting will be recorded for next time use.

4.2 Function Pages in Menu Bar

When a function in the menu bar is selected, the **[About]** function will change to **[Home]**.

- **Home**

Figure 4-9

Click **[Home]** to return to home page.

When a function is selected, the menu bar will light as shown in Figure 4-10 and Figure 4-11.

Figure 4-10

Figure 4-11

5. Communication Interface

The setup page of communication interface is as shown below.

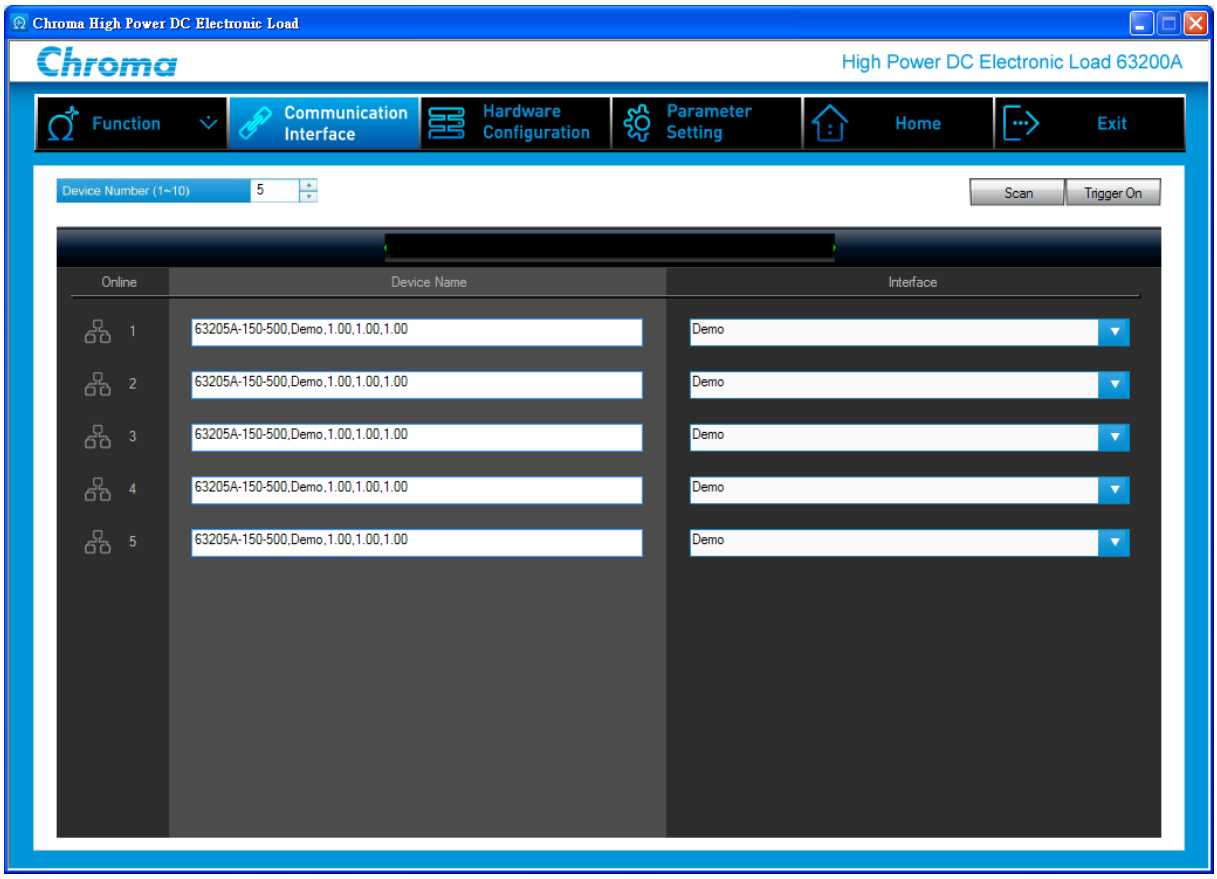


Figure 5-1

- **Device Number**

Figure 5-2

As the figure shown above, the device number can be increased or reduced by clicking the up/down arrow keys or using keyboard to key in. It can control up to 10 devices at a maximum.

- **Scan**

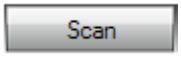


Figure 5-3

Click Scan to search the connected devices and fill in to the interface menu.

- **Interface**

Figure 5-4

Click the down arrow of a communication interface to select the scanned device. If no device is scanned, select "Other" and an IP address input column will appear. It can input a maximum of 10 IP addresses. Click OK and the address will be listed in the menu.

Figure 5-5

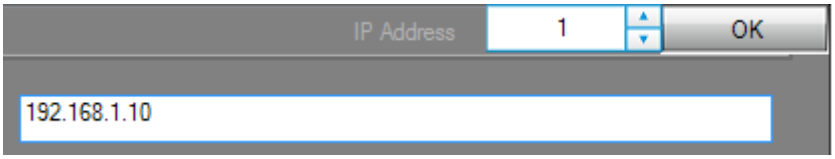


Figure 5-6

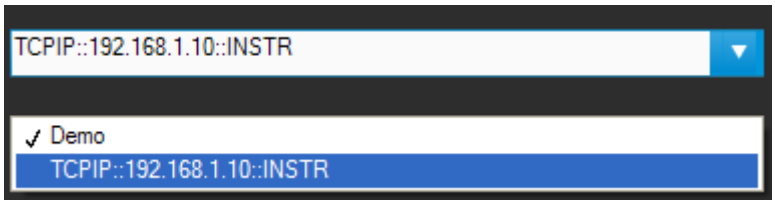
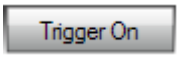


Figure 5-7

- **Repeated Communication**

Figure 5-8

When Repeated Communication is selected, the 

button will be hidden. The communication to be repeated will blink in red box. Click Repeated Communication again to cancel it.

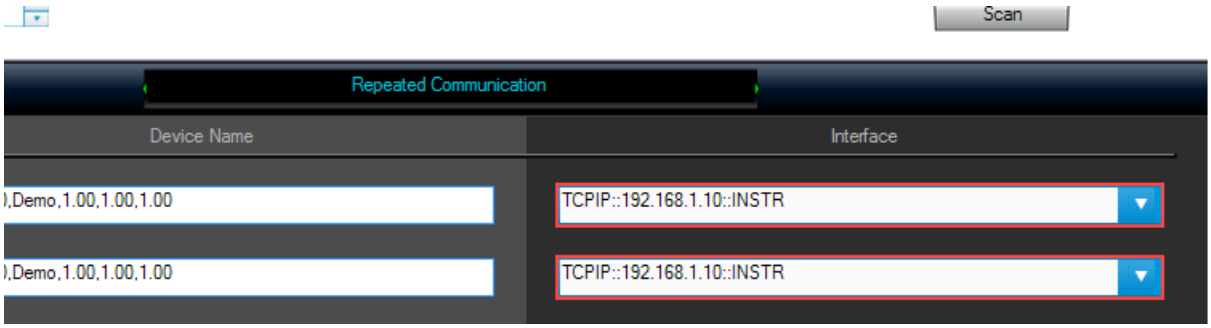


Figure 5-9

- **Trigger On Button**

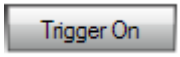


Figure 5-10

Click **Trigger On** and the software will try to connect to hardware and prompt the device name, serial number and firmware version. If the connection fails, the serial number will show DEMO instead. If the connection is success, the online indicator on the left will show in green.

Notice

1. When the setting is done, the software is only online and recording the communication settings when Trigger On is clicked. If switching to other pages with clicking Trigger On, no connect is done and the settings will be lost.
2. If all online settings are failure, the software automatically switches to DEMO mode. The user can enter into SoftPanel to learn more about the functionalities. In Demo mode, the set ranges are all virtual without mapping to the actual range.

6. Hardware Configuration

Parallel or synchronous function can be applied when more than one hardware devices are used. The screen is shown as below when in hardware configuration page.

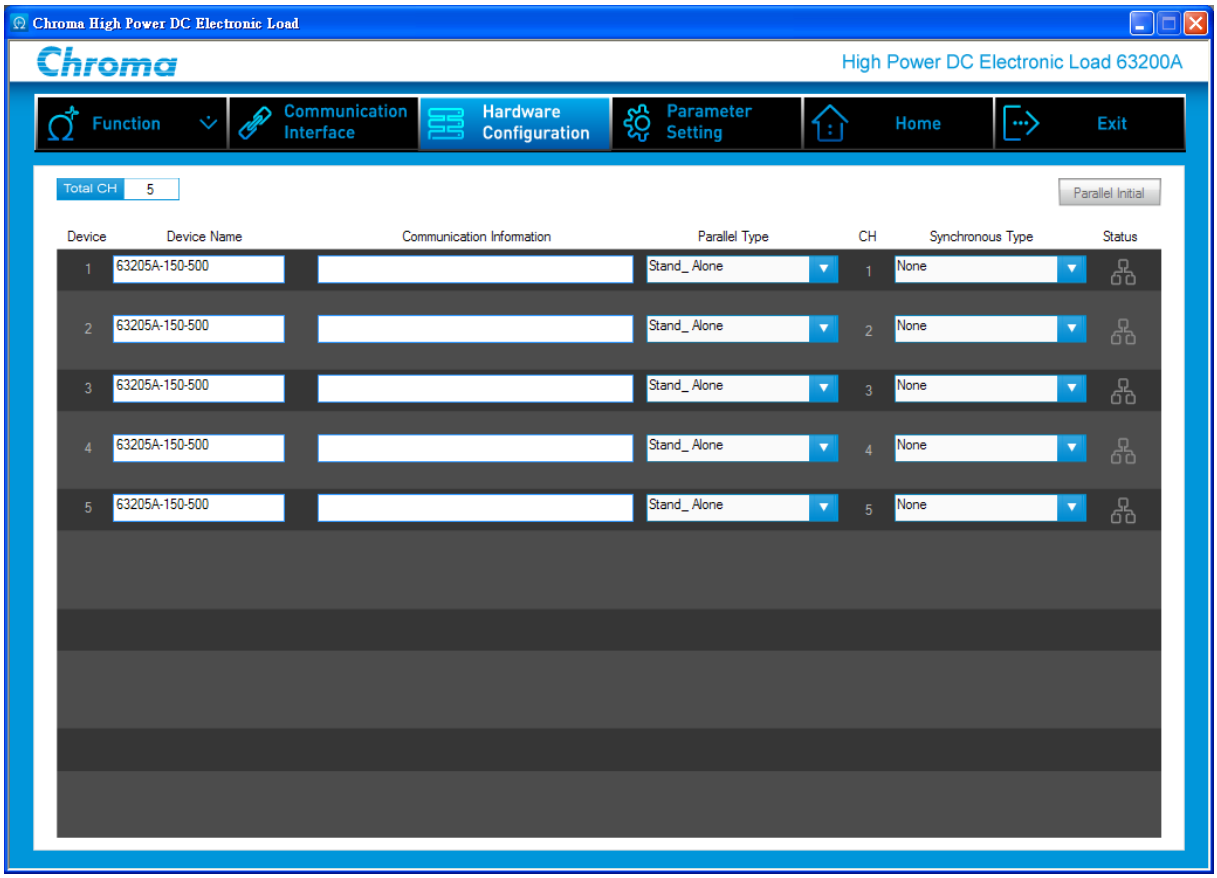


Figure 6-1 Hardware Configuration Window

- **Parallel Type**

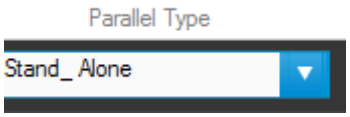


Figure 6-2

When the down arrow of parallel type is clicked, a list of set hardware devices will prompt for selection. Each parallel setting can set a master device and several salve devices. The **Parallel Initial** button will be grayed out and locked if the setting is wrong.

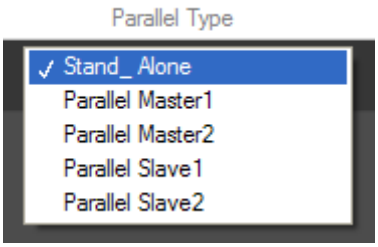


Figure 6-3

- **Parallel Initial**

Figure 6-4

When the setting is done, click **Parallel Initial** to enable parallel function. If the initialization is done successfully, the parallel unit will be treated as a device and the total device number will be changed. It is able to operate the slave device now.

Be noted that if the parallel function is not set by software it is off by default. This means the user cannot set the parallel function manually when using soft panel. It is because the paralleled number set in software will affect the element operation; therefore, the parallel number cannot be set manually.

- **Synchronous Type**

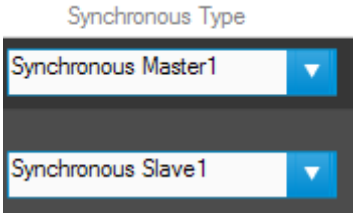


Figure 6-5

The setting of synchronous type is the same as parallel except initialization. Once the synchronous type is set, the slave device cannot automatically perform loading by itself. Instead the master device controls the loading's on and off. The synchronous parameter is set individually.

- **Total Channel**

Figure 6-6

When in test page, the channels for testing are varied with the total channels set here.

Notice

Device quantity – parallel (slave) unit = total channel.
Be noted that parallel and synchronous function cannot be used at the same time. When parallel type is set, the synchronous type will be disabled.

7. Parameter Setting

To facilitate the operation, the infrequently used parameters are placed in this page. The setting method follows the hardware configuration to expand into General, Static SPEC, CC Parameter Setting, CP Parameter Setting, Specification and FW Save Recall by channel number.

Figure 7-1 Parameter Setting Window

7.1 General

It comprises Von, Voff, Von Latch, Sign of Voltage, CC Vrange, Window Time, Auto, Sound, External Waveform, Short Key, Current Limit and CV Response parameters. The settings according to the Output Name give orders to the mapped Channel. Please refer to the device user's manual for the detailed description of each parameter.

Figure 7-2 General Parameters Setting Window

7.2 Static SPEC

The setting page is only associated with Static Test. The main purpose is to test if the measured voltage, current and power is within the range. It shows PASS if yes or FAIL if not.

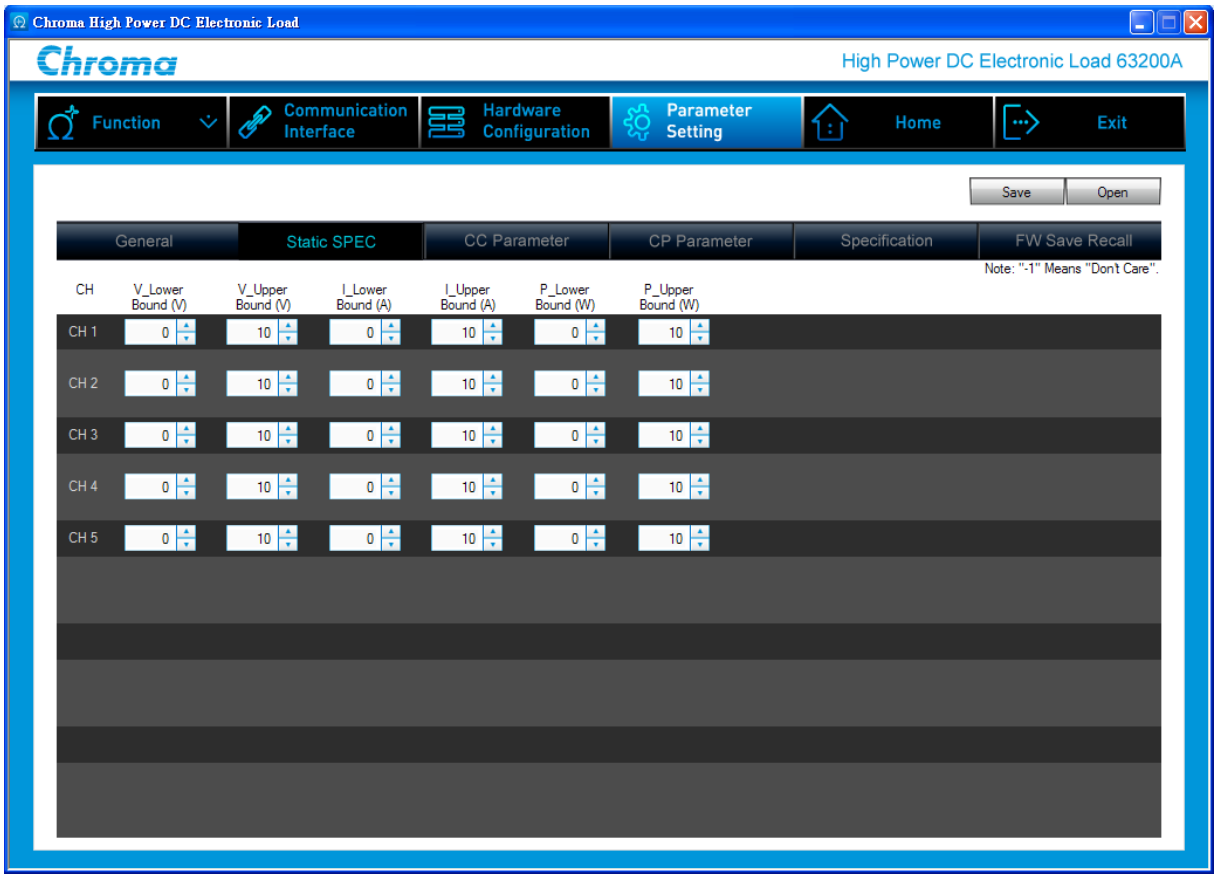


Figure 7-3 SPEC Parameters Setting Window

7.3 Setting CC Parameters

This page sets the Rise Slew Rate and Fall Slew Rate in Static mode.

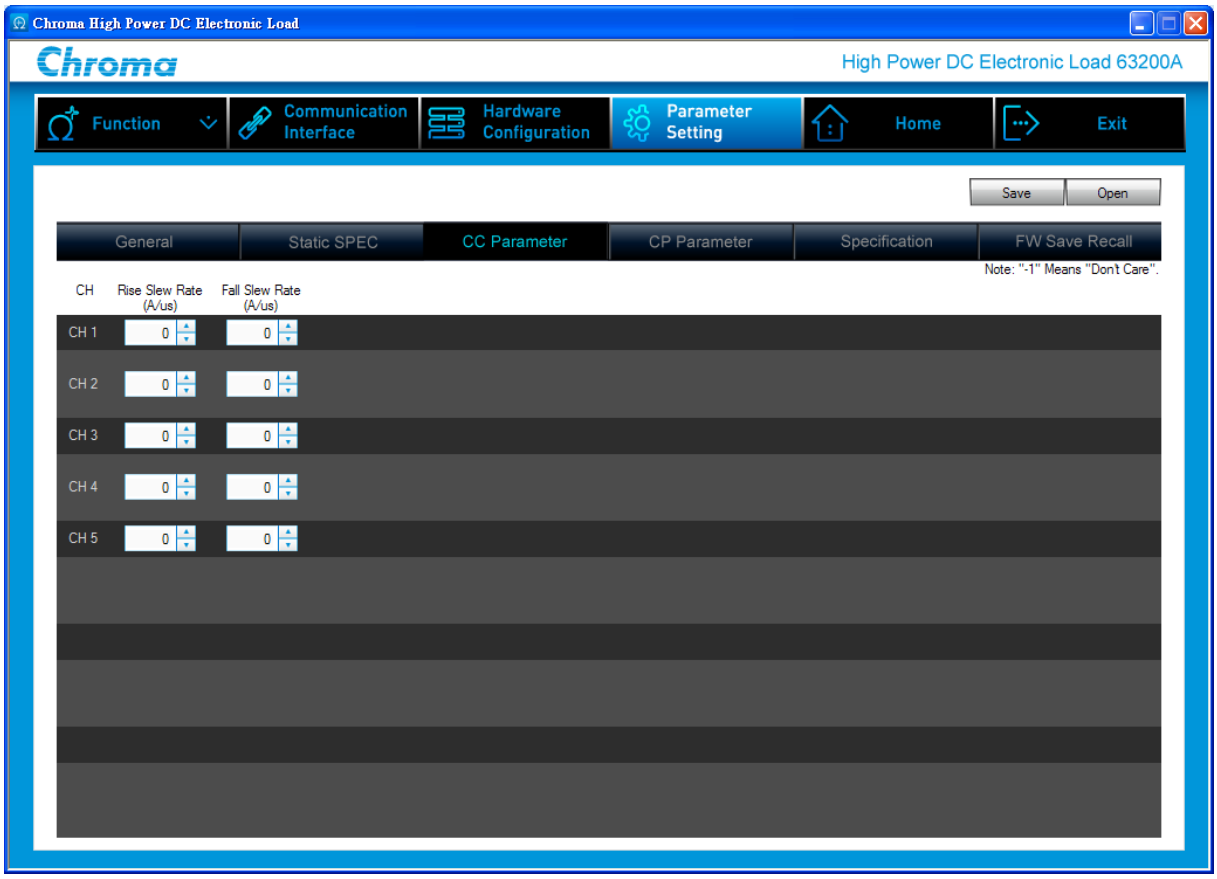


Figure 7-4 Static Parameters Setting Window

7.4 Setting CP Parameters

This page sets the Rise Slew Rate and Fall Slew Rate in Power mode.

