Chroma Systems Solutions

Application Note

Chroma Systems Solutions, Inc.

63600 DC Electronic Load with Digitizing Measurement Function

63600 DC Electronic Loads

Keywords: DC Current, DC Electronic Load, Transient Load, Dynamic Load, Transient Measurements, Transient Response

Title:

63600 DC Electronic Load with Digitizing Measurement

Product Family: **63600 DC Electronic Loads**

Abstract

Dynamic Loading and Transient Response testing is a common test requirement for Power Supplies, DC DC Converters and Battery Chargers. Dynamic and Dynamic Sweep tests are used to confirm the response times of the DUT when load is changed suddenly. It requires a DC Electronic Load and an Oscilloscope. Capturing the voltage and current waveforms and recording the information requires working knowledge of the DC Load and the Oscilloscope and proper triggering to capture the exact moment the transient occurs.

Solution

Chroma 63600 family of DC Electronic loads have advance features for many types of applications. One of these features is a Digitizing Measurement Function that can capture 4096 current and voltage measurements in increments from 2 uSec to 40mSec with various trigger methods, such as Manual, Bus, TTL, Load On, & Load Off.

Reference

63600 Quick Start Guide	QSG-63600-dcload-v1.1-04210.pdf
63600 User Manual	UM-63600-dcload-v1.3-04210.pdf
63600 Softpanel User Manual	UM-63600-Softpanel-v1.0-04210.pdf

Using the 63600 Softpanel for Dynamic Loading and Digitizing Measurements.

Figure 1 The 63600 Softpanel interface screen

When first accessing the 63600 Softpanel you will see the initial panel (Figure 1) this is where you will select the interface type (GPIB, ETHERNET, or USB) and you can also define the number of Mainframes in quantities of 1 to 4.

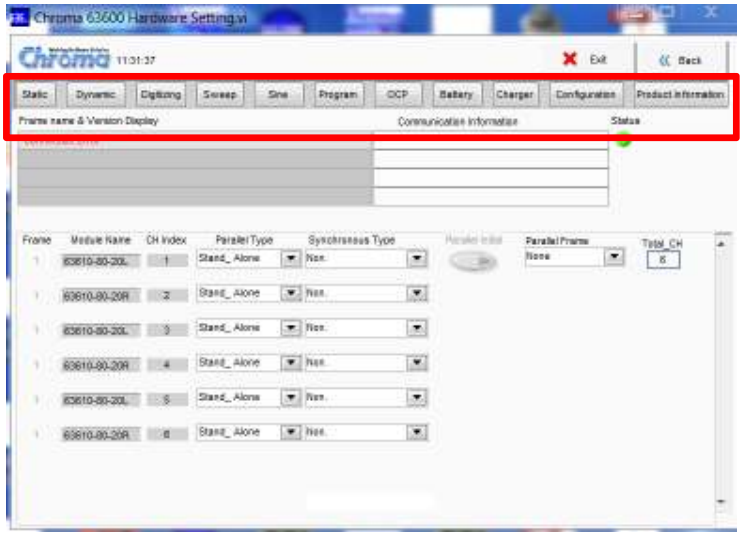

Figure 2 The 63600 Softpanel Hardware Setting Panel

Selection Tabs at the top of this panel will take you to the operating panel for the function.

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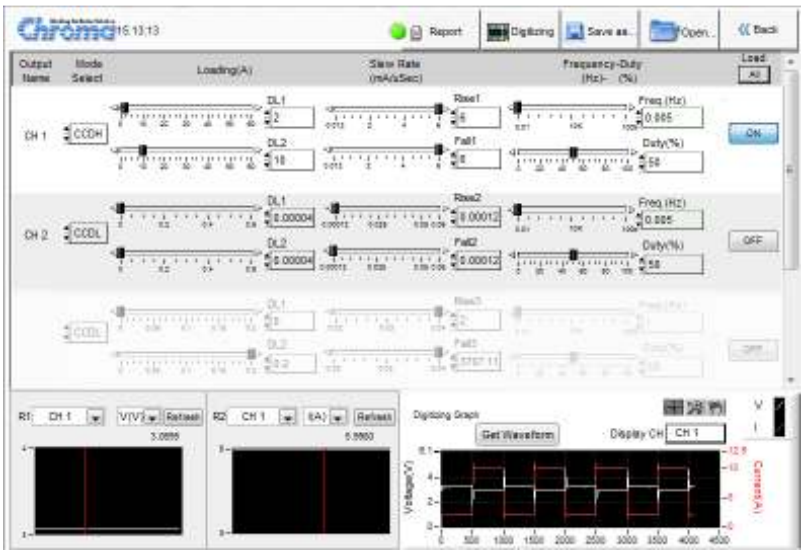


Figure 2 Dynamic Load Panel

The Dynamic Load panel is simple to set up, using parameters for Dynamic Load setting #1 (DL1) and Dynamic Load Setting #2 (DL2) which are the High and Low Current settings. Then you can input the Rise Time and Fall Time, Frequency and Duty cycle %. For more information see the 63600 softpanel user manual.

