Programmable
DC Electronic Load

63600 Series

Soft Panel User's Manual

Chroma
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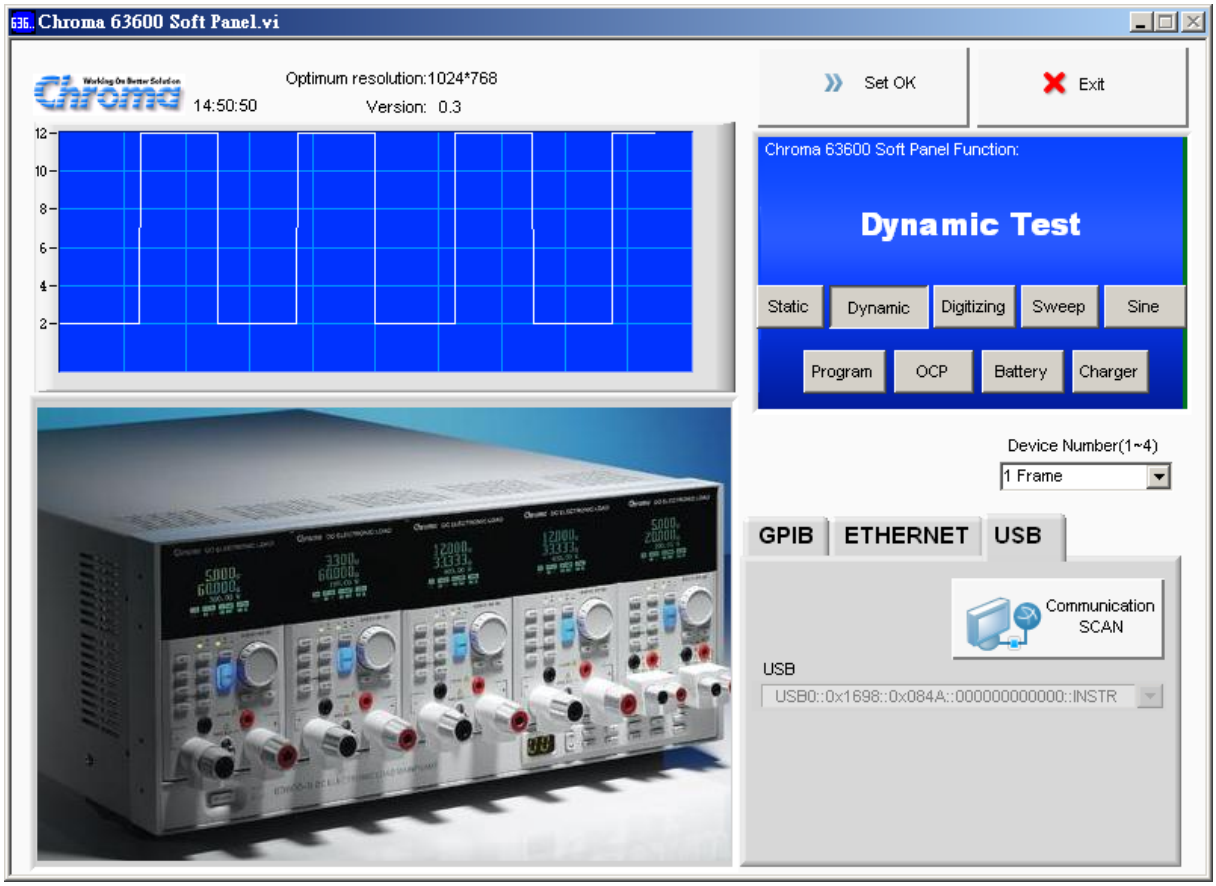

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April 2011

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Revision History

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

Date	Version	Revised Sections
Apr. 2011	1.0	Complete this manual.

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1. System Structure

This chapter explains the structure and functions of Chroma DC Load 63600 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 63600 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 63600 Series DC Electronic Load can be programmed for control:

A. Frame
   a. 63600-2
   b. 63600-5

B. Module
   a. 63610-80-20
   b. 63630-80-60
   c. 63640-80-80

1.3 Communication Interface

There are three types of communication interfaces between PC and 63600 Series Programmable DC Electronic Load.

A. GPIB
B. USB
C. Ethernet

1.4 Operation

Please the mouse pointer 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 63600 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 50 MB or above hard disk space on PC. Place the software CD into the CD drive.

2.1 Files in CD

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

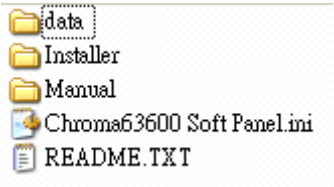


Figure 2-1 Files in CD

2.2 Installing Chroma 63600 Soft Panel

Place the CD into the CD drive and execute ”Setup.exe” under the folder of Installer to start the installation.

Step 1

Double-click “Setup.exe” and a window will appear as Figure 2-2 shows. Click **Next >** to carry on the installation.

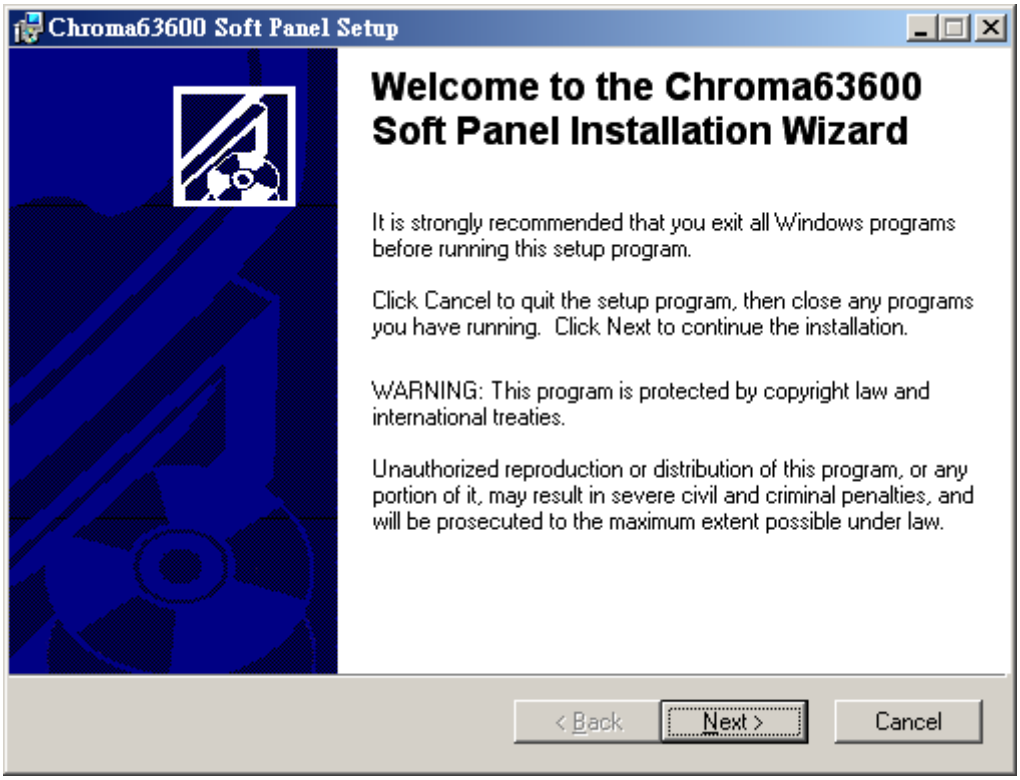


Figure 2-2 Beginning Chroma 63600 Soft Panel Installation

Step 2

When Figure 2-3 appears, select the installation path. The program is default installed in `C:\Program Files` directory. To change it, click **Browse** and specify the path for installation and then click **Next >** to go on.

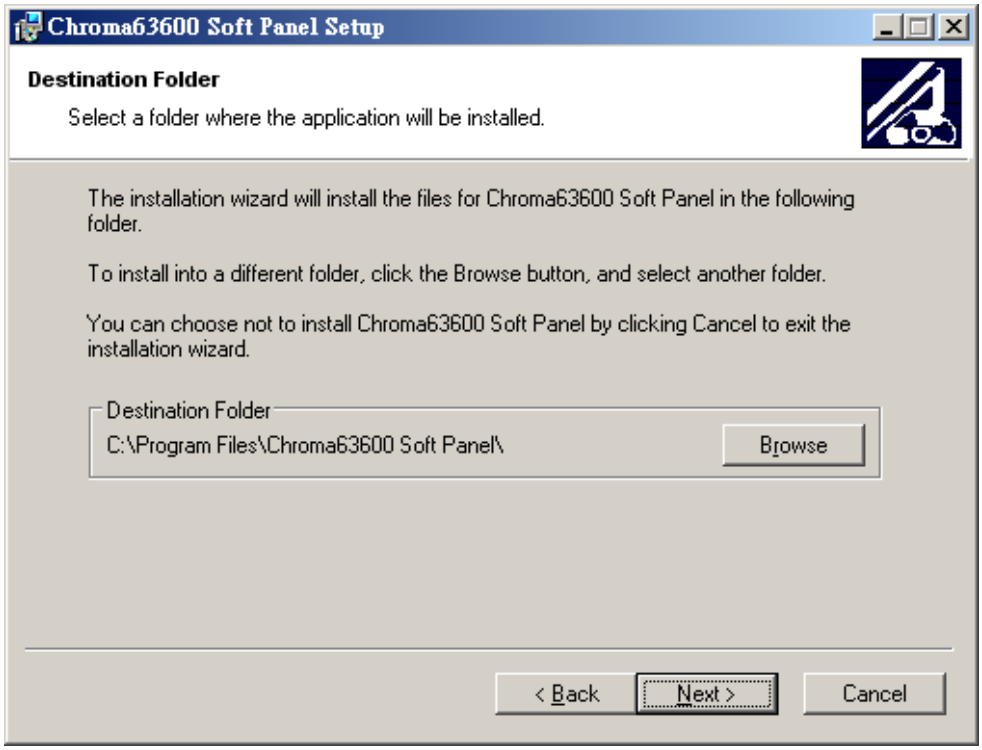


Figure 2-3 Selecting Chroma 63600 Soft Panel Installation Path

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

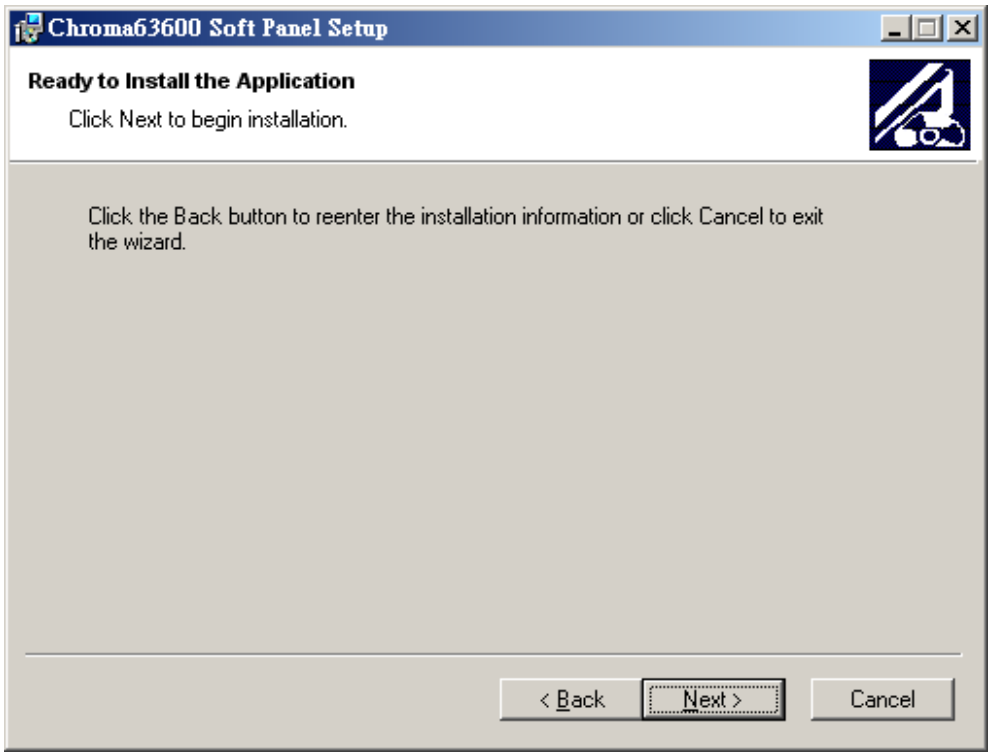


Figure 2-4 Ready to Install Chroma 63600 Soft Panel

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

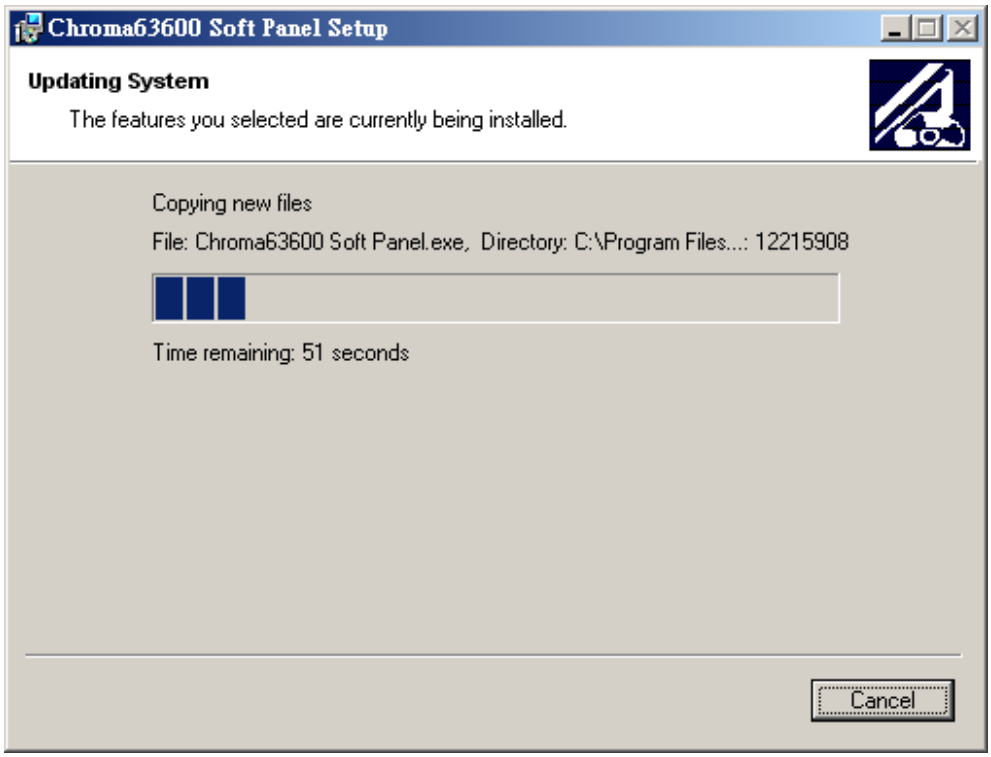


Figure 2-5 Chroma 63600 Soft Panel Installation Progress

When the installation is done successfully, click **Finish** to complete it without reboot.

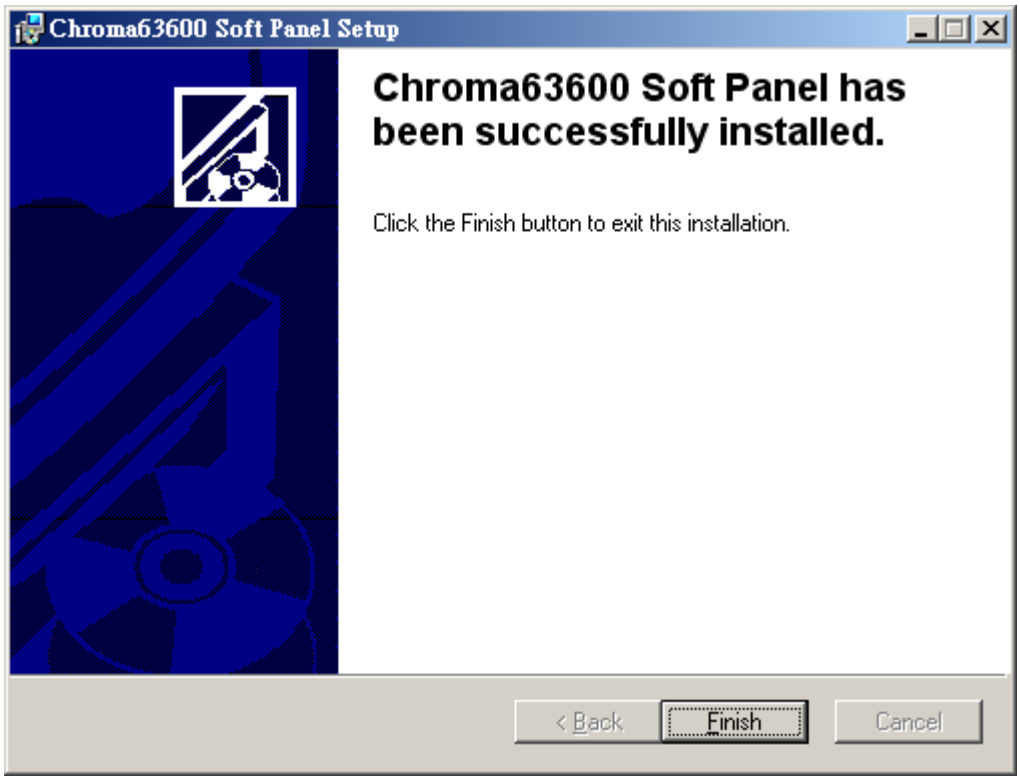


Figure 2-6 Installation Completed

2.3 Installing NI VISA Runtime

NI VISA Runtime is required software and the version is upgraded following the OS of Windows. For Windows XP it is suggested to use version 3.0.1 or above and for Windows 7 (32 or 64 bits) it is suggested to use version 4.1. The following example is based on version 3.0.1.

Step 1

Double-click "visa301runtime.exe" and a window as Figure 2-7 shows will appear to start decompressing. Click **Setup** to carry on the installation.

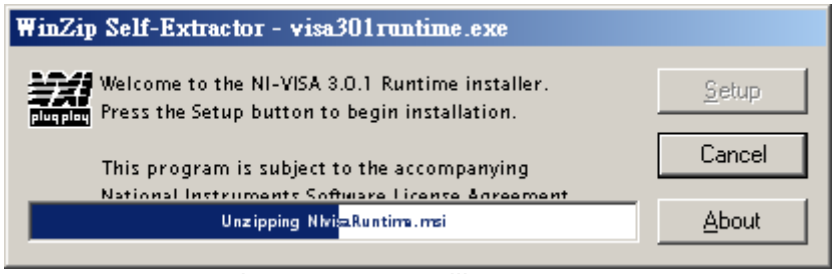


Figure 2-7 Installing NI VISA

Step 2

The following window indicates the NI VISA is decompressed. Click **Next >>** to go on.

Figure 2-8 NI VISA Decompressed Window

Step 3

When the NI VISA license agreement window appears, click “I accept the License Agreement” and **Next >>**.

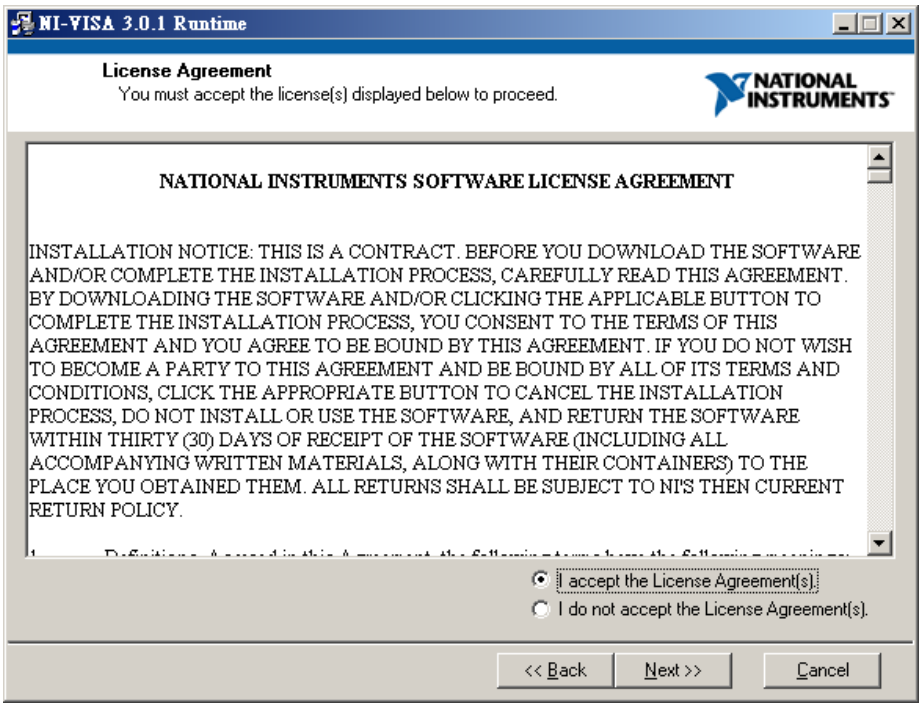


Figure 2-9 NI VISA License Agreement Window

Step 4

Select the NI VISA installation path when Figure 2-10 show. The default installation path is `C:\Program Files`. To change it, click **Browse** and specify a path for installation and click **Next >>**.

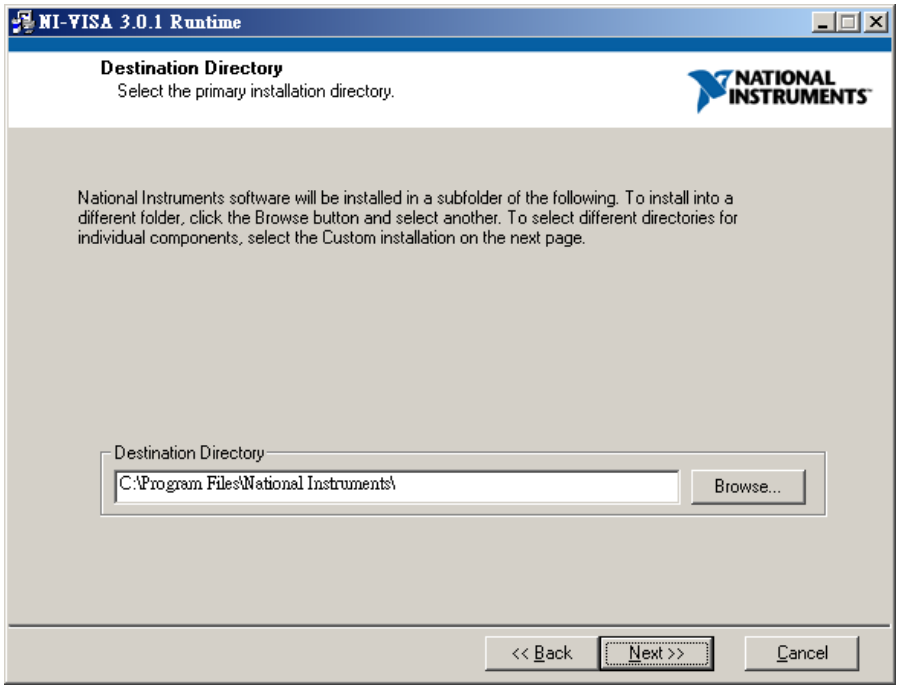


Figure 2-10 Selecting NI VISA Installation Path

Step 5

Select the NI VISA installation option. The default is Complete.

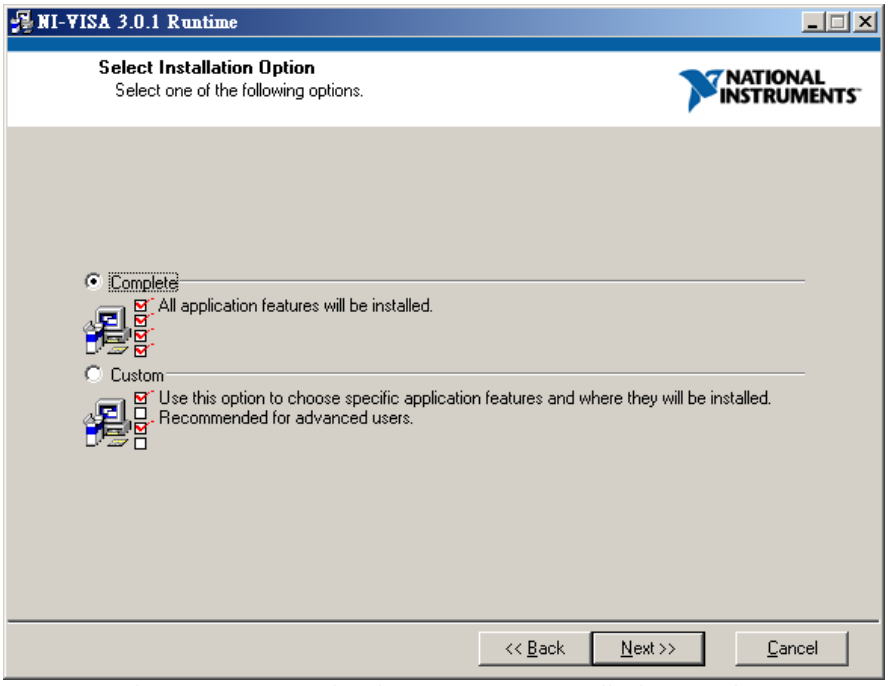


Figure 2-11 Selecting NI VISA Installation Option

Step 6

The NI VISA is ready for installation. Click **Next >>** to start.