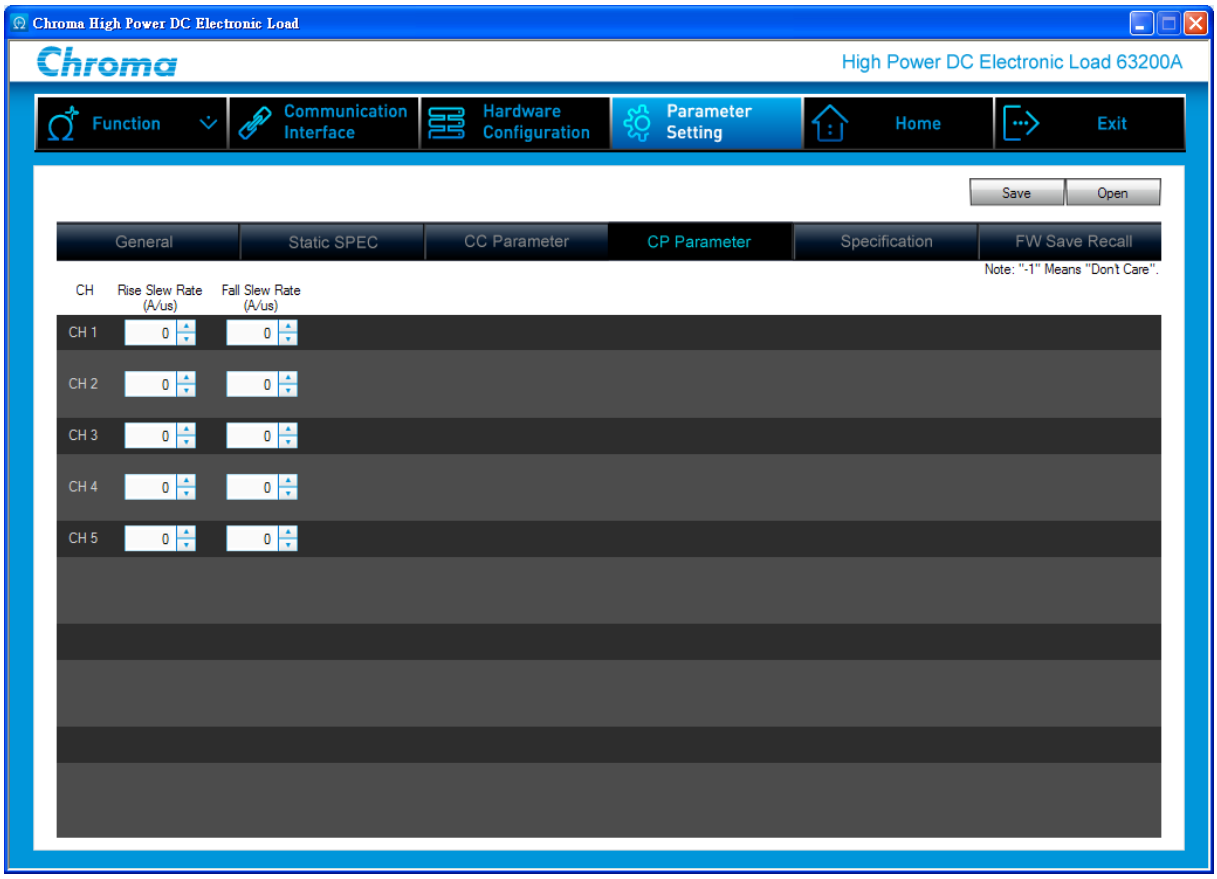


Figure 7-5 CP Parameters Setting Window

7.5 Specification

It comprises Mode, V center, V High, V Low, I center, I High, I Low, P center, P High and P Low parameters. The settings according to the Output Name give orders to the mapped Channel. Please refer to the device user's manual for the detailed description of each parameter.

Figure 7-6 Readings Display Window

Notice

1. -1 means don't care and the standalone panel is indicated by symbol "-----".
2. The high and low limits in Specification page are varied with Center value. It is recommended to enter Center value and then adjust the HIGH and LOW limits during operation.

7.6 FW Save Recall

This page comprises 4 elements - Device, File, Save and Recall that can save the settings to device memory for use next time.

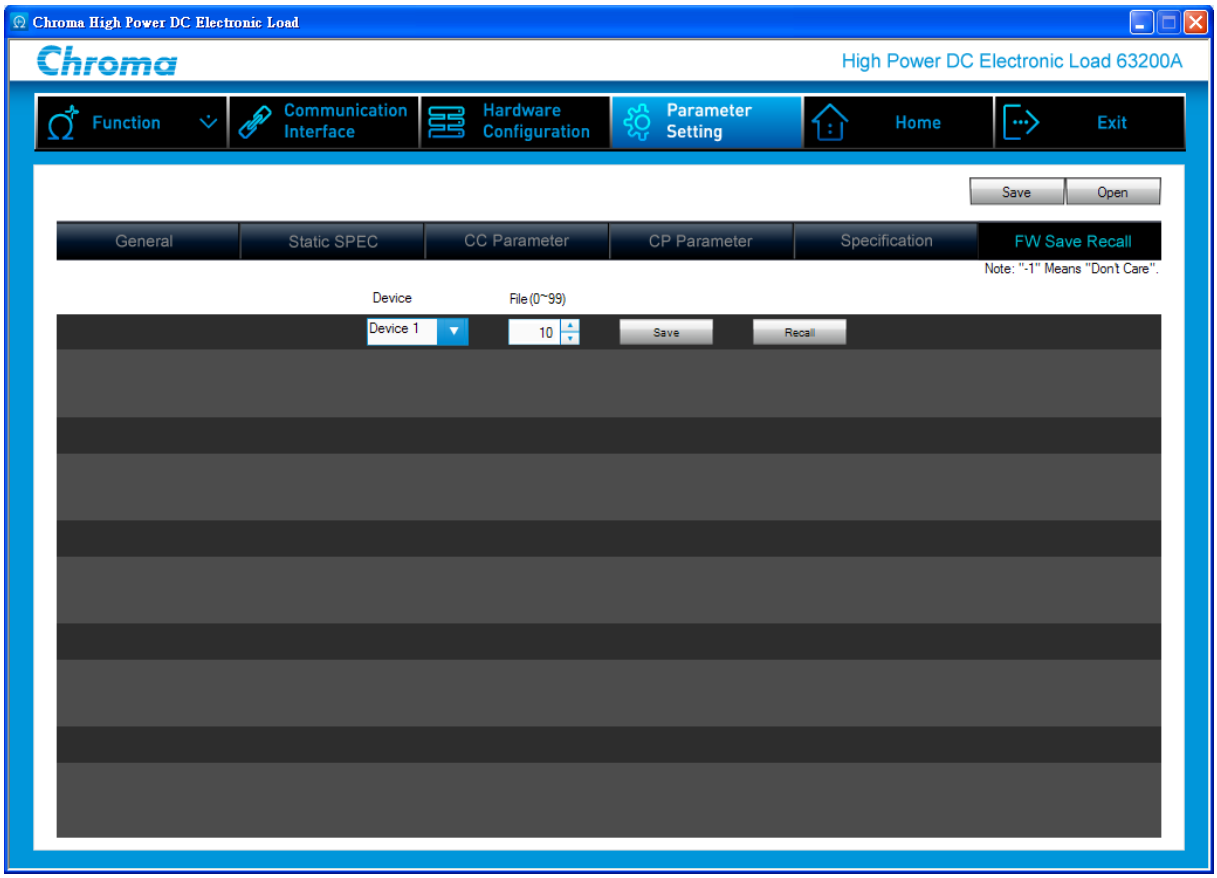


Figure 7-7 FW Save Recall Window

Figure 7-8

Device: It is a drop-down menu to select the device number set by communication interface.
File: It sets the file number for access.
Save: Click it to save the settings in the device memory.
Recall: Click it to read the settings saved in the device memory.
Save: Click it to save the parameters set on the window to a .conf file.

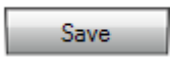


Figure 7-9

The user can save the current parameters for use next time by opening the files directly during power on. Click “Save” to specify the storage path and a filename (with .conf extension for instance) to save the settings into different files. These files may occupy some space in the hard disk; however, it can save many setting files if the disk space is big enough.

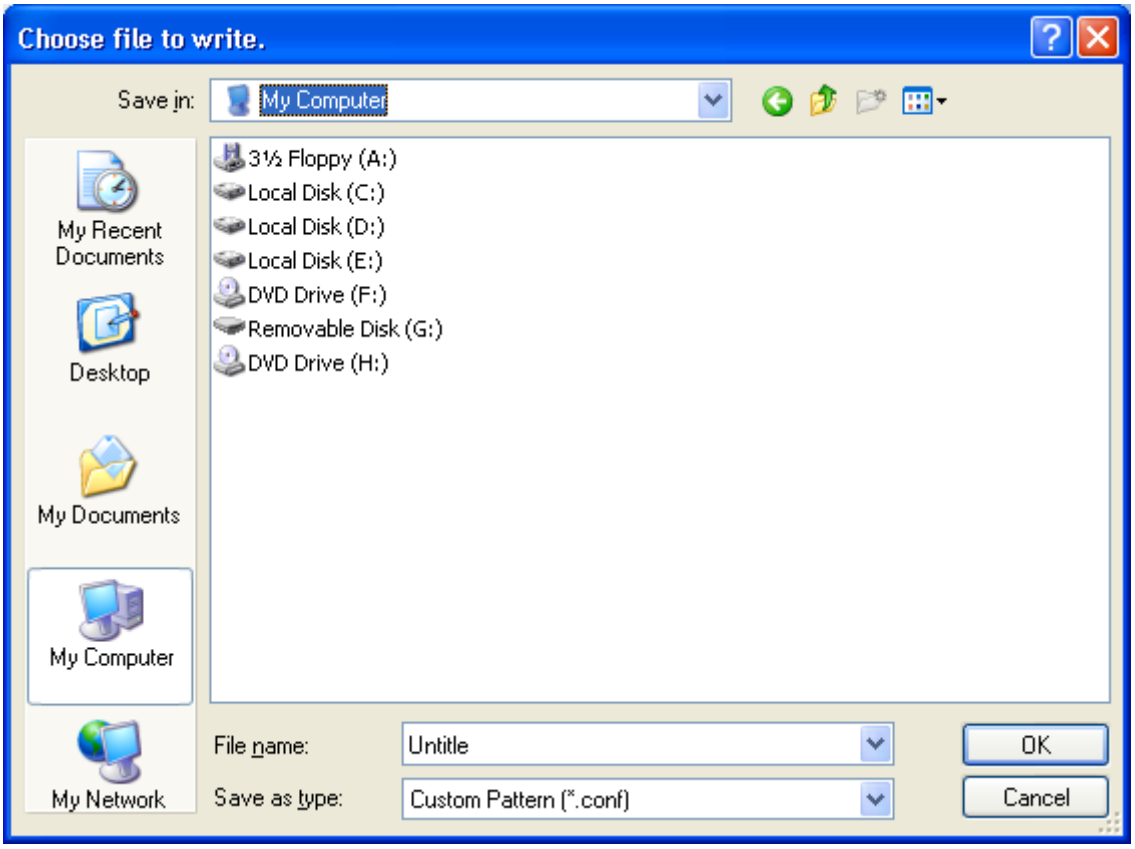


Figure 7-10 Save Dialog Box

Notice

Extension filename: Configuration is *.conf, Static Test is *.sta, Dynamic Test is *.dyn, Sweep Test is *.swe, Program Test is *.pro, Battery Test is *.batt, OCP Test is *.ocp, Sine Test is *.sin and Charger test is *.chr.

7.7 Open

Click this button to open a .conf file saved in the disk. It simplifies the parameters input to avoid error from occurring.

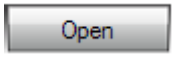


Figure 7-11

Open dialog box allows the user to load the parameter settings from the stored directory. Click **Cancel** and it will stop the action.

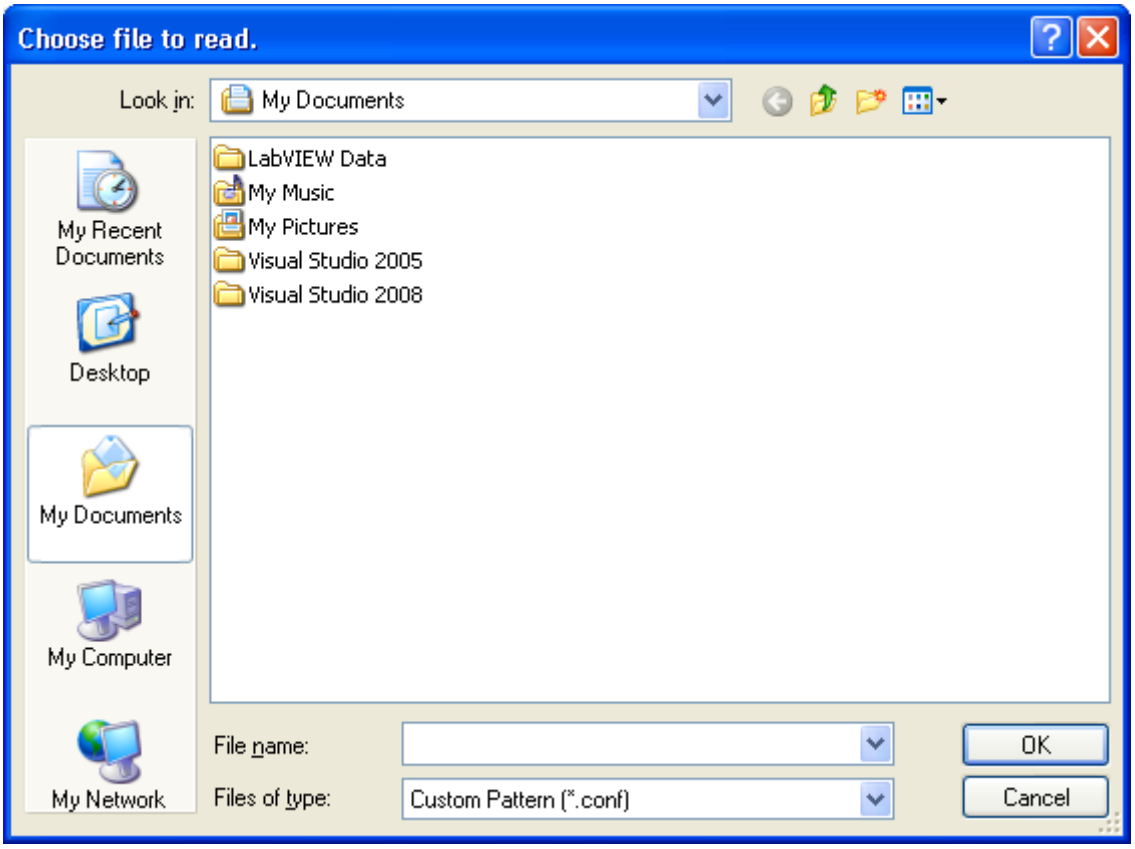


Figure 7-12 Open Dialog Box

8. Static Test

The main function of this window is to run static test. The user can follow the requirements to select the loading mode for test. First, the software will prompt an Output Name to indicate the Channel for action. It is necessary to refer to this column when setting Mode and Loading. Scroll can be used to change page on the window and the maximum channel number on each page is 6. The functions of this window are explained below.

Figure 8-1 Static Test Window

8.1 Selecting Mode

There are CCL, CCM, CCH, CRL, CRM, CRH, CVL, CVM, CVH, CPL, CPM, CPH, CZL, CZM and CZH modes in Static Test. Each channel has these 15 selections. When different mode is selected, the loading range to be set changes too. Click the mode of each channel will prompt a menu for selection.

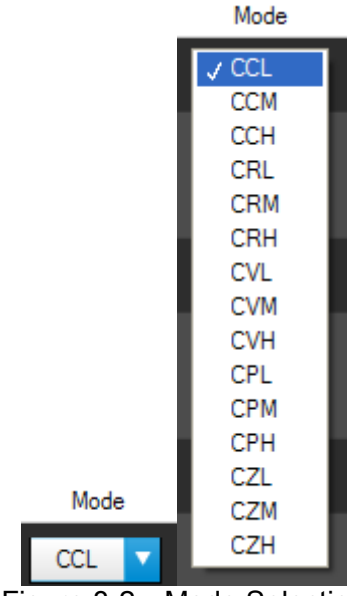


Figure 8-2 Mode Selection

8.2 Loading Parameter

The Loading range changes following not only the Mode but also the Model No. Moreover, it changes according to parallel use that the user should always keep in mind. When the input value exceeds the maximum range, it will stay there and the same for the minimum. The Loading unit A/Ohm/V/W varies with Mode, for instance, in CC mode the unit is A (Ampere), in CR mode the unit is Ohm, in CV mode the unit is V (Volt) and in CP mode the unit is W (Watt.) The usage is to slide the slider or input the numeric value directly on the right. The invalid display bit will be covered and the accuracy is 5 digits after decimal. When CZ mode appears, CL (uF), LS(uH), RL(ohm), RS(ohm) 4 parameters will appear.

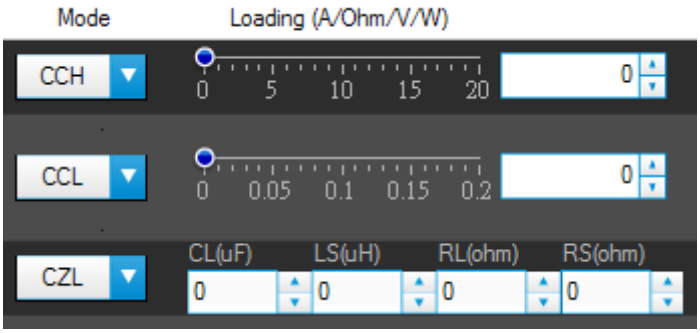


Figure 8-3 Loading Parameter

8.3 Reading Select

It works with the Readback indicator on the left and has Voltage, Current, Power or Off for selection. When Off is selected, the mapping Readback indicator will be cleared.

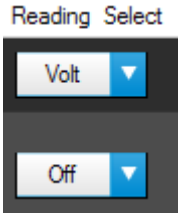


Figure 8-4 Reading Select

8.4 Readback Indicator

It is composed of bars and digital value indicators. This digital value indicator shows the measured value and the bar shows PASS or FAIL. If the reading is within the set range, the bar will appear in green to indicate PASS; or it will show in red to indicate FAIL. The purpose of it is to allow the user to adjust the UUT output to be within the range when performing fine tune. The setting of Low Spec and High Spec. are done in Configuration Setting. The digital display on the right indicates the correct physical quantity with the unit set in Reading Select.

