

Programmable DC Electronic Load



1. LCD Display :
320 x 240, TFT LCD display
2. Function Keys :
Assigned to the menu functions on the bottom of the display
3. System Keys :
Used to access the Channel, File, Program, Help, Sequence or Parallel menu
4. Operation Keys :
Turns the load on/off and Enter key
5. USB Input :
Upgrades the firmware or stores settings
6. Module Operation Keys :
These turn the load On/Off and control the channels, display and the short circuit function. They also set the load to static or dynamic mode
7. V Sense Terminals :
The V Sense terminals are used to compensate for voltage drop
8. Positive and Negative Terminals :
Inputs for the power source
9. Slave Knob :
It is used to edit and vary parameters for the active channel on the local load

A An Introduction to Programmable DC Electronic Load

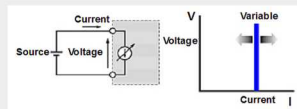
1. What is an Electronic Load ?

Load is a component consuming the power. An electronic load can emulate the behavior of a real load. It is designed by using active components to stably consume power from the power source and is able to precisely measure voltage and current. Normally a DC electronic load has a number of different modes and functions to simulate a number of different load conditions such as constant current mode (CC), constant resistance mode (CR), constant voltage mode (CV), constant power mode (CP), constant voltage + constant current mode (CV+CC), dynamic mode and short circuit simulation.



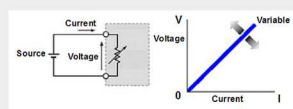
2. Operation Modes

Constant Current Mode (CC)



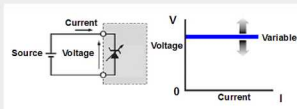
In constant current mode, an electronic load will sink a constant amount of current, regardless of the voltage.

Constant Resistance Mode (CR)



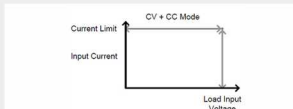
In constant resistance mode, the resistance load will remain unchanged as the voltage and current remain proportional.

Constant Voltage Mode (CV)



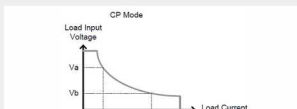
In Constant Voltage Mode the load units will sink current whilst keeping the voltage constant.

Constant Voltage + Constant Current (CV+CC)



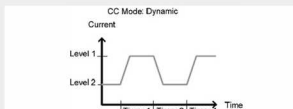
In CV+CC mode the input voltage must be greater than load voltage setting and then it will have two conditions. When the input current is less than the current limit, the channel will operate in CV mode; and vice versa, when the input current exceeds the current limit, the channel will operate in CC mode.

Constant Power Mode (CP)



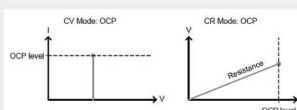
In constant power mode, an electronic load will ensure that the power consumed is constant.

Dynamic Functions



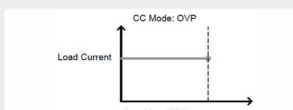
Dynamic load functions allow users to set load levels (Level1, Level2), load time (Timer1, Timer2), and the slew rate (rising, falling). Depending on the settings, the load will automatically switch between levels 1 and 2.

Over Current Protection (OCP)



Over current protection stops the load from sinking more current than its recommended limit which can cause damage to the unit.

Over Voltage Protection (OVP)



Over voltage protection is used to limit the amount of input voltage. When the input voltage exceeds the OVP setting, the electronic load will stop working and the OVP alarm will be ringing.

B Basic Operation

1. Mainframe

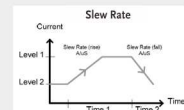
The mainframe has a number of different operating functions that are completely configurable. The mainframe has customizable load parameters, Go/NoGo limits, range limits, timers, slew rates, alarms, protection limits and can turn each load on or off.

2. Module

The modules have a number of different operating functions. They can switch the load, channels or display on or off. They can also set the load to static or dynamic mode or simulate a short-circuit.

3. Slew Rate

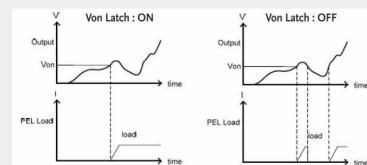
The slew rate is the rate at which the current will increase to a set level. There are two slew rates: rising slew rate & falling slew rate.



4. Von Voltage is the Voltage Limit at Which the Load Will Start to Sink Current

Von Latched ON :

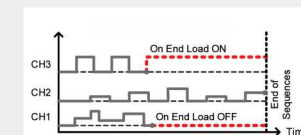
When the input voltage reach to the Von setting. It will start to sink current. Even if the input voltage drops below the Von setting, it will continue to sink current.



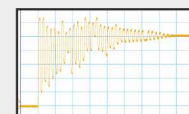
Von Latched OFF :

When the input voltage reach to the Von setting. It will start to sink current. But when the input voltage drops below the Von setting, it will stop sinking current.

5. Sequence Function



Quick Sequences Function



Current Waveform

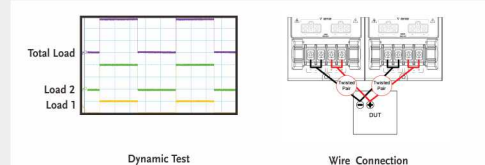
The Sequence function allows each channel to change its load sink according to a predefined sequence at a rate of up to 1000 per step. Up to 120 points can be used with each sequence. Each sequence is able to run concurrently, under the control of one clock.

The figure above shows the current waveform of a simulation using the sequence function.

C Programmable DC Electronic Load Application

1. Parallel Dynamic Loading

When the load modules of a mainframe are connected in parallel and set to dynamic mode, they can perform dynamic tests synchronously following the same clock. Under dynamic mode, load current or resistance is pulsed between two preset levels. When used in parallel, higher power outputs can be tested.



Dynamic Test

Wire Connection