MODEL 200

CONSTANT CURRENT SOURCE

Description

This instrument is a constant current source. It will provide a stable current through an external load as long as the internal compliance limit (about +12 volts) is not exceeded. Inputs are provided on the instrument rear for connection to an interlock switch for safety purposes, and separately to a remote on/off so that the current may be computer controlled.

Supplying power

Place the small switch on the AC module at the rear of the instrument into the "0" position and attach a source of 115VAC to the instrument with a modular AC cord.

Connecting a load

Use a dual banana plug or discrete wiring to connect the load to the rear banana jacks labeled 'current out'. Note that the total load resistance (including wiring) times the selected current must not exceed approximately 12 volts. This is the compliance limit of the instrument. The red banana jack is the positive terminal.

Turning the unit on

With the load connected to the rear panel connectors labeled 'current out', turn the front panel control switch labeled on/standby to standby. Turn the front panel control switch labeled remote/local to local.

At the top of the AC input module on the rear panel turn the small switch to the "1" position. The front panel LCD display should illuminate. If the display does not light up remove the AC cord and check the AC input module fuse.

Setting the output current and current limit

Select the desired current with the rotary selector switch labeled 'meter select'. Turn the rotary switch to the position labeled 'setpoint'. Use the 10-turn control potentiometer labeled 'current' to adjust the setting for the desired output current. Turn the meter select switch to the position labeled 'limit'. Use the 10-turn control potentiometer labeled 'limit' to adjust the setting for the desired current limit. Turn the meter select switch to the center position labeled 'output' to monitor the actual output current.

Note: the limit setting *must* be higher than the setpoint setting or the current limit will immediately shut down the output drive when first turned on. The front panel red LED will illuminate to indicate this condition.

Applying current to the load

Verify the current limit and desired output current settings on the front panel controls. Connect the interlock switch to the rear panel banana jacks labeled 'interlocks in'. Verify that the red LED on the rear panel illuminates when the interlock switch is closed. *This connection must be closed to allow the instrument to source current.*

Confirm that the front panel remote/local switch is in the local position. Move the front panel standby/on switch to the on position. If the meter select switch is in the output position you should now see the actual current delivered to the external load.

The current may be adjusted with the current potentiometer, and the current limit adjusted with the limit potentiometer while the instrument is on. If the current limit is exceeded the output current will turn off and the red front panel LED will illuminate.

Resetting an over-current condition

When the red front panel LED illuminates turn the standby/on switch to the standby position. Press the momentary reset button to reset the over current latch and turn off the red LED. It may be necessary to lower the output current to enable the reset to function.

Using the remote on/off input

Use the front panel controls and adjust the current limit and output current to the desired settings. Connect a signal source (5 volt nominal) to the rear panel connector labeled remote, positive to the red banana jack. Change the front panel remote/local switch to the remote position. When the standby/on switch is placed into the on position the rear panel inputs will control the on/off state of the instrument. Provide +5 volts when you wish the current to flow through the load, and 0 volts when you do not wish current to flow. *Always adjust the current setting with the remote/local in the local position.* All front panel settings, including current limit, will remain active when using the remote input. Note however, that the meter will display an average value.

Turning the instrument off

Use the front panel controls and set the remote/local switch to the local position. Set the standby/on switch to the standby position. At the top of the AC module on the rear panel turn the small switch to the "0" position. The LCD display on the front panel should turn off after just a few seconds.

Specifications

AC power source	115VAC, 60Hz
AC current draw	25VA
Constant current	0 – 200 mA
Compliance of current source	~12 volts
Output current leakage (off)	50uA (standby or remote off)
Current meter reading in	milliamps
Current limit reading in	milliamps
Current stability	± .000010 amps
Reading accuracy	± .1 % of reading, ± 1 digit
Current limit trip point	± 1 milliamp absolute
Current rise time, 10 Ω load	30uS (100mA, remote in)
Current fall time, 10 Ω load	80uS (100mA, remote in)
Current rise time, 100 Ω load	50uS (100mA, remote in)
Current fall time, 100 Ω load	250uS (100mA, remote in)
Interlock voltage/current	+12 volts/12 milliamps
Remote input voltage threshold	~1.75VDC (nominal +5 volt)