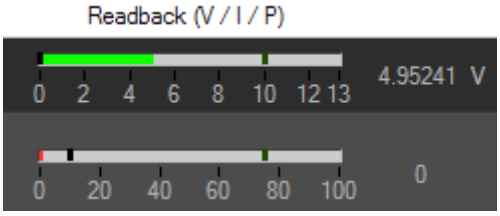


Figure 8-5 Readback Indicator

8.5 Setting Load On/Off

It can enable the loading action to Load On or disable it to Load Off. When Load All is set, all channels will be Load On or Load Off together.

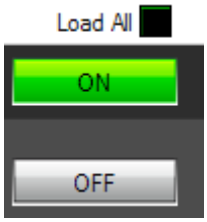


Figure 8-6 Setting Load On/Off

Notice Be noted that the Load All function here only gives Load On from software. It is unable to perform synchronous loading accurately. Refer to synchronous type setting in Hardware Configuration for synchronous loading tests.

8.6 Setting Short On/Off

It executes short circuit test. When ON is set, the hardware loading will perform short circuit test and click it again will turn to Short OFF that disables the test.

Figure 8-7 Setting Short On/Off

8.7 Digitizing Graph

It captures the voltage and current waveform. The blue waveform indicates voltage and the red one indicates current. They can be identified easily by the figure but be aware that the Y-axis on the left is voltage and on the right is current. The figure shown below is the display of capturing and captured waveform. Check if the waveform is captured correctly after clicked **Get Waveform**. The test data is from Digitizing Panel and the user can see the waveform captured last time without using the Digitizing Panel. However, only the waveform of the channel set in Digitizing Panel can be displayed.

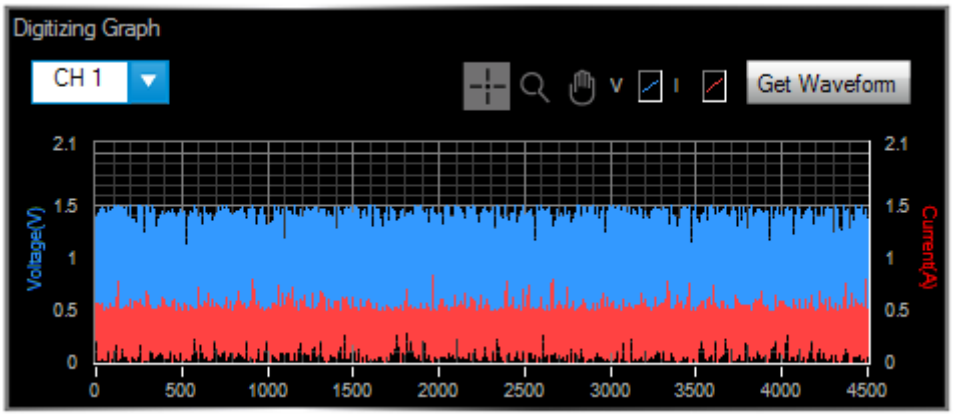


Figure 8-8 Digitizing Get Waveform Display

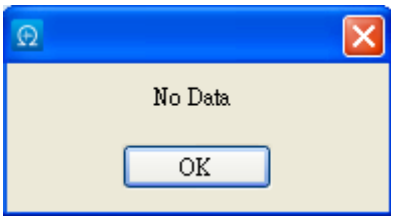


Figure 8-9 Digitizing Trigger On - No Data

CH Select: It indicates the channel that the current waveform is captured.

Graph tools: There are three tools - normal  , scale  and shifting  as explained below.

Normal  : No action in Digitizing Graph. Click this button to return to normal.
Scale  : It has 5 zoom in and 1 zoom out functions as shown below. There are 6 icons

available for selection as shown below: the yellow part in  and  indicates the partial zoom in function. Drag it to zoom in the partial area accordingly. The fifth icon  means it can zoom in wherever the mouse clicked. The sixth icon  indicates it can zoom out wherever the mouse clicked.

Note Since the scale ratio is not fixed, the user can click Digitizing Trigger On again to capture the waveform one more time or modify the maximum/minimum value of X, Y-axis directly to return to normal waveform.

Shifting  : When it is selected, press and hold the mouse on the waveform and the waveform can be shifted up/down/right/left that is to move the viewing position without changing the scale.

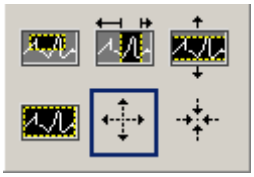


Figure 8-10 Digitizing Graph Waveform Zoom In Selection

8.8 Reading Display

The reading display area is composed of 2 boxes of the same as shown in Figure 8-11. Each box has the same functions including graph display, numeric display, readback display selections and a refresh button.

Figure 8-11 Reading Display Box

- **Reading Graph Display**
  It displays the readings captured from the device. The red vertical line indicates the position updated (the latest value). The vertical scale of the readings will automatically adjust. The X-axis is the timeline and the Y-axis is the mapped measurement.

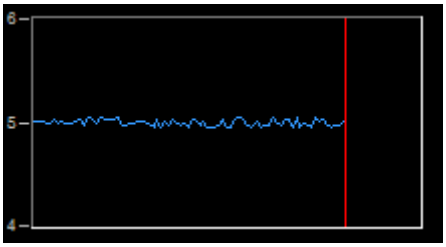


Figure 8-12 Reading Display

- **Numeric Display**
  It is the newest data readback in digital format and will update continuously.

Figure 8-13 Digital Readings

- **Readback Selections**
  It selects the type of value to readback. To monitor the voltage, clik the drop-down menu next to Off in R1 block to select the readback type. Off means not to readback the value or stop returning the value.

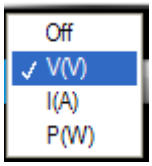


Figure 8-14 Readback Type Selections

- **Refresh**
  It clears the remaining data in the box to display the readings again.

Figure 8-15 Clear the Chart Data

8.9 SAVE and OPEN

The functions of these two buttons are the same as in Parameter Setting. Please see sections 7.6 and 7.7 for detailed information.

8.10 Report

This button sets the report for data generation. Since the Static, Dynamic and UDW tests are irregular, it is necessary to use the Report function to record the V, I, P values of each channel of the standalone device. Click this button to enter into the Report Panel for parameter setting.

Figure 8-16 Report Function Button

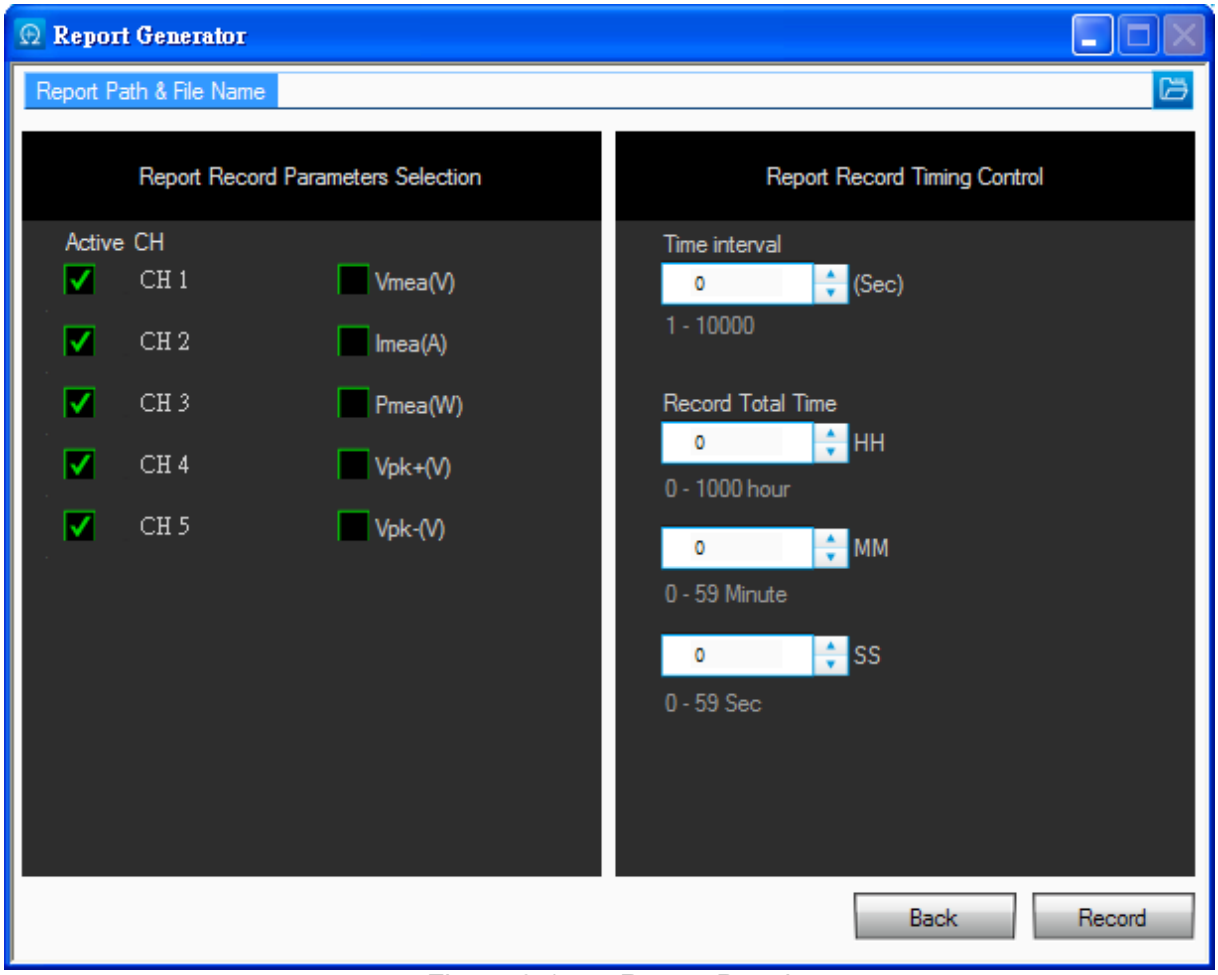


Figure 8-17 Report Panel

- **Report Path & File Name**

  Before using the record, it has to set the report path and filename. Click  to prompt a path and filename dialog box. The default report is a pure text file named “Untitle.txt”. The user can modify the path and filename as desired and click OK to save it.

Figure 8-18 Report Path & File Name

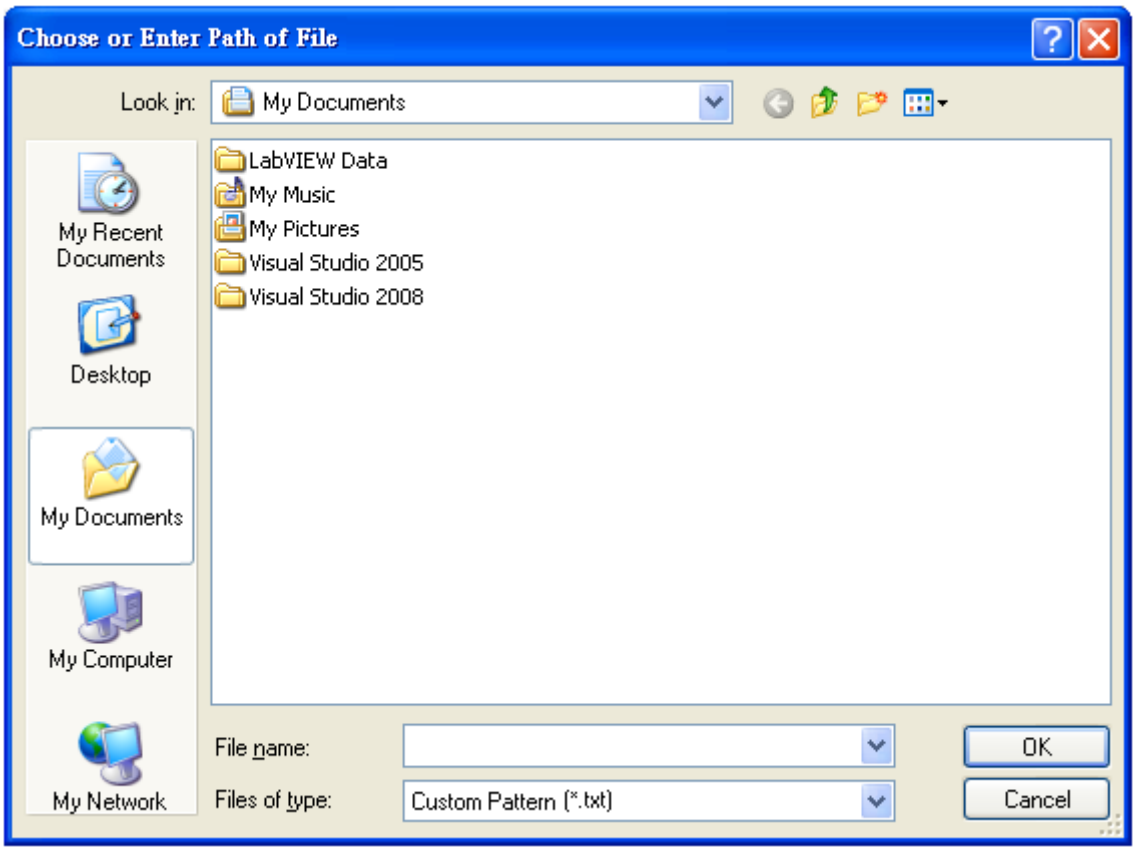


Figure 8-19 File Path Dialog Box

The columns on the left set the channels and values to be recorded while the columns on the right sets the recording time interval and total time length.

- **Back Button**
  Click **Back** to close the Report Panel. However, the Report Panel is unable to close but be minimized when recording is on. It will return to close state when the recording is done or aborted.

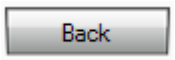
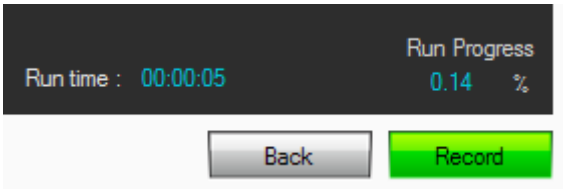


Figure 8-20 Back Button

- **Record Button**
  Click **Record** to enable Report recording function.

Figure 8-21 Record Button

When recording is on, the columns on the right will show recording time and percentage. To end the recording early, click **Record** again to abort it. The Report Panel is unable to close but be minimized when recording is on. It will return to close state when the recording is done or aborted.


Run time : 00:00:05
Run Progress
0.14 %
Back
Record

9. Dynamic Test

The main function of this window is to test the dynamic loading as need. First, the software will prompt an Output Name to indicate the Channel for action. It is necessary to refer to this column when setting Mode and Loading. Scroll can be used to change page on the window and the maximum channel number on each page is 3. The functions of this window are explained below.

Figure 9-1 Dynamic Test Window

9.1 Mode

There are CCDL, CCDM, CCDH, CRDL, CRDM and CRDH loading modes in Dynamic Test. Each channel has these 6 options. When different mode is selected, the loading range to be set changes too. Click the mode of each channel will prompt a menu for selection.

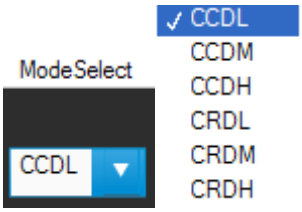


Figure 9-2 Mode Selection

9.2 Setting Loading

There are DL1 and DL2 two dynamic loadings. The Loading range changes not only following the Mode but also following the Model No. Moreover, it changes according to parallel use, which should be kept in mind. When the input value exceeds the maximum range, it will stay at the maximum and the same for the minimum. The Loading unit is A. The usage is to slide the slider or input the numeric value directly on the right. The invalid display bit will be covered and the accuracy is 4 digits after decimal.

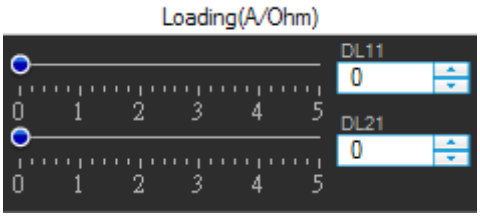


Figure 9-3 Setting Loading

9.3 Setting Slew Rate

Slew Rate has Rise and Fall two parameters. It is to set the current falling speed when setting load, the unit is mA/uS. The range changes not only based on the Mode but also following the Model No. The usage is to slide the slider or input the numeric value directly on the right. The invalid display bit will be covered and the accuracy is 4 digits after decimal.
Be noted that the Slew Rate range in CRDL, CRDM and CRDH is varied with current range.

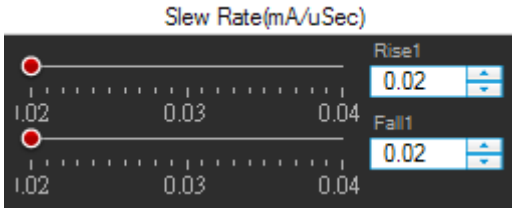


Figure 9-4 Setting Slew Rate

9.4 Setting Frequency-Duty

It is composed of Freq (Hz) and Duty (%). The setting range of Frequency is from 0.01 to 100KHz and Duty is from 0.1 % to 100%. The mapped instrument settings are T1 and T2, and the calculation formula is T1= (1/Frequency)* Duty%, T2= (1/Frequency)*(1- Duty%).

The minimum duration specification of standalone device is 0.02ms. When the frequency rises, the Duty range available for setting will be convergent. When the frequency is up to the limit of 25000Hz, the convergence of time component is set to 50% (which means both T1 and T2 are set to 0.02ms.)

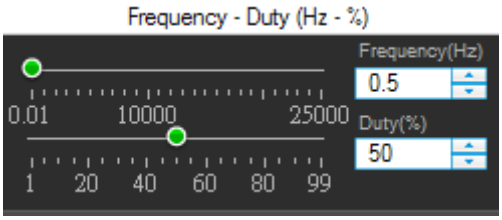


Figure 9-5 Setting Frequency-Duty

9.5 Setting Load On/Off

Please refer to section 8.5 for detailed description.

9.6 Digitizing Graph Display

Please refer to section 8.7 for detailed description.

9.7 Reading Display

Please refer to section 8.8 for detailed description.

9.8 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

9.9 Report

Please refer to section 8.10 for detailed description.

10. Digitizing

The Digitizing Panel sets the parameter for waveform capture. The user can determine the desired trigger conditions, sampling points and the execution time of each point to capture the voltage and current waveform of each channel. It follows the channels opened in Hardware Configuration for expansion downward. The parameters applicable for setting are described in the section below.

Figure 10-1 Digitizing Panel Window

10.1 Setting Parameters

- **Sampling Time**
  It sets the sampling time. The figure below sets to 100uSec. Assuming to sample 4096 points and the time required to get all points would be 4096*100uSec=0.4096 seconds.

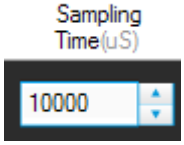


Figure 10-2 Setting Sampling Time

- **Sampling Point**
  It sets the total points of sampled waveform. The figure below sets to 100 points, which is associated with sampling time.

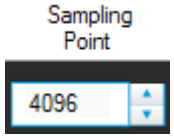


Figure 10-3 Setting Sampling Point

- **Trigger Source**
  It sets the trigger source. There are 4 types of trigger source: Load On, Load Off, TTL and BUS. Load On means when it is triggered when status is Load On and Load Off means it is triggered when the status is Load Off. TTL means to trigger the hardware via external TTL signal. (Refer to the standalone device for detail information.) BUS means it is triggered by the communication command.

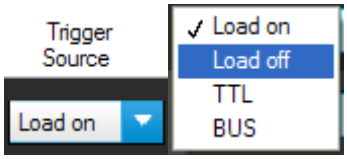


Figure 10-4 Setting Trigger Source

- **Trigger Point**
  It sets the points to begin before triggered. For instance, the Trigger Point in the figure below sets to 2000 and the Sampling Point = 4096, assuming the trigger source is Load On and when the standalone device turns to Load On from Load Off it starts to sample 2000 points backward and 2096 points (4096-2000) forward to form the desired sample waveform.

