# Use SCAN Command to Sweep the Laser Output Current

For LDC500 series laser diode controllers, the **SCAN** command can be used to initiate an automated