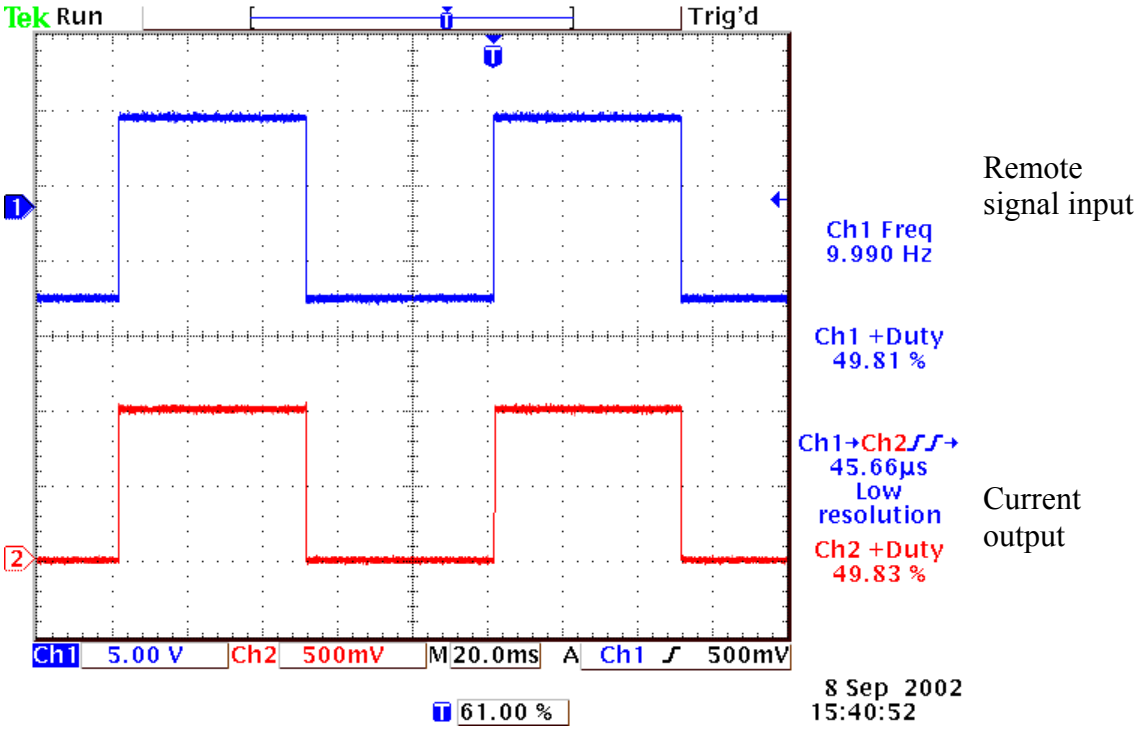


Figure 1: 10 Hz remote signal

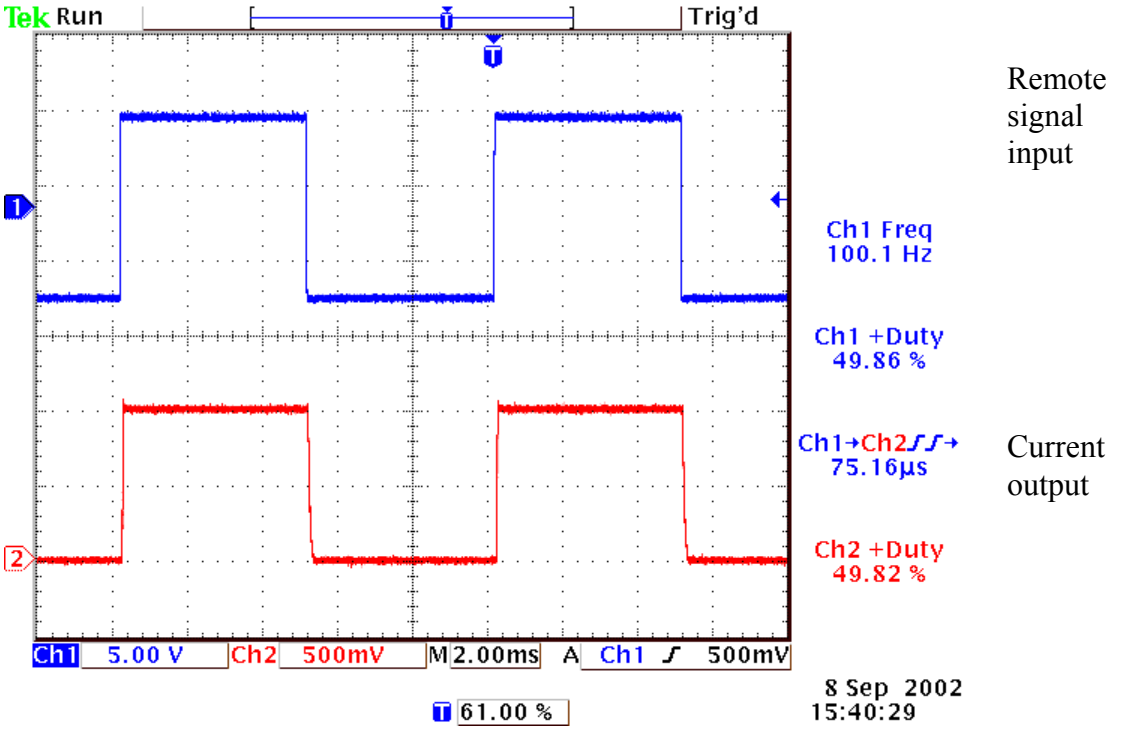


Figure 2: 100 Hz remote signal