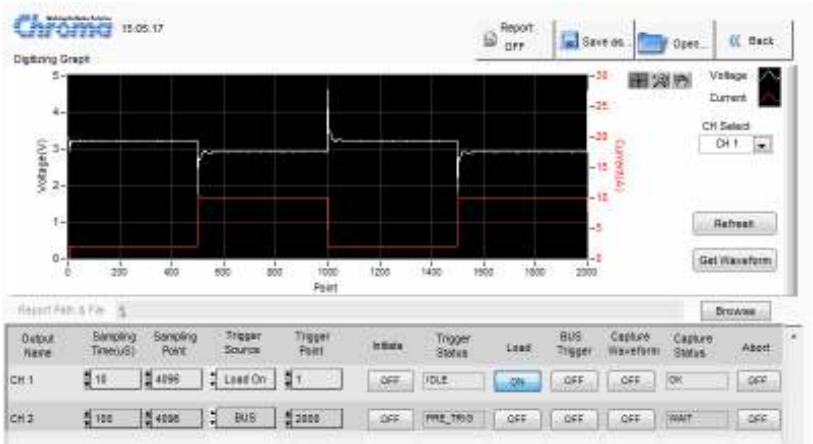


Figure 3 Digitizing Measurement Panel

Using the 63600 Softpanel for Dynamic Loading and Digitizing Measurements.

On the Digitizing measurement panel there are 11 tabs for selecting Sampling time, Sampling Point, Trigger Source, Trigger Point, Initiate, Trigger Status, Load on/off, BUS trigger, Capture Waveform, Capture Status and Abort. Se more descriptions below. Also for detailed information use the 63600 Soft panel User Manual.

Sampling Time is the timing between intervals or measurements. If you want to capture a waveform that occurs from 0 to 40 mSec then you would calculate the sampling time as follows.
40mSec / 4000 points = 0.01mSec or 10uSec So the Sampling time would be 10usec.

Sampling Point are the number of measurements to be made. The maximum number of measurements is 4096 points. The number can be set from 1 to 4096.

Trigger Source is for selecting what will be used to trigger the start of the digitizing measurement. The Trigger source can be Load On, Load Off, Bus, TTL, Manual.
Load On = activating the Load On from the Softpanel
Load Off = activating the Load Off from the Softpanel
Bus = sending a trigger command from the remote interface bus via USB, GPIB or LAN. This can be accomplished using SCPI commands.
TTL = using the TTL trigger located on the back of the load mainframe

Manual = to manually trigger the Digitizing Measurement you can press the blue LOAD activate button on the front of the unit as shown below.