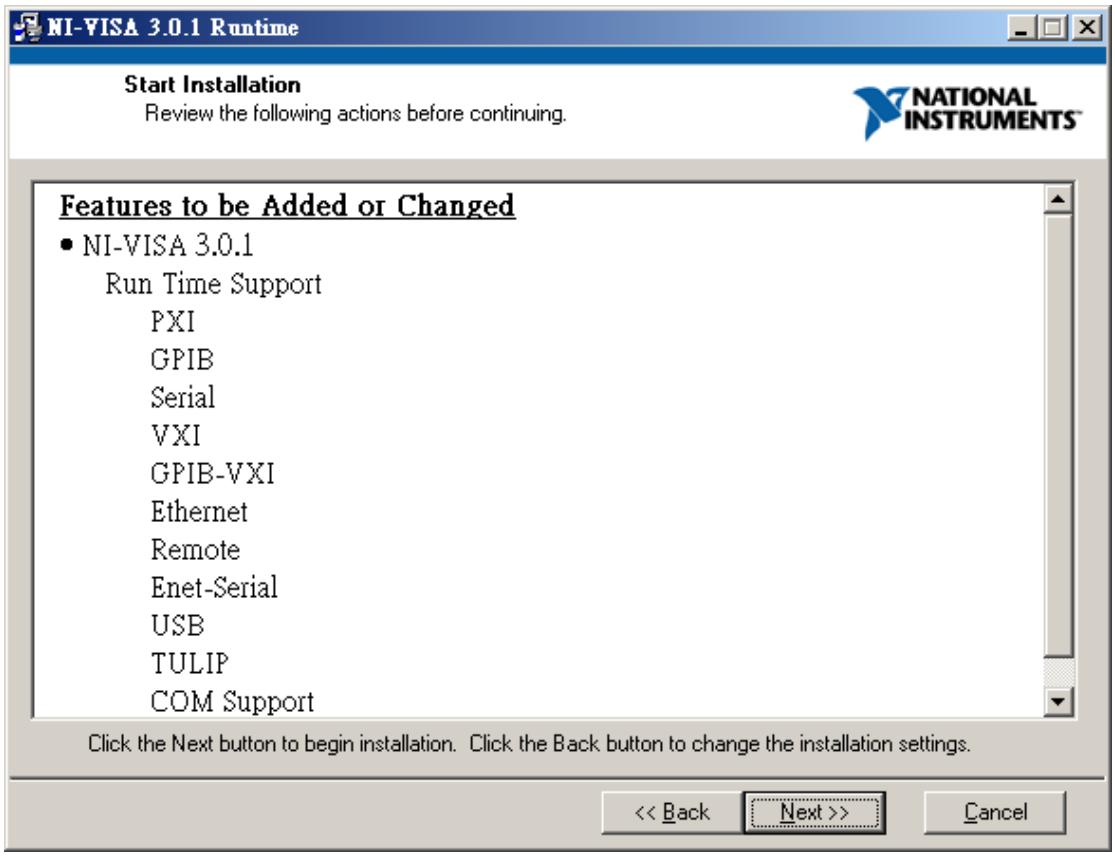


Figure 2-12 NI VISA Ready for Installation

Step 7

Figure 2-13 shows the NI VISA is installing and it shows as Figure 2-14 when complete. Please be noted that the PC needs to reboot after the installation is done.

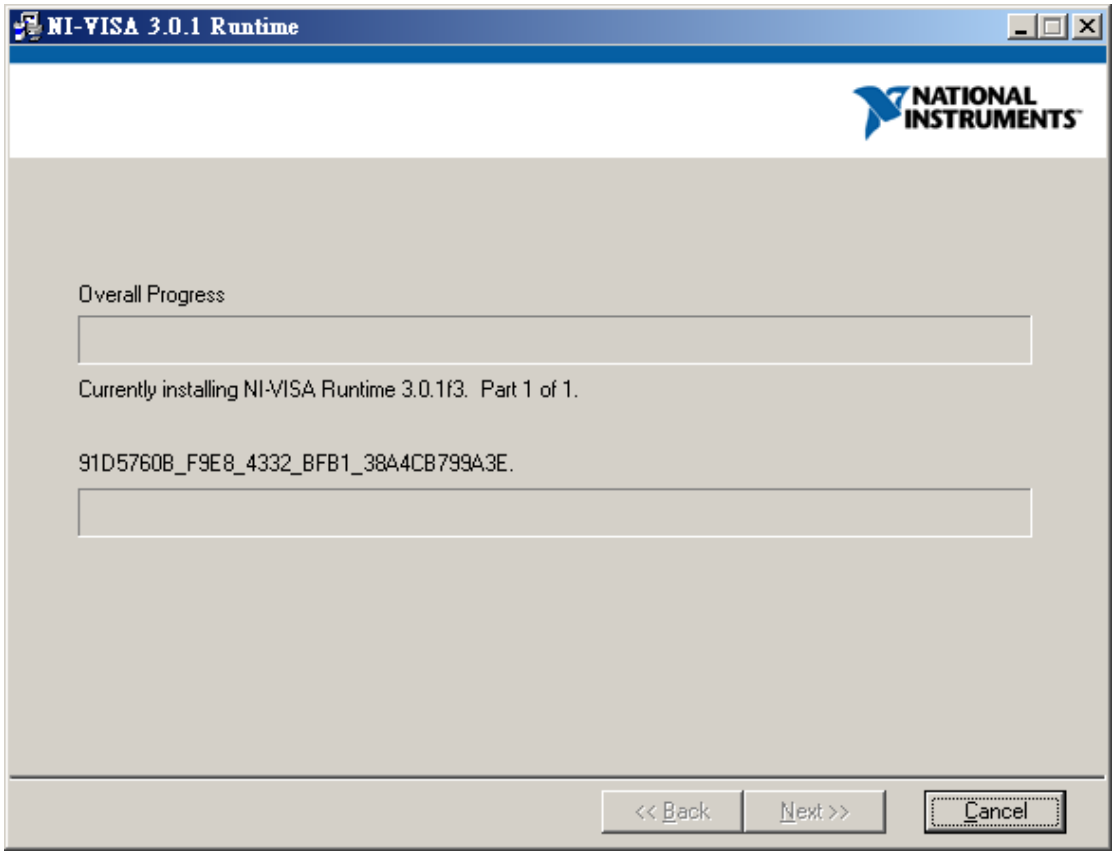


Figure 2-13 Installing NI VISA

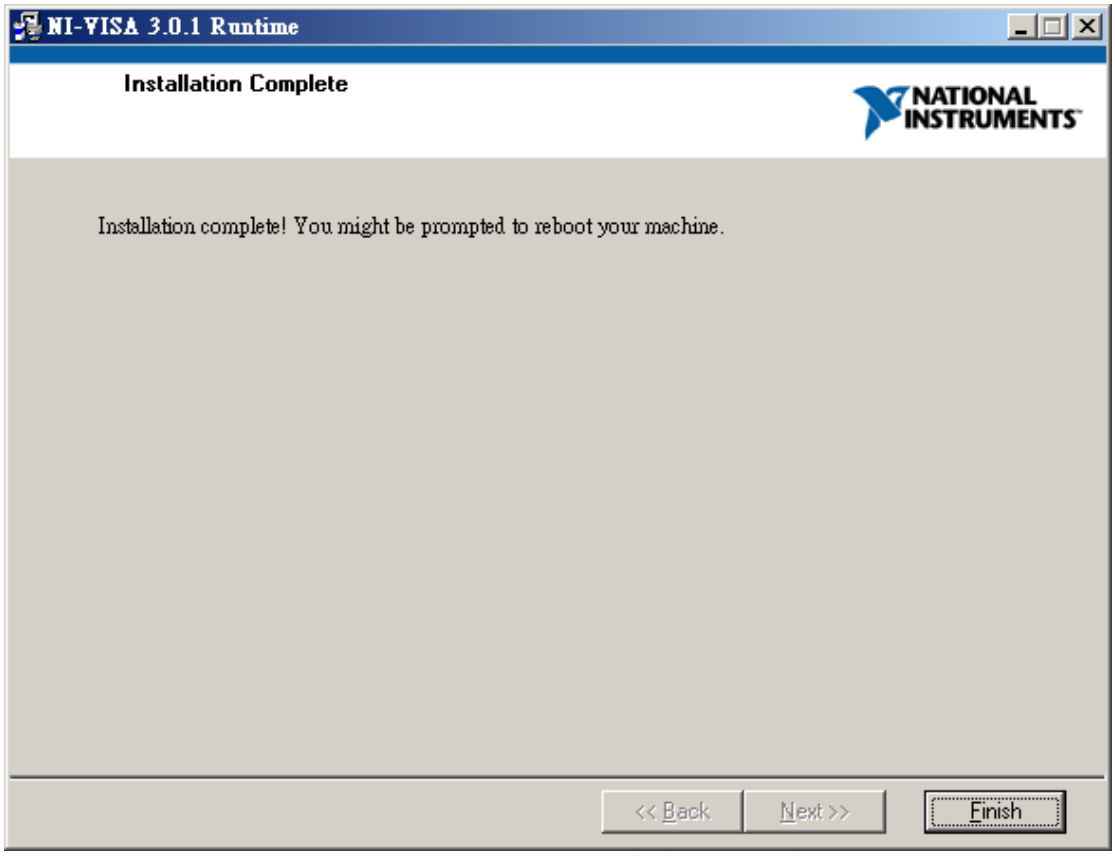


Figure 2-14 NI VISA Installation Complete

2.4 Installing GPIB Interface Driver

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

2.5 Uninstalling Chroma 63600 Soft Panel

The uninstalling procedure is the same as the installation. Double-click"Setup.exe" and a window as Figure 2-15 shows will appear. Click **Next >** to carry on the execution.

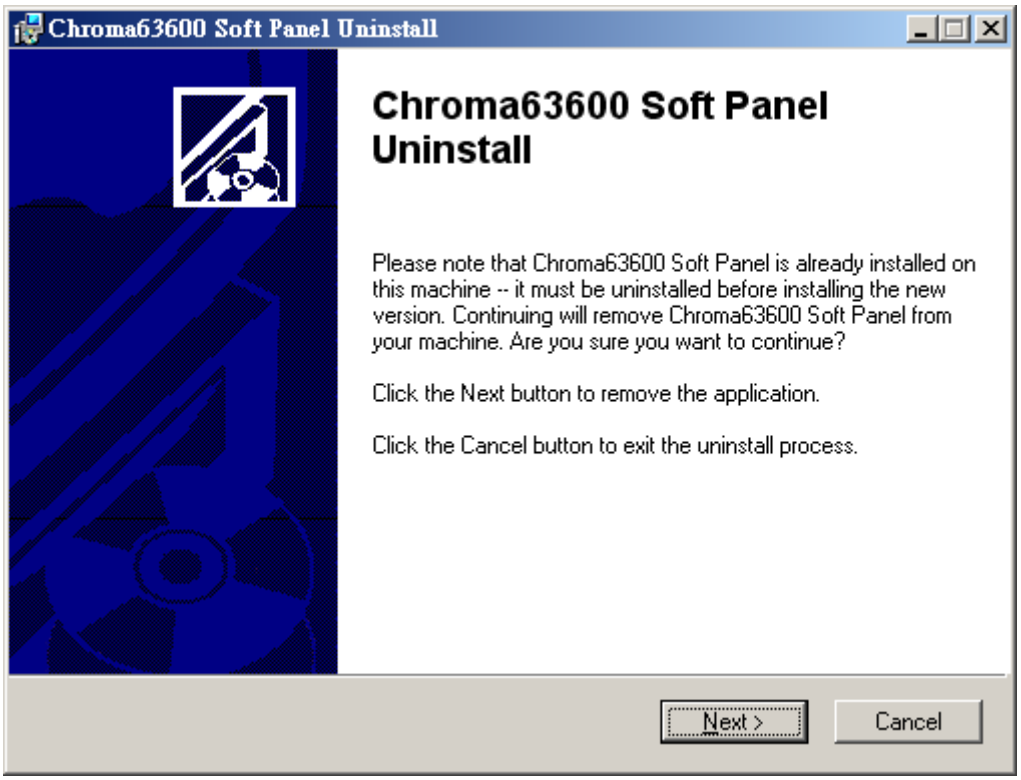


Figure 2-15 Uninstalling Chroma 63600 Soft Panel

3. Starting Chroma 63600 Soft Panel

3.1 Starting

After the installation is completed, click **Start→Programs→**`Chroma 63600 Soft Panel` will prompt the start screen as Figure 3-1 shows.

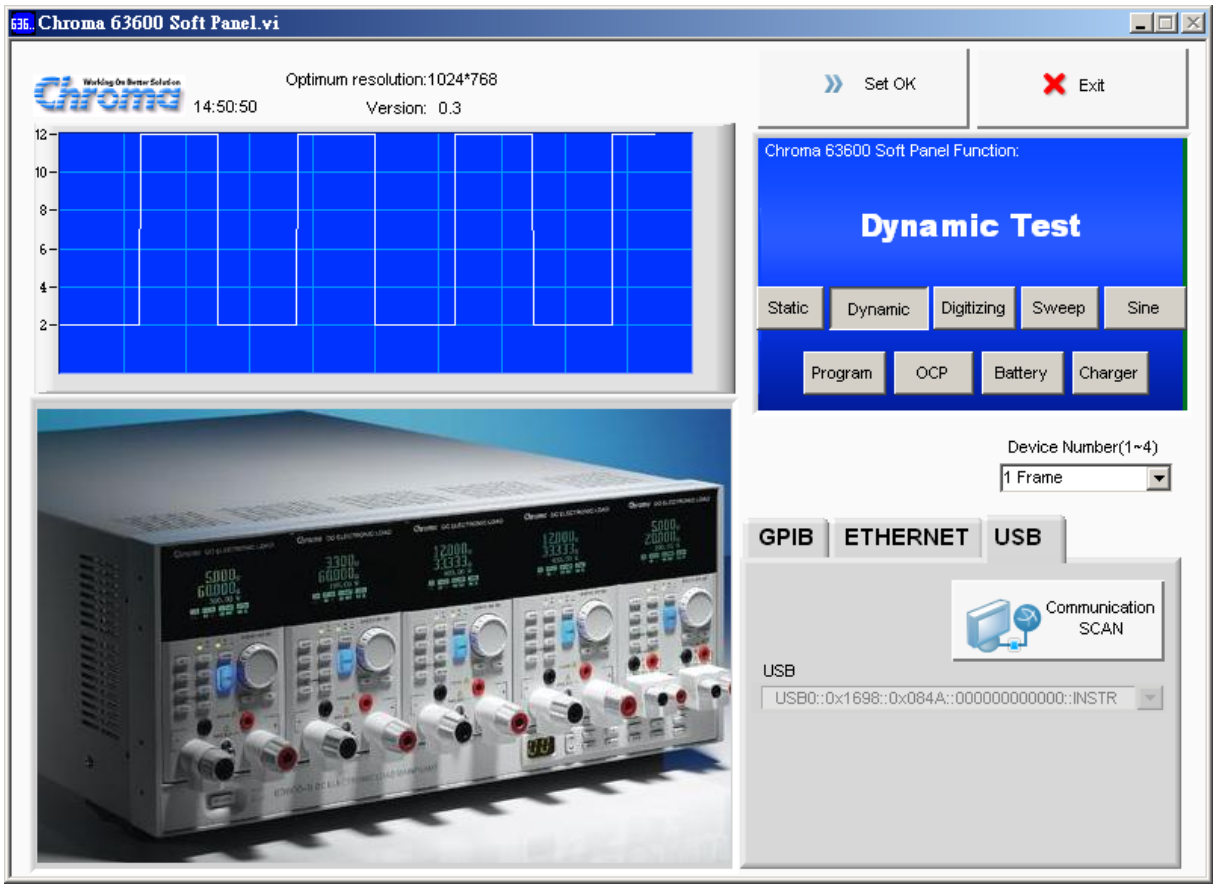


Figure 3-1 Chroma 63600 Soft Panel Start Window

Description:

a. The hardware configuration needs to be set when the Chroma DC Load 63600 Soft Panel starts. It is necessary to setup the number of devices (or Frames) and the communication protocol. The Soft Panel at present provides maximum 4 Frames to be detected and selected by Module. Each frame has different Channel number but the last valid Channel number has to be under 40. Thus, if the Channel number used in the Hardware is over 40, only 40CH are available or parallel channel is required.

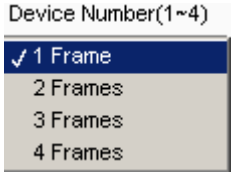


Figure 3-2 Selecting the Device Number Connected

b. The communication protocol that is the transmission commands between PC and instrument needs to be determined as well. There are GPIB, USB and Ethernet available for selection. The mapping parameter will appear for setting when selected, such as GPIB Address will appear when GPIB is selected and TCP/IP settings will appear when Ethernet is selected.

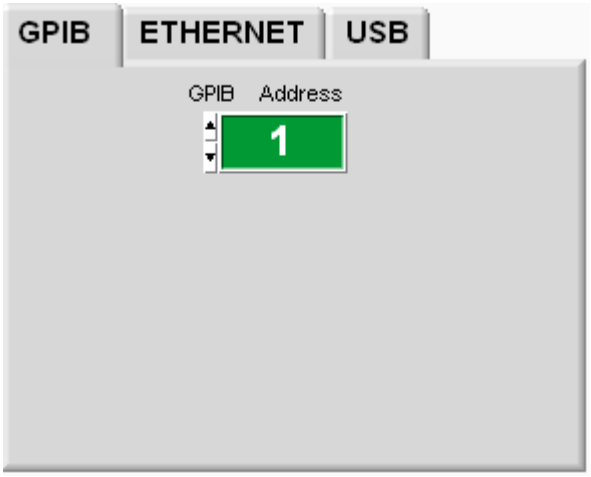


Figure 3-3 Selecting Communication Interface to Set Parameter

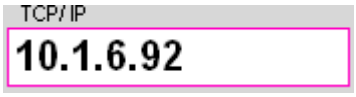


Figure 3-4 Setting TCP/IP for Ethernet

c. Communication SCAN:
The software will detect if the USB communication port is linked successfully when clicked. It is suggested to click this icon to scan all USB devices, as the USB ID is too long and can be entered wrong easily.

d. USB:
A drop-down menu will appear when USB communication interface is selected. If there are many USB devices connected, please make sure to select the correct Produce ID Vendor ID as shown below:

USB0::0x0A69:0x083E::636002000066::INSTR

Figure 3-5 Selecting USB and Scanning USB Device

e. The parameter set on the Soft Panel should be the same as the one set on the instrument. For instance, if the GPIB Address on the instrument is set to 1, the GPIB Address on the Soft Panel has to set to 1 as well.

Figure 3-6 Setting GPIB Address Parameter

f. When the setting is confirmed without error, click **Set OK** on the Soft Panel and the program will start initialization and enter into next window.

Figure 3-7 Confirmation Button

g. To leave the 63600 Soft Panel, click **Exit** or the **X** icon on Windows.

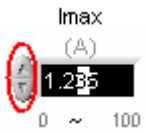
Figure 3-8 Quitting 63600 Soft Panel

The other display areas are for DEMO use to introduce the functional appearance of Soft Panel instead of setting functions.

Notice

1. The Soft Panel applied models are remote controlled. Please use the software on PC to control the various parameter settings of the standalone device. If there is a need to switch to Local control, disable the Remote signal by removing the connection and wait until Local control is done to reboot the standalone device for Soft Panel reconnection.
2. For GUI operation, each setting element has its range. If boundary value is desired (to enter the maximum and minimum value), please select all with highlight or delete all to input the value via keyboard. If increment or decrement is desired, select the digit to be carried and press the key ↑(increment) or ↓(decrement) to change the value or click the up/down arrow button to increase or decrease the value.

   For example, in the figure below if Imax is to increase 0.01A after Load On, the user can select “3” with highlight and then press the key ↑(increment) or ↓(decrement) on the keyboard to change the value or select the digit to be carried and click the up/down arrow button to increase or decrease the value.



4. Setting Hardware

Click **Set OK** on the start screen will go to the following window as Figure 4-1 shows. This is the main window that links to other tests. It can return to the start window to redefine the communication protocol and ensure if it is set OK, or to change the channel to be tested separately or in parallel as well as to set for Synchronous loading. For parallel or synchronize setting among frames, be sure to connect the device sync cable correctly to prevent any error from occurring.

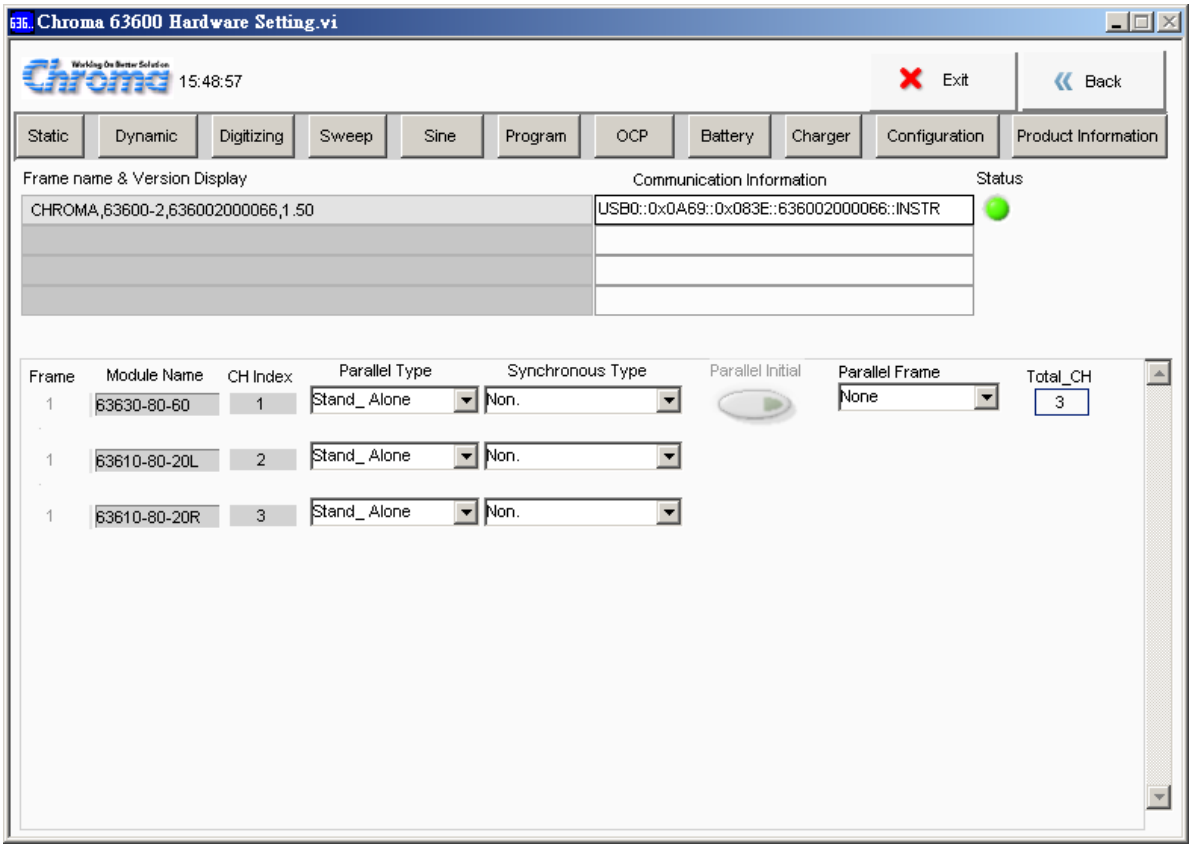


Figure 4-1 Hardware Setting Window

In this window, it will check the communication protocol first. If the communication check passed it will read back the F/W version info of the instrument in Frame Name & Version Display also the hardware settings including the linked Frame (63600-2 on the upper left in Figure 4-1) and Modules (63600-80-60, 63600-80-20L and 63600-80-20R on the lower left in Figure 4-1.) If there is any error in the communication protocol, the message “Connection Error” will appear as Figure 4-2 shows. If the communication protocol is correct, the model no. and firmware version will display in black as Figure 4-3 shows. Status will show in green when connected successfully.

Figure 4-2 Indication when Communication Check Fail

Notice TCPIP0::10.1.6.92::2101::SOCKET where 10.1.6.92 is the user set IP value in the start window, TCPIP0 is the communication protocol selected and :2101::SOCKET is the ID string of software.