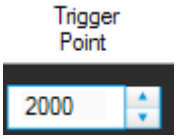


Figure 10-5 Setting Trigger Point

- **Load On/Off**
  No matter what mode the channel is in (Static, Dynamic...). Click it to change the loading status to Load On or Off.

Figure 10-6 Setting Load On/Off

- **Initiate On/Off**
  Click it to get the waveform and check the return message of Trigger Status.

Figure 10-7 Setting Initiate On/Off

- **Trigger Status**
  Click Digitizing Trigger On, the horizontal axis mapped Trigger Status will show the status of capture. IDLE will appear when the trigger is done. The status transition sequence is Pre _Trigger, Wait_Trigger, Post_Trigger and IDLE.

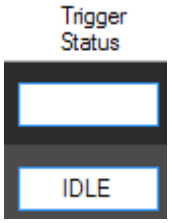


Figure 10-8 Trigger Status

- **Capture Waveform**
  When IDLE is shown for Trigger Status, click On/Off of the mapped channel to capture the waveform and check the return message of Capture Status.

Figure 10-9 Setting Capture Waveform

- **Capture Status**
  Click Capture Waveform On, the horizontal axis mapped Capture Status will show the status of capture. OK will appear when trigger is done and Wait will show if it is not ready. To capture the waveform, the Status of mapped channel has to be in OK state.

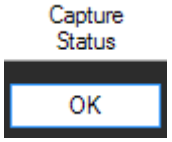


Figure 10-10 Capture Status

- **Abort**
  To abort trigger after Initiate On, simply click the mapped channel.

Figure 10-11 Setting Abort

- **Digitizing Graph**

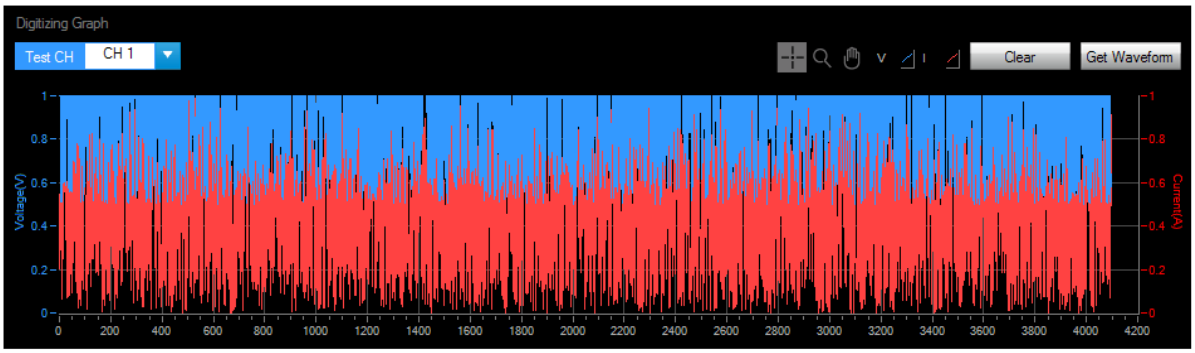


Figure 10-12 Digitizing Graph Panel

It captures the voltage and current waveform. The blue waveform indicates voltage and the red one indicates current. They can be identified easily by the figure but be aware of the Y-axis in which the left is voltage and the right is current. The figure shown below is the display of capturing and captured waveform. Check if the waveform is captured correctly after clicked **Get Waveform**. If the time is too long, check if the setting of capture time is too long or there is problem with trigger condition. If the status of mapped Channel Capture is not OK, the **Get Waveform** button will be invalid.

Test CH: It indicates the channel waveform that the current waveform is captured.
Refresh: It clears the current Digitizing Graph waveform data.

Graph Tools: Please refer to section 8.7.

10.2 Report

It records the captured channel voltage/current waveform to a *.txt file as the figure shown below. The 1st column is point and the maximum is 4096 points. The 2nd column is voltage and the 3rd column is current. The user can open the report via Excel for curve drawing.

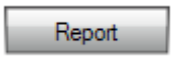


Figure 10-13 Digitizing Report

Before converting the captured waveform to report, it needs to assign a desired path and filename and then click Report On. The path and filename can be specified using .

Figure 10-14 Digitizing Report Path & File

Report format and partial contents:
1st column: points serial number, 2nd column: voltage value, 3rd column: current value.

```
4069     4.526    1.6001
4070     4.525    1.5998
4071     4.522    1.6004
4072     4.526    1.6008
4073     4.530    1.5992
4074     4.524    1.6009
4075     4.525    1.6009
4076     4.528    1.5999
4077     4.529    1.6006
4078     4.530    1.6001
4079     4.529    1.6005
4080     4.529    1.6006
4081     4.526    1.5996
4082     4.532    1.5997
4083     4.530    1.5999
4084     4.530    1.5993
4085     4.533    1.6004
4086     4.529    1.5989
4087     4.532    1.5998
4088     4.530    1.5997
4089     4.529    1.5989
4090     4.528    1.5987
4091     4.534    1.5994
4092     4.529    1.5989
4093     4.534    1.5998
4094     4.533    1.5989
4095     4.529    1.5998
4096     4.529    1.6006
```

Figure 10-15 Digitizing Report Format & Partial Contents

10.3 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

11. Sweep Test

Sweep Test is mainly operated in Dynamic Mode. It executes from start frequency (F_start) and changes the output frequency following the value (F_step) increased every step until end of the frequency (F_end). It checks the V_pk+, Fpk+ and V_pk-, Fpk values during sweep.

Figure 11-1 Sweep Mode Window

11.1 Setting Parameter

- **Test CH**
  The channel number set in Hardware Configuration panel will list here. It is a drop-down menu to select the desired channel for test.

Figure 11-2 Setting Test CH

- **F_start (Hz)**
  It sets the start frequency within the range of 0.01Hz~ 50000Hz and the resolution of 0.01. The value can be input directly or by moving the point slider to adjust the start frequency.

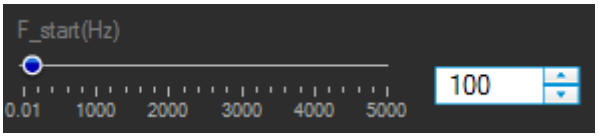


Figure 11-3 Setting F_start (Hz)

- **F_end (Hz)**
  It sets the end frequency within the range of 0.01Hz~ 50000Hz and the resolution of 0.01. The value can be input directly or by moving the point slider to adjust the end frequency.

Figure 11-4 Setting F_end (Hz)

- **Imax**
  It sets the maximum loading of Sweep in the unit of Ampere (A). It will change based on the Range selected. The numbers underneath in gray indicate the valid range.

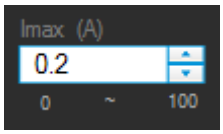


Figure 11-5 Setting Imax

- **Imin**
  It sets the minimum loading of Sweep in the unit of Ampere (A). It will change based on the Range selected. The numbers underneath in gray indicate the valid range.

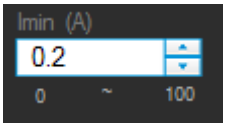


Figure 11-6 Setting Imin

- **Dwell Time**
  It sets the execution time of each step in the unit of Sec. The numbers underneath in gray indicate the valid range.

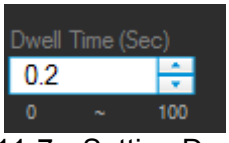


Figure 11-7 Setting Dwell Time

- **F_step**
  It sets the amount of steps from F_start to F_end. The numbers underneath in gray indicate the valid range.

Figure 11-8 Setting F_step

- **Duty**
  The value of Duty maps to the Imax that is the execution percentage of Imax within a cycle. The remaining percentage, 100 minus Duty, is the execution time of Imin.

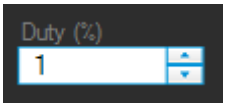


Figure 11-9 Setting Duty

- **Range**
  It sets the Sweep range. There are Low, Middle and High for selection. Any change of range will affect the setting range of Imax, Imin, Rise Slew Rate & Fall Slew Rate.

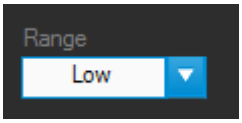


Figure 11-10 Setting Range

- **Rise Slew Rate**
  It sets the current rise slew rate. The setting varies with the Range set. The numbers underneath Fall Slew Rate in gray indicate the valid range.

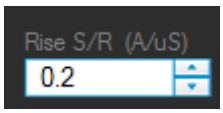


Figure 11-11 Setting Rise Slew Rate

- **Fall Slew Rate**
  It sets the fall slew rate of current. The setting varies with the Range set. The numbers underneath in gray indicate the valid range.

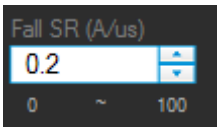


Figure 11-12 Setting Fall Slew Rate

- **Sampling Time**
  It sets the interval of readback in the unit of second. When it is Trigger On, the Voltage, Current and Frequency will continue to show the present readings. It means the speed appears on the Panel and the recording speed of Report will change due to this setting. The applicable range is 0.01~100 seconds.

Figure 11-13 Setting Sampling Time

- **Trigger**
  It triggers the execution of Sweep Test. It starts the test when Trigger ON is clicked. Click it again to turn it to Trigger and the test will be aborted or cancelled.

Figure 11-14 Trigger ON

- **Total Time**
  It sums up the total test time when operated in Auto mode. Trigger On will count the time executed when operated in Manual mode.

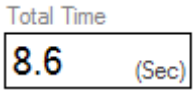


Figure 11-15 Total Time

11.2 V-F Chart

It shows the readback voltage of each frequency swept point when Trigger On is clicked. It follows F_start and the execution time of every step to draw the voltage curve.

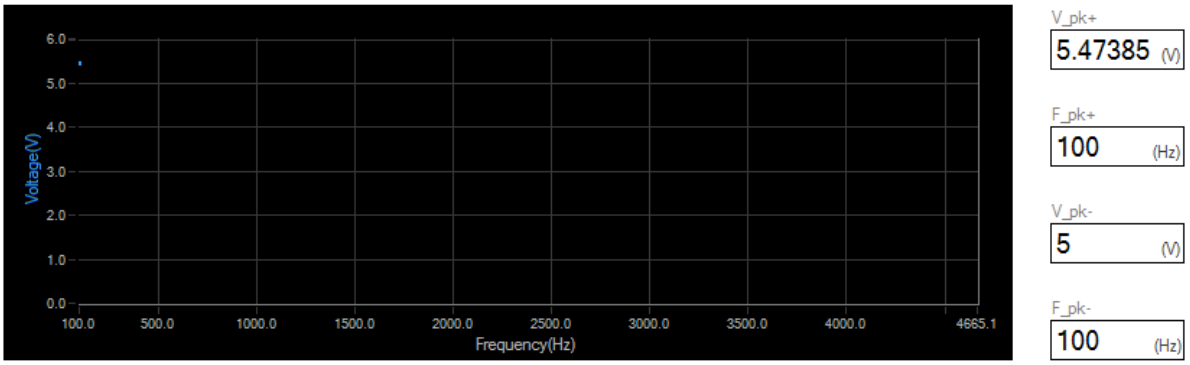


Figure 11-16 V-F Chart

The V_pk+, Fpk+, Vpk- and Fpk- 4 parameters values shown here are the results after the entire test time ended and Trigger On is clicked.

11.3 Reading Display

It shows the present channel readings of Voltage, Current and Frequency after Trigger On is clicked. The reading interval is determined by Sampling Time.

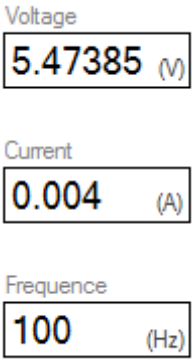


Figure 11-17 Reading Display

11.4 Digitizing Waveform

Please refer to section 8.7 for detailed description.

11.5 Report Format

The Sweep test starts when Trigger On is clicked and ends after all frequencies are swept. The reading captured interval is determined by Sampling Time, the report saves an entry when the time is due. Thus long time recording will not affect its correctness and will not miss the readings due to sudden power outage. To create a Report, be sure to specify the desired path and filename for saving when Trigger On is clicked.

A simple report in pure text file with *.txt extension is provided during Sweep test. The user should decide if turning on the Report function as well as the path and filename for storage.

Before saving the file, it is necessary to turn the Report from Off to On.

Figure 11-18 Report On/Off

It can set the desired filename and path when Report turns to On. The user can click  to specify the path and filename. The file format is pure text that can be opened by Notepad.

Figure 11-19 Browse for Report Path & Filename

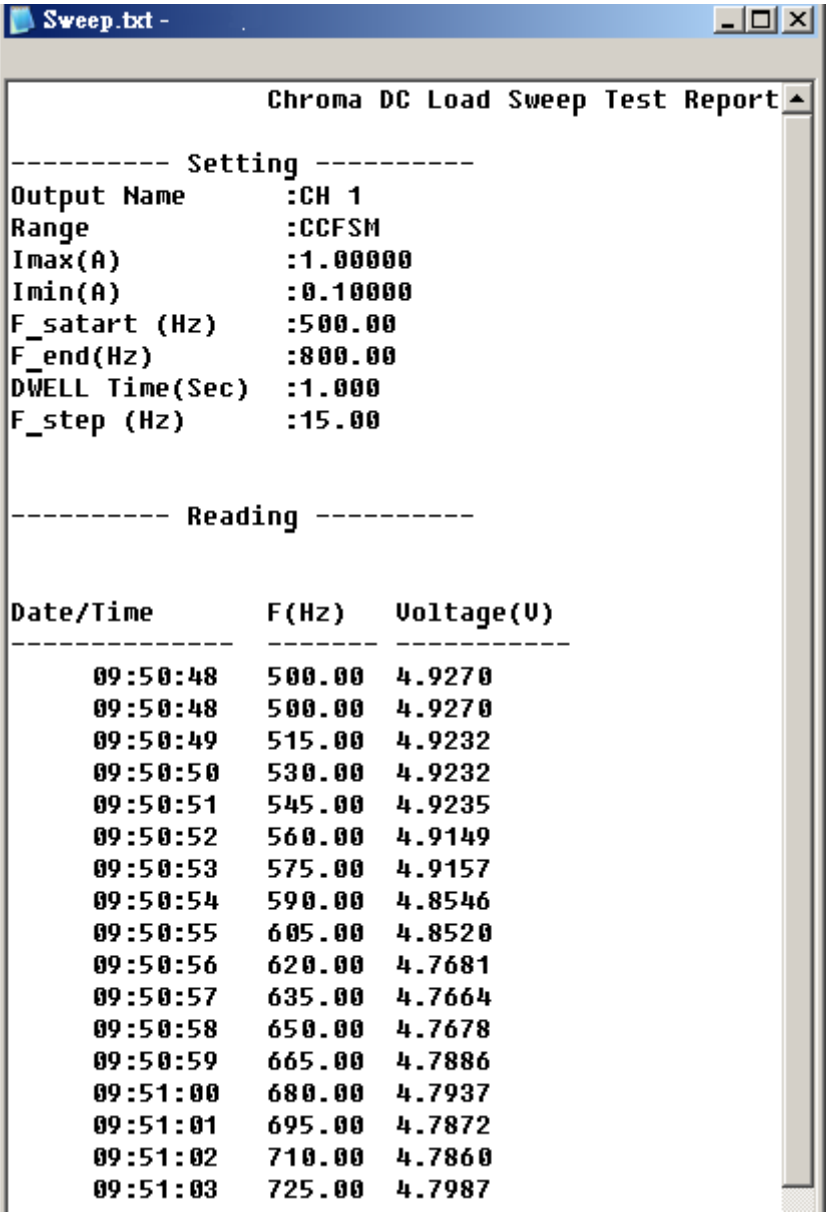


Figure 11-20 Sweep Report Saving Format

11.6 Digitizing Graph Display

Please refer to section 8.7 for detailed description.

11.7 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

12. Sine Test

Sine Test is able to load a current waveform of sine with frequency from 0.01Hz to 20KHz. The software has a simulation graph to inform user the loading pattern and a reading chart to check the graph display of voltage, current (Idc) and power, also provides report function for user to see the data in detail.

Figure 12-1 Sine Test Window

12.1 Setting Parameter

- **Test CH**
  The channel number set in Hardware Configuration panel will list here. It is a drop-down menu to select the desired channel for test.

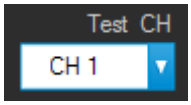


Figure 12-2 Setting Test CH

- **Frequency**
  It sets the frequency within the range of 0.01Hz~ 20000Hz and the resolution of 0.01. The value can be input directly or by moving the point slider to adjust the start frequency.

Figure 12-3 Setting Frequency

- **Idc**
  It sets the value of DC loading. The setting value varies with range. A dialog box will appear to inform the valid range and return to previous setting when it exceeds the range.

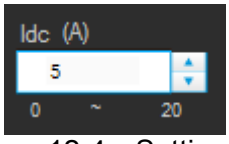


Figure 12-4 Setting Idc

Notice

When setting the loading value for Sine Test, it needs to set the Idc first and then the Iac as the Iac range will change based on the Idc. Once the Iac and Idc are set, the sum of these two values cannot exceed the valid range. When the value reaches the upper limit, it is necessary to adjust the mapping value first before any other modification.

- **Iac**
  It sets the value of AC loading. The setting value varies with range and its upper limit is restricted by Idc. A dialog box will appear to inform the valid range and return to previous setting when it exceeds the range.

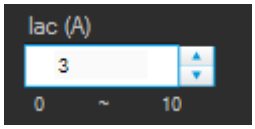


Figure 12-5 Setting Iac

Notice

Iac upper limit = (Idc upper limit – Idc setting)*2. As the Iac is peak-to-peak value, the loading value =Idc+ (Iac/2) that can be seen on the simulation graph.

- **Range**
  It sets the range for Sine Test. There are Low, Middle and High for selection. Any change of range will affect the setting range of Iac and Idc.

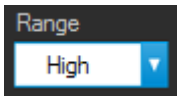


Figure 12-6 Setting Range

- **Sampling Time**
  It sets the interval of readback in the unit of second. When Trigger On is clicked, the Voltage, Current, Frequency, Vpk+ & Vpk- will continue to show the present readings. It means the speed appears on the panel and the recording speed of report will change due to this setting. The applicable range is 0.01~5 seconds.

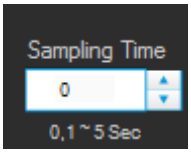


Figure 12-7 Setting Sampling Time

12.2 Simulation Graph

The simulation graph shows the diagram of present settings when Frequency, Iac and Idc changes. The Y-axis is the current and X-axis is the cycle density without any unit.

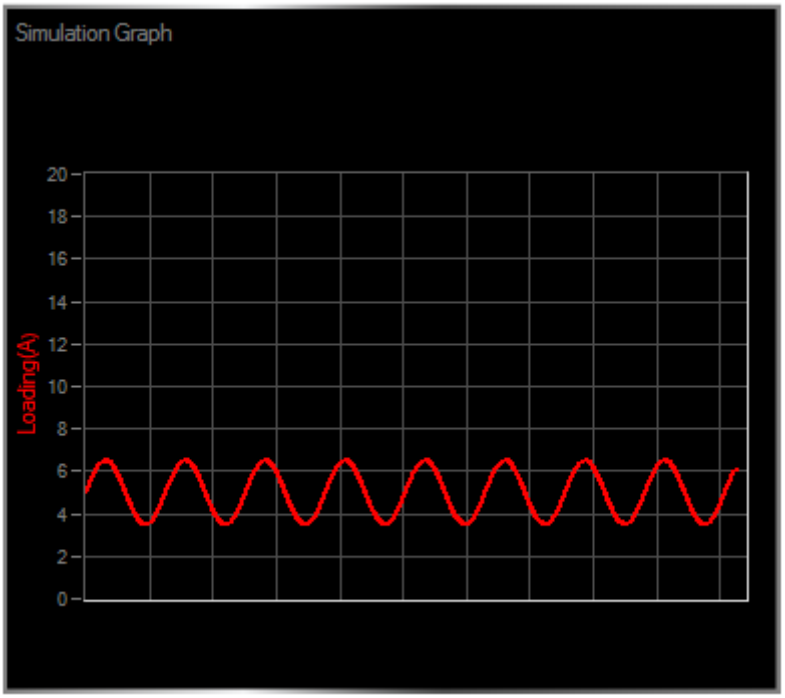


Figure 12-8 Simulation Graph

12.3 Digitizing Waveform

Please refer to section 8.7 for detailed description.