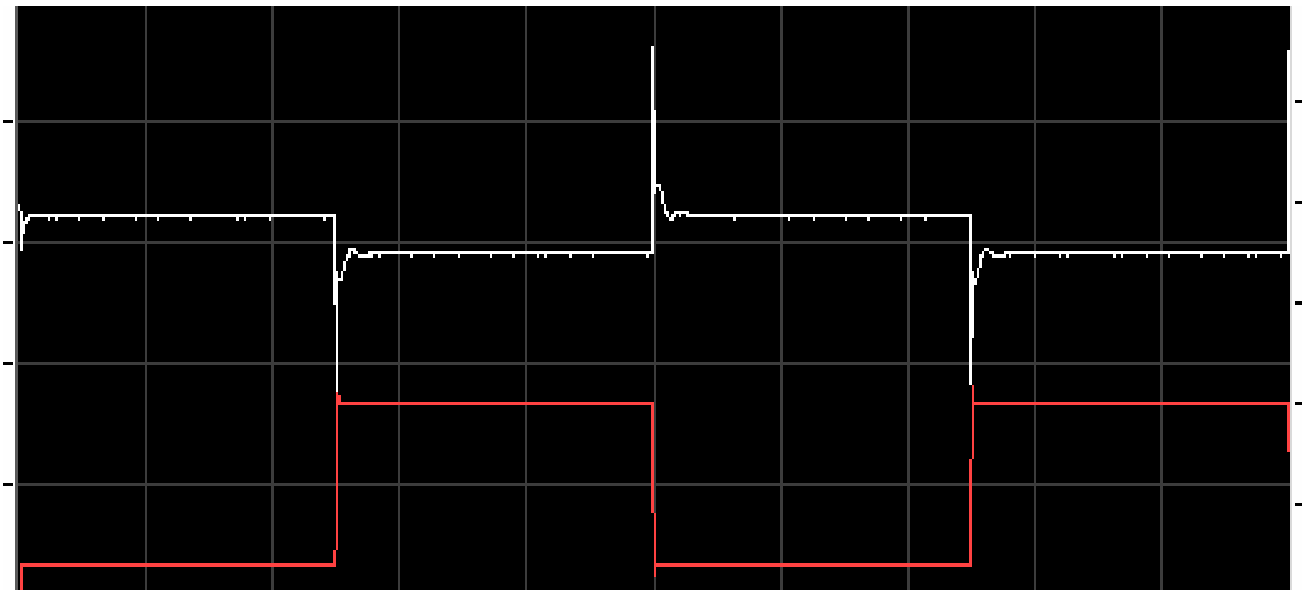
Trigger Point = is the number of interval from 1 to 4096 to begin the trigger from.
Initiate = after selecting all the parameters listed above the initiate will begin set the Digitizing measurement parameters and then wait for a trigger.
Trigger Status = indicates the condition of the trigger, which can be Wait for Trigger, Pre-Trigger or Idle.
LOAD = turns the load on or off through the softpanel rather than using the LOAD button manually.
BUS Trigger = is you selected the trigger source to be the Bus, then this button will activate the trigger.
Capture Waveform = runs the capture command that reads the measurements into a file.
Capture Status = gives an OK when the data has been written to a file.

Additional information can be found in the 63600 Softpanel User Manual
(UM-63600-Softpanel-v1.0-04210.pdf)

Using the 63600 Softpanel for Dynamic Loading and Digitizing Measurements.

Once you have triggered and captured the waveform you can display it on the Graphical Display of the softpanel by pressing the Get Waveform tab on the Digitizing Measurement Panel. Below shows a typical Dynamic load test results.

You can expand the view by adjusting the sample time or use the magnifying symbol  on the panel.



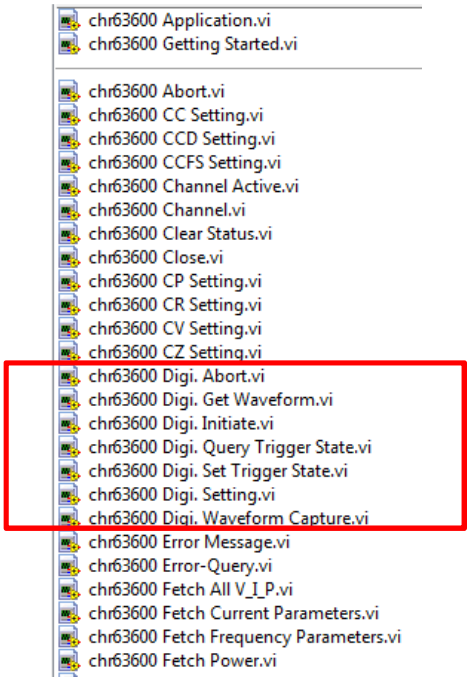
Using the SCPI & Labview Driver for accessing the Digitizing Measurements Function

Other ways to use the Digitizing Measurements are with the SCPI commands and Labview Driver see the examples below.

Example of execute digitizing function by using SCPI commands

DIG:SAMP:TIME 100us	set sampling time 100us
DIG:SAMP:POIN 3596	set sampling point 3596
DIG:TRIG:POIN 500	set trigger point 500
DIG:TRIG:SOUR 0	trigger source load on
DIG:INIT	initializing the function of digitizing
DIG:TRIG?	the trigger status
LOAD ON	turn on the load
!D7000	delay for 7000ms
DIG:WAV:CAP?	send the module waveform to frame
DIG:WAV:DATA? V	download the voltage waveform to PC from frame
DIG:WAV:DATA? I	download the current waveform to PC from frame

Example of execute digitizing function by using LabView code



Using the SCPI & Labview Driver for accessing the Digitizing Measurements Function

Execution order of sub Vis
Chr63600 Digi. Setting→Chr63600 Digi. Initiate→ Chr63600 Digi. Set Trigger State→ Chr63600 Digi. Query Trigger State→(Trigger by Load On/Off, External trigger, Bus trigger, etc.)→ Chr63600 Digi. Query Trigger State→ Chr63600 Digi. Waveform Capture→ Chr63600 Digi. Get waveform