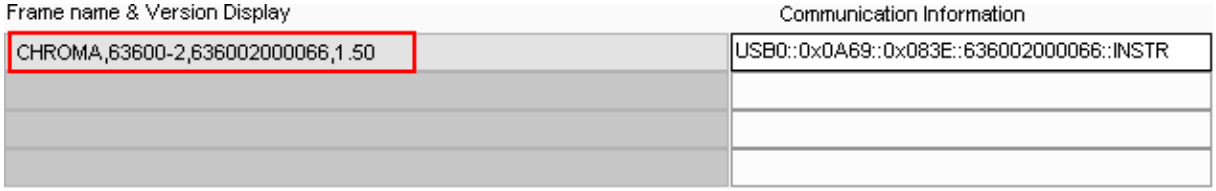


Figure 4-3 Indication when Communication Check PASS

Notice CHROMA,63600-2,636002000066,1.50 where 63600-2 is the module name, 636002000066 is the factory serial number and 1.50 is the F/W version.

4.1 Setting Channel

When the hardware is connected successfully, the software will request for the Module sequence. As the figure shown below, Chroma DC Load (1 Frame) standalone where Device 1 has 3 modules. Regardless of the Channel position, the software lists it in sequential. Following explains the mapping relationship.

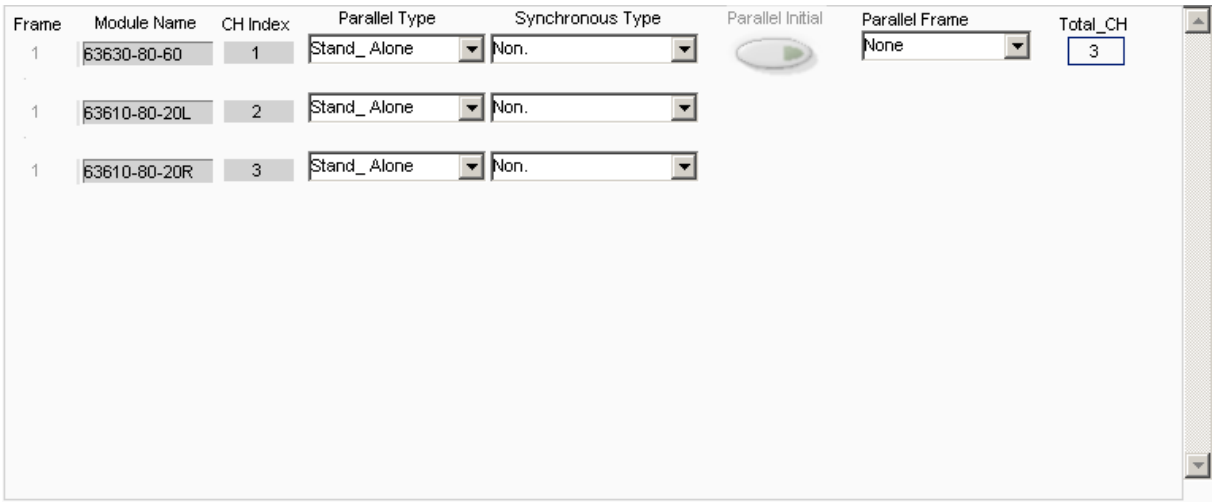


Figure 4-4 Channel Index in Hardware Window

Frame: Based on the sequence of communication, each CH that maps to the Frame will appear in this column as Figure 4-5 shows. The 3 CH are the internal module of Frame1 and Frame2. The range is 1-4.

Figure 4-5 Frame No. in Hardware Window

Module Name: If there is hardware connected, it will read back the Module Name. It is aligned following the communication parameter set in the start window.

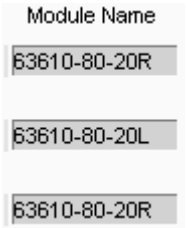


Figure 4-6 Module Name Frame in Hardware Window

CH Index: The sequence of CH is different from the standalone device. If a Frame has 4CH slots (63600-2), only two Modules can be installed. However, a single Module could have 1CH or 2CH and empty slot perhaps, thus the CH position count is the same. Nevertheless, if there are only 3CH valid in actual, no matter it is 4CH slots or 10CH slots, the software shows CH1, CH2, CH3 only.

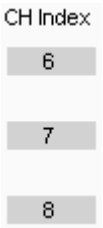


Figure 4-7 CH Index in Hardware Window

Notice

The CH Index will change following the setting of Parallel Master and Parallel Slave. When Master and Slave are assigned to be parallel, the two CH will assign to the same Index.

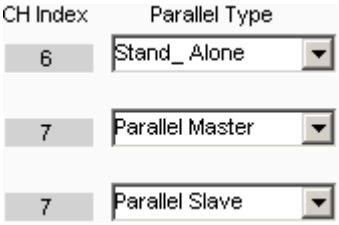


Figure 4-8 Parallel CH Index in Hardware

4.2 Using Demo Mode

The software will enter into Demo mode if no hardware device is connected, and users can understand the functions of Soft Panel through the Demo program. It means the software goes to Demo window when the communication protocol fails and all settings in Demo are pseudo without mapping to any module.

4.3 Using Channel in Parallel

All channel's name will be loaded in the Module Name at the very beginning as Figure 4-9 shows and the software will start to define the CH Index from top to down (such as 1, 2, 3).

The CH number will decrease after paralleled as 6CH turned to 1CH in the figure below. The usage or description of each element is explained below.

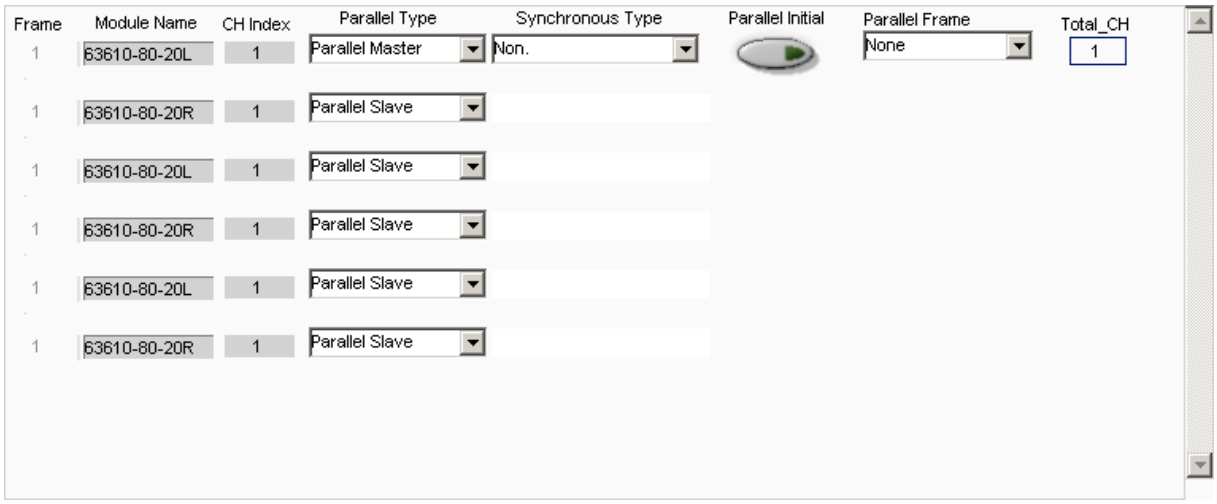


Figure 4-9 Channel in Parallel Usage

4.3.1 Total Channel

It shows the total effective channel number read back by Soft Panel after initialization. It is for indication only and is not changeable.

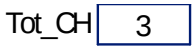


Figure 4-10 Total Channel

Notice The total channel number will decrease by parallel and the user can see the change via the column of CH Index.

4.3.2 Parallel Type

The default for Parallel Type is Stand_Alone and it can set to Parallel Master or Parallel Slave as per user's request. When parallel is set, the channel number will decrease as well. Since only Parallel Master can do Load On and all functions are unable to access when changed to Parallel Master or Parallel Slave, it has wait until Parallel Initial is triggered to On to be active.

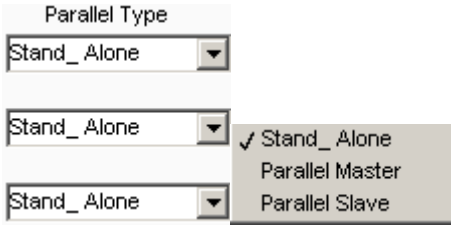


Figure 4-11 Setting Parallel Type

Notice Only the first channel of each Frame can set to Parallel Master. If Parallel Frame is set, the Parallel Master can only set to the first channel of the smaller Frame Index.

If only Parallel Slave is set without the mapping Master, an error will appear as shown below. The Status will show red light and all functions are invalid.

Figure 4-12 Parallel Setting Error Indicator

Figure 4-13 Parallel Setting Error – Function Invalid

4.3.3 Parallel Initial

It turns to valid for setting from grayed-out when set to Parallel Master and Parallel Slave and all function buttons will gray out. Click this button to set to On and the function to do parallel test will turn to linked button from invalid.

Figure 4-14 Parallel Initial

Notice Click Parallel Initial in Demo mode does not do parallel confirmation but demonstrate further executable actions.

4.3.4 Parallel Frame

When more than two standalone devices are connected and over two Frames are paralleled, besides to connect the parallel cable correctly, it is necessary to set the Parallel Frame too.

Figure 4-15 Setting Parallel Frame

4.3.5 Functions

The functions include Static Test, Dynamic Test, Digitizing, Sweep Test, Program Test, Battery Test, OCP Test, Sine Test, Charger test, Configuration, Production Information, and Exit as Figure 4-16 shows. The user can enter into each function window for operation as per test requirement. The chapters below explain each function in detail.

Figure 4-16 Function Elements

When the parallel setting is done, the functions valid will appear as Figure 4-17 shows. The functions not valid for parallel test are “Sine”, “Program”, “Battery” and “Charger”.

Figure 4-17 Functions Valid when Parallel

4.4 Synchronous Type

It is to set the synchronous loading between channels. The channel sets each loading value; however, for synchronous loading it has to specify Load On for Synchronous Master for the action.

There is a drop-down menu with Non., Synchronous Master and Synchronous Slave 3 selections. It does not support CV mode if synchronous is set.

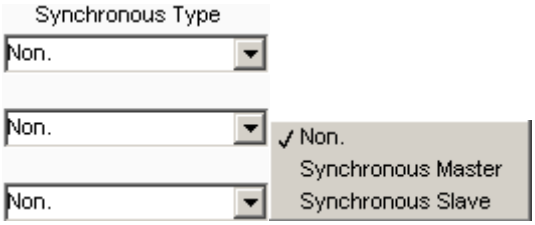


Figure 4-18 Setting Synchronous Type

Notice When Synchronous Slave is set, it can set the channel's parameter but unable to set Load On, Short On and Digitizing Trigger On.

4.5 Back

Click this button will exit the window and return to previous window.

Figure 4-19 Back Button

4.6 Exit

Click the button will exit the Soft Panel and close the program.

Figure 4-20 Exit Button

5. Configuration

This panel places the less used parameters and the settings are extended according to CH Index, which is set on Hardware Panel. They are General, Static SPEC, CC Parameter Setting, CP Parameter Setting, Specification and FW Save Recall.

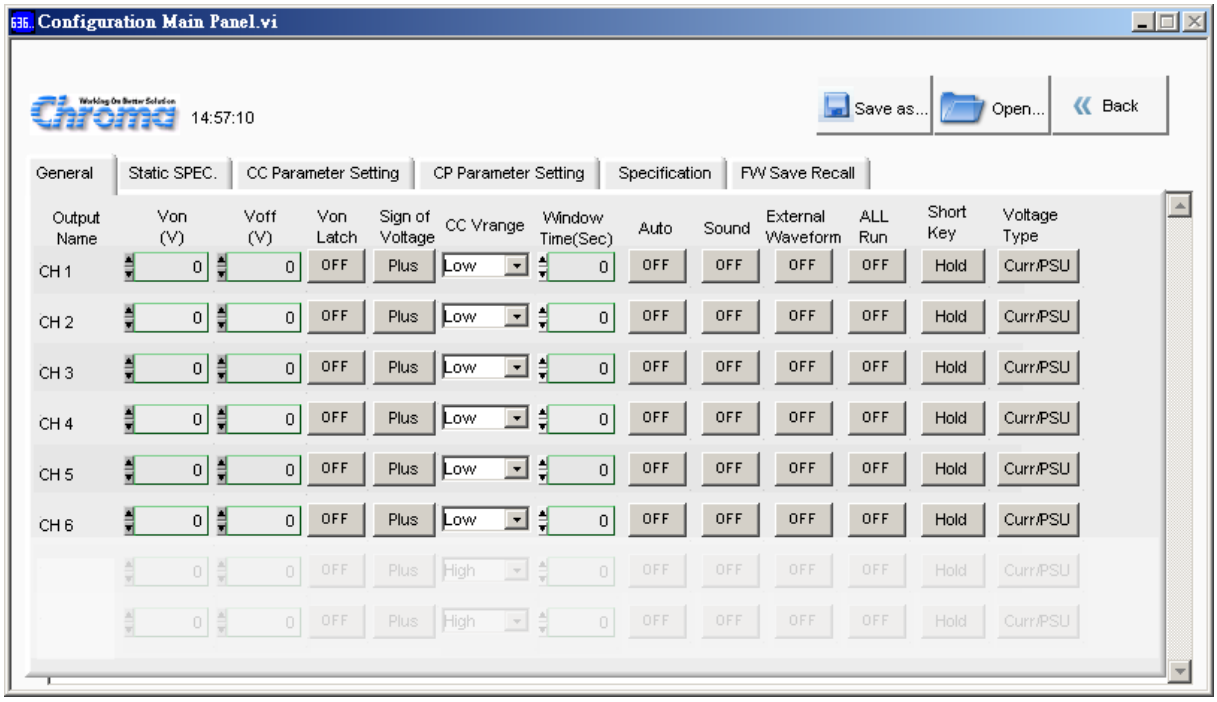


Figure 5-1 Configuration Setting Window

5.1 General Parameters

There are Von, Voff, Von Latch, Sign of Voltage, CC Vrange, Window Time, Auto, Sound, External Waveform, All Run, Short Key and Voltage Type for setting. The method is to map the parameter to the Output Name and send command to the mapping channel. Please see the operation manual of each device for the definition of each parameter.

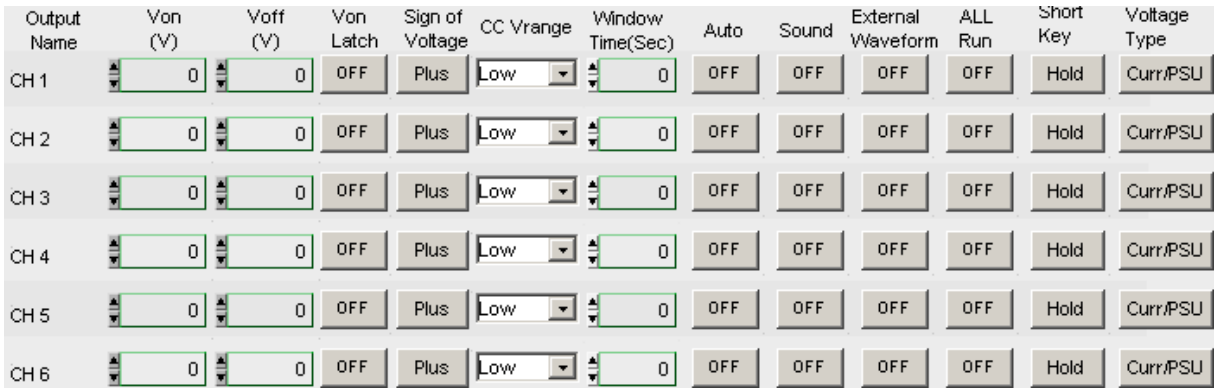


Figure 5-2 Setting General Parameters

5.2 Static SPEC

The settings in this tab page are related to Static Test only. Its main purpose is to indicate if the measured voltage, current and power are within the range. It shows PASS if yes and FAIL if otherwise.

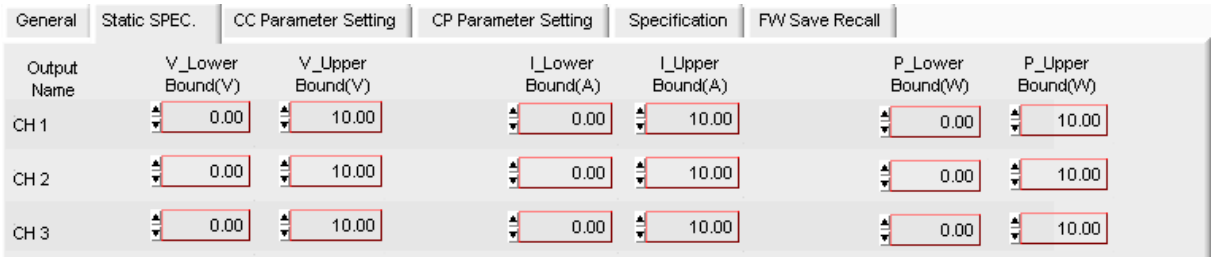


Figure 5-3 Setting Static SPEC. Parameters

Notice The range is -Inf~ Inf (infinity.)

5.3 CC Parameter Setting

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

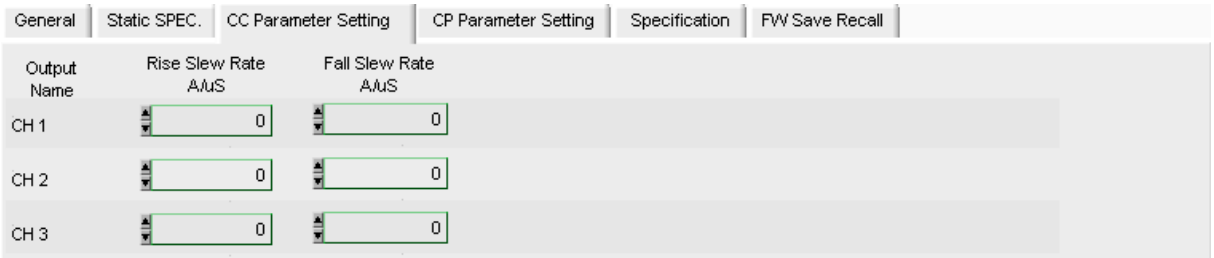


Figure 5-4 CC Parameter Setting

5.4 CP Parameter Setting

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

Figure 5-5 CP Parameter Setting

5.5 Specification

There are Mode, V center, V High, V Low, I center, I High, I Low, P center, P High and P Low for setting. The method is to map the parameter to the Output Name and send command to the mapping channel. Please see the operation manual of each device for the definition of each parameter.

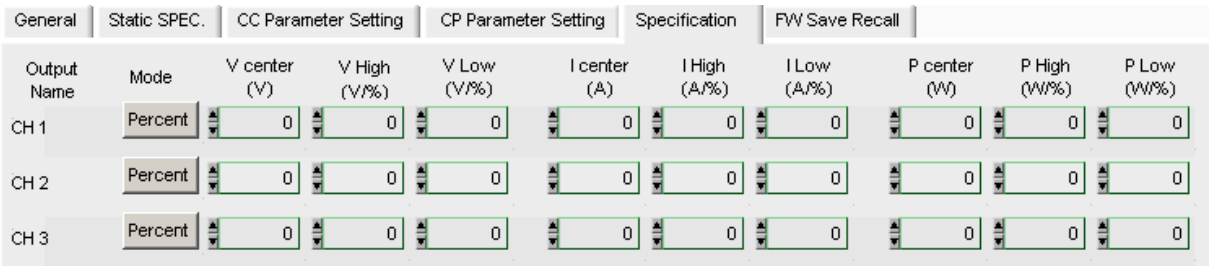


Figure 5-6 Reading Display Diagram

Notice -1 means Don't Care and the standalone device shows "-----".

5.6 FW Save Recall

This tab page can save all of the channel settings in the memory of standalone device for recall next time. There are Frame Device, File, Save and Recall 4 elements.

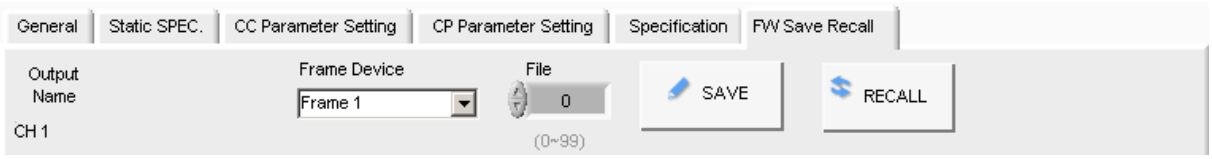


Figure 5-7 Reading Display

Frame Device: It has a drop-down menu to list the Frame number set by Hardware Setting. As the saving is to store all channels of a single Frame, the user should select it as need.

5.7 Save as…

Click this button as Figure 5-8 shows to save the current parameter settings to a .conf file.

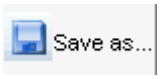


Figure 5-8 Save as… Button

Saving the current parameter allows the user to use the parameter file directly when power on next time. Click the path to save the file and name the file (with extension .conf) for setting as different settings can save to different files. These files may occupy some disk space and many setting files can be stored if the disk space is big enough.

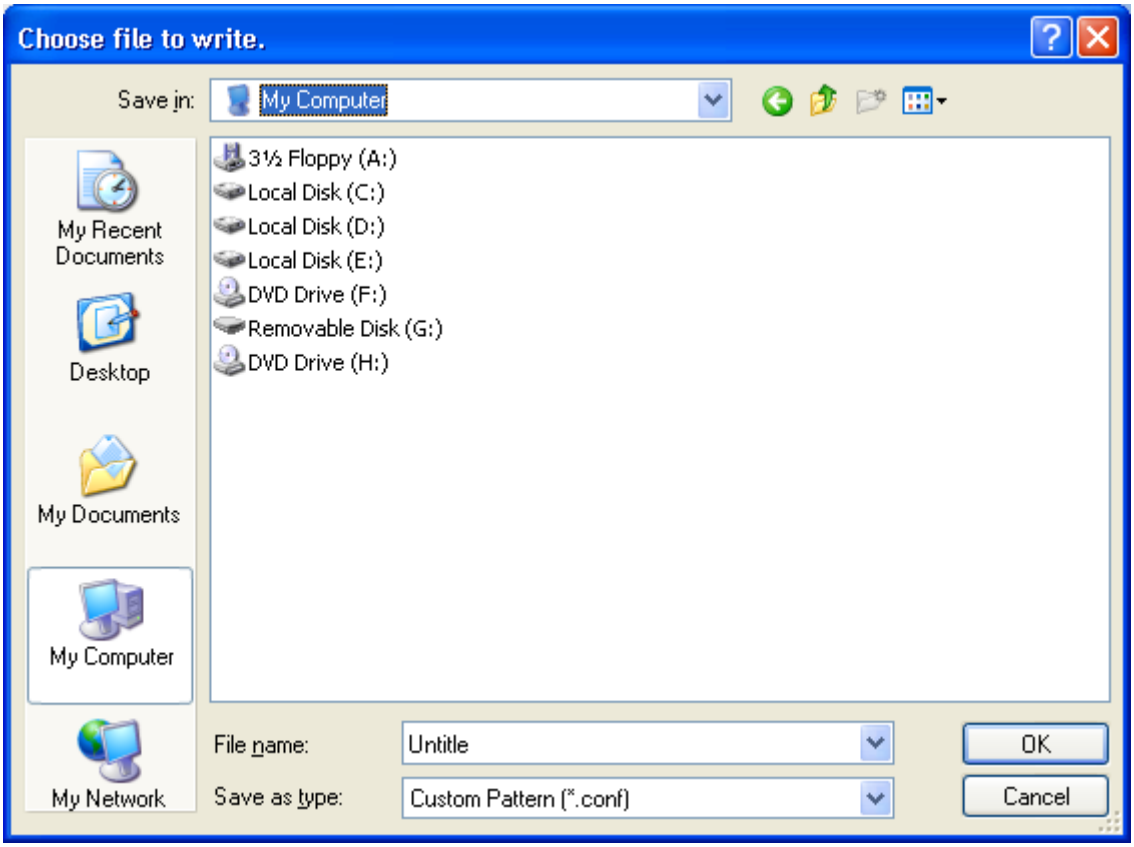


Figure 5-9 Save as…Dialog Box

Notice

The extensions of various kinds of files are listed below:
*.conf for Configuration, *.sta for Static Test, *.dyn for Dynamic Test, *.swe for Sweep Test, *.pro for Program Test, *.bat for Battery Test, *.ocp for OCP Test, *.sin for Sine Test, and *.chr for Charger test.

5.8 Open…

Click this button as Figure 5-10 shows can open an existing .conf file to simplify the parameter entering action and avoid input error from occurring.

Figure 5-10 Open…Button

The Open dialog box can read the parameter settings according to the path specified. Click **Cancel** can stop the action.