12.4 Reading Chart

The Reading Chart has three curves: V, I & P. The lower part has displays of Vpk+, Vpk- and more. In addition, the Times Length can set visible length of Reading Chart X axis, which is affected by sampling. Enlarge the setting if there is a need to check longer time.

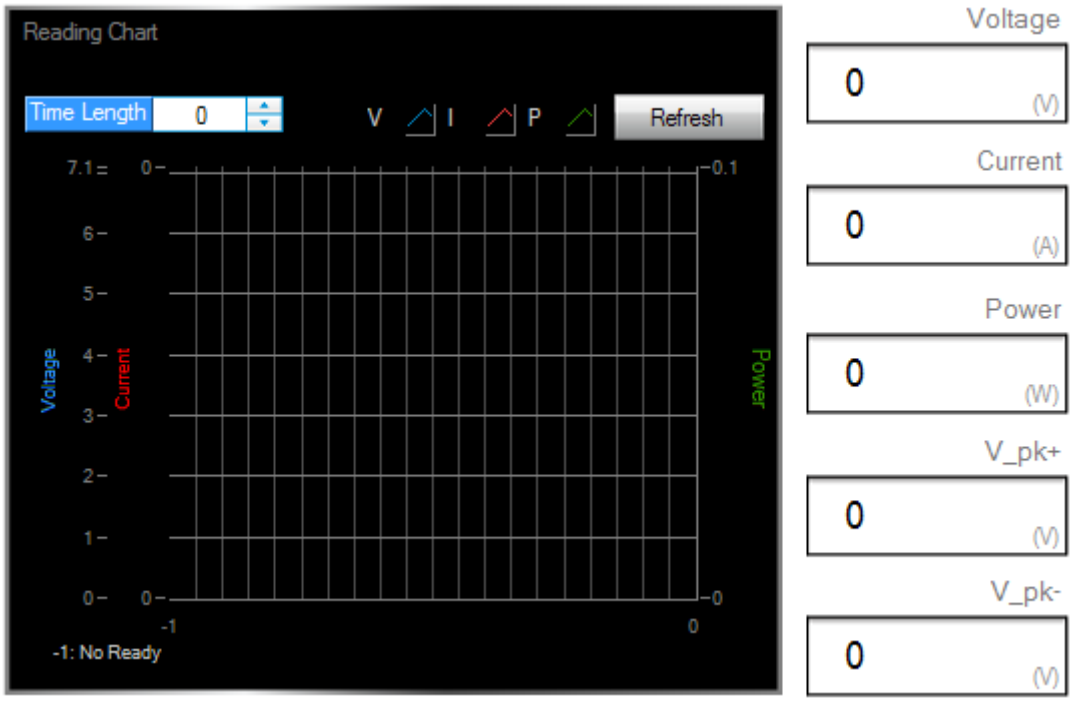


Figure 12-9 Reading Chart

12.5 Report Format

As the Sine test starts when Trigger On is clicked and the reading captured interval is determined by Sampling Time, the report saves an entry when the time is due. Thus long time recording will not affect its correctness and will not miss the readings due to sudden power outage. To create a report, be sure to specify the desired path and filename for saving when Trigger On is clicked.

A simple report in pure text file with *.txt extension is provided during Sine test. The user should decide if turning on the Report function as well as the path and filename for storage.

Before saving the file, it is necessary to turn the Report On.

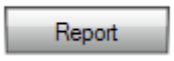


Figure 12-10 Report Button

It can set the desired filename and path when Report turns to On. The user can click  to specify the path and filename. The file format is pure text that can be opened by Notepad.

Figure 12-11 Browse for Report Path & Filename

Sine.txt

```
                Chroma DC Load Sine Test Report

---------- Setting ----------
Output CH       :1

Range           :SWDM
Iac(A)          :1.000
Idc(A)          :1.000
Frequency(Hz)   :10.00
Sampling(Ses)   :1.0


---------- Reading ----------
 Vmea     Imea     Pmea    Vpk+     Vpk-         Time
  (V)      (A)      (W)     (V)      (V)
------   ------   ------   ------   ------   ------
4.7916   0.9998   4.76     4.9366   4.6376        10:17:03
4.7909   0.9998   4.76     4.9176   4.6349        10:17:04
4.7902   0.9998   4.76     4.9176   4.6363        10:17:05
4.7897   0.9998   4.76     4.9176   4.6363        10:17:06
4.7893   0.9998   4.76     4.9216   4.6336        10:17:07
4.7891   0.9998   4.76     4.9203   4.6349        10:17:09
4.7890   0.9998   4.76     4.9189   4.6173        10:17:10
4.7887   0.9998   4.76     4.9203   4.6336        10:17:11
4.7883   0.9998   4.76     4.9176   4.6295        10:17:12
4.7879   0.9998   4.76     4.9176   4.6295        10:17:13
4.7875   0.9998   4.75     4.9312   4.6322        10:17:14
4.7875   0.9998   4.75     4.9271   4.6308        10:17:15
4.7874   0.9998   4.75     4.9189   4.6308        10:17:16
4.7872   0.9998   4.75     4.9176   4.6322        10:17:17
4.7869   0.9998   4.75     4.9176   4.6308        10:17:18
4.7867   0.9998   4.75     4.9176   4.6295        10:17:20
4.7866   0.9998   4.75     4.9176   4.6308        10:17:21
4.7866   0.9998   4.75     4.9176   4.6308        10:17:22
4.7863   0.9998   4.75     4.9149   4.6254        10:17:23
4.7882   0.9998   4.76     4.9176   4.6349        10:17:24
```

Figure 12-12 Sine Report Saving Format

12.6 Digitizing Function

Please refer to section 8.7 for detailed description.

12.7 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

13. Program Test

This mode provides List Sequence Test and Step Sequence Test to replace the step by step manual tests. The test program (maximum 100 sequences) can be defined in advance so that the software can bring out the channel settings for modification. If gray shading appears in the window, it means not available for use. Please be aware that the execution of Program Mode in Soft Panel is the same as the Program mode on the standalone unit. The diagram of Program Simulation Graph allows user to check if the loading waveform and timing are desired. As there are many parameter combinations, parameter saving and opening functions are also provided. The user can use Reading Chart or Report On to check the data change during execution. The functions of this window are explained below.

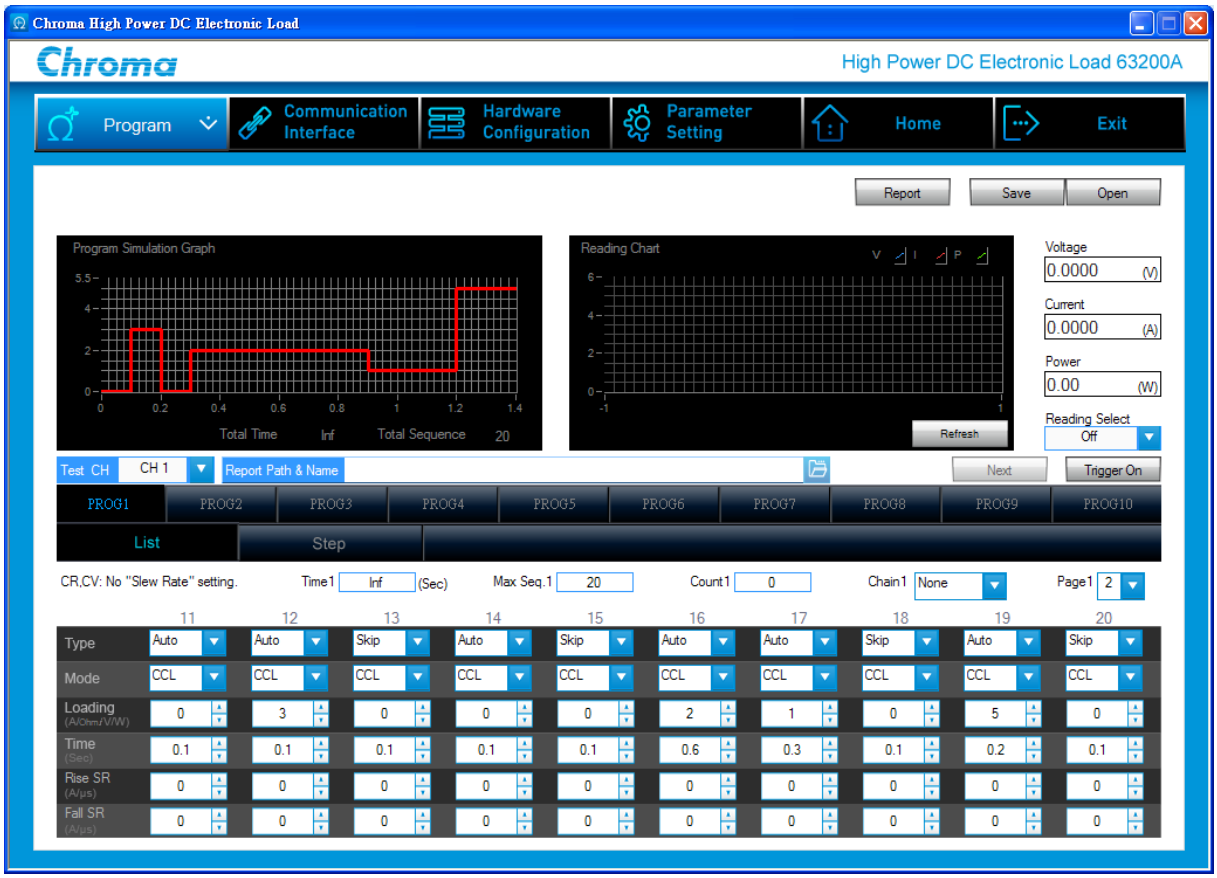


Figure 13-1 Program Test Window

13.1 Program Simulation Graph

This is a display area that follows the loading change status to draw loading value (Y-axis) and execution time (X-axis). The user can select one channel at a time. The Total Time indicator shows the time it will take to complete the execution. Total Sequence indicates the sequence set for use (maximum 100.) The chart will draw one time only without repetition as Count specified.

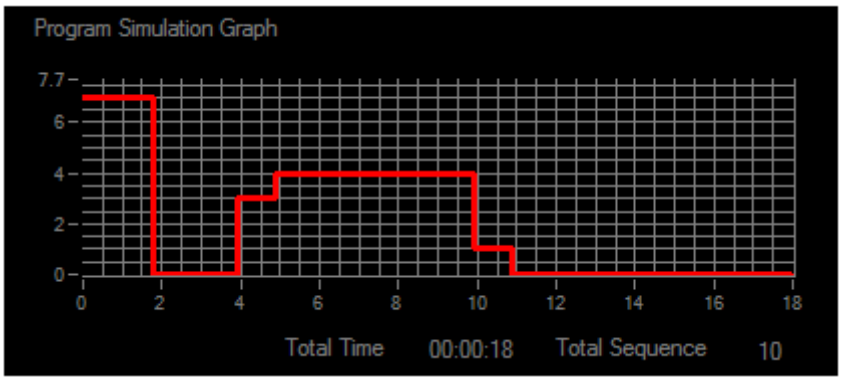


Figure 13-2 Program Simulation Graph

Please be aware that if Type is set to Skip it means to skip the sequence for every sequence in use and no sequence stands, the Program Simulation Graph will prompt an error message - Skip Type!

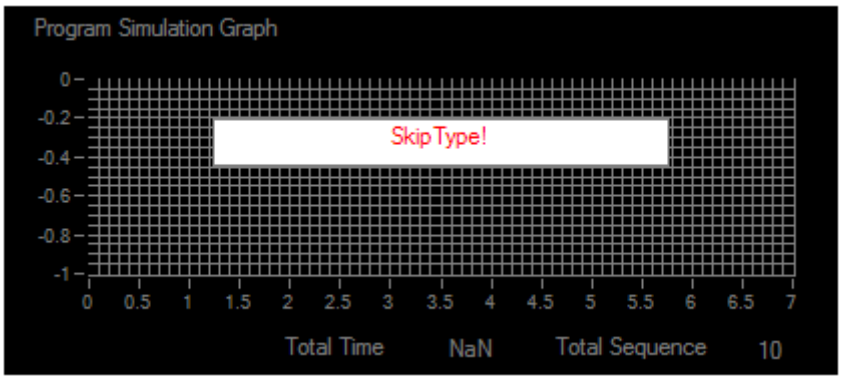


Figure 13-3 Warning for Invalid Program Simulation Graph

13.2 Setting Parameter

The parameter is set following the sequence of CH, 10 programs, List or Step and others.

When Test CH is specified, the software will read the settings of standalone device and display them in the area as shown below. Change the parameter if it is not desired.

Following is the introduction of each layer.

Figure 13-4 List Mode Parameters

- **Setting Program**
  Each channel can set 10 programs that are labeled from PROG01 to PROG10. Each program is able to set the parameters in LIST or STEP, Max Seq. and Count (the number of repeated tests under this program. 0 means repeated execution.) Chain1 indicates where the program will skip to when the program is done.

  Please be aware that the specified Program Tab is the one to be executed. For instance, assuming there are 10 sequences in Program 1 and 10 sequences in Program 2, the user stops at Program 2 for setting and if it is executing now, the channel will start to run the 10 sequences under Program 2. It will run the sequences in Program 1 only when Chain 2 is set to Program 1.

- **Setting List or Step Parameters**
  Click the tab **"LIST"** or **"STEP"** to select the mode for parameters setting. The parameters available in **"LIST"** are TYPE, MODE, Loading, Time, Rise SW Rate and Fall SW Rate.

  The parameters available in Step are Step_Type, Step_Mode, Step_Time, Start Loading, End Loading, Rise Slew Rate and Fall Slew Rate.

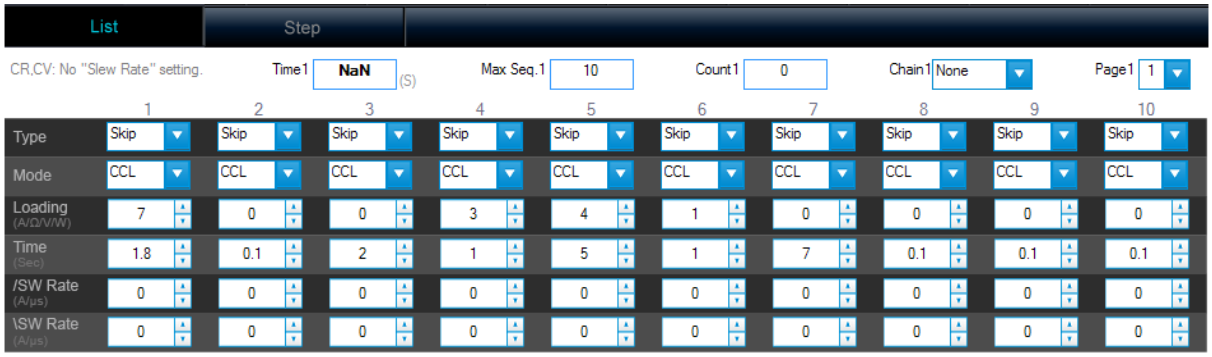


Figure 13-5 Setting List Parameters

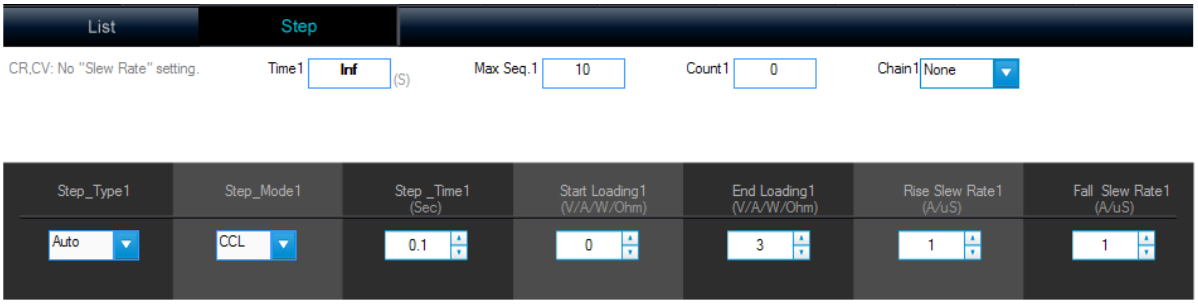


Figure 13-6 Setting Step Parameters

- **Setting Max Seq.**
  The range available for Max Seq. is 1 to100. A channel has 100 sequences for execution. The user can set it in different program. When switching to different sequence, the parameters of Setting, Short and Time will change as well. Each of these parameters has 100 sequences available for settings.

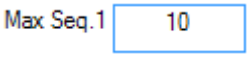


Figure 13-7 Setting Max Seq.

- **Setting Count**
  It sets the number repeated for the selected program. The time calculated under valid Max. Sequence has to multiply the value of Count to become the total execution time. If the setting is 0, it means the program is in infinite loop.

Figure 13-8 Setting Count

- **Setting Chain**
  It skips to another program by selecting it from a drop-down menu. The menu has eleven selections containing None and Program 1 to 10. If None is selected, it executes only the program selected presently. If the present program no is selected, it will fall into infinite loop and if other program number is selected, it will skip to the program specified and execute the sequences.

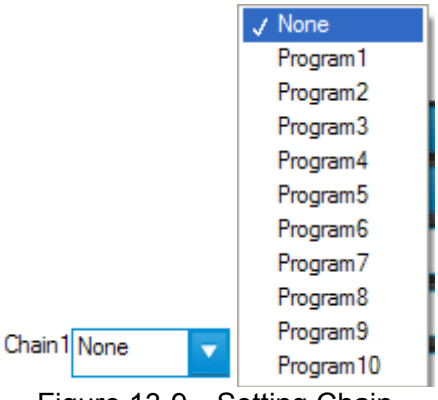


Figure 13-9 Setting Chain

- **Program Time**
  It shows the execution time of present program including the settings of Count but without the link of Chain. Be aware that if Count sets to 0 or Type sets to Manual or External, it will show Inf as infinite. The unit is second.

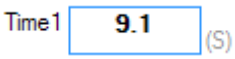


Figure 13-10 Program Time

13.2.1 Setting LIST

The parameters available in LIST for setting are Sequence indicator, TYPE, MODE, Loading, Time, Rise SW Rate and Fall SW Rate.

13.2.1.1 Sequence Indicator

This indicator varies with the setting of Max Seq. When Max Seq. sets to 10, the sequence will expand to 10 sequences from left to right and each sequence has settings of TYPE, MODE, Loading, Time, Rise SW Rate and Fall SW Rate. When the sequence exceeds 10, it needs to use Sequence Page to control the sequence position.

Figure 13-11 Sequence Indicator

13.2.1.2 Setting TYPE

Type parameter sets how to execute sequence in LIST mode. It has Skip, Auto, Manual and External 4 selections. Skip means to skip the sequence without execution, Auto means to execute normally, Manual means to trigger the test manually and go to next sequence when Next is clicked, and External means to wait for the hardware external signal to trigger next sequence.

Figure 13-12 Setting TYPE

The Time setting is invalid when executing the sequence set to Manual. The user has to click Next to carry on the process and the software will show Inf. as it is unable to calculate the execution time.