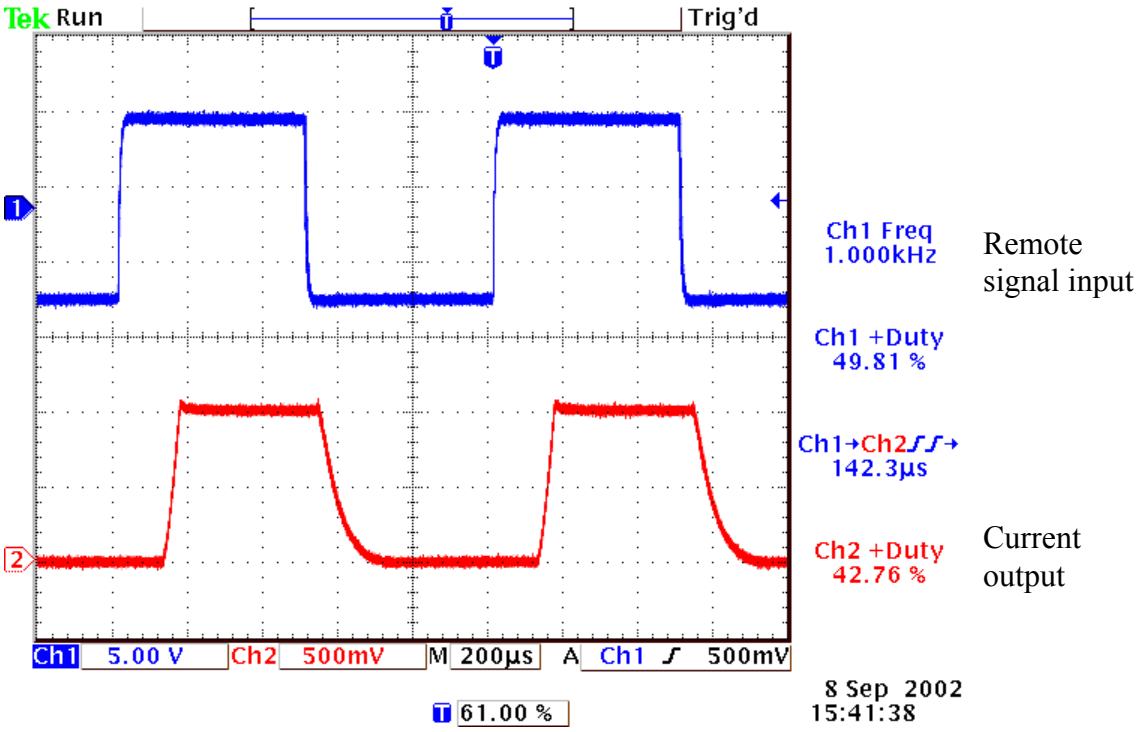


Figure 3: 1000 Hz remote signal

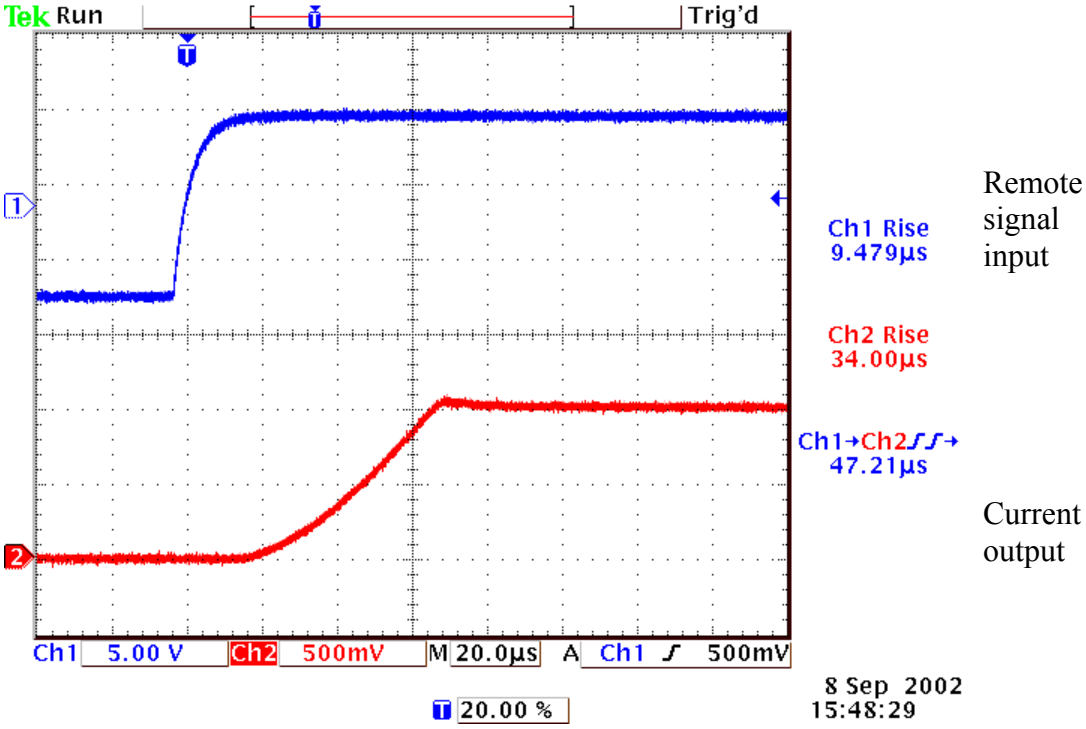


Figure 4: Rise time, remote to current out