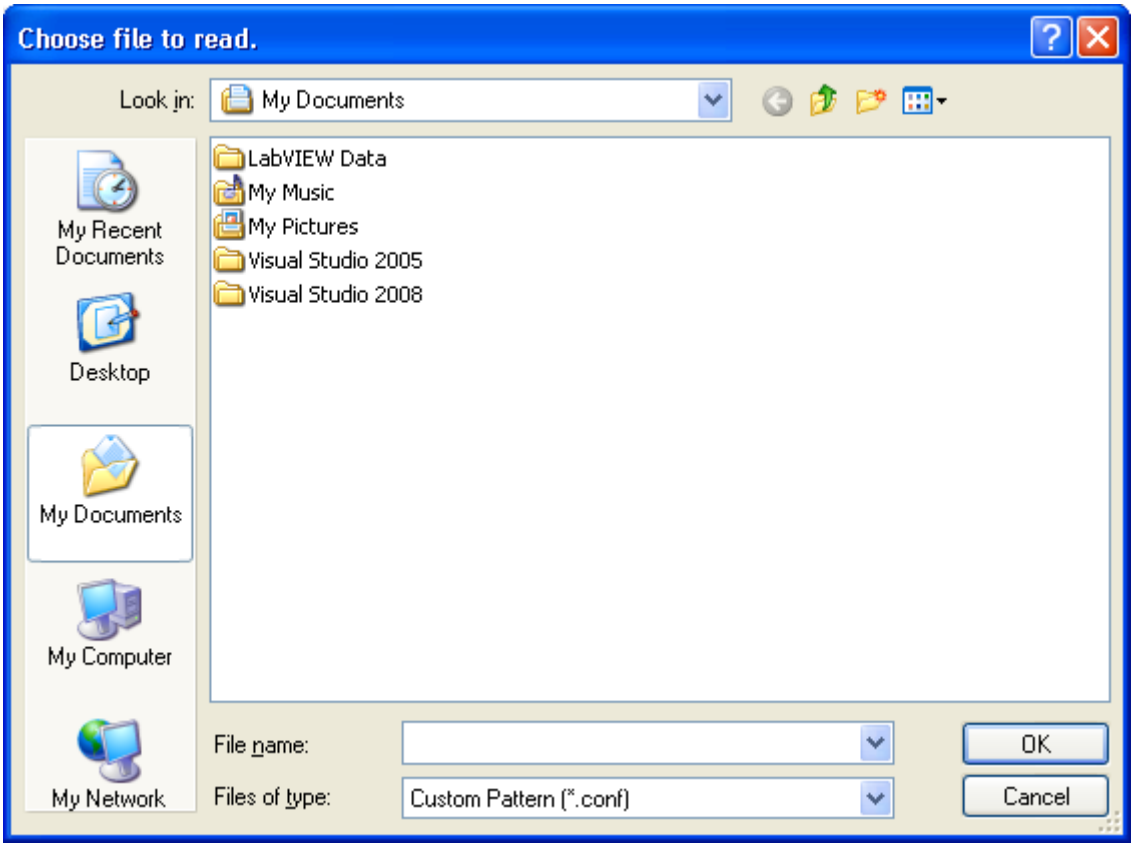


Figure 5-11 Open… Dialog Box

5.9 Back

Click this button will exit the window and return to previous window.

Figure 5-12 Back Button

6. Static Test

The main function of this window is to run static test. Users can follow the requirements to select the loading mode for test. First, the software will prompt the Output Name to indicate the Channel for action. It is necessary to refer to this column when setting Mode and Loading. If gray shading appears in the window, it means not available for use. When the total Channel number is larger than 8, the scroll bar will be active. Users are able to scroll it for page change and the maximum channel number on each page is 8. The functions of this window are explained below.

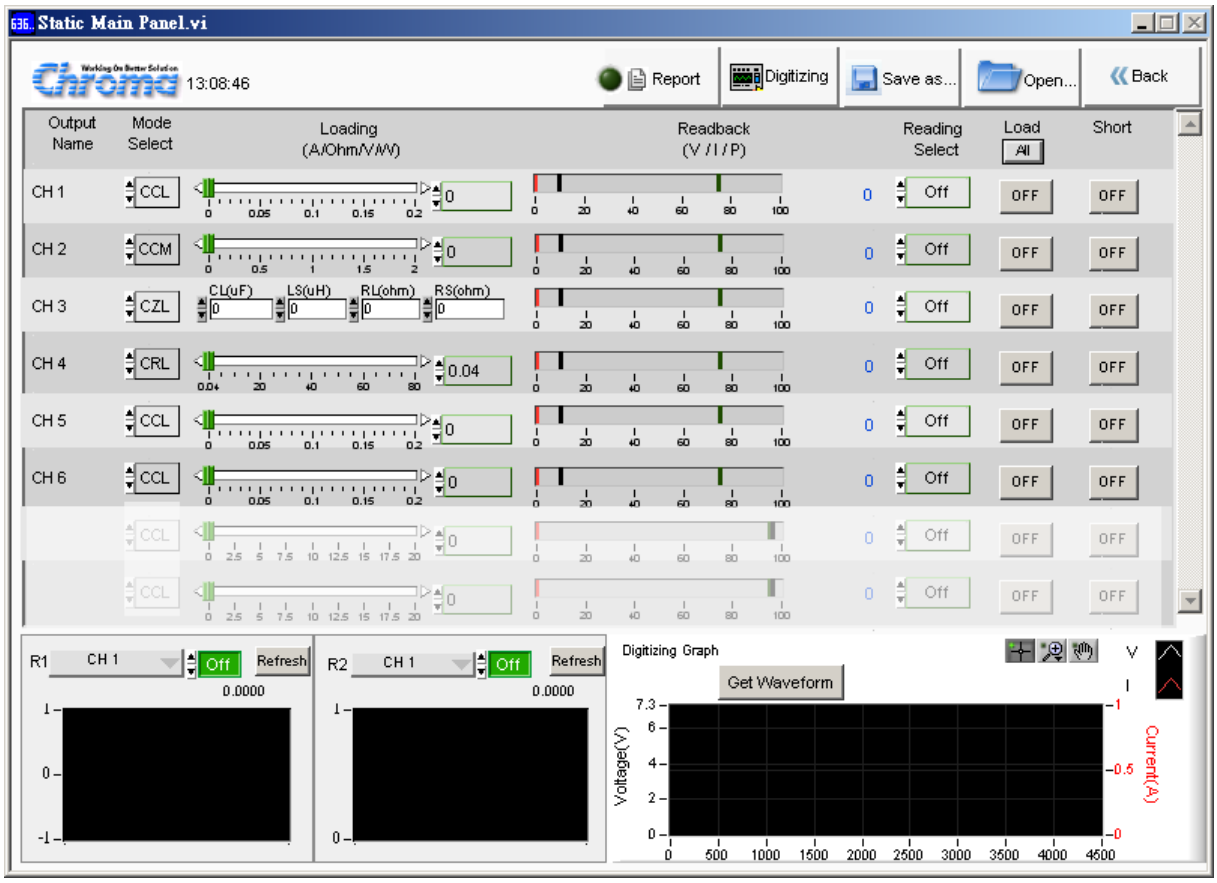


Figure 6-1 Static Test Window

6.1 Mode Selection

There are CCL, CCM, CCH, CRL, CRM, CRH, CVL, CVM, CVH, CPL, CPM, CPH, CZL, CZM and CZH loading 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 as Figure 6-2 shows for selection or use the up and down arrow to select it.

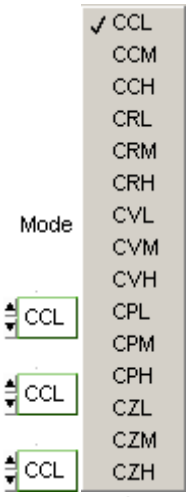


Figure 6-2 Mode Selection

6.2 Loading Parameter

The Loading range changes following not only the Mode but also the Module No. Moreover, it changes according to parallel use that users 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 show.

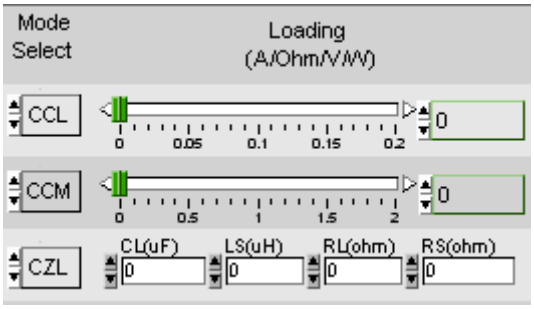


Figure 6-3 Loading Parameter

6.3 Reading Select

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

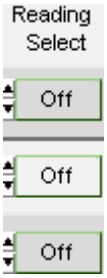


Figure 6-4 Reading Select

6.4 Readback

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 mean FAIL. The purpose of it is to enable the user to adjust the UUT output to be within the range when doing 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.

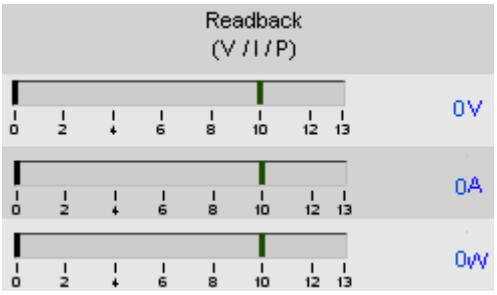


Figure 6-5 Readback Indicator

6.5 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 6-6 Setting Load On/Off

6.6 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 6-7 Setting Short On/Off

6.7 Digitizing Graph

It captures the voltage and current waveform. The white waveform indicates voltage and the red one indicates current. They can be identified easily by the figure shown but be aware of the Y-axis in which the left is voltage and the right is current. The figure below shows 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.

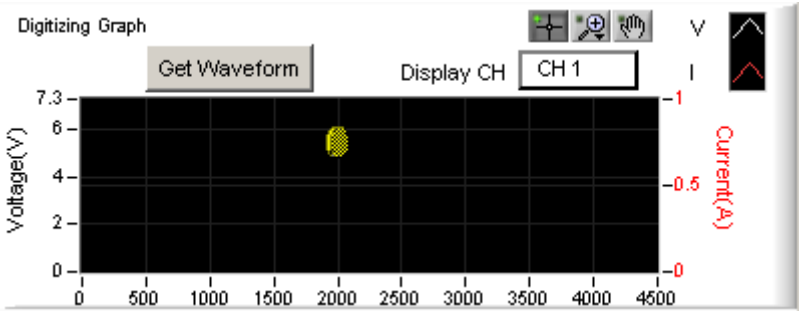


Figure 6-8 Digitizing Trigger On for Waveform Capturing

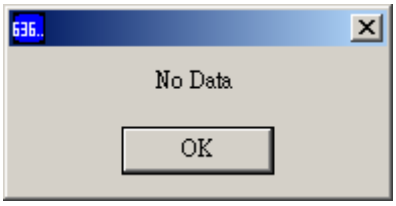


Figure 6-9 Digitizing Trigger On – No Data

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

Graph Tools: There are three tools - normal and 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 the figure shows below: the yellow part in and indicates the partial zoom in function. Drag it can 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.

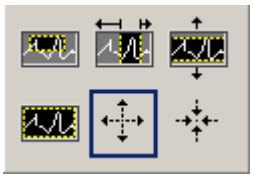


Figure 6-10 Digitizing Graph Waveform Zoom In Selection

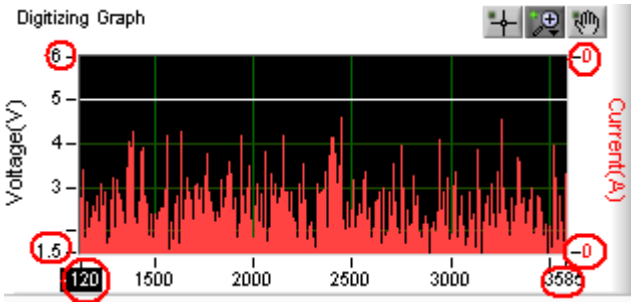


Figure 6-11 Setting X, Y Axis Maximum/Minimum Value

6.8 Reading Display

The reading display area is composed of 2 boxes of the same as Figure 6-12 shows. Each box has the same functions including graph display, numeric display, readback display selections and a refresh button.

Figure 6-12 Structure of Reading Display Box

6.8.1 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 adjust automatically. The X-axis is the timeline and the Y-axis is the mapped measurement.

Figure 6-13 Reading Display

6.8.2 Numeric Display

It is the newest data reakback in digital format and will update continuously.

4,6650

Figure 6-14 Digital Reading

6.8.3 Readback Selections

It selects the value to be read back. To monitor the voltage, click R1 as Figure 6-15. Off indicate not to read back the value or stop returning the value.

Figure 6-15 Readback Type Selections

6.8.4 Refresh

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

Figure 6-16 Clear the Chart Data

6.9 SAVE, OPEN & BACK

The function of these three buttons is the same as in Configuration Setting. Please see section 5.7, 5.8 and 5.9 for detail information.

6.10 Digitizing Function

Click this button will enter into the Digitizing Function Panel for parameter setting. Click Back in Digitizing Function Panel will return to its original panel.

Figure 6-17 Digitizing Function Button

6.11 Report

This button sets the report for data generation. Since the Static and Dynamic tests are irregular, it is necessary to use the Report function to log the V, I, P values of each channel of the standalone device. Click this button to enter into the Report Panel for parameter setting and click Back in Report Panel will return to its original panel. If Report function is already in use, the light in front of it will be on.

Figure 6-18 Report Function Button & Light

7. Dynamic Test

The main function of this window is to test the dynamic loading as need. First, the software will prompt the Output Name to indicate the Channel for action. It is necessary to refer to this column when setting Mode and Loading. If gray shading appears in the window, it means not available for use. When the total Channel number is larger than 3, the scroll bar will be active. Users are able to scroll it for page change and the maximum channel number of each page is 3. The functions of this window are explained below.

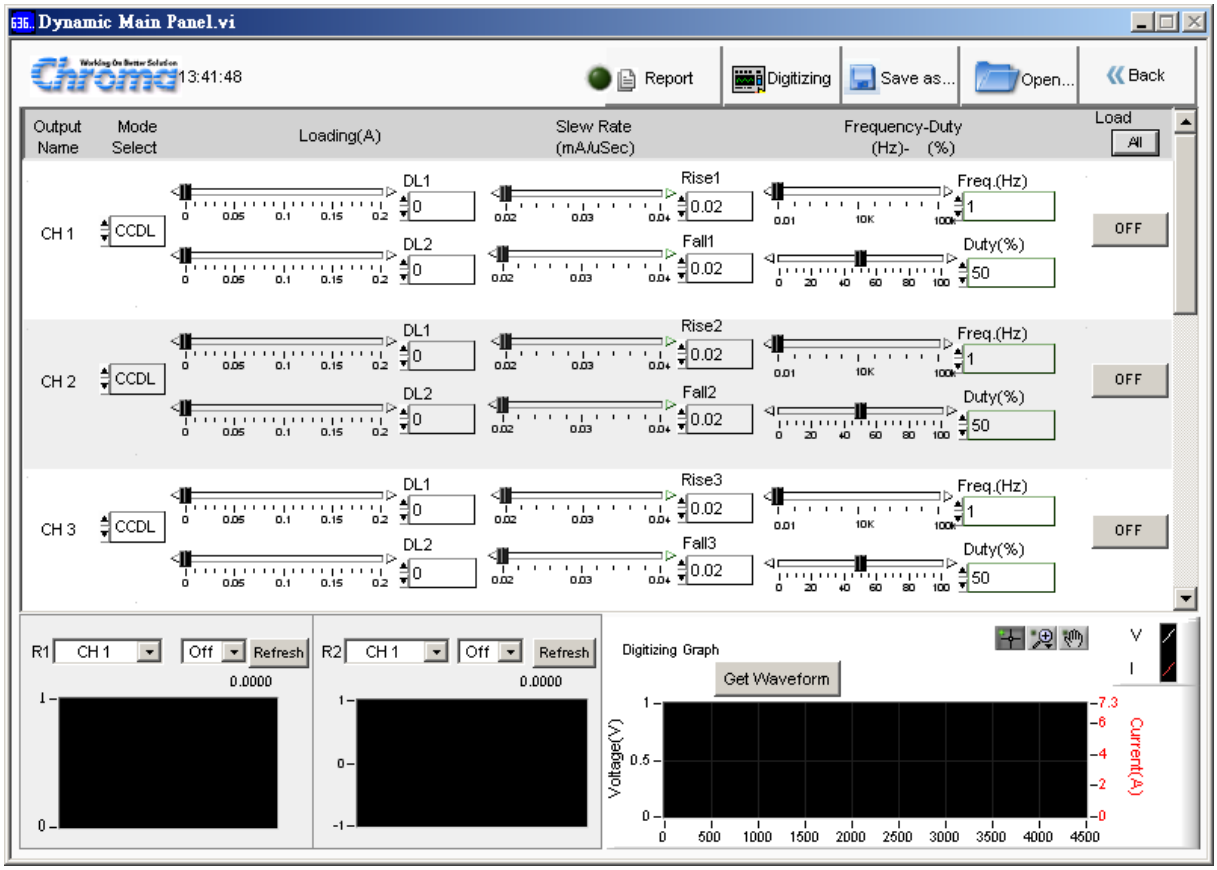


Figure 7-1 Dynamic Test Window

7.1 Mode Selection

There are CCDL, CCDM and CCDH loading modes in Dynamic Test. Each channel has these three 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 or use the up and down arrow to select it.

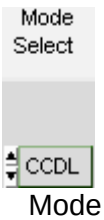


Figure 7-2 Mode Selection

7.2 Setting Loading

There are DL1 and DL2 two dynamic loadings. The Loading range changes not only following the Mode but also following the Module 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 5 digits after decimal.

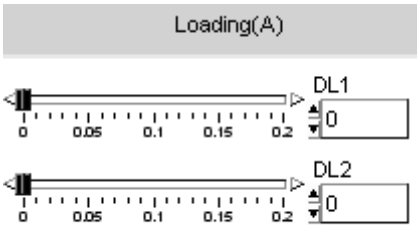


Figure 7-3 Setting Loading Parameters

7.3 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 Module 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 5 digits after decimal.

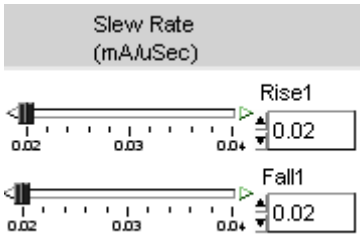


Figure 7-4 Setting Slew Rate Parameters

7.4 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%).

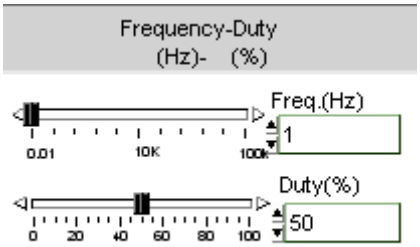


Figure 7-5 Setting Frequency-Duty Parameters

7.5 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 7-6 Setting Load On/Off

7.6 Digitizing Graph

Pease refer to section 6.7 for detail description.

7.7 Reading Display

Please refer to section 6.8 for detail description.

7.8 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

7.9 Digitizing Function

Please refer to section 6.10 for detail description.

7.10 Report

Please refer to section 6.11 for detail description.

8. 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 H/W Setting for expansion downward. The parameters applicable for setting are described in the section below.

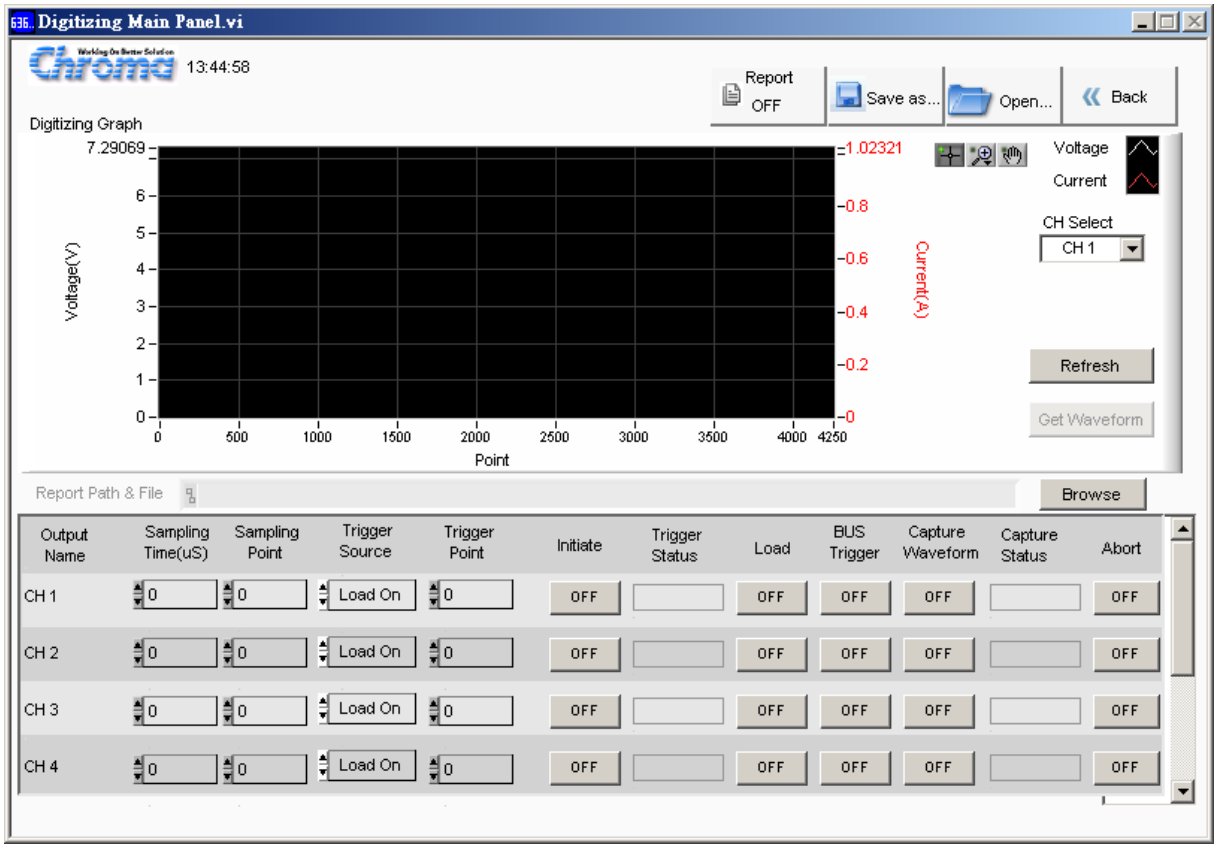


Figure 8-1 Window of Digitizing Panel

8.1 Setting Parameters

8.1.1 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 8-2 Setting Sampling Time

8.1.2 Sampling Point

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

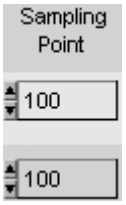


Figure 8-3 Setting Sampling Point

8.1.3 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.

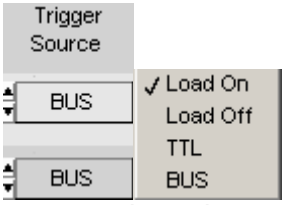


Figure 8-4 Setting Trigger Source

8.1.4 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.

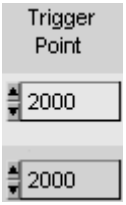


Figure 8-5 Setting Trigger Point

8.1.5 Load On/Off

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

Figure 8-6 Setting Load On/Off

8.1.6 Initiate On/Off

Click it to get the waveform and check the return message of Trigger Status.

Figure 8-7 Setting Initiate On/Off

8.1.7 Trigger Status

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

Figure 8-8 Trigger Status

8.1.8 Capture Waveform

Once the Trigger Status showed IDLE, click On/Off of the mapped channel to capture the waveform and check the return message of Capture Status.

Figure 8-9 Capture Waveform

8.1.9 Capture Status

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

Figure 8-10 Capture Status

8.1.10 Abort

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

Figure 8-11 Abort the Trigger

8.1.11 Digitizing Graph

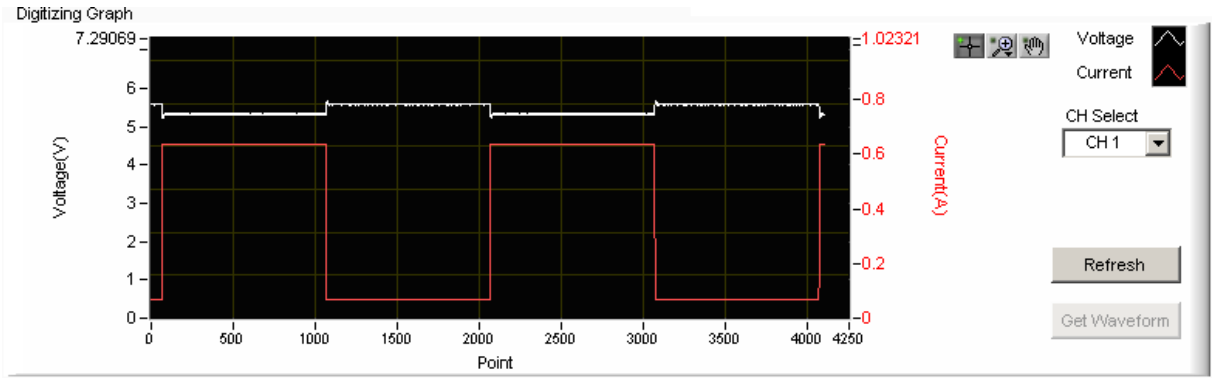


Figure 8-12 Digitizing Graph Panel

It captures the voltage and current waveform. The white waveform indicates voltage and the red one indicates current. They can be identified easily by the figure shown but be aware of the Y-axis in which the left is voltage and the right is current. The figure below shows 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.