Figure 13-13 Next Button

13.2.1.3 Setting MODE

It can set to CCL, CCM, CCH, CRL, CRM, CRH, CPL, CPM, CPH, CVL, CVM or CVH mode for program test. Once the loading mode and range are changed, the setting ranges of Loading and Slew Rate will change as well. Therefore, it is necessary to pay attention to the message prompted on the screen when switching the mode.

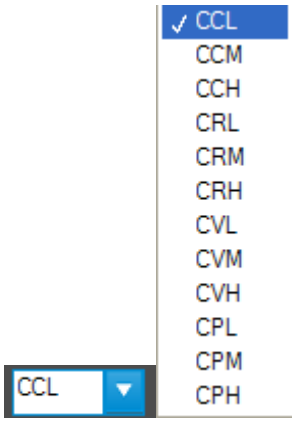


Figure 13-14 Setting MODE

13.2.1.4 Setting Loading

It sets the loading under Sequence column. The unit varies with Mode, for instance, in CC mode the unit is A (Ampere), in CR mode the unit is Ohm, in CP mode the unit is W (Watt) and in CV mode the unit is V (Volt.)

Figure 13-15 Setting Loading

13.2.1.5 Setting Time

It sets the execution time under Sequence column. The unit is second and the range is 0.0001 to 30 seconds.

Figure 13-16 Setting Time

13.2.1.6 Setting Rise Slew Rate

It sets the rise slew rate under Sequence column in the unit of A/uS. The applicable range varies with the mode selected. It will get the minimum setting first when mode changes and will prompt the range on Reading Chart. It supports CC and CP modes only.

Figure 13-17 Setting Rise Slew Rate

13.2.1.7 Setting Fall Slew Rate

It sets the fall slew rate under Sequence column in the unit of A/uS. The applicable range varies with the mode selected. It will get the minimum setting first when mode changes and will prompt the range on Reading Chart. It supports CC and CP modes only.

Figure 13-18 Setting Fall Slew Rate

13.2.1.8 Setting Sequence Page

When Max Seq.>10, the Sequence Page drop-down selection is active. So, when Max Seq.=100, the drop-down page has Page1 to 10. As the page is unable to expand, this element is used for page break.

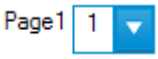


Figure 13-19 Setting Sequence Page

13.2.2 Setting STEP

The parameters in Step containing Step_Type, Step_Mode, Step _Time, Start Loading, End Loading, Rise Slew Rate and Fall Slew Rate.

13.2.2.1 Setting Step_Type

There are four selections in STEP mode, which are Skip, Auto, Manual and External. Skip means to skip the program without execution, Auto means to execute normally, Manual means to trigger the test manually and go to next program when **Next** is clicked, and External means to wait for the hardware external signal to trigger next program.

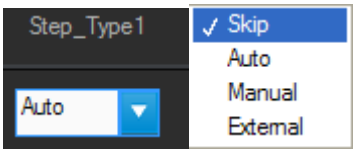


Figure 13-20 Setting Step_Type

The Time setting is invalid when executing the program set to Manual. The user has to click **Next** to carry on the process and the software will show Inf. as it is unable to calculate the execution time.

Figure 13-21 Next Button

13.2.2.2 Setting Step_Mode

It can set to CCL, CCM, CCH, CRL, CRM, CRH, CPL, CPM, CPH, CVL, CVM or CVH mode for program test. Once the loading mode and range are changed, the setting ranges of Loading and Slew Rate will change as well. Therefore, it is necessary to pay attention to the message prompted on the screen when switching the mode.

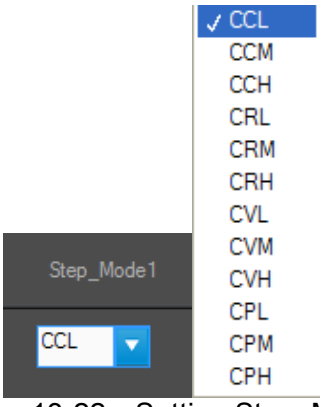


Figure 13-22 Setting Step_Mode

13.2.2.3 Setting Step_Time

It sets the execution time under Program column. The unit is second and the range is 0.0001 to 30 seconds.

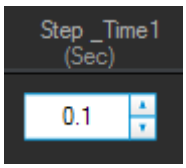


Figure 13-23 Setting Step_Time

13.2.2.4 Setting Start Loading

It sets the start loading for Program. The unit varies with mode, for instance, in CC mode the unit is A (Ampere), in CR mode the unit is Ohm, in CP mode the unit is W (Watt) and in CV mode the unit is V (Volt.)

Figure 13-24 Setting Step_ Loading

13.2.2.5 Setting End Loading

It sets the end loading for Program. The unit varies with mode, for instance, in CC mode the unit is A (Ampere), in CR mode the unit is Ohm, in CP mode the unit is W (Watt) and in CV mode the unit is V (Volt.)

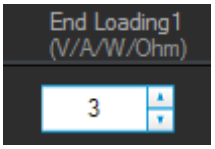


Figure 13-25 Setting End Loading

13.2.2.6 Setting Rise Slew Rate

It sets the rise slew rate for Program in the unit of A/uS. The applicable range varies with the mode selected. It will get the minimum setting first when mode changes and will prompt the range on Reading Chart. It supports CC and CP modes only.

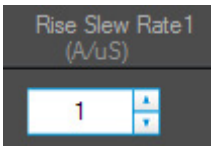


Figure 13-26 Setting Rise Slew Rate

13.2.2.7 Setting Fall Slew Rate

It sets the fall slew rate for Program in the unit of A/uS. The applicable range varies with the mode selected. It will get the minimum setting first when mode changes and will prompt the range on Reading Chart. It supports CC and CP modes only.

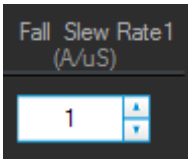


Figure 13-27 Setting Fall Slew Rate

13.2.3 Reading Chart

The Reading Chart shows the readings for check including voltage, current or power for selection. Clear the Chart data first before changing the reading type and restart. It can click Refresh any time to clear the Chart data.

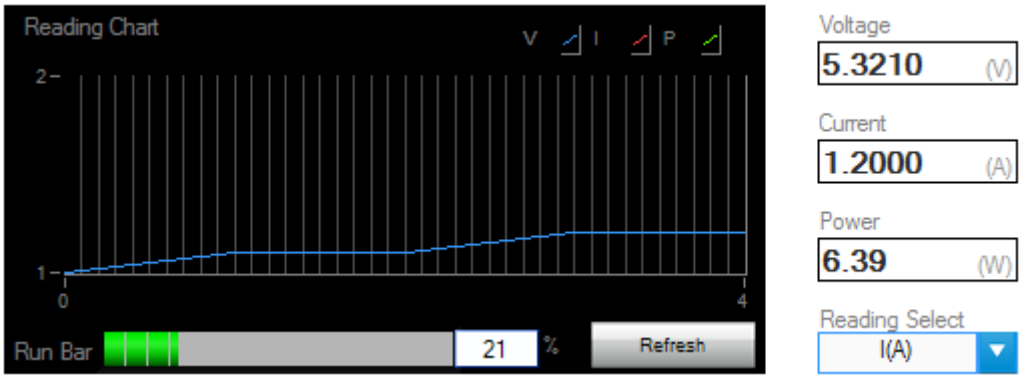


Figure 13-28 Reading Chart

13.2.4 Setting Trigger

It triggers the Program to start testing. The test begins when Trigger On is clicked. To cancel or stop the test, click the button again to turn it off (shown in gray).

Figure 13-29 Trigger Button

13.2.5 Program Execution Time

The program execution time will appear as shown in Figure 13-30 after Trigger On is clicked. The Run Bar shows the progress and percentage to inform user the status.

Figure 13-30 Program Execution Time

13.3 Report Format

In Program test, the report starts when Trigger On is clicked and ends when the all sequences are done. The reading captured interval is 1 second and the report saves an entry when the time is due. Thus long time recording will not affect its correctness and will not miss the readings due to sudden power outage. To create a Report, be sure to specify the desired path and filename for saving when Trigger On is clicked.

A simple report in pure text file with *.txt extension is provided during Program test. The user should decide if turning on the Report function as well as the path and filename for storage.

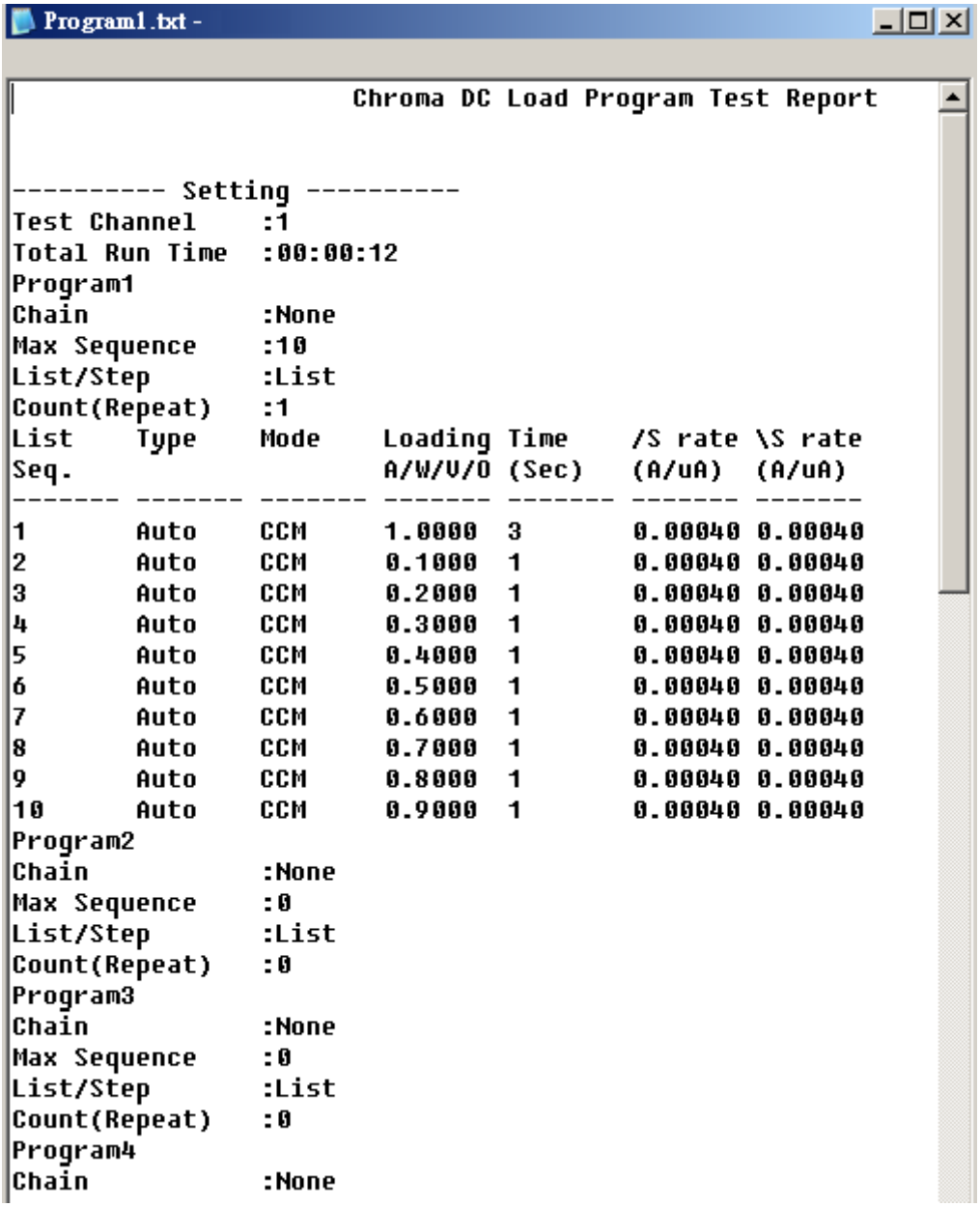
Before saving the file, it is necessary to click Report first.

Figure 13-31 Report Button

It can set the desired filename and path when Report turns to On. The user can click  to specify the path and filename. The file format is pure text that can be opened by Notepad.

Figure 13-32 Browse for Report Path & Filename

Report format: The former part is settings and the latter part is readings. If the Program has no actions set for execution, it will describe the user settings briefly.



Program1.txt -

```
                    Chroma DC Load Program Test Report


---------- Setting ----------
Test Channel     :1
Total Run Time   :00:00:12
Program1
Chain            :None
Max Sequence     :10
List/Step        :List
Count(Repeat)    :1
List    Type    Mode    Loading Time    /S rate \S rate
Seq.                    A/W/V/O (Sec)   (A/uA)  (A/uA)
------- ------- ------- ------- ------- ------- -------
1       Auto    CCM     1.0000  3       0.00040 0.00040
2       Auto    CCM     0.1000  1       0.00040 0.00040
3       Auto    CCM     0.2000  1       0.00040 0.00040
4       Auto    CCM     0.3000  1       0.00040 0.00040
5       Auto    CCM     0.4000  1       0.00040 0.00040
6       Auto    CCM     0.5000  1       0.00040 0.00040
7       Auto    CCM     0.6000  1       0.00040 0.00040
8       Auto    CCM     0.7000  1       0.00040 0.00040
9       Auto    CCM     0.8000  1       0.00040 0.00040
10      Auto    CCM     0.9000  1       0.00040 0.00040
Program2
Chain            :None
Max Sequence     :0
List/Step        :List
Count(Repeat)    :0
Program3
Chain            :None
Max Sequence     :0
List/Step        :List
Count(Repeat)    :0
Program4
Chain            :None
```

Figure 13-33 Program Report Format

13.4 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detail description.

14. Battery Test

This function tests battery discharge by setting a fixed load and checking the battery output voltage after loading started. Once the voltage is adjusted to a certain cutoff potential, stop loading and calculate the total electric charge (mA-hour). The entire battery discharge status can be seen from Battery Reading Chart. If gray shading appears in the window, it means not available for use. When the total channel number is larger than 4, a scroll bar will appear on the right. The user can scroll it to change page. The maximum channel numbers are 4 in each page. The battery test can be performed on multiple channels and provide test reports for user to check.

Figure 14-1 Battery Test Window

14.1 Setting Battery Test Parameters

The parameters to be set for battery testing are Setting CH, Mode, Loading, Time Out, End_V, Rise Slew Rate, Fall Slew Rate, Active and Sampling Time.

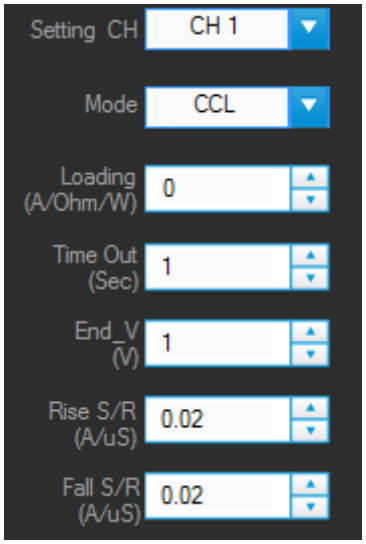


Figure 14-2 Setting Battery Test Parameters

- **Setting CH**
  The channels set in Hardware Configuration panel will list here. It is a drop-down menu for user to select any channel for testing. When a channel is selected, the program will load in the parameters (Mode, Loading, Time Out, End_V, Rise Slew Rate & Fall Slew Rate) set previously and the user can modify them as desired.

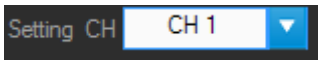


Figure 14-3 Setting CH

- **Setting Mode**
  It can set CCL, CCM, CCH, CRL, CRM, CRH, CPL, CPM & CPH modes. Once the loading mode and range are changed, the setting ranges of Loading and Slew Rate will change as well.

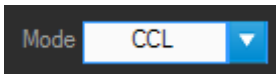


Figure 14-4 Setting Mode

- **Setting Loading**
  It sets the loading and the unit varies with mode, for instance, the unit is A (Ampere) in CC mode, Ohm in CR mode and W (Watt) in CP mode.

Figure 14-5 Setting Loading

- **Setting End_V**
  It sets the condition to end discharge test. When the test voltage is lower than the set condition, it stops loading and discharge test on channel, and then calculates the AH power to show in Capacity column.

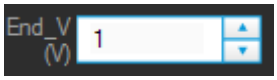


Figure 14-6 Setting End_V

- **Setting Time Out**
  It sets the condition to end discharge test. Once the test time reached the time set here, it stops loading and discharge test on channel, and then calculates the AH power to show in Capacity column.

Figure 14-7 Setting Time Out

- **Setting Rise Slew Rate**
  It sets the rise slew rate in the unit of A/uS. The applicable range varies with the mode selected. It will get the minimum setting first when mode changes and supports CC and CP modes only.

Figure 14-8 Setting Rise Slew Rate

- **Setting Fall Slew Rate**
  It sets the fall slew rate in the unit of A/uS. The applicable range varies with the mode selected. It will get the minimum setting first when mode changes and supports CC and CP modes only.

Figure 14-9 Setting Fall Slew Rate

- **Setting Active**
  It sets the channel to do Battery Test. Checked means enabled for testing and unchecked means disabled for testing.

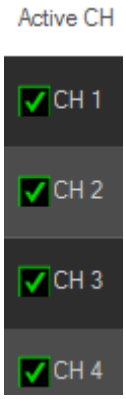


Figure 14-10 Setting Active

- **Setting Sampling Time**
  It sets the interval to readback readings in the unit of second. The Voltage, Current and Power, etc. will continue to display the present readings that is both of the parameters displayed on the panel. The recording speed of Report will change accordingly when Trigger On is clicked. The applicable range is 1~100 seconds.

Figure 14-11 Setting Sampling Time

14.2 Setting for Battery Testing

Though the channel is set one by one for testing, multiple channels are tested together in actual test. In order to let the user understand the settings of each channel, the channel settings are shown here for confirmation. Use the vertical scroll bar on the right to view each channel's setting including Mode, Loading, Time, End_V, Rise S/R (Rise Slew Rate) and Fall S/R (Fall Slew Rate).

Notice When setting CR mode the invalid Slew Rate setting will show "- -" string.

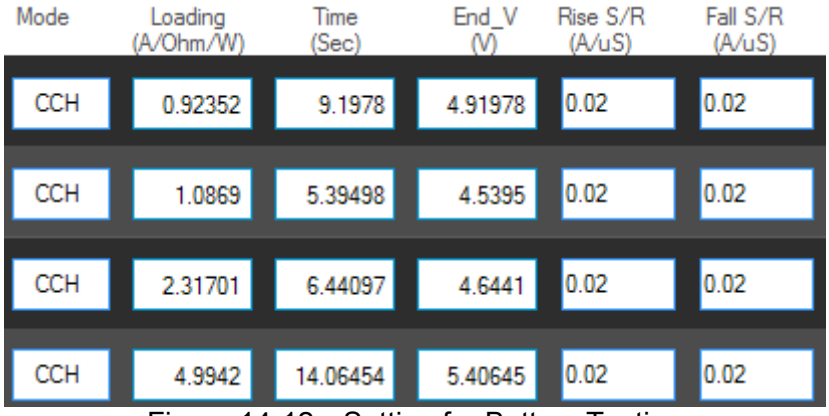


Figure 14-12 Setting for Battery Testing

14.3 Measurement Display

This area shows the measured voltage (V), current (I), power (P), executed time (Run Time) and discharged power (Capacity AH and Capacity WH). The voltage, current and power will read back once per second. When the voltage is lower than Cut Off_V, the Channel Time Count will stop and the Capacity (mAH) will stop as well.