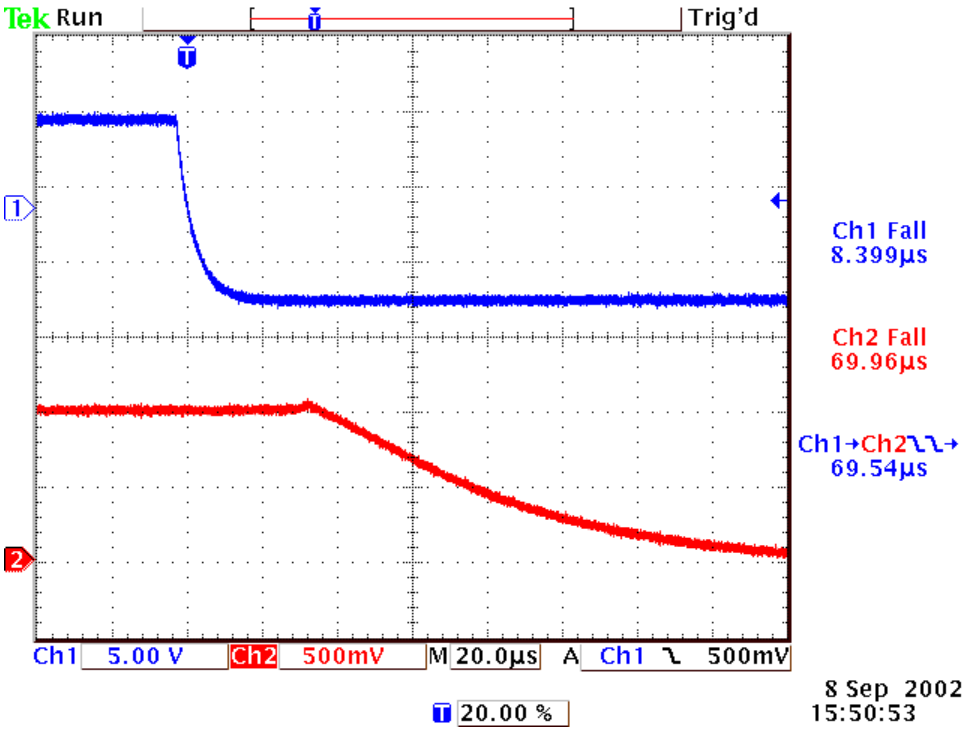


Figure 5: Fall time, remote to current out

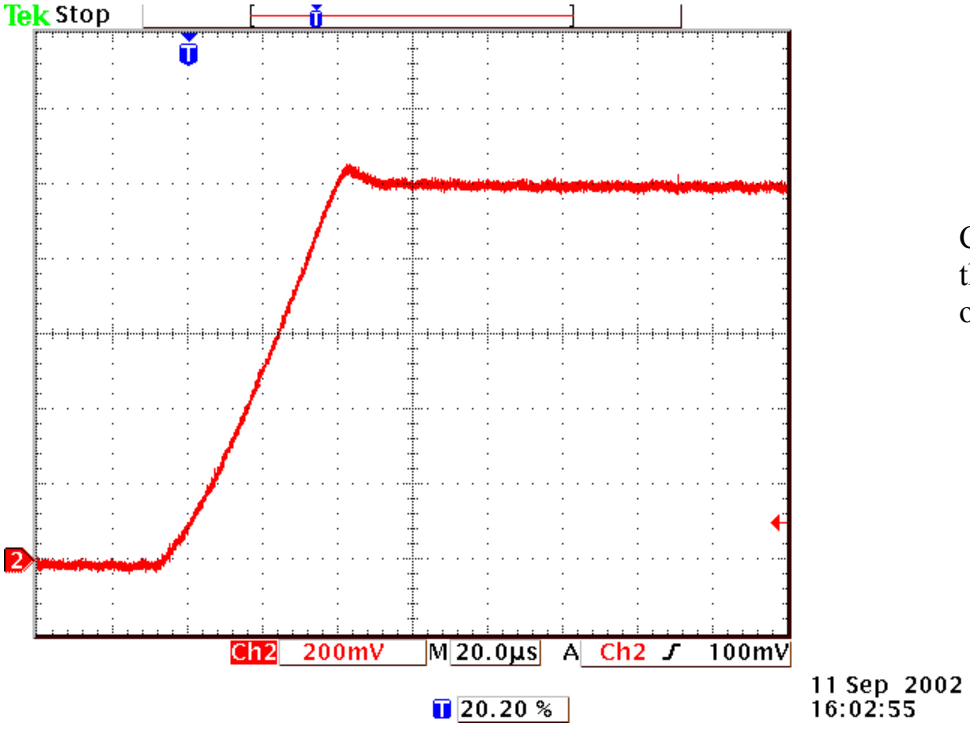