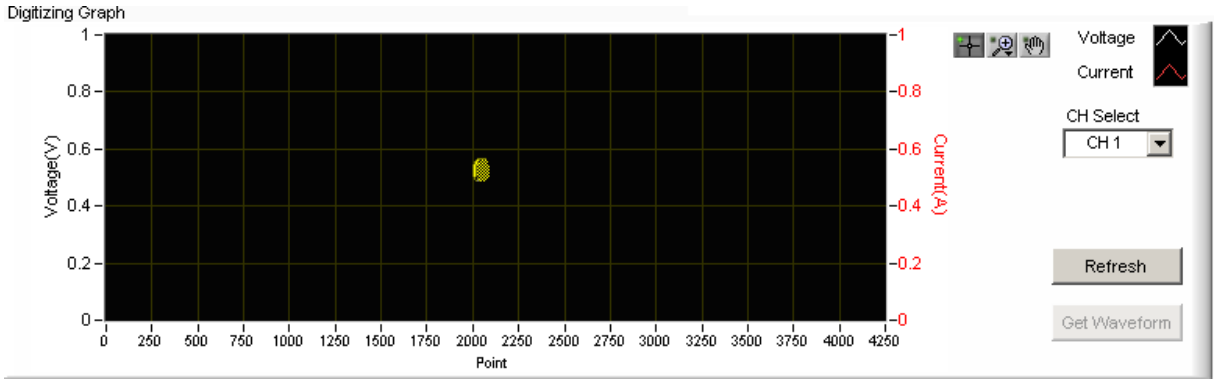


Figure 8-13 Digitizing Trigger On – Waiting for Waveform Capture

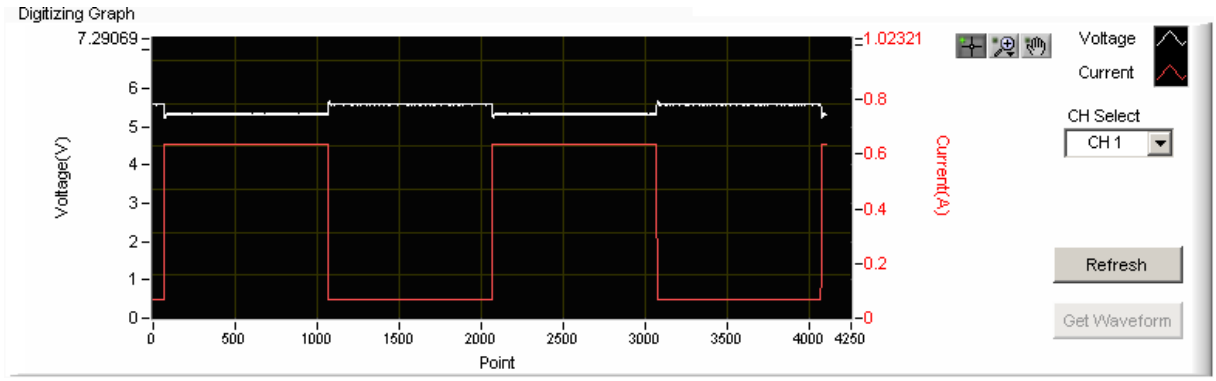


Figure 8-14 Digitizing Trigger On – Waveform Captured

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

Graph Tools: There are three tools - normal and 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 the figure shows below: the yellow part in and indicates the partial zoom in function. Drag it can 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.

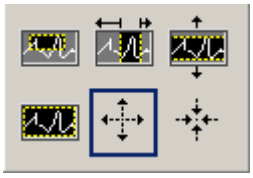


Figure 8-15 Digitizing Graph Waveform Zoom In Selection

8.2 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 use open the report via Excel for curve drawing.

Figure 8-16 Digitizing Report

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

Figure 8-17 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 8-18 Digitizing Report Format & Partial Contents

8.3 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

9. 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 the process of sweep.

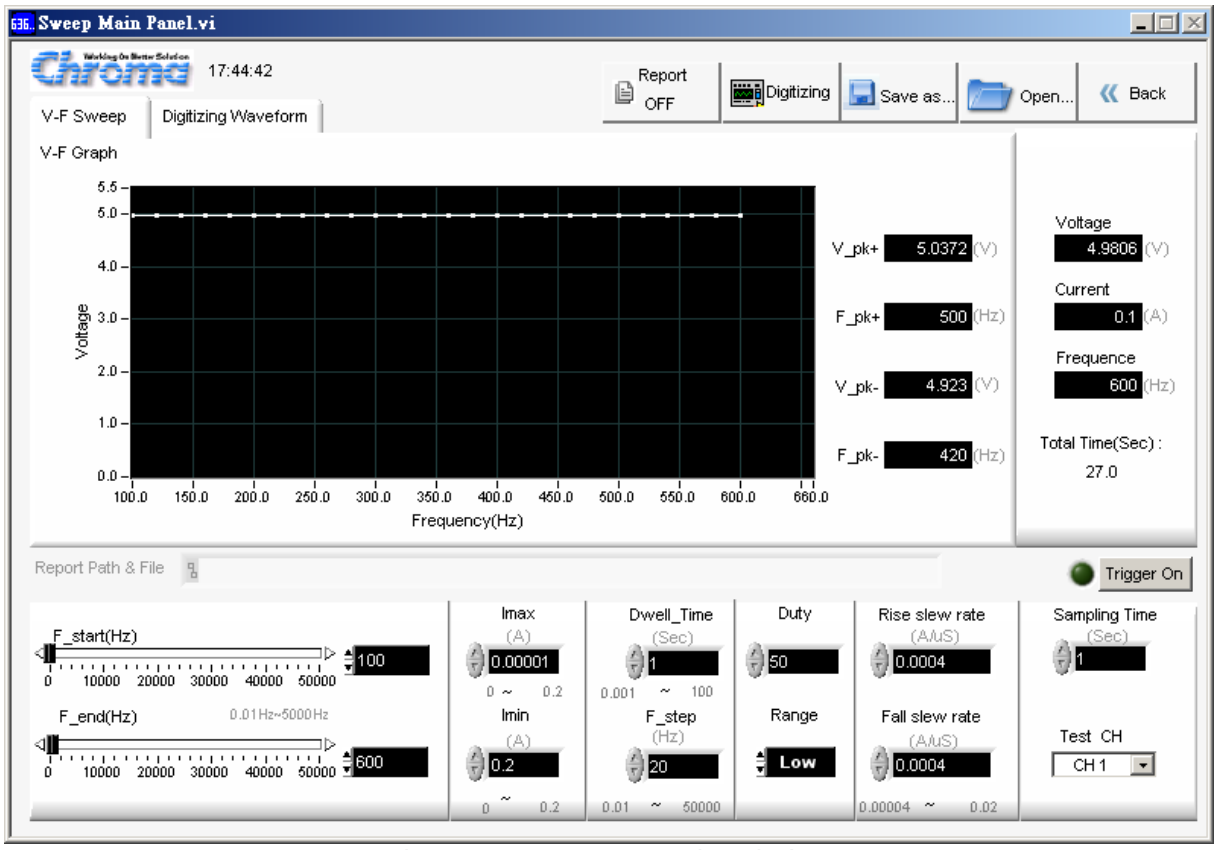


Figure 9-1 Sweep Mode Window

9.1 Setting Parameter

9.1.1 Test CH

The channel number set in H/W Setting Panel will list here. It is a drop-down menu to select the desired channel for test.

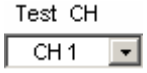


Figure 9-2 Setting Test CH

9.1.2 Setting Start Frequency – F _start (Hz)

It sets the start frequency within the range of 0.01Hz~ 50000Hz and the resolution of 0.01. The user can input the value directly or move the slider to adjust the start frequency.

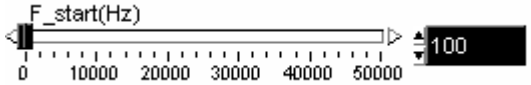


Figure 9-3 Setting Start Frequency - F_start (Hz)

9.1.3 Setting End Frequency – F_end (Hz)

It sets the end frequency within the range of 0.01Hz~ 50000Hz and the resolution of 0.01. The user can input the value directly or move the slider to adjust the end frequency.

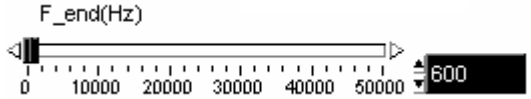


Figure 9-4 Setting End Frequency - F_end (Hz)

9.1.4 Setting 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.

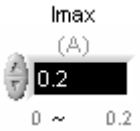


Figure 9-5 Setting Imaxt

9.1.5 Setting 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.

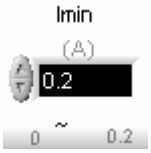


Figure 9-6 Setting Imin

9.1.6 Setting Dwell Time

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

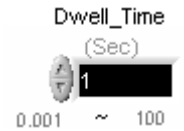


Figure 9-7 Setting Dwell Time

9.1.7 Setting F_step

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

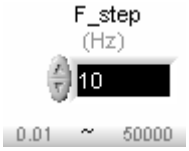


Figure 9-8 Setting F_step

9.1.8 Setting 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.

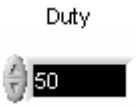


Figure 9-9 Setting Duty

9.1.9 Setting Range

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

Figure 9-10 Setting Range

9.1.10 Setting Rise slew rate

It sets the rise slew rate of current. The setting varies with the Range set. The numbers underneath in gray indicate the valid range.

Figure 9-11 Setting Rise slew rate

9.1.11 Setting 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 9-12 Setting Fall slew rate

9.1.12 Setting Sampling Time

It sets the interval of reakback 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 9-13 Setting Sampling Time

9.1.13 Setting 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 Off can abort or cancel the test.

Figure 9-14 Setting Trigger

9.1.14 Total Time Indicator

It sums up the total test time when operating in Auto o mode. Trigger On will count the time executed when operating in Manual mode.

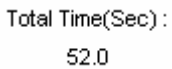


Figure 9-15 Total Time Indicator

9.2 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.

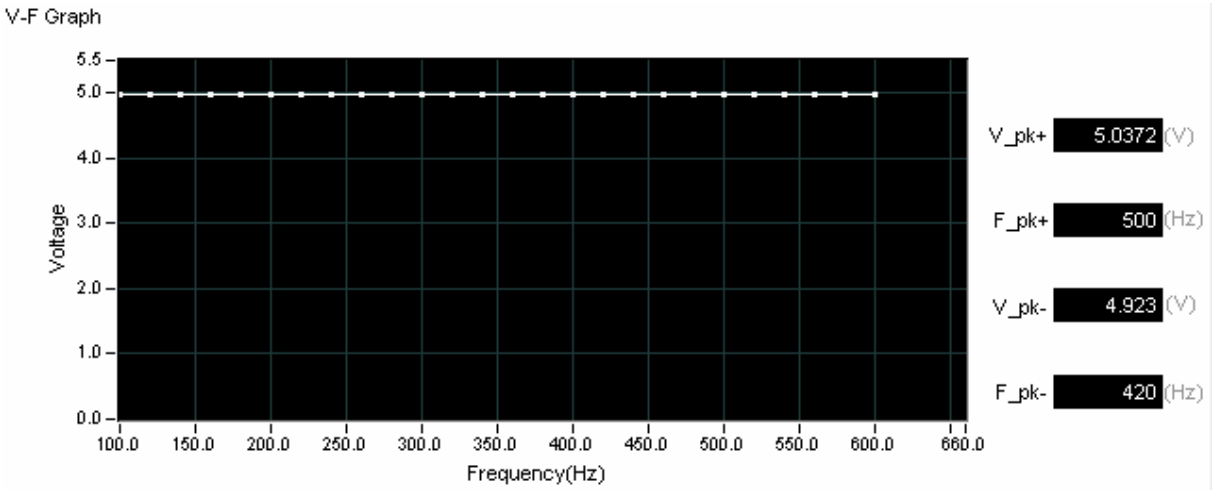


Figure 9-16 V-F Chart

The V_pk+, Fpk+, Vpk- and Fpk- 4 parameters appeared are the result when the entire test time ends after Trigger On.

9.3 Reading Display

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

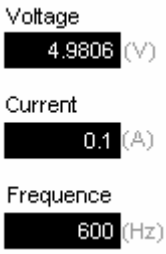


Figure 9-17 Reading Display

9.4 Digitizing Waveform

Please refer to section of 6.7 for detail description.

9.5 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.

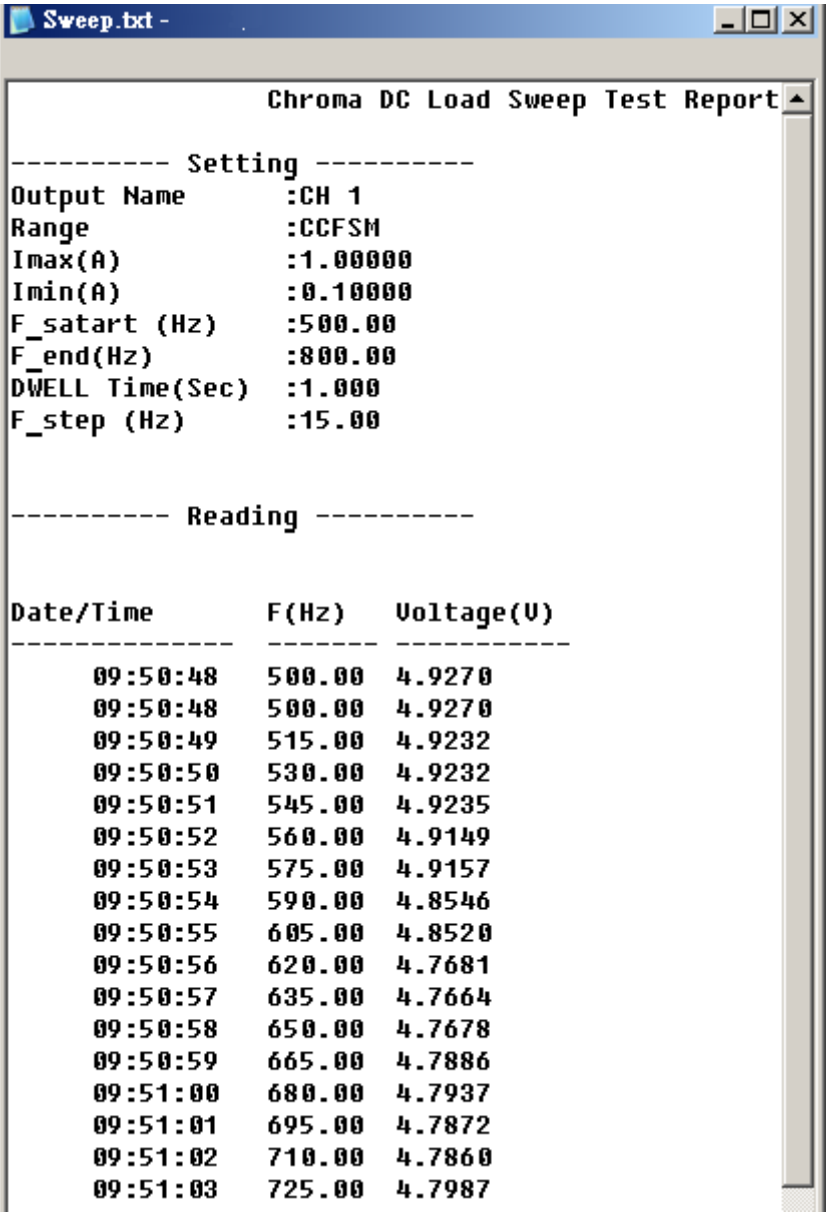
A simple report in pure text file with *.txt extension is provided during Sweep test. The user should decide if turning on the Report function as well as the path and filename for storage.

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

Figure 9-18 Report On/Off

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

Figure 9-19 Browse for Report Path & Filename



Sweep.txt -

```
                Chroma DC Load Sweep Test Report

---------- Setting ----------
Output Name       :CH 1
Range             :CCFSM
Imax(A)           :1.00000
Imin(A)           :0.10000
F_satart (Hz)     :500.00
F_end(Hz)         :800.00
DWELL Time(Sec)   :1.000
F_step (Hz)       :15.00


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


Date/Time       F(Hz)   Voltage(V)
--------------  ------- -----------
     09:50:48   500.00  4.9270
     09:50:48   500.00  4.9270
     09:50:49   515.00  4.9232
     09:50:50   530.00  4.9232
     09:50:51   545.00  4.9235
     09:50:52   560.00  4.9149
     09:50:53   575.00  4.9157
     09:50:54   590.00  4.8546
     09:50:55   605.00  4.8520
     09:50:56   620.00  4.7681
     09:50:57   635.00  4.7664
     09:50:58   650.00  4.7678
     09:50:59   665.00  4.7886
     09:51:00   680.00  4.7937
     09:51:01   695.00  4.7872
     09:51:02   710.00  4.7860
     09:51:03   725.00  4.7987
```

Figure 9-20 Sweep Report Saving Format

9.6 Digitizing Graph Display

Please refer to section 6.7 for detail description.

9.7 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

10. Sine Test

Sine Test is able to load a current waveform of sine with the 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 the user to see the data in detail.

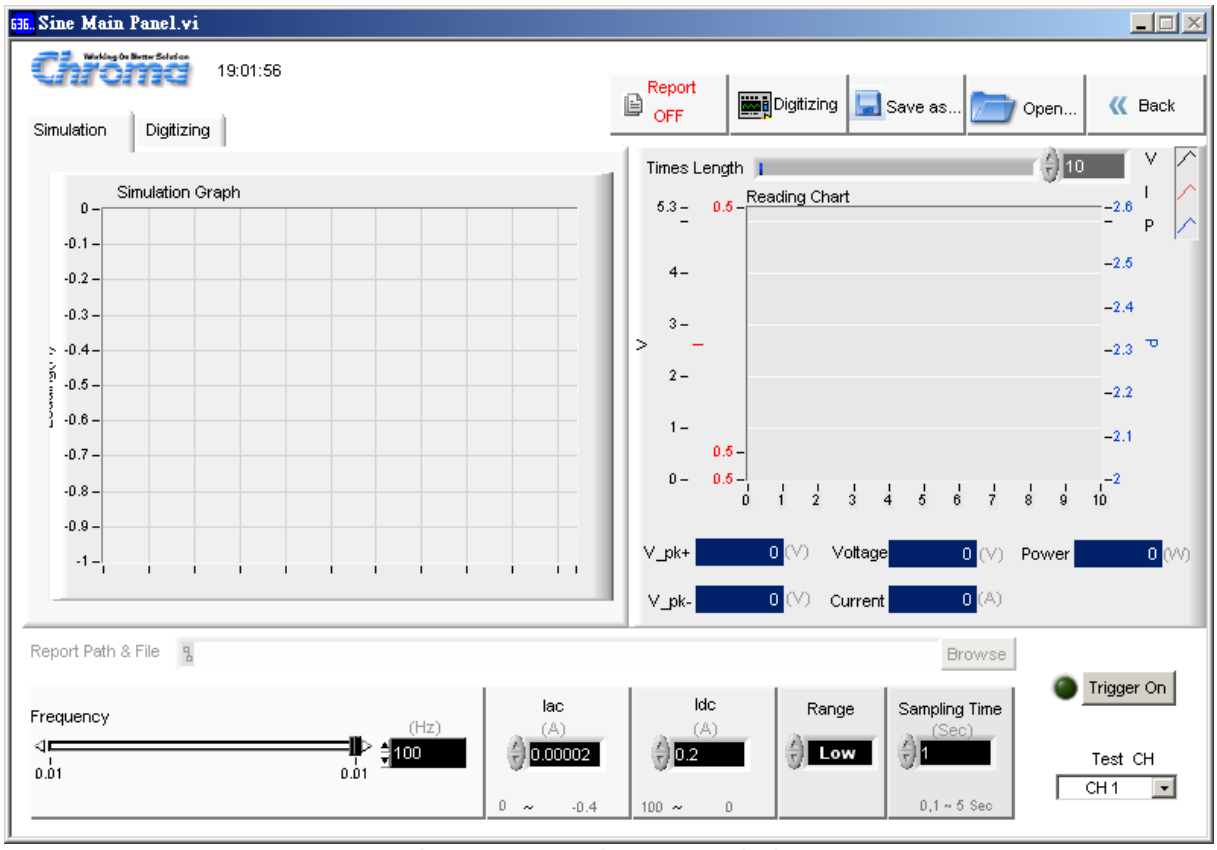


Figure 10-1 Sine Test Window

10.1 Setting Parameter

10.1.1 Test CH

The channel number set in H/W Setting Panel will list here. It is a drop-down menu to select the desired channel for test.

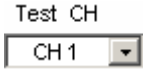


Figure 10-2 Setting Test CH

10.1.2 Setting Frequency

It sets the frequency within the range of 0.01Hz~ 20000Hz and the resolution of 0.01. The user can input the value directly or move the slider to adjust the start frequency.

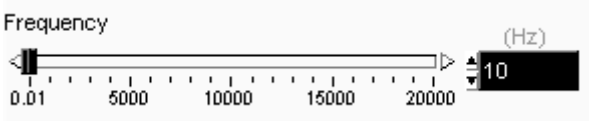


Figure 10-3 Setting Frequency

10.1.3 Setting 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.

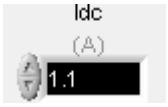


Figure 10-4 Setting Idc

Notice

When setting the loading value for Sine Test, it will 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 modification.

10.1.4 Setting Iac

It sets the value of AC loading. The setting value varies with Range and it 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 10-5 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.

10.1.5 Setting Range

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

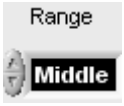


Figure 10-6 Setting Range

10.1.6 Setting Sampling Time

It sets the interval of readback in the unit of second. When it is Trigger On, 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 0.01~100 seconds.

Figure 10-7 Setting Sampling Time

10.2 Simulation Graph Display

This indication area shows the diagram of the present setting when the setting of Frequency, Iac and Idc changes. The Y-axis is the current and X-axis is the cycle density without any unit.

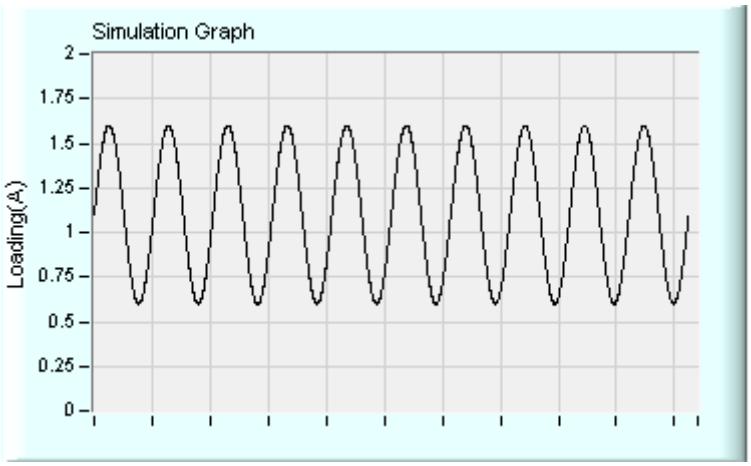


Figure 10-8 Simulation Graph

10.3 Digitizing Waveform

Please refer to section 6.7 for detail description.

10.4 Reading Display

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

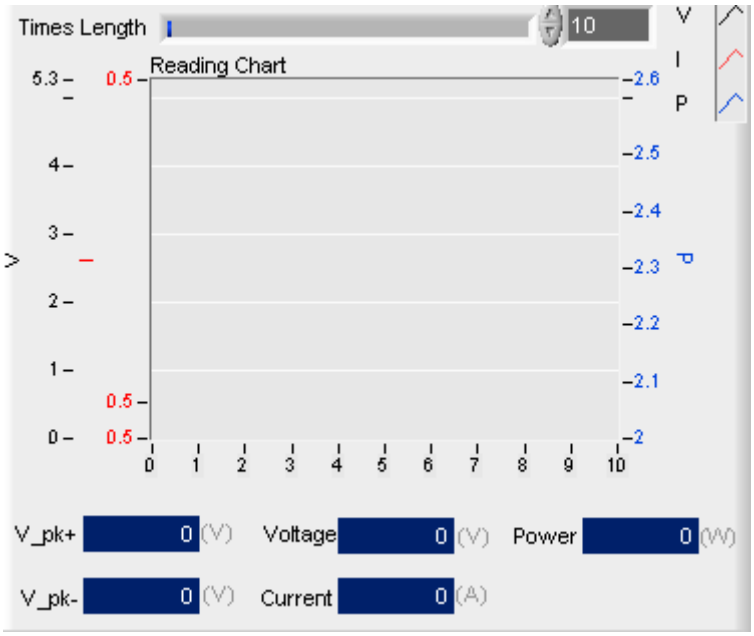


Figure 10-9 Reading Display

10.5 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.