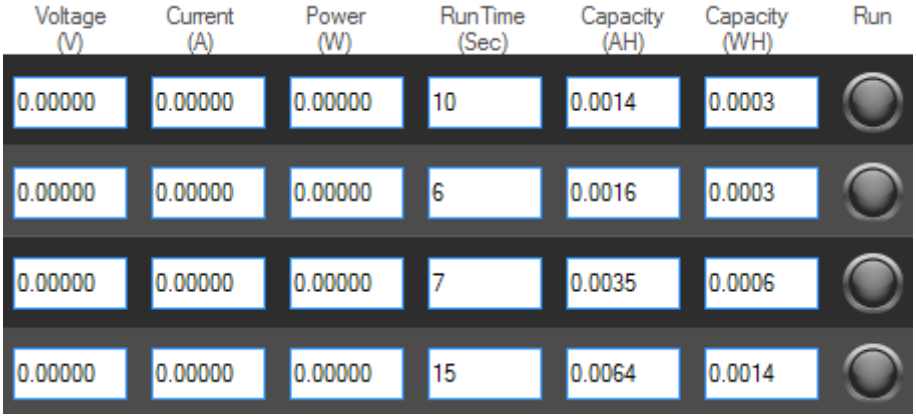


Figure 14-13 Measurement Display

- **Run Indicator**
  It shows green light after Trigger On is clicked and the conditions set on each channel are followed to perform battery testing. Once the channel reached the end condition (Time Out or voltage less than End_V (pass through), it will show Off and the parameters of each channel will stop updating.

Figure 14-14 Battery Run Indicator

- **Run Time Indicator**
  It shows the time executed after Trigger On is clicked and the conditions set on each channel are followed to perform battery testing. Once the channel reached the end condition (Time Out or voltage less than End_V), it will show the time spent at last. The parameter reads the time from each channel so it is synchronized with the standalone device.

Figure 14-15 Battery Run Time Indicator

- **Power Display**
  It shows Capacity AH and Capacity WH after Trigger On is clicked and the conditions set on each channel are followed to perform battery testing. Once the channel reached the end condition (Time Out or voltage less than End_V), it will show the power stayed at last. The parameter reads the power from each channel so it is synchronized with the standalone device.

Figure 14-16 Battery Power Display

14.4 Setting Trigger On

The set conditions can be executed by clicking Trigger On. The Battery Reading Chart will start to draw measurement curve to inform user the execution status and progress. To abort it, just click it again. All testing channels will count following the condition set or stop the execution.

Notice

Run indicator will open the channel under testing when Trigger On is clicked. Besides clicking Trigger Off by the user, the other two conditions to stop the test are Time Out and less than End_V. However, the occurrence of End_V has to be a process, ex. End_V=1V, so the start voltage has to be larger than 1V at first and it triggers to stop at <1V after discharge. If the channel has no voltage input at the beginning, it will wait until Time Out to end the execution.

Figure 14-17 Trigger On Button

14.5 Battery Reading Chart

Each channel follows the conditions set to perform battery testing when Trigger On is clicked. The Battery Reading Chart displays the voltage (V), current (I) and power (W) of the channel set at last. After all channels are tested, it can use Display CH to check the V, I, P curves created during battery testing. The horizontal axis of Battery Reading Chart is the time point. Assuming Time Out is set to 120 seconds but the Sampling Time is set to 10 seconds, then the horizontal axis will show the readings of 12 points only.

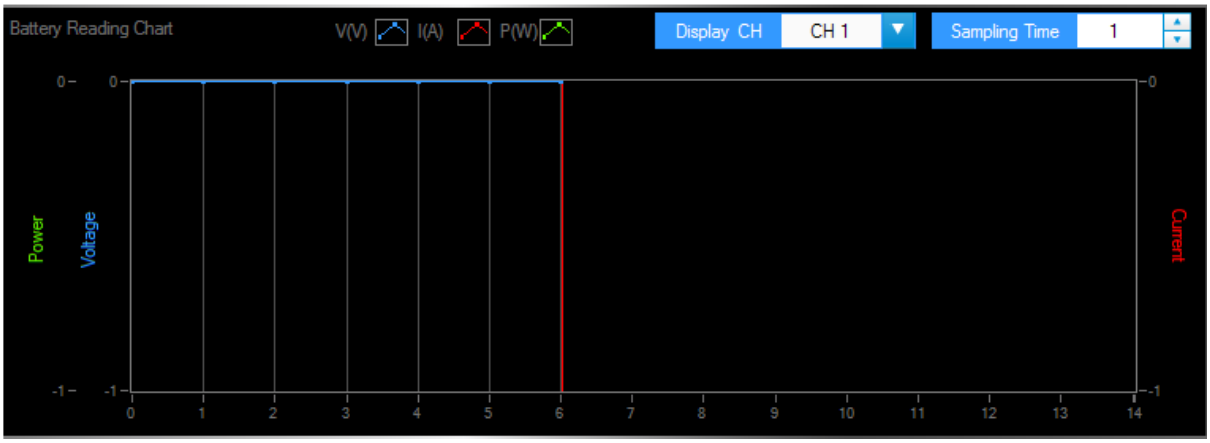


Figure 14-18 Battery Reading Chart

- **Setting Display CH**
  This parameter is used to browse the reading stats of each channel when battery testing is done. It will stay at the last channel set in Display CH when Trigger On is clicked.

Figure 14-19 Setting Display CH

14.6 Report Format

In battery test, the report starts when Trigger On is clicked and ends when all channels stopping testing. The reading captured interval is determined by Sampling Time, the report saves an entry when the time is due. Thus long time recording will not affect its correctness and will not miss the readings due to a sudden power outage. To create a Report, be sure to specify the desired path and filename for saving when Trigger On is clicked.

A simple report in pure text file with *.txt extension is provided during battery testing. The user should decide if turning on the Report function as well as the path and filename for storage.

Before saving the file, it is necessary to turn on the Report first.

Figure 14-20 Report Button

It can set the desired filename and path when Report turns to On. The user can click to specify the path and filename. The file format is pure text that can be opened by Notepad.

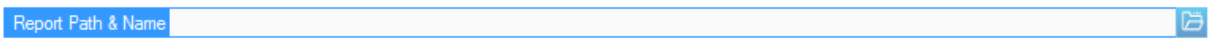


Figure 14-21 Browse for Report Path & Filename

Report Result:
The report result contains setting and readings. The settings are Range of each CH, Loading (A/ohm/W), End_V (V), Time (Sec), S/R_/ and S/R_\. The readings are displayed rightwards by the channel number containing the V, I, P, C AH, C WH of each channel and the last recording time. See the figure below for the format.

battery.txt -

---------- Setting ----------

CH	Range	Loading A/Ohm/P	Time Sec	End_V V	S/R_/ (A/uS)	S/R_\ (A/uS)	
CH 1	CCM	1.00000	120	2.000	0.004000		0.004000
CH 2	CCH	0.00000	0	0.000	0.004	0.004	
CH 3	CCM	0.00000	120	2.000	0.0012	0.0012	

---------- Reading ----------

CH1 Volt (V)	Current (A)	Power (W)	C AH	C WH	CH2 Volt (V)	Current (A)	Power (W)	C AH	C WH	CH3 Volt (V)	Curren (A)
4.697	0.99970	4.696	0.00083	0.00391	0.001	0.00000	0.000	0.0000	0.0000	0.001	0.0000
4.698	0.99971	4.696	0.00111	0.00521	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.698	0.99971	4.696	0.00138	0.00652	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99973	4.696	0.00166	0.00782	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.698	0.99973	4.696	0.00194	0.00913	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99974	4.696	0.00222	0.01043	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99974	4.696	0.00249	0.01174	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99973	4.696	0.00277	0.01304	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99976	4.696	0.00305	0.01434	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99975	4.696	0.00333	0.01565	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99973	4.696	0.00361	0.01695	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99974	4.696	0.00388	0.01826	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99973	4.696	0.00416	0.01956	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99971	4.696	0.00444	0.02087	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000
4.697	0.99971	4.696	0.00472	0.02217	0.001	0.00000	0.000	0.0000	0.0000	0.000	0.0000

Figure 14-22 Battery Report Format

14.7 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

15. OCP Test

The over current protection test observes the output voltage and current changes when the loading current gets bigger. The changes are shown in graphic on the Reading Chart. This test is not suitable for parallel mode and it can only select one channel for one test.

Figure 15-1 OCP Window

15.1 OCP Parameters

There are Range, Trig_V, I_step, Dwell_Time, I_start, I_end, Test CH, SPEC L, SPEC_H and Sampling Time available for setting.

- **Setting Range**
  The ranges available for setting in OCP Test mode are Low, Middle and High. The range set will change the range available for I_start and I_end, also the settings of I_start, I_end and I_step will return to different range based on the setting.

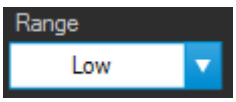


Figure 15-2 Setting Range

- **Setting Trig_V**
  It sets the output voltage drop to end the test.

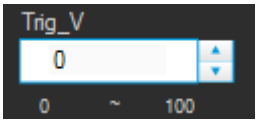


Figure 15-3 Setting Trig_V

- **Setting I_step**
  It sets to the step to test from I Start to I_End for the current increased per step. The loading value will be larger as OCP test executes. Starting from I Start=0 to I_End=1, I_step=5, therefore 5 times of current 0, 0.25, 0.5, 0.75 and 1 are tested.

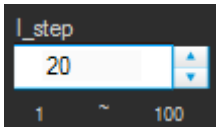


Figure 15-4 Setting I_step

- **Setting I_start**
  It sets the start loading current for OCP Test.

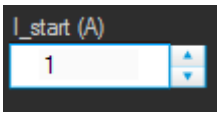


Figure 15-5 Setting I_start

- **Setting I_end**
  It sets the end loading current for OCP Test.

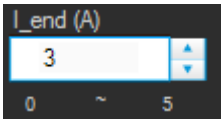


Figure 15-6 Setting I_end

- **Setting Sampling Time**
  It sets the interval to readback the readings in the unit of second. The Voltage, Current and Frequency, etc. will continue to display the present readings. The Panel displaying speed and Report recording speed will change accordingly when Trigger On is clicked. The applicable range is 0.1~ 1 second.

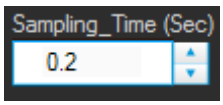


Figure 15-7 Setting Sampling Time

- **Setting Dwell_Time**
  It sets the loading time of each Step in the unit of second. T

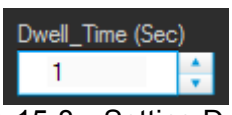


Figure 15-8 Setting Dwell_Time

- **Setting Test CH**
  It specifies the channel to be tested and only a single channel is supported. There is a drop-down menu to select the channel number set in Hardware Configuration panel and it will read the settings of standalone device first when switching channels.

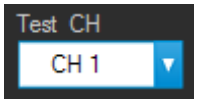


Figure 15-9 Setting Test CH

- **Setting Spec_H**
  It sets the spec of high limit for OCP test. As all results have to go through Pass/Fail judge, it is necessary to determine the spec first.

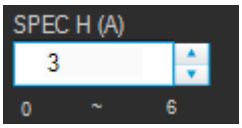


Figure 15-10 Setting Spec_H

- **Setting Spec_L**
  It sets the spec of low limit for OCP test. As all results have to go through Pass/Fail judge, it is necessary to determine the spec first.

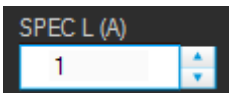


Figure 15-11 Setting Spec_L

15.2 Trigger Function

- **Trigger On**
  Click it to start loading current for OCP test. Click it again to cancel the test.

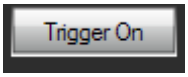


Figure 15-12 Trigger on

- **Run Bar**
  The Run Bar will become visible from gray scale during execution to show the progress. The Run Bar will not reach 100% if triggered in advance.

Figure 15-13 Run Bar Indicator

15.3 OCP Display

There are Total time, Voltage, Current, Power, W_Max, OCP Current, Simulation Waveform, Reading Chart and PASS/FAIL judgment.

- **Total Time**
  It is calculated by Dwell_Time and I_step; however, it will stop execution if OCP occurs in the middle.

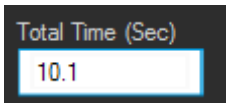


Figure 15-14 Total Time

- **Voltage**
  It shows the measured output voltage after the test started. The reading is updated according to Sampling Time.

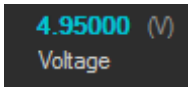


Figure 15-15 Voltage

- **Current**
  It shows the measured output current after the test started. The reading is updated according to Sampling Time.

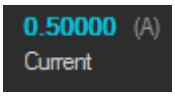


Figure 15-16 Current

- **Power**
  It shows the measured output power after the test started. The reading is updated according to Sampling Time.

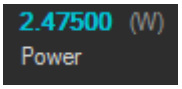


Figure 15-17 Power

- **W_Max**
  It shows the maximum power when the test is done. It means during testing when ---- appears.

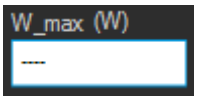


Figure 15-18 W_Max

- **OCP Current**
  It shows the current occurred for OCP when the test is done. It means during testing when ---- appears.

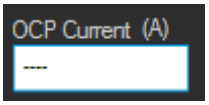


Figure 15-19 OCP Current

- **Simulation Waveform**
  The graph displays the present setting by Y-axis indicating current (ampere) and X-axis indicating time (second) when the I_start, I_end, SPEC L and SPEC H settings are changed.

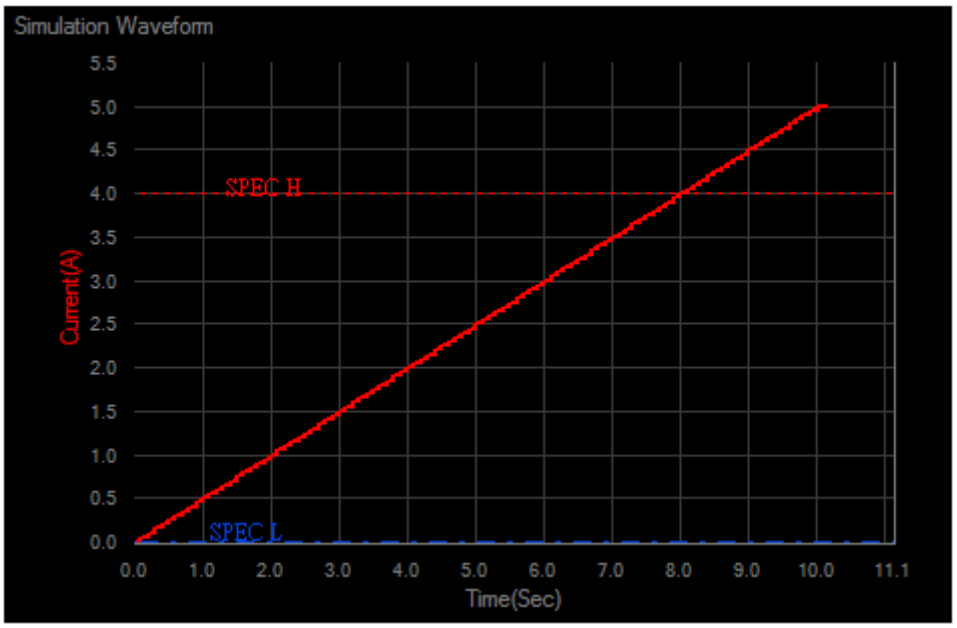


Figure 15-20 Simulation Waveform

- **Reading Chart**
  The Reading Chart shows three curves: V, I and P. It follows the interval of Sampling Time to read back the readings.

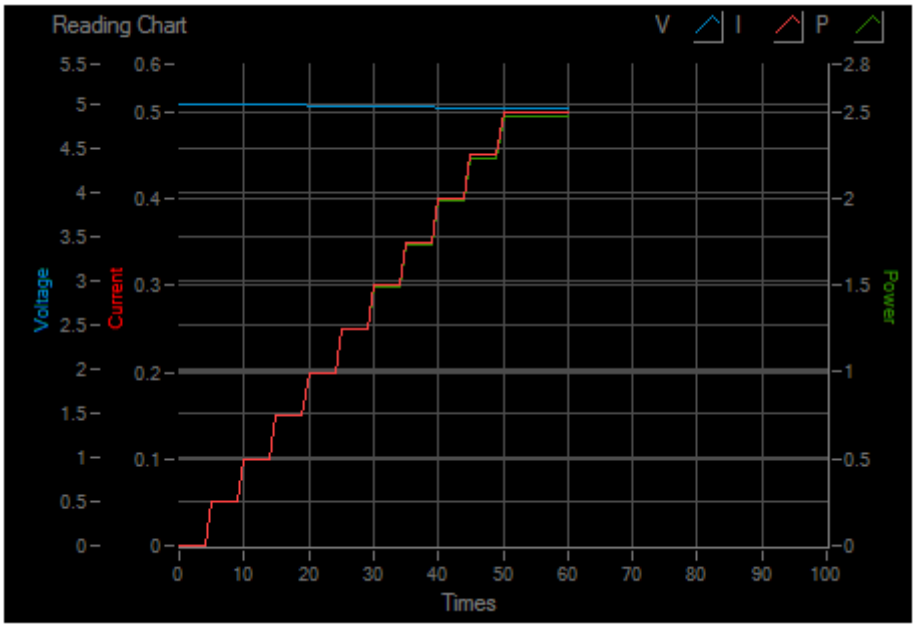


Figure 15-21 OCP Waveform Curve

- **PASS/FAIL**
  It shows if the measured value is within specification after tested. If yes, it shows PASS in green; otherwise, it shows FAIL in red.

Figure 15-22 PASS/FAIL

15.4 Report Format

In OCP test, the report starts when Trigger On is clicked and the reading captured interval is determined by Sampling Time. The report saves an entry when the time is due, thus long time recording will not affect its correctness and will not miss the readings due to sudden power outage. To create a Report, be sure to specify the desired path and filename for saving before Trigger On is clicked.

A simple report in pure text file with *.txt extension is provided during OCP test. The user should decide if turning on the Report function as well as the path and filename for storage.

Before saving the file, it is necessary to turn the Report on first.

Figure 15-23 Report Button

It can set the desired filename and path when Report turns to On. The user can click  to specify the path and filename. The file format is pure text that can be opened by Notepad.

Figure 15-24 Browse for Report Path & Filename

OCP1.txt -

```
---------- Setting ----------
Output Name       :CH 1
Range             :OCPM
SPECH(A)          :1.20000
SPECL(A)          :0.10000
I_satart (A)      :0.10
I_end(A)          :1.50
DWELL Time(Sec)   :1.000
I_step            :5


---------- Reading ----------


No.     V (V)    I (A)    P (A)
------- -------- -------- -----------
0       5.0001   0.08071  0.40300
1       4.9912   0.09986  0.49829
2       4.9912   0.09984  0.49839
3       4.9912   0.09984  0.49837
4       4.9913   0.09987  0.49852
5       4.9913   0.09985  0.49853
6       4.9912   0.09985  0.49834
7       4.9912   0.09987  0.49827
8       4.9912   0.09987  0.49828
9       4.9912   0.09984  0.49829
10      4.9911   0.09983  0.49838
11      4.9660   0.37984  1.8865
12      4.9660   0.37985  1.8865
13      4.9659   0.37987  1.8864
14      4.9659   0.37987  1.8864
15      4.9660   0.37989  1.8863
16      4.9660   0.37988  1.8864
17      4.9659   0.37986  1.8863
18      4.9659   0.37984  1.8865
19      4.9659   0.37985  1.8864
```

Figure 15-25 OCP Report Format

15.5 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

16. Charger Test

For Charger test, the user can select a Load Channel for test. During the test, the program will follow certain procedure (first CV mode and then CC mode) to execute loading. Check the present voltage/current readings and the user can define the Spec during observation. The program will use the data inputted to draw the waveform graph for judgment. Furthermore, the user can save the measured data in Excel file during test.