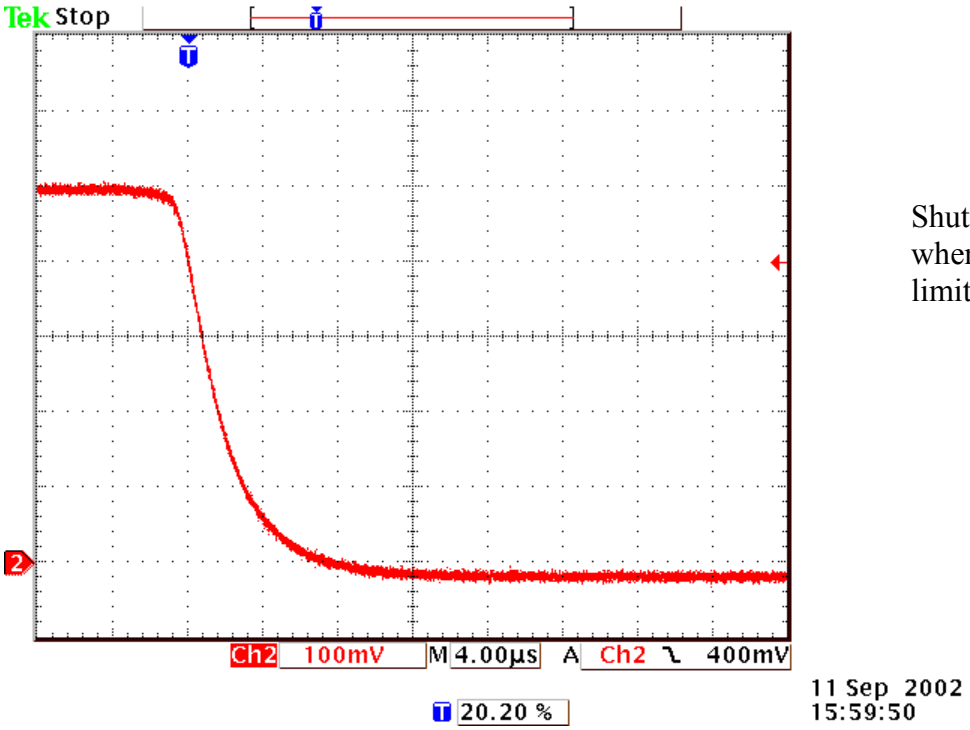


Figure 6: 100mA current rise time



Shut down when current limit reached

Figure 7: 100mA current shut down