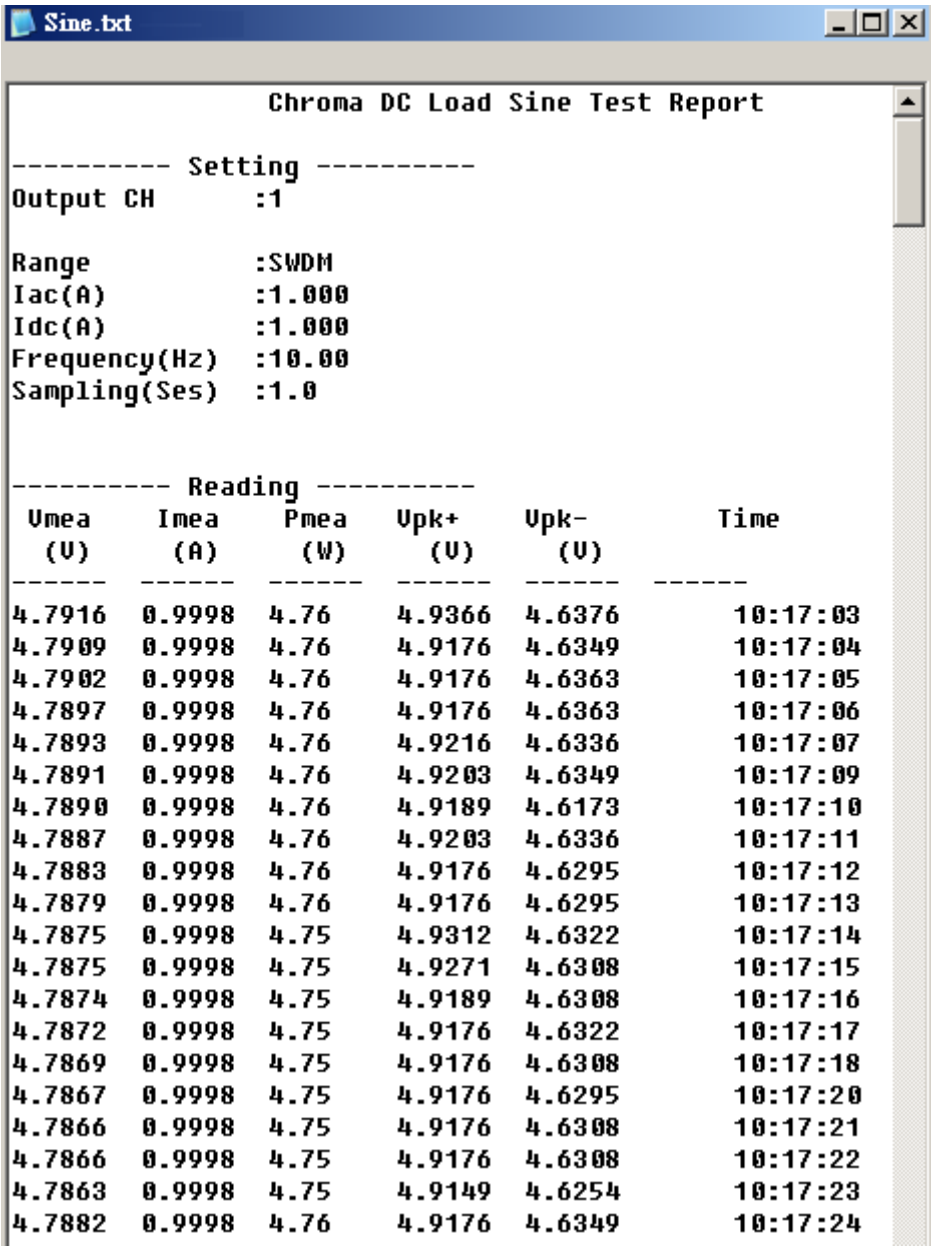
A simple report in pure text file with *.txt extension is provided during Sine test. The user should decide if turning on the Report function as well as the path and filename for storage.

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

Figure 10-10 Report On/Off

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

Figure 10-11 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 10-12 Sine Report Format

10.6 Digitizing Function

Please refer to section 6.10 for detail description.

10.7 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

11. Program Test

This mode provides List Sequence Test and Step Sequence Test to replace the manual step test. 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 the 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 for use. The user can use Reading Chart or Report On to check the data change during execution. The functions of this window are explained below.

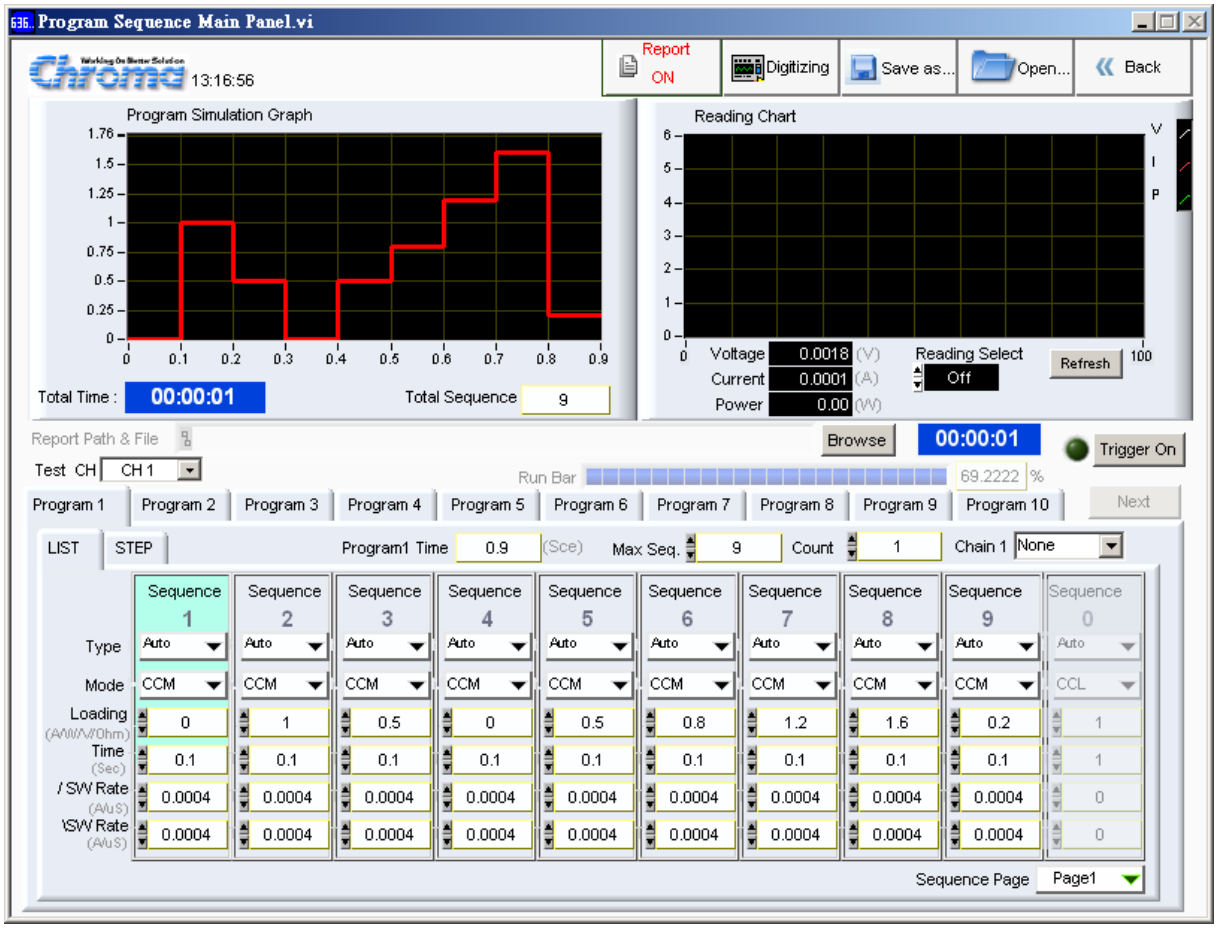


Figure 11-1 Program Test Window

11.1 Program Simulation Graph

This is a display area that follows the loading change status to draw the 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.) No matter it is time, Max Sequence, List or Step mode in use, all of them will display on this Chart. However, the chart will draw one time only without repetition as Count specified.

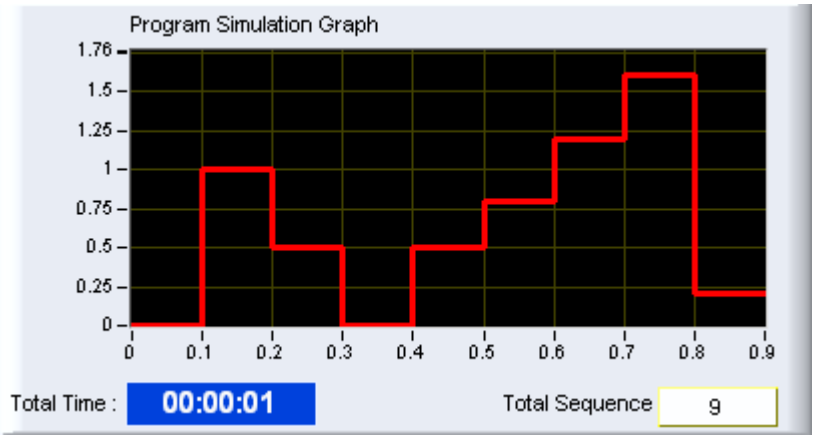


Figure 11-2 Program Simulation Graph

Please be aware that if setting the Type to Skip which 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!

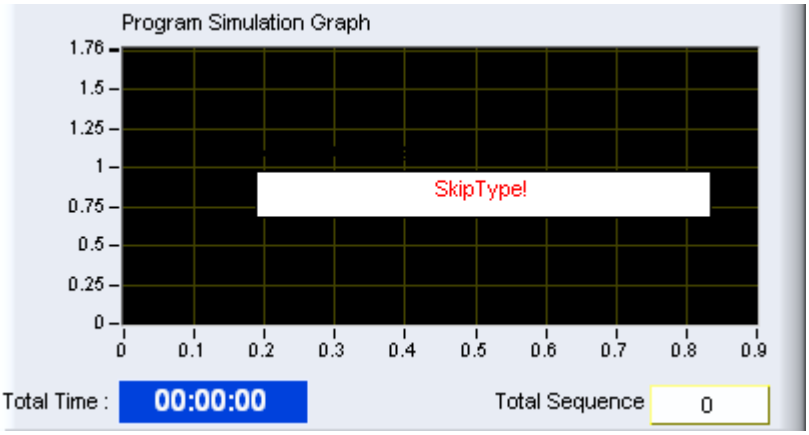


Figure 11-3 Warning for Invalid Program Simulation Graph

11.2 Setting Parameter

It sets the parameter in the sequence of CH, 10 Programs, List or Step and various settings.

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.

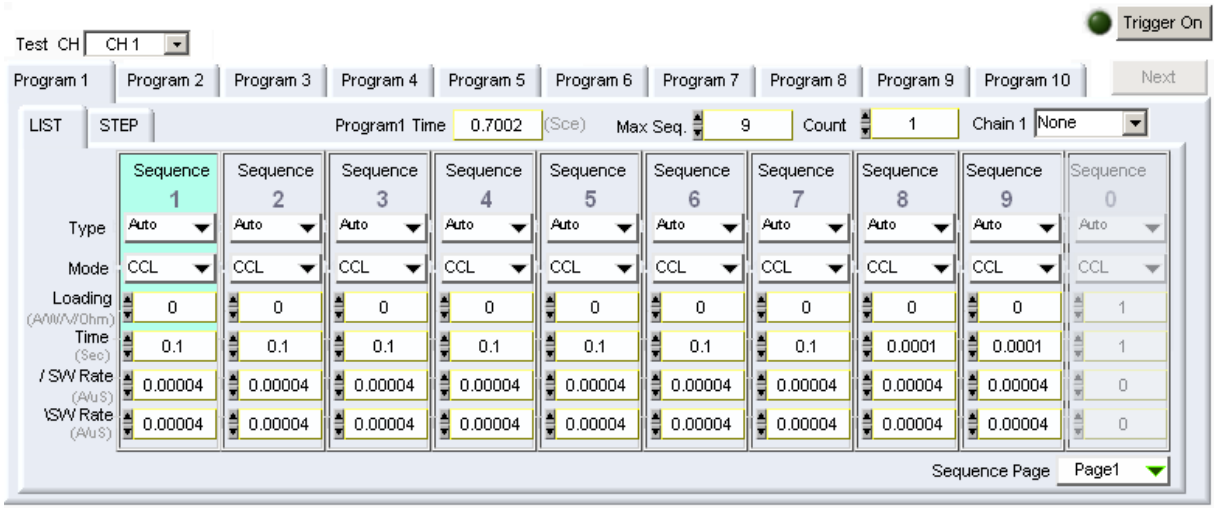


Figure 11-4 List Mode Parameter Display

11.2.1 Setting Program

Each channel can set 10 programs. Figure 11-4 shows one tab page, which is labeled as Program 1 to Program 10. Each program is able to set the parameters in LIST or STEP option, Max Seq. and Count (the number of repeated tests under the program.) Chain1 indicates the program to skip to when the execution of present 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.

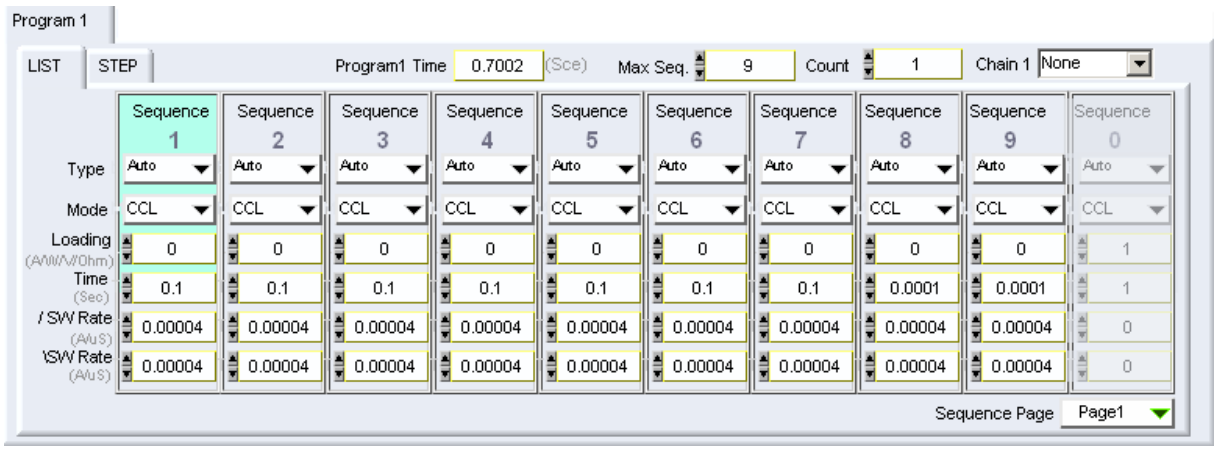


Figure 11-5 Setting Program Parameter

11.2.2 Selecting List or Step

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.

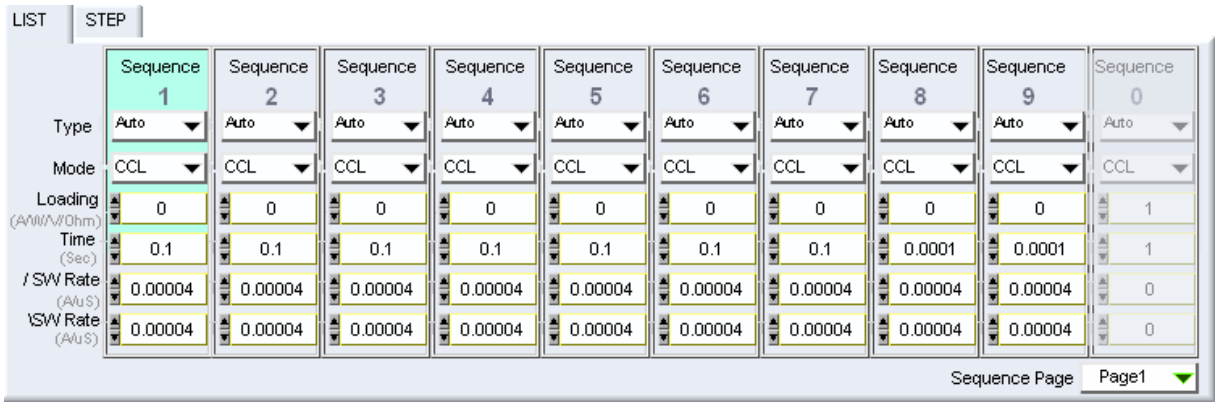


Figure 11-6 Setting List Parameters

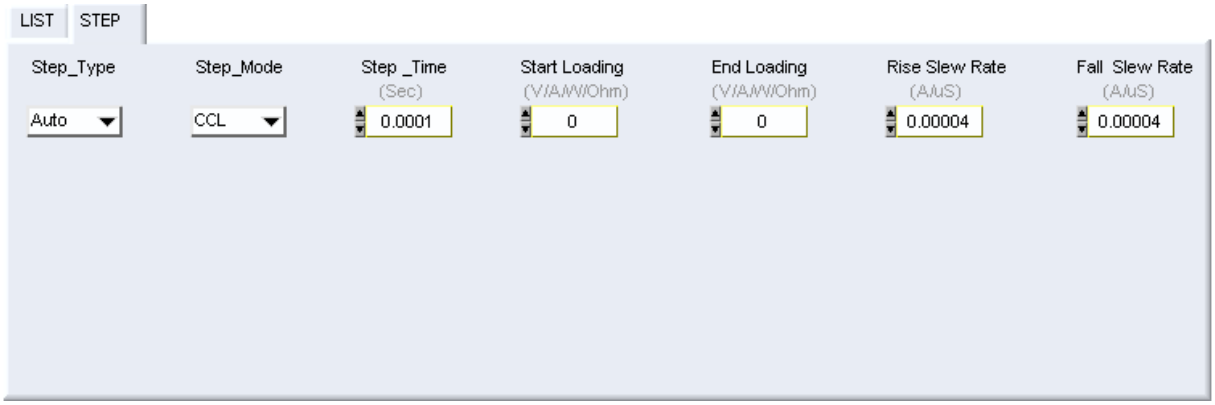


Figure 11-7 Setting Step Parameters

11.2.3 Setting Max Seq.

The range available for Max Seq. is 1 to100. A channel has 100 Sequences for execution. The user can set the 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 sets for settings.

Figure 11-8 Setting Max Seq.

11.2.4 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 11-9 Setting Count

11.2.5 Setting Chain

It sets to skip to another program from the present program. It is a drop-down menu that has eleven selections containing None and Program 1 to Program 10. It executes the program selected presently only when None is selected. 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.

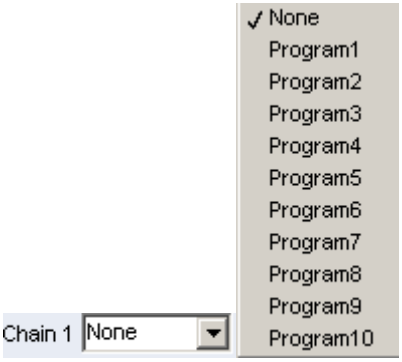


Figure 11-10 Setting Chain

11.2.6 Program Time Display

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, this display will show Inf as infinite. The unit is second.

Figure 11-11 Program Time Display

11.2.7 Setting LIST Parameters

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

11.2.7.1 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 the mapped 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.

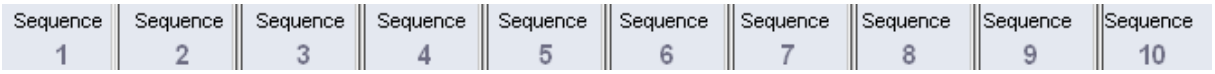


Figure 11-12 Sequence Indicator

11.2.7.2 Setting TYPE

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

Figure 11-13 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 11-14 Next Button

11.2.7.3 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 changed, the setting ranges of Loading and Slew Rate will change as well. Therefore, it is necessary to pat attention to the message prompted on the screen when switching the mode.

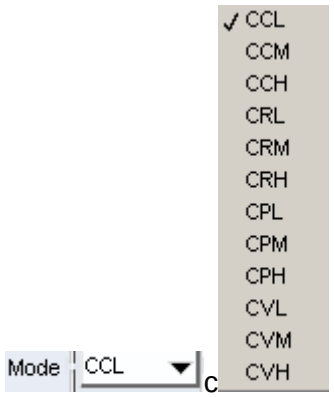


Figure 11-15 Setting MODE

11.2.7.4 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 11-16 Setting Loading

11.2.7.5 Setting Time

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

Figure 11-17 Setting Time

11.2.7.6 Setting Rise Slew Rate

It sets the rise slew rate under Sequence column in the unit of A/uS. The applicable range changes based on 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.

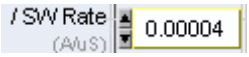


Figure 11-18 Setting Rise Slew Rate

11.2.7.7 Setting Fall Slew Rate

It sets the fall slew rate under Sequence column in the unit of A/uS. The applicable range changes based on 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 11-19 Setting Fall Slew Rate

11.2.7.8 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 Page10. As the page is unable to expand, this element is used for page break.

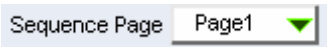


Figure 11-20 Setting Sequence Page

11.2.8 Setting STEP Parameter

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

11.2.8.1 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 executing normally, Manual means to trigger the test manually and to go to next program when **Next** is clicked, and External means to wait for the hardware external signal to trigger the execution of next program.

Figure 11-21 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 11-22 Next Button

11.2.8.2 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 changed, the setting ranges of Loading and Slew Rate will change as well. Therefore, it is necessary to pat attention to the message prompted on the screen when switching the mode.

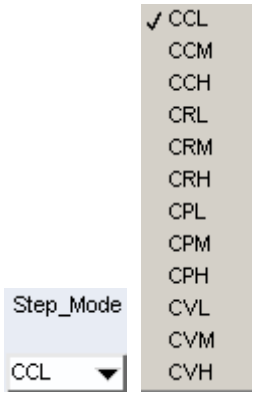


Figure 11-23 Setting Step_Mode

11.2.8.3 Setting Step_Time

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

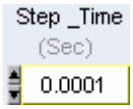


Figure 11-24 Setting Step_Time

11.2.8.4 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.)

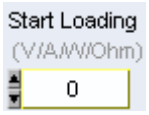


Figure 11-25 Setting Step_Loading

11.2.8.5 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 11-26 Setting End Loading

11.2.8.6 Setting Rise Slew Rate

It sets the rise slew rate for Program in the unit of A/uS. The applicable range changes based on 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 11-27 Setting Rise Slew Rate

11.2.8.7 Setting Fall Slew Rate

It sets the fall slew rate for Program in the unit of A/uS. The applicable range changes based on 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 11-28 Setting Fall Slew Rate

11.2.9 Reading Chart Indicator

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. There are three digital elements to display Voltage, Current and Power. It can click Refresh any time to clear the Chart data.

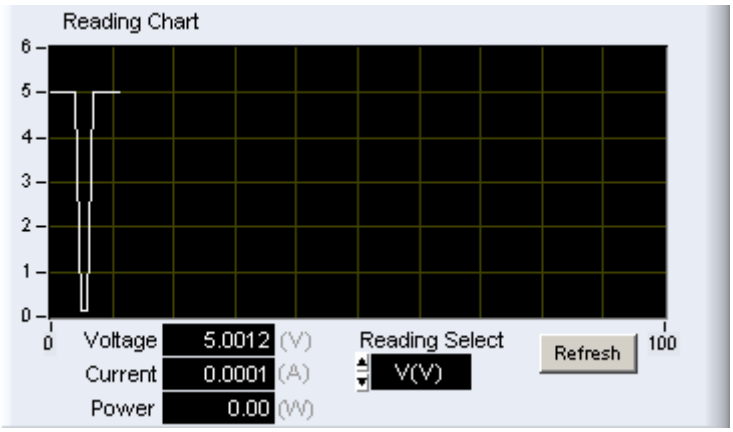


Figure 11-29 Reading Chart Indicator

11.2.10 Setting Trigger

It triggers the execution of Program Test. The test begins when Trigger on is clicked. To cancel or stop the test, click the button again to turn it to Trigger Off.

Figure 11-30 Setting Trigger

11.2.11 Program Execution Time

The program execution time will appear as Figure 11-31 shows after Trigger On. The Run Bar shows the progress and percentage to inform user the status.

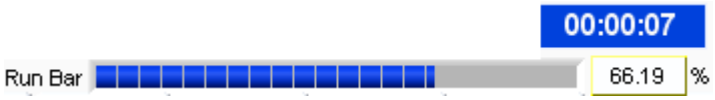


Figure 11-31 Program Execution Time Display

11.2.12 Program Execution Status

The program execution status will indicate which program is being executed, the LIST/STEP selections and the Sequence in use with highlight as Figure 11-32 shows after Trigger On.