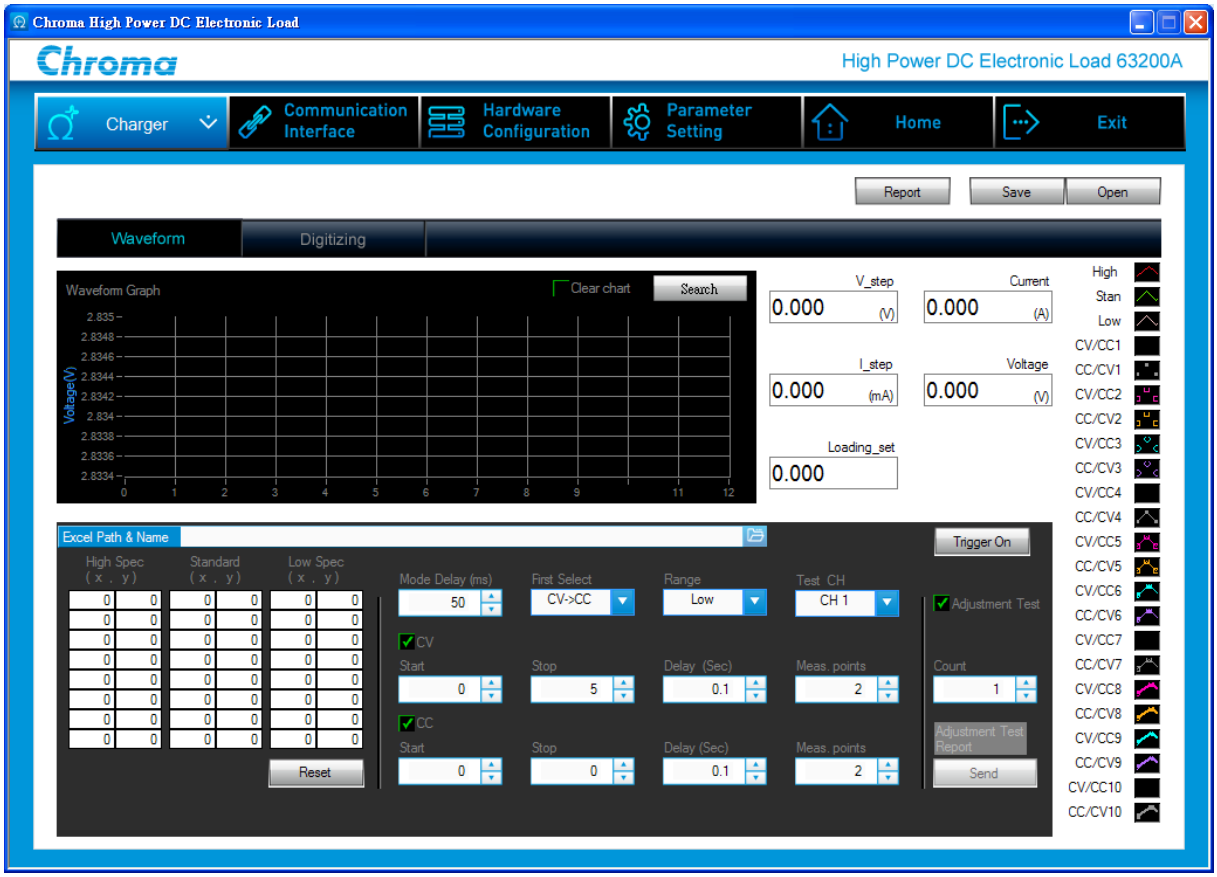


Figure 16-1 Charger Window

16.1 Charger Test Parameters

Charger test parameters set the specifications of High Spec, Standard and Low Spec. Each of them has 8 sets of X and Y coordinates. The unit of X coordinate is current (mA) and the unit of Y coordinate is voltage (V). Once the values are set, a waveform graph will be drawn and the dot sequence on the graph is from up to down with line connected for 8 sets of values in colors. Click “Reset” to clear all SPEC settings to 0.

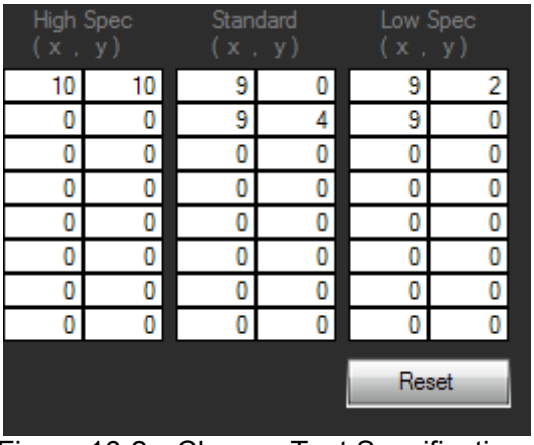


Figure 16-2 Charger Test Specifications

16.2 Setting Parameter

The main test flow for charger test includes Constant Voltage (CV) and Constant Current test (CC). First of all the user needs to set the Load Module for UUT to connect, so an applicable channel needs to be selected for Test on the CH. Next, the user can set CV start, CV stop, Delay (Sec) every time the voltage changes in CV mode, and the Meas. points from CV start to CV stop in CV mode, as well as the same for CC mode.

At last, the user needs to set the count for how many times the test will be done. The user can select to test CV mode or CC mode during the test. When CV Setting is Off, only CC mode will be tested and the items that are not subject to execute will be grayed out on the screen for reminding. In addition, the function of Clear chart is to clear the readings in Waveform Graph when doing tests repetitively. The default is Off which means not to clear the data.

Figure 16-3 Parameters Setting Area

- **Setting CV Mode Parameters**

  CV mode contains parameters of CV Setting, CV start, CV stop, Delay (sec) and Meas. Points.

  CV Setting: It sets if executing the entire CV mode tests when set to ON. Test items will be grayed out to remind user when it sets to OFF.

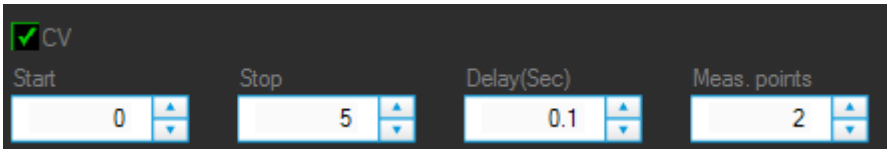


Figure 16-4 CV Settings

CV start: It sets the CV start test voltage in the unit of V. The range varies with the mode selected by user.

CV stop: It sets the CV stop test voltage in the unit of V. The range varies with the mode selected by user.

Delay (Sec): It sets the time for each test in the unit of Sec. The range is from 0.1 second to 100000 seconds. The time is set based on the property of UUT.

Meas. Points: It sets the measurement points including Start and Stop. Assuming testing 3 points, if Vstart = 4V and Vstop=5V then it will test 4V, 4.5V and 5V 3 points.

- **Setting CC Mode Parameters**

CC mode contains the parameters of CC Setting, CC start, CC stop, Delay (sec), Meas. Points and Range Select.

CC Setting: It sets if executing the entire CC mode tests when set to ON. Test items will be grayed out to remind user when it sets to OFF.

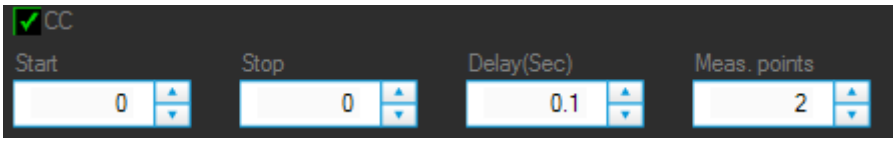


Figure 16-5 CC Settings

CC start: It sets the CC start test voltage in the unit of mA. The range varies with the mode selected by user.

CC stop: It sets the CC stop test voltage in the unit of mA. The range varies with the mode selected by user.

Delay (Sec): It sets the time for each test in the unit of Sec. The range is from 0.1 second to 100000 seconds. The time is set based on the property of UUT.

Meas. points: It sets the measurement points including Start and Stop. Assuming testing 2 points, CC start = 1000mA, CC stop=5000 mA, then it will test 1000mA and 5000mA two points.

Range Select: A standalone device has Low, Middle and High selections that can be selected as desired. The default is Low.

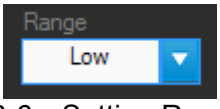


Figure 16-6 Setting Range Select

Test CH: The channel at present can only use one channel for test. When more than one channel is opened, a drop-down menu will appear to list the name of all channels. The user needs to specify the channel connected to UUT at present for test.

Figure 16-7 Setting Test CH

Count: It sets the number of times for the test needs to be done repeatedly in CV and CC mode. The test count will show on the Waveform Graph readings. The maximum setting is 10 and 1 at least.

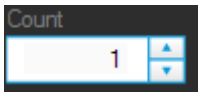


Figure 16-8 Setting Count

Clear chart: It sets if clearing the readings in Waveform Graph. When count is greater than 1 and Clear chart is On, the test reading will be cleared when the voltage and current is read next time. On the contrary, all readings will remain in the Waveform Graph and mark with different colors along with different shapes to show the waveform of different count if Clear chart is disabled.

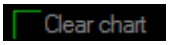


Figure 16-9 Clear chart

Trigger On: It sets the charger to begin the test. Click it again to stop the test.

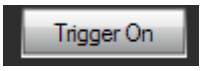


Figure 16-10 Trigger On Button

Adjustment Test: It enters into Adjustment test when set to On and only one complete test can be count. Click 

to save the tested values.

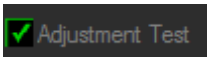


Figure 16-11 Adjustment Test

16.3 Report Format

An Excel file test report is provided for Charger test under the filename of *.xls. The user can decide to enable or disable the Report function (Report On/Off), the storage path and filename as explained below.

- **Report Button**
  Enable the Report function by setting it on. It will log all settings and measurements based on the storage path and filename set when the execution is done or stopped in the middle.

Figure 16-12 Report Button

- **Report Path & File**
  Once the Report function is active, it needs to determine the storage path and filename by clicking  . A dialog box will appear for the user to enter the path and filename. The file type is an Excel file.

Figure 16-13 Report Path & File

Report example:

	A	B	C	D	E	F
1	Chroma DC Load Charger Test Report		2007/10/4 上午 10:55			
2						
3	Test Channel	Output2				
4	CV Start Setting(V)	4				
5	CV End Setting(V)	5				
6	CV Delay(Sec)	0.5				
7	CV Meas. points	20				
8	CC Start Setting(mA	3000				
9	CC End Setting(mA	0				
10	CC Mode Select	CCL				
11	CC Delay(Sec)	0.5				
12	CC Meas. points	20				
13	Count setting	3				
14						
15	Curr, High	Volt, High	Curr, Nom	Volt,Nom	Curr,Low	Volt,Low
16	0	9	0	0	0	5.7
17	800	9	0	0	3	5.6
18	850	8	0	0	3	1.5
19	3200	7	0	0	9	1.5
20	3200	0	0	0	5	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0
24						
25	Reading					
26	Count	Mode	Voltage(V)	Current(mA)		

Test / Chart1 / Chart2

Figure 16-14 Charger Report Test Data

16.4 Digitizing Graph

Please refer to section 8.7 for detailed description.

16.5 SAVE and OPEN

Please refer to sections 7.6 and 7.7 for detailed description.

17. UDW Test

In the UDW panel, it able to load the data to the Electronic Load from an Excel file so that the user can quickly test the UUT's Vpk+ and Vpk- values via this UI (User Interface.)

Figure 17-1 UDW Window

The UI of UDW panel is divided into two sections. The upper section contains the parameters settings from panel to Electronic Load CH, measured data and communication process display. The lower section is mainly for Excel operation that can specify the file path, data location, data length for capturing and the data for preview.

17.1 Setting Parameters

The parameters for setting are Mode Select, Wave No., Time Interval, Repeat, Chain, Interpolation, Down Load and Load on/off.

- **Setting Mode Select**
  The applicable ranges for setting UDW are Low, Middle and High. The change of Mode Select will not affect the setting range of other parameters.

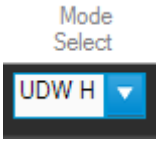


Figure 17-2 Setting Mode Select

- **Setting Wave No.**
  It is a parameter for Electronic Load. The range is from 1 to 10 that the loaded data can be store in one of them. If chain concept is applied, different data can be strung for use. See the hardware user's manual for detailed information.

Figure 17-3 Setting Wave No.

- **Setting Time Interval**
  It is a parameter for Electronic Load and the unit is mSec. It sets the waveform interval from 0.01 mSec to 20 Sec. See the hardware user's manual for detailed information.

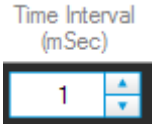


Figure 17-4 Setting Time Interval

- **Setting Repeat**
  It is a parameter for Electronic Load and the range is 1 to 1000. It sets the number of times for repeat testing. See the hardware user's manual for detailed information.

Figure 17-5 Setting Repeat

- **Setting Chain**
  It is a parameter for Electronic Load and the range is 1 to 10. It sets the waveform to be chained. If chain concept is applied, different data can be strung for use. See the hardware user's manual for detailed information.

Figure 17-6 Chain 設定參數

- **Setting Interpolation**
  It is a parameter for Electronic Load that can set to Yes or No for waveform interpolation. It means to make up points by interpolation when Yes is set. See the hardware user's manual for detailed information.

Figure 17-7 Setting Interpolation

17.2 Excel Capturing Function

For Excel operation, it can specify an existed Microsoft excel file, the file path, specific row and column data, start position for data capturing, length setting and data for preview.

- **Excel Path**
  It shows the Excel file path and name of a file to be loaded. Click the rightmost button as shown in the figure below to open a dialog box for specifying a file path and filename.

Figure 17-8 Excel Path

- **Excel Data Graph**
  It shows the data loaded from Excel file. The X-axis is the entry numbers while the Y-axis the current amplitude. It has to specify the Excel file first and then determine the entries to be loaded. The Max shows the maximum value of loaded data and the Max Index shows its position. The Min shows the minimum value of loaded data and the Min Index shows its position.

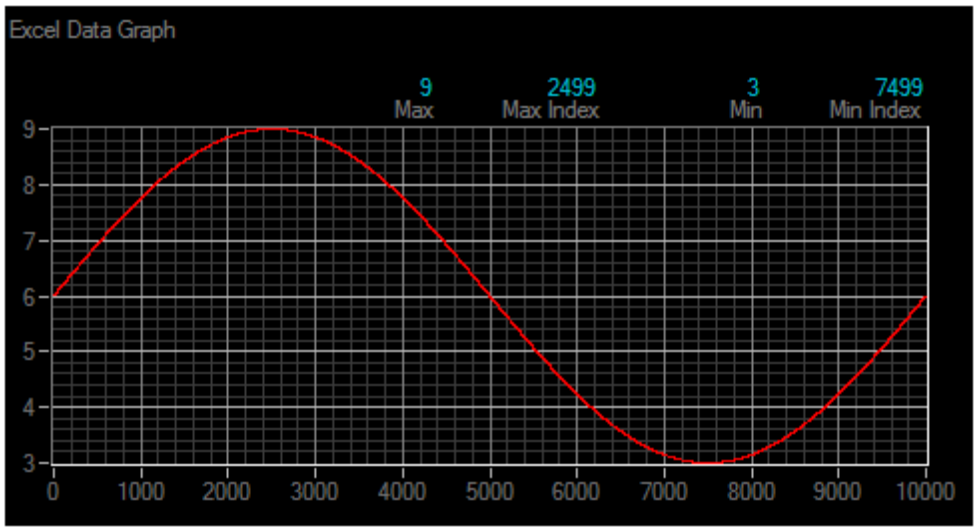


Figure 17-9 Excel Data Graph

- **Data Select**
  It is a drop down menu that can select Column or Row with a mapping icon displayed on the right. It indicates the Excel data is input vertically when Column is set and input horizontally when Row is set.

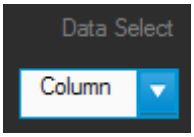


Figure 17-10 Data Select

- **Column**
  It sets the start position of selected vertical data. The input range is A to J.

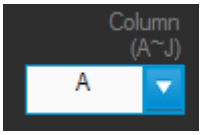


Figure 17-11 Column

- **Row**
  It sets the start position of selected horizontal data. The input range is 0 to 120000.

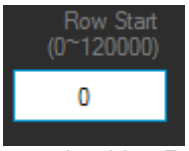


Figure 17-12 Row

- **Data Number**
  It sets the number of entries to read from the Excel to the Electronic Load. The range is 1-120000 entries and the default is 1000 entries.

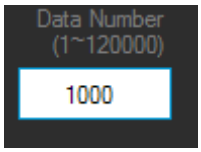


Figure 17-13 Data Number

- **Preview**
  It is a trigger button to view Excel data from specified position. Click it to preview the Excel Data Graph with all related setting info.

Figure 17-14 Preview Button

17.3 Download

It triggers the panel data to download to Electronic Load. It maps to each channel horizontally. Be sure that the horizontal mapped channel and the Excel data/entries are correct when using this function. When the box is check, it will download the data to every channel.

Figure 17-15 Download

17.4 Load On/Off

It maps to each channel horizontally and turns UDW testing on or off. When the box is checked, all channels will execute together.

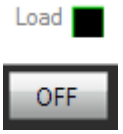


Figure 17-16 OCP Current

17.5 Vpk+, Vpk- Readings

When testing a UDW, the Vpk+ and Vpk- readings of each channel will show on the mapped horizontal position under Load On state.

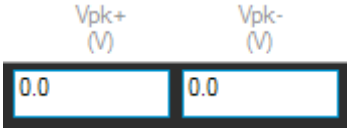


Figure 17-17 Vpk+, Vpk- Readings

17.6 Auxiliary Information

The auxiliary information contains two columns: Execute Time and Waveform Message.
Execute Time: The mapped channel starts to count after Load On is executed.
Waveform Message: It will show the Electronic Load process status when executing Download or Load On/Off.
Idle: No waveform is downloaded.
Wait Processing: The waveform is transmitting to module.
Finish: The waveform transmission is completed and the status will return to Idle after read.
Data Format Error: The status will return to Idle after read.
Data Length Error: The status will return to Idle after read.
Over limit of waveform data: The status will return to Idle after read.
ChkSum Error: The status will return to Idle after read.

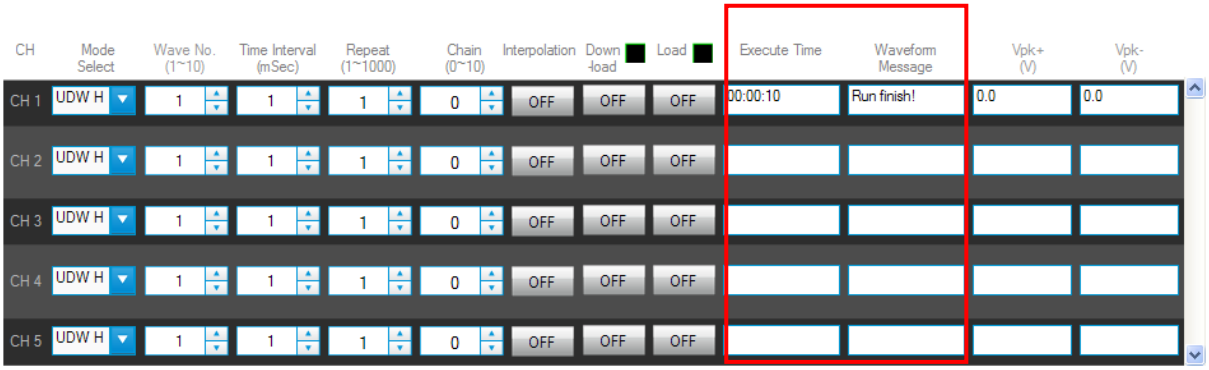


Figure 17-18 Auxiliary Information

17.7 Report Format

Please refer to 8.10 for detailed information.

CHROMA ATE INC.

致茂電子股份有限公司

66 Huaya 1st Road, Guishan,

Taoyuan 33383, Taiwan

台灣桃園市 33383 龜山區

華亞一路 66 號

T +886-3-327-9999

F +886-3-327-8898

Mail: info@chromaate.com

http://www.chromaate.com