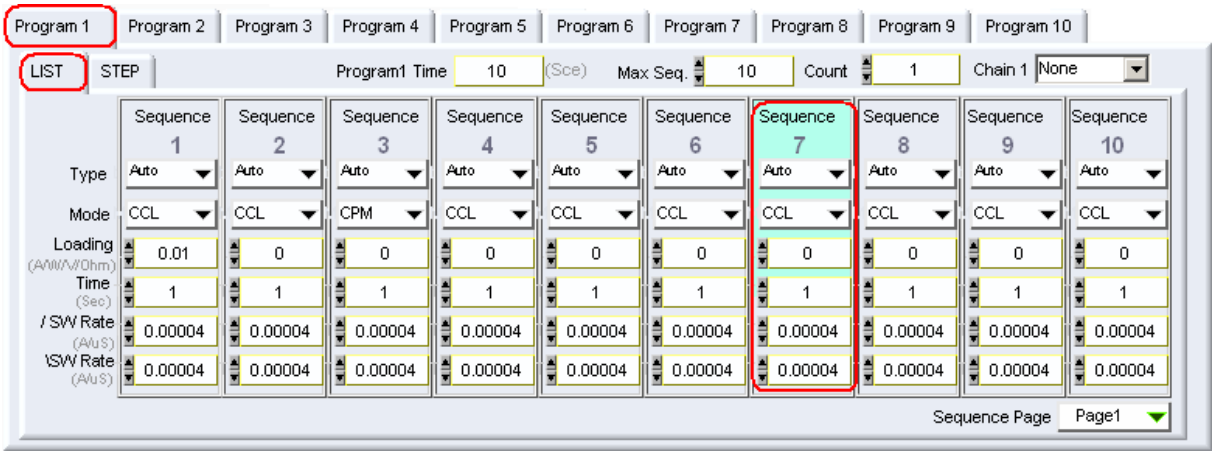


Figure 11-32 Program Execution Status

11.3 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, 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.

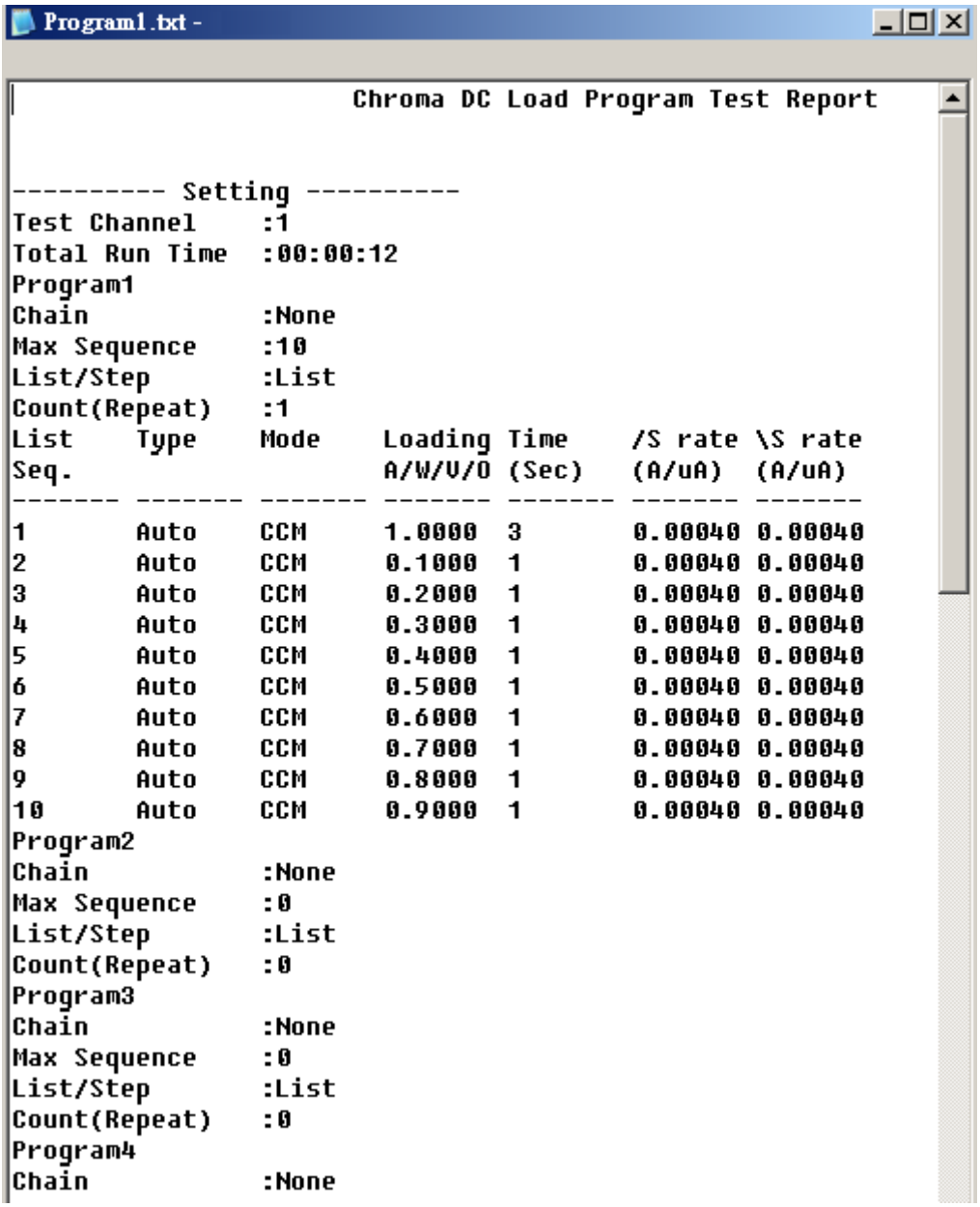
Before saving the file, it is necessary to turn the Report from Off to On.

Figure 11-33 Report On/Off

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

Figure 11-34 Browse for Report Path & Filename

Report format: The former part is settings and the latter part is readings. If the Program is the settings with no action, please 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 11-35 Program Report Format

11.4 Digitizing Graph Display

Please refer to section 6.7 for detail description.

11.5 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

12. Battery Test

This function is to test 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 the Battery Voltage and Current 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 be active. Users are able to scroll it for page change and the maximum channel number of each page is 4. The battery test can be performed on multiple channels and provide test report for user to check.

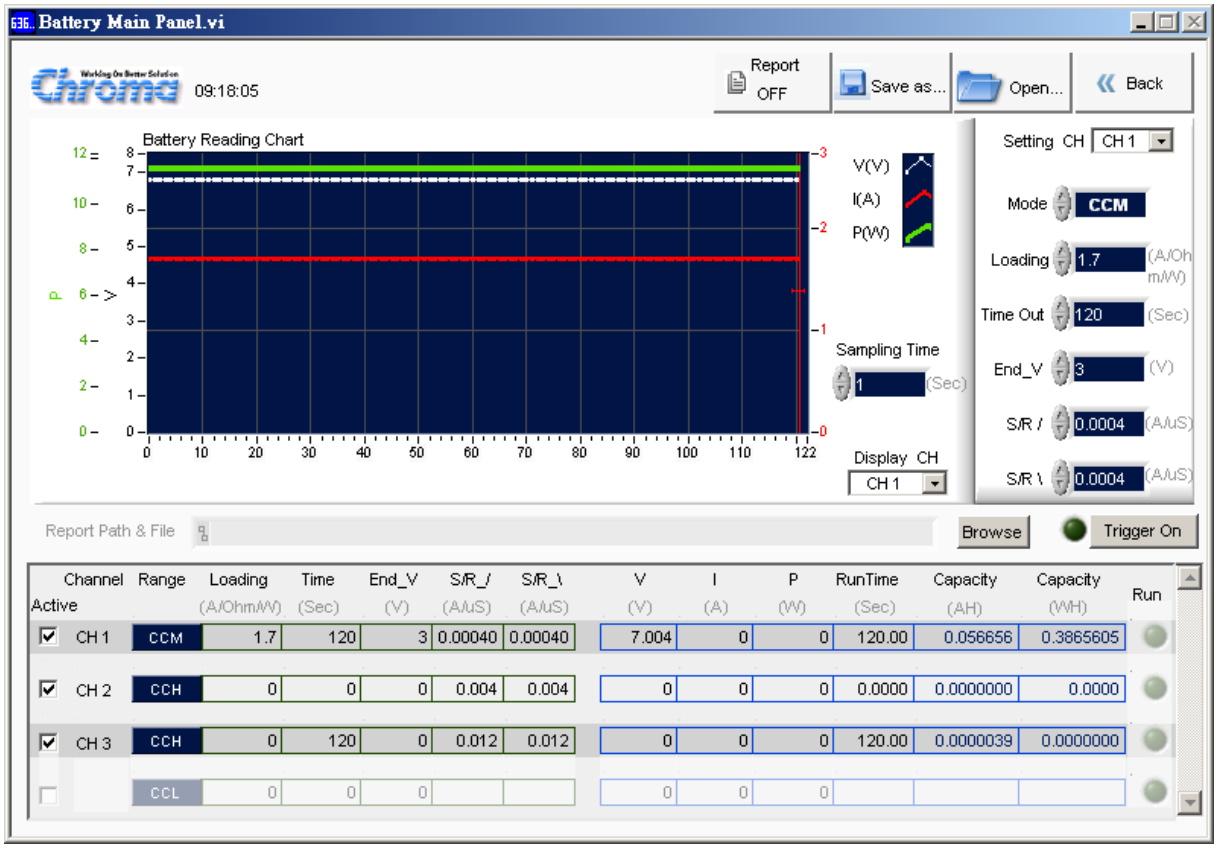


Figure 12-1 Window of Battery Test Panel

12.1 Setting Battery Test Parameters

The battery test parameters can be set in this window are Setting CH, Modem Loading. Time Out, End_V, Rise Slew Rate, Fall Slew Rate, Active and Sampling Time.

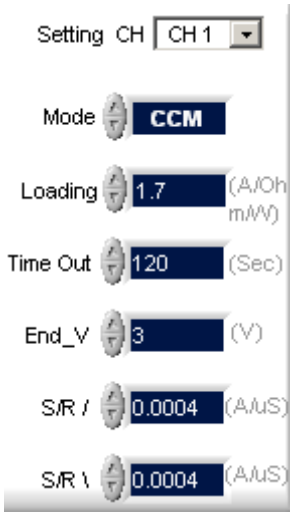


Figure 12-2 Setting Battery Test Parameters

12.1.1 Setting CH

The channels set in H/W Setting Panel will list here. It is a drop-down menu that the user can select any channel for test. When the 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.

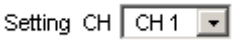


Figure 12-3 Setting CH

12.1.2 Setting Mode

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

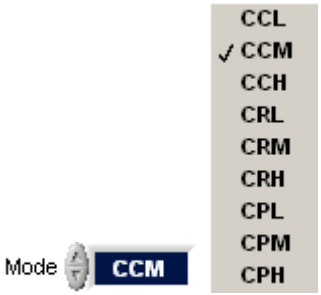


Figure 12-4 Setting Mode

12.1.3 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 12-5 Setting Loading

12.1.4 Setting End_V

It sets the condition for ending the discharge test. When the test voltage is lower than the set condition, it stops loading and discharge test on Channel as well as calculates the AH power to show in Capacity column.

Figure 12-6 Setting End_V

12.1.5 Setting Time Out

It sets the condition for ending the discharge test. Once the test time reached the time set here, it stops loading and discharge test on Channel as well as calculates the AH power to show in Capacity column though the test voltage did not exceed the value set by End_V.

Figure 12-7 Setting Time Out

12.1.6 Setting Rise Slew Rate

It sets the rise slew rate in the unit of A/uS. The applicable range changes based on the Mode selected. It will get the minimum setting first when Mode changes and supports CC and CP modes only.

Figure 12-8 Setting Rise Slew Rate

12.1.7 Setting Fall Slew Rate

It sets the fall slew rate in the unit of A/uS. The applicable range changes based on the Mode selected. It will get the minimum setting first when Mode changes and supports CC and CP modes only.

Figure 12-9 Setting Fall Slew Rate

12.1.8 Setting Active

It sets the channel to do Battery Test. Checked means enable for test and unchecked means disable for test.

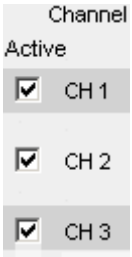


Figure 12-10 Setting Active

12.1.9 Setting Sampling Time

It sets the interval to readback the 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 and the recording speed of Report will change accordingly when Trigger On is clicked. The applicable range is 1~100 seconds.

Figure 12-11 Setting Sampling Time

12.2 Battery Test Setting Display

Though the channel is set one by one for test, 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 Channel, Range, Time, End_V、S/R_/(Rise Slew Rate), S/R_\(Fall Slew Rate) when the channel exceeds 4.

Notice The invalid Slew Rate setting will show "- -" string when setting in CR mode.

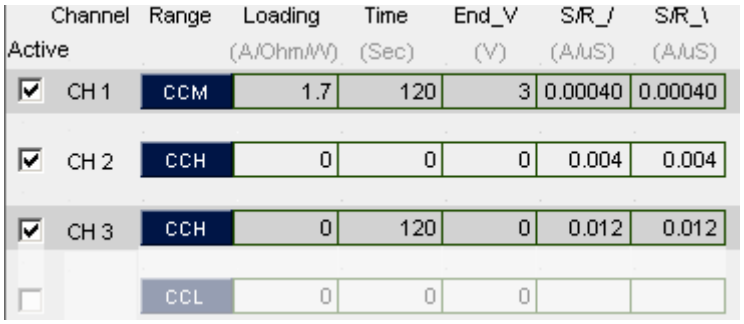


Figure 12-12 Battery Test Setting Display

12.3 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 & 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 12-13 Measurement Display

12.3.1 Run Indicator

It maps to the channel that performs Battery Test following the conditions set when Trigger On is clicked in green light. 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 update.

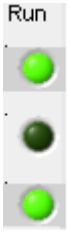


Figure 12-14 Battery Run Indicator

12.3.2 Run Time Indicator

It maps to each channel that performs Battery Test following the conditions set when Trigger On is clicked to show the time executed. 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 12-15 Battery Run Time Indicator

12.3.3 Power Display

It maps to each channel that performs Battery Test following the conditions set when Trigger On is clicked to show Capacity AH and Capacity WH. 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 12-16 Battery Power Display

12.4 Setting Trigger On/Off

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

Notice

Run indicator will open the channel in test 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 12-17 Setting Trigger On/Off

12.5 Battery Reading Chart

Each channel performs Battery Test following the conditions set 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 Test. The horizontal axis of Battery Reading Chart is the time point and 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.

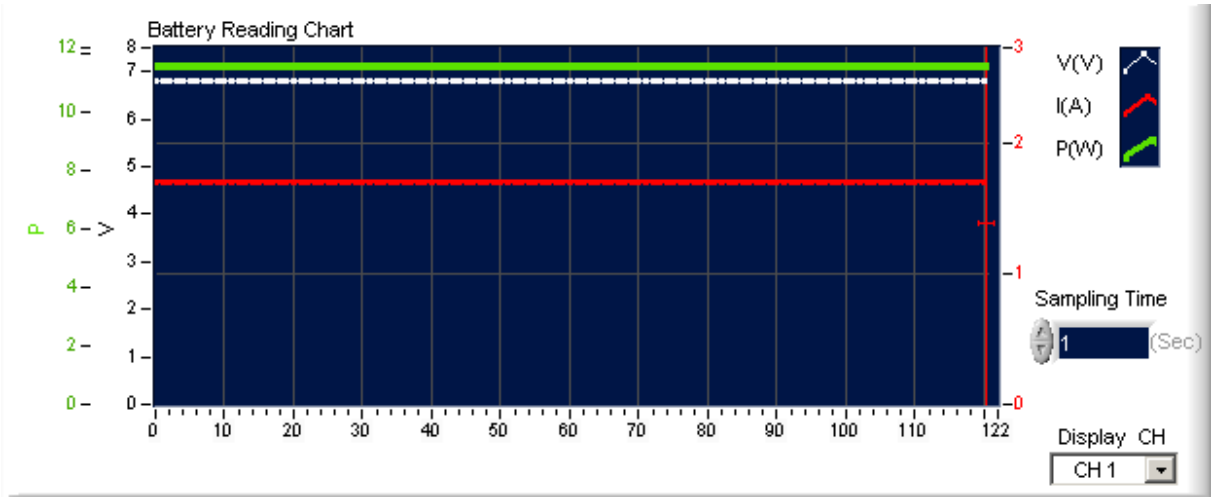


Figure 12-18 Battery Reading Chart

12.5.1 Setting Display CH

This parameter is used to browse the reading stats of each channel when Battery Test is done. It will stay at the last channel set in Setting CH when Trigger On is clicked.

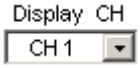


Figure 12-19 Setting Display CH

12.6 Report Format

In Battery test, the report starts when Trigger On is clicked and ends when all channels stopping the test. 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 Battery test. The user should decide if turning on the Report function as well as the path and filename for storage.

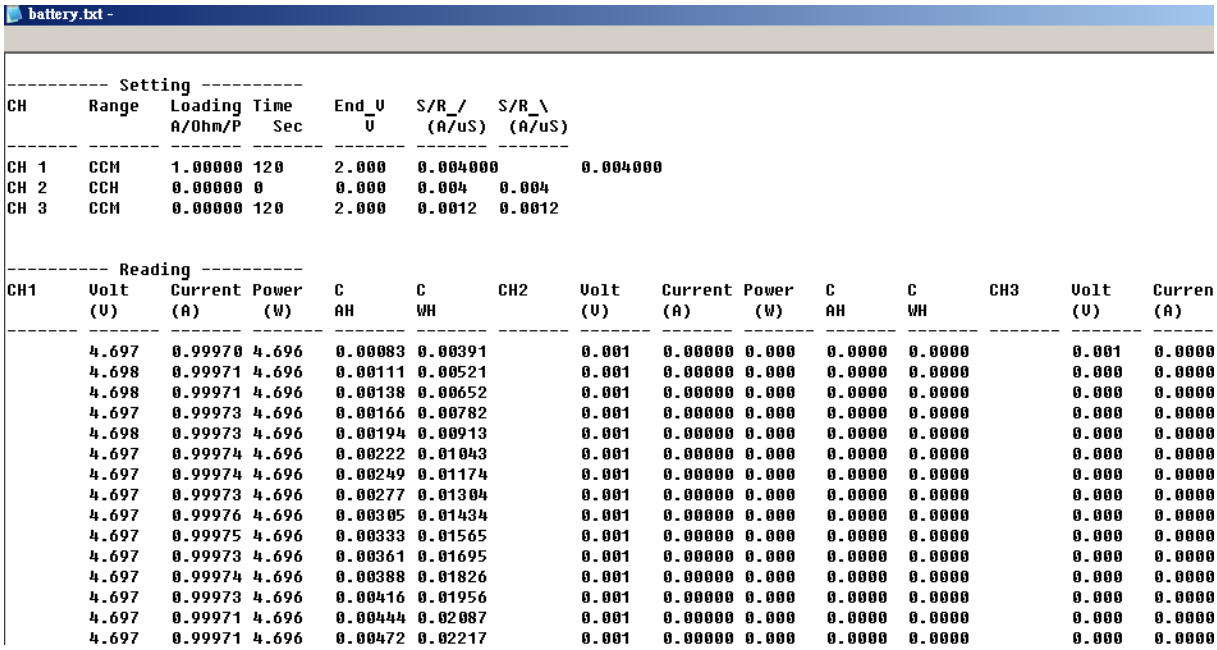
Before saving the file, it is necessary to turn the Report from Off to On.

Figure 12-20 Report On/Off

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

Figure 12-21 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 Figure 12-22 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 12-22 Battery Report Format

12.7 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

13. OCP Test

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

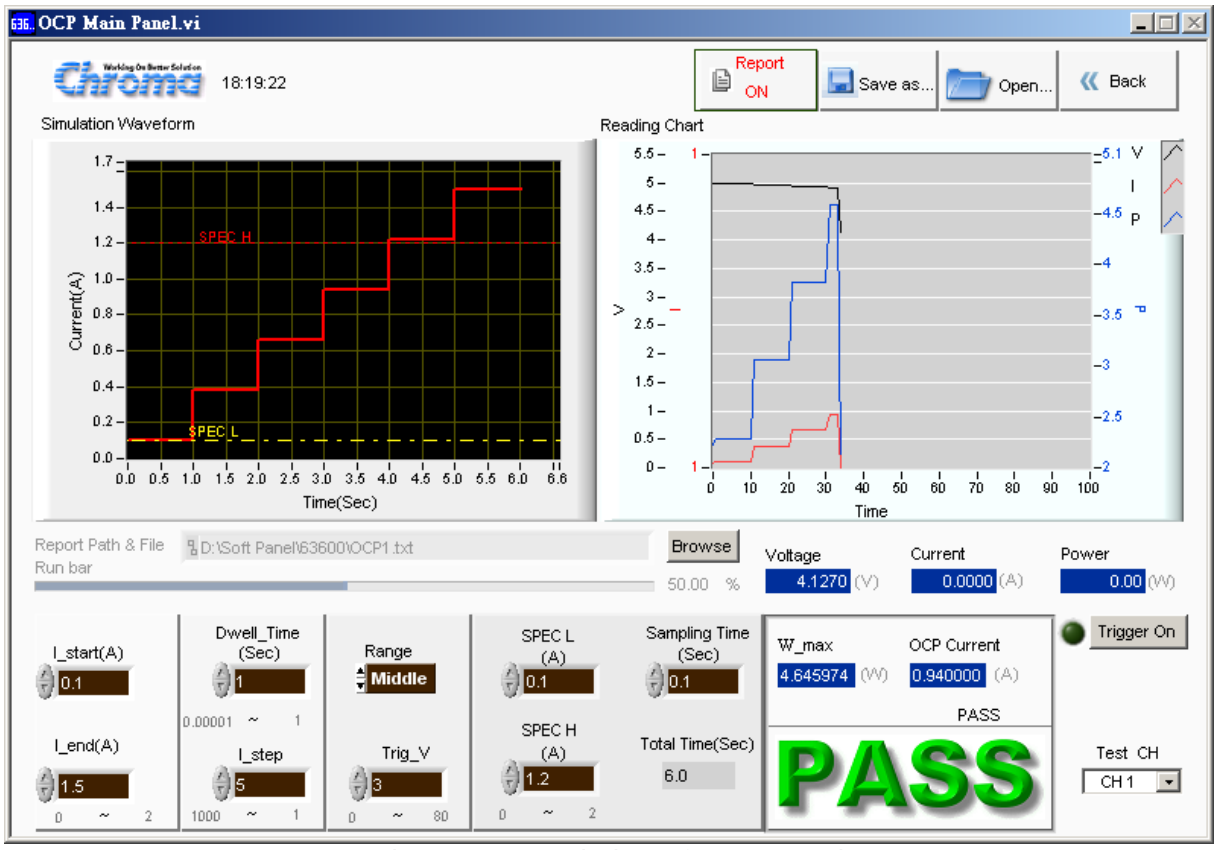


Figure 13-1 Window of OCP Panel

13.1 OCP Parameters

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

13.1.1 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 13-2 Setting Range

13.1.2 Setting Trig_V

It sets the output voltage drop to end the test.

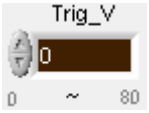


Figure 13-3 Setting Trig_V

13.1.3 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 every as OCP test executes. Starting from I Start=0 to I_End=1, I_step=5, thus 5 times of current 0, 0.25, 0.5, 0.75 and 1are tested.

Figure 13-4 Setting I_step

13.1.4 Setting I_start

It sets the start loading current for OCP Test.

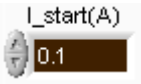


Figure 13-5 Setting I_start

13.1.5 Setting I_end

It sets the end loading current for OCP Test.

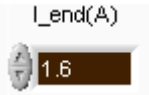


Figure 13-6 Setting I_end

13.1.6 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 that is the Panel displaying speed and the recording speed of Report will change accordingly when Trigger On is clicked. The applicable range is 0.1~ 1 second.

Figure 13-7 Setting Sampling Time

13.1.7 Setting Dwell_Time

It sets the loading time of each Step in the unit of second. The applicable range is 0.00001~ 1 second.

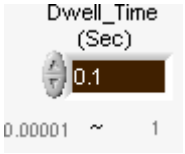


Figure 13-8 Setting Dwell_Time

13.1.8 Setting Test CH

It specifies the Channel to be tested and only a single Channel is supported. It is a drop-down menu to select the channel number set in H/W Setting Panel and it will read the settings of standalone device first when switching channels.

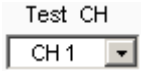


Figure 13-9 Setting Test CH

13.1.9 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.

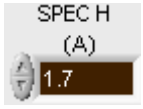


Figure 13-10 Setting Spec_H

13.1.10 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.

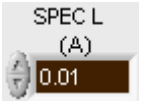


Figure 13-11 Setting Spec_L

13.2 Trigger Function

13.2.1 Trigger On

Click it to start loading current for OCP test. Click it again will turn to Trigger Off to cancel the test.

Figure 13-12 Trigger on

13.2.2 Run Bar Indicator

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.

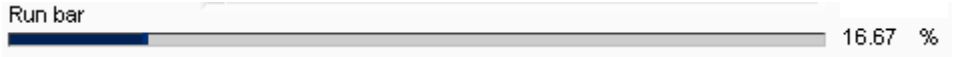


Figure 13-13 Run Bar Indicator

13.2.3 PASS/FAIL Indicator

It will prompt Test… to inform user the test is still ongoing after Trigger On is clicked and before the process is completed.

Figure 13-14 Indicator before PASS/FAIL Judgment

13.3 OCP Display

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

13.3.1 Total Time

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

Figure 13-15 Total Time

13.3.2 Voltage

It appears the measured output voltage and the reading is updated according to Sampling Time after the test stated.

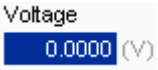


Figure 13-16 Voltage

13.3.3 Current

It appears the measured output current and the reading is updated according to Sampling Time after the test stated.

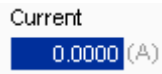


Figure 13-17 Current

13.3.4 Power

It appears the measured output power and the reading is updated according to Sampling Time after the test stated.

Figure 13-18 Power

13.3.5 W_Max

It appears the maximum power when the test is done.

Figure 13-19 W_Max

13.3.6 OCP Current

It appears the current occurred for OCP when the test is done.

Figure 13-20 OCP Current

13.3.7 Simulation Waveform Display

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

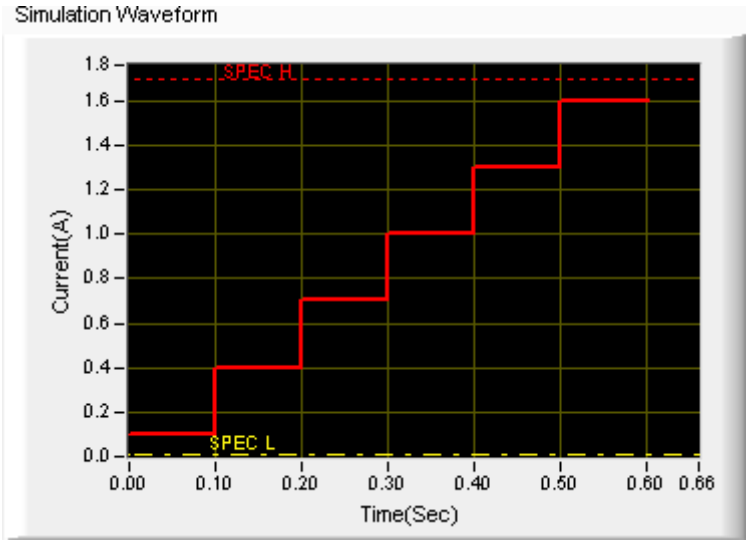


Figure 13-21 Simulation Waveform Display

13.3.8 Reading Chart

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

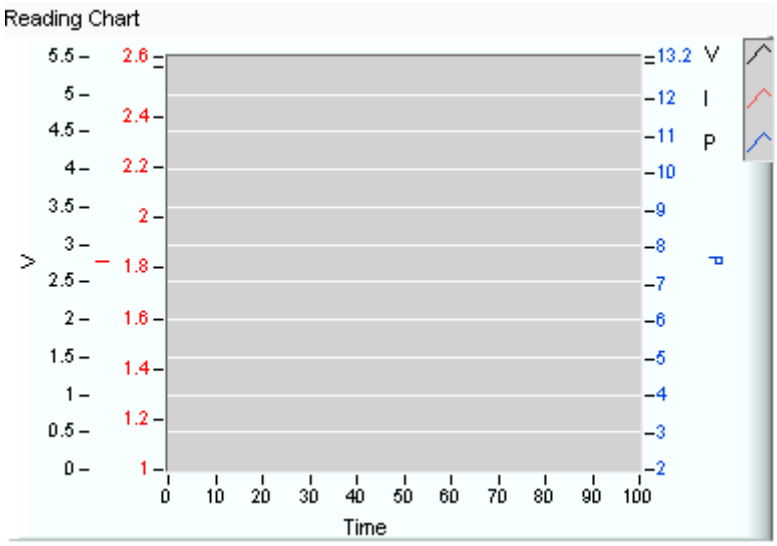


Figure 13-22 OCP Waveform Curve

13.3.9 PASS/FAIL

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

Figure 13-23 PASS/FAIL

13.4 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 when Trigger On is clicked.

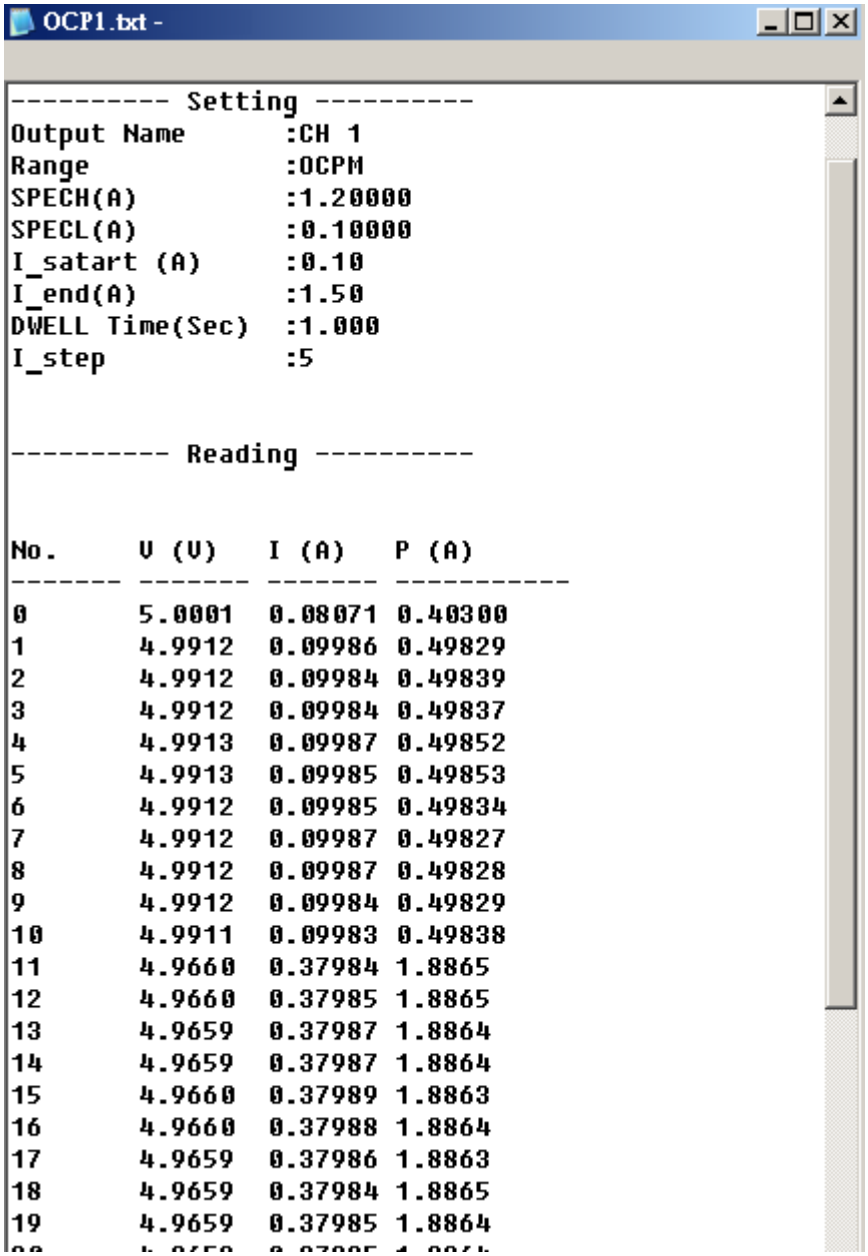
A simple report in pure text file with *.txt extension is provided during OCP test. The user should decide if turning on the Report function as well as the path and filename for storage.

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

Figure 13-24 Report On/Off

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

Figure 13-25 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 13-26 OCP Report Format

13.5 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

14. 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 user inputted to draw the waveform graph for judgment. Furthermore, the user can save the measured data in Excel file during test.

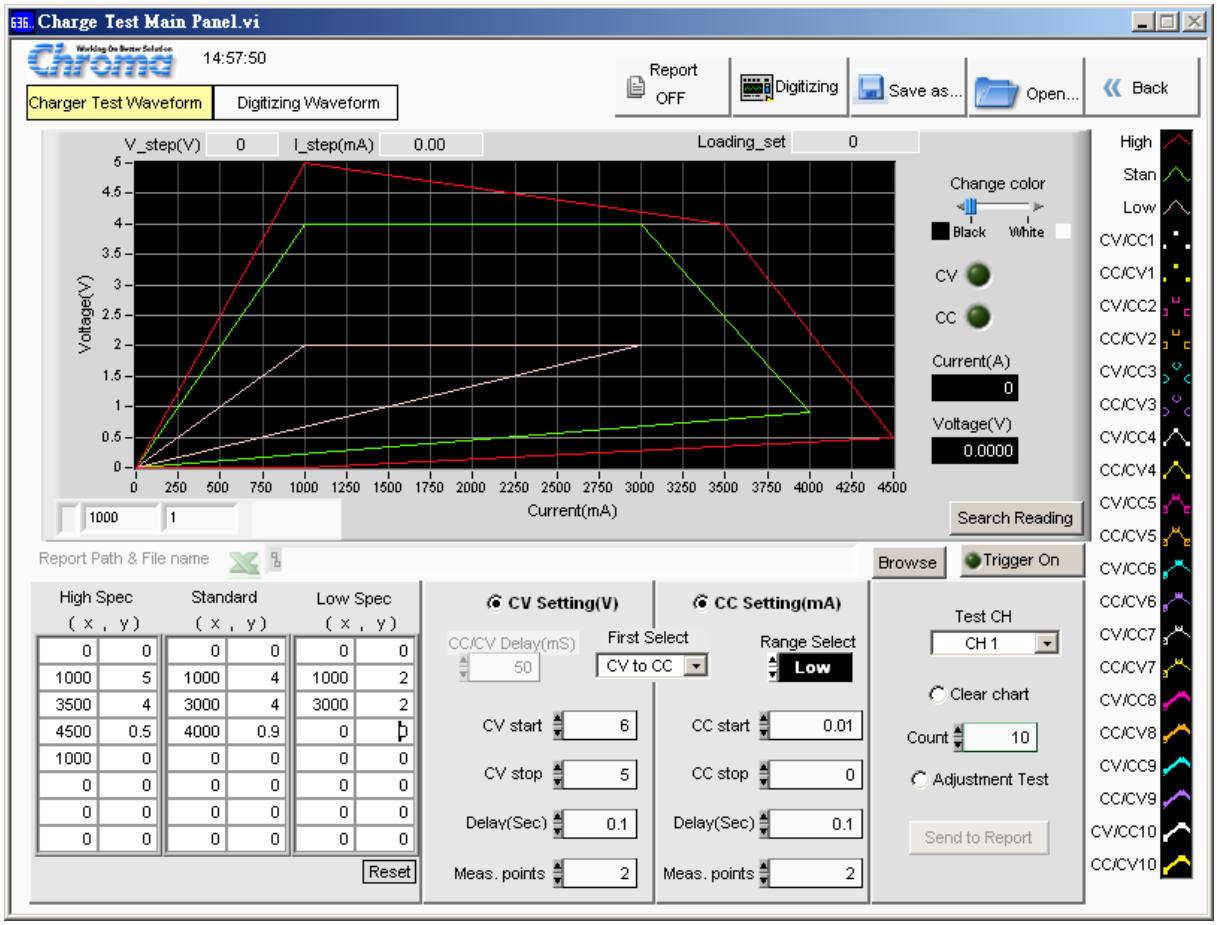


Figure 14-1 Window of Charger Test Panel

14.1 Charger Test Parameters

High, Standard, Low Spec

These three parameters are able to set the specifications for High Spec, Standard and Low Spec. Each item 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.

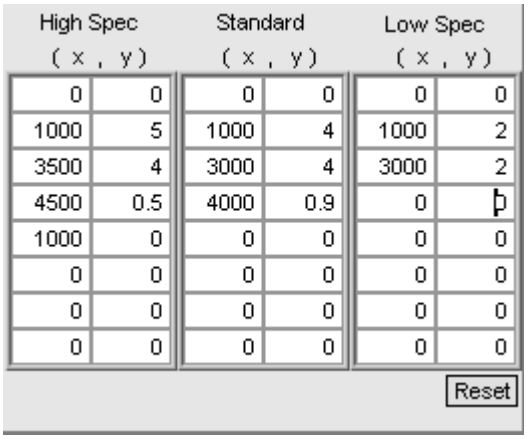


Figure 14-2 Setting SPEC

14.2 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.

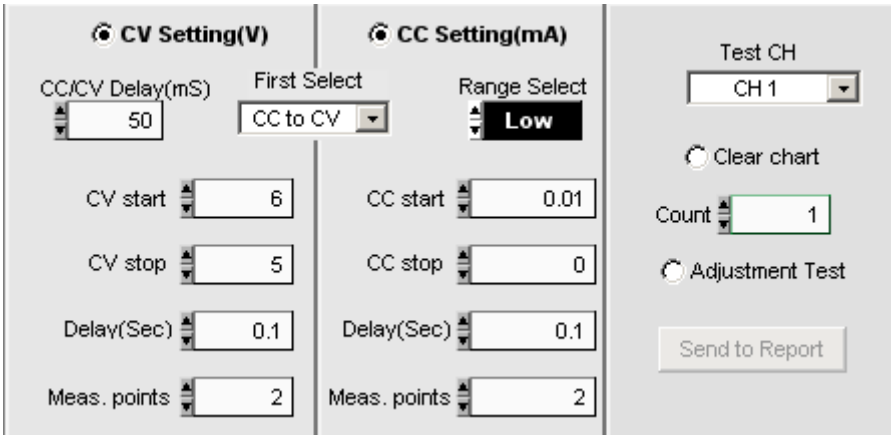


Figure 14-3 Parameters Setting Area

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 the user when it sets to OFF.

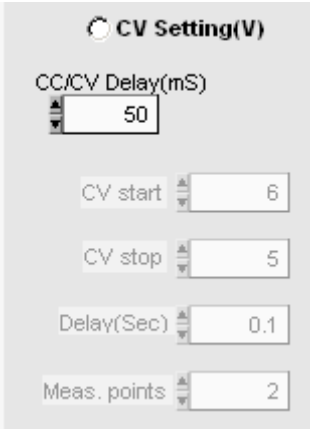


Figure 14-4 CV Setting

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

Figure 14-5 CV start

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

Figure 14-6 CV stop

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

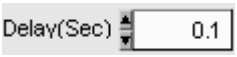


Figure 14-7 Delay (Sec)

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

Figure 14-8 Meas. 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 the when it sets to OFF.

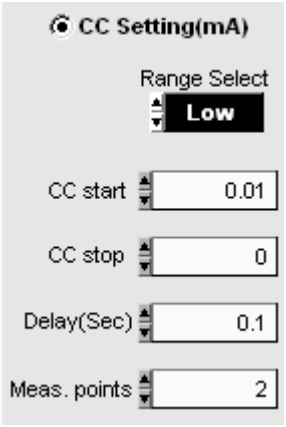


Figure 14-9 CC Setting

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

Figure 14-10 CC start

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

Figure 14-11 CC stop

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

Figure 14-12 CC Delay (Sec)

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

Figure 14-13 CC Meas. points

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

Figure 14-14 Range Select

Test CH: The channel at present can only use 1 channel for test. When the channels are opened more than 1, a drop-down menu will appear to list the name of all channels. The user needs to specify the channel connected to the UUT at present for test.

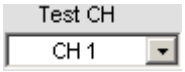


Figure 14-15 Test CH

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

Figure 14-16 Count

Clear chart: It sets if clearing the Waveform reading. When Count is greater than 1 and Clear chart is On, then each test reading will be cleared when reading the voltage and current of next for save instead. On the contrary, all readings will remain in the Waveform Graph and mark with different colors, in addition different shape to show the waveform of different count if Clear chart is disabled.

Figure 14-17 Clear chart

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

Figure 14-18 Trigger On

Adjustment Test: It enters into Adjustment test when set to On. One complete Count test can be done one time and click **Send to Report** can save the tested values.

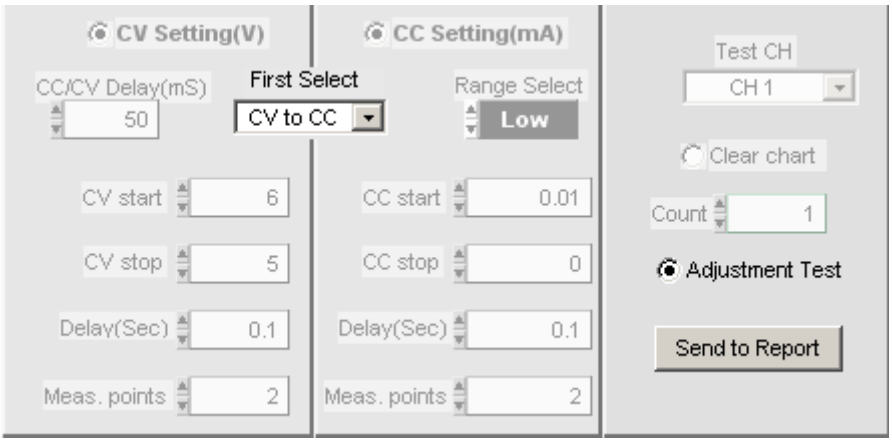


Figure 14-19 Adjustment Test

14.3 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.

14.3.1 Report On/Off

Click Report ON to use the Report function. 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. Click it again will turn it off.

Figure 14-20 Report On/Off

14.3.2 Report Path & File

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

Figure 14-21 Report Path & File

14.3.3 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 14-22 Charger Report Test Data

14.4 Digitizing Graph Display

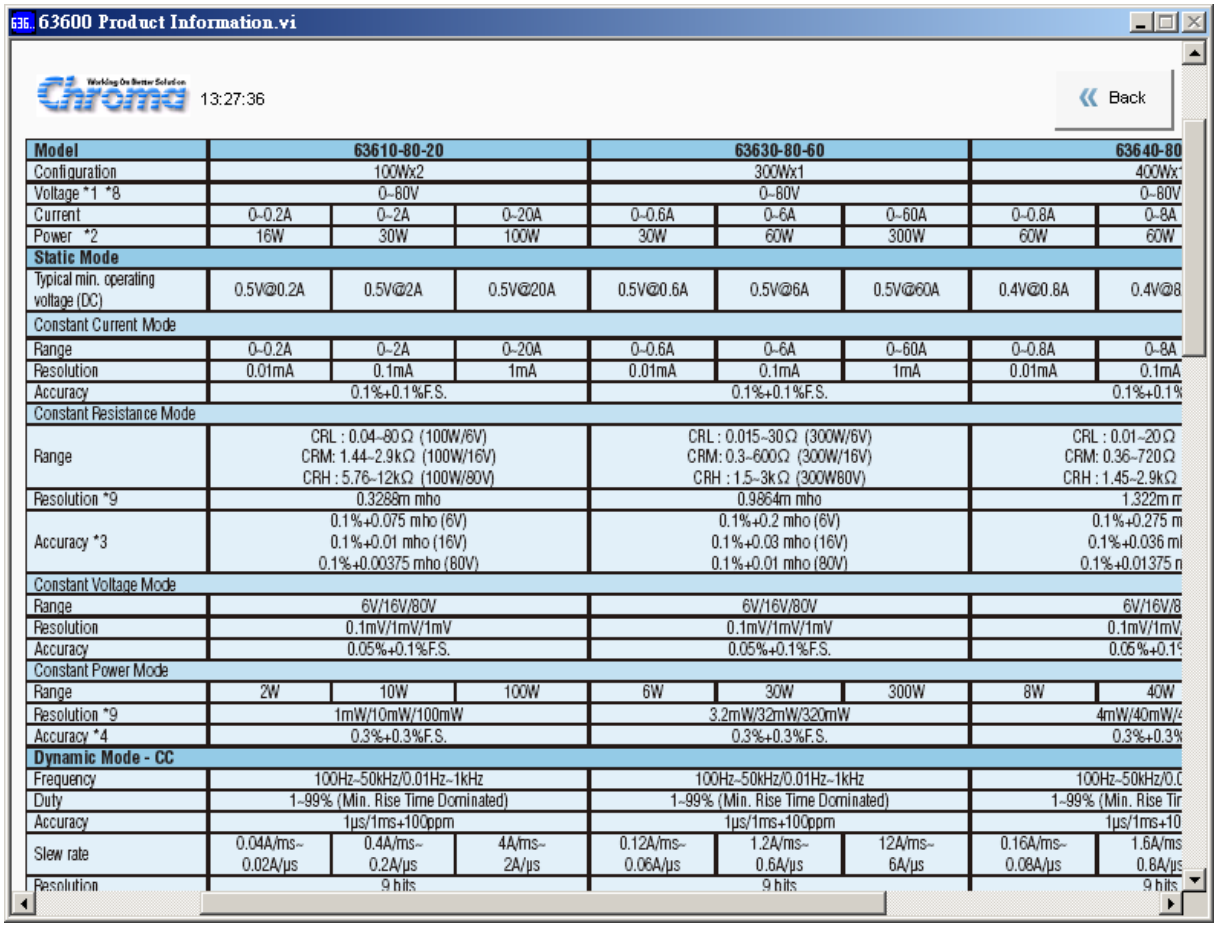
Please refer to section 6.7 for detail description.

14.5 SAVE, OPEN & BACK

Please refer to sections 5.7, 5.8 and 5.9 for detail description.

15. Product Information

This window is easy for users to check the specifications of each module. The modules included in the table are 63610-80-20, 63630-80-60 and 63640-80-80. Click the Module Name on each tab can go to the individual specification page.



Model	63610-80-20			63630-80-60			63640-80	
Configuration	100Wx2			300Wx1			400Wx	
Voltage *1 *8	0~80V			0~80V			0~80V	
Current	0~0.2A	0~2A	0~20A	0~0.6A	0~6A	0~60A	0~0.8A	0~8A
Power *2	16W	30W	100W	30W	60W	300W	60W	60W
Static Mode								
Typical min. operating voltage (DC)	0.5V@0.2A	0.5V@2A	0.5V@20A	0.5V@0.6A	0.5V@6A	0.5V@60A	0.4V@0.8A	0.4V@8
Constant Current Mode								
Range	0~0.2A	0~2A	0~20A	0~0.6A	0~6A	0~60A	0~0.8A	0~8A
Resolution	0.01mA	0.1mA	1mA	0.01mA	0.1mA	1mA	0.01mA	0.1mA
Accuracy	0.1%+0.1%F.S.			0.1%+0.1%F.S.			0.1%+0.1%	
Constant Resistance Mode								
Range	CRL : 0.04~80Ω (100W/6V) CRM: 1.44~2.9kΩ (100W/16V) CRH : 5.76~12kΩ (100W/80V)			CRL : 0.015~30Ω (300W/6V) CRM: 0.3~600Ω (300W/16V) CRH : 1.5~3kΩ (300W80V)			CRL : 0.01~20Ω CRM: 0.36~720Ω CRH : 1.45~2.9kΩ	
Resolution *9	0.3288m mho			0.9864m mho			1.322m m	
Accuracy *3	0.1%+0.075 mho (6V) 0.1%+0.01 mho (16V) 0.1%+0.00375 mho (80V)			0.1%+0.2 mho (6V) 0.1%+0.03 mho (16V) 0.1%+0.01 mho (80V)			0.1%+0.275 m 0.1%+0.036 m 0.1%+0.01375 n	
Constant Voltage Mode								
Range	6V/16V/80V			6V/16V/80V			6V/16V/8	
Resolution	0.1mV/1mV/1mV			0.1mV/1mV/1mV			0.1mV/1mV	
Accuracy	0.05%+0.1%F.S.			0.05%+0.1%F.S.			0.05%+0.1	
Constant Power Mode								
Range	2W	10W	100W	6W	30W	300W	8W	40W
Resolution *9	1mW/10mW/100mW			3.2mW/32mW/320mW			4mW/40mW/4	
Accuracy *4	0.3%+0.3%F.S.			0.3%+0.3%F.S.			0.3%+0.3%	
Dynamic Mode - CC								
Frequency	100Hz~50kHz/0.01Hz~1kHz			100Hz~50kHz/0.01Hz~1kHz			100Hz~50kHz/0.0	
Duty	1~99% (Min. Rise Time Dominated)			1~99% (Min. Rise Time Dominated)			1~99% (Min. Rise Tir	
Accuracy	1μs/1ms+100ppm			1μs/1ms+100ppm			1μs/1ms+10	
Slew rate	0.04A/ms~ 0.02A/μs	0.4A/ms~ 0.2A/μs	4A/ms~ 2A/μs	0.12A/ms~ 0.06A/μs	1.2A/ms~ 0.6A/μs	12A/ms~ 6A/μs	0.16A/ms~ 0.08A/μs	1.6A/ms 0.8A/μs
Resolution	9 bits			9 bits			9 bits	

Figure 15-1 Product Information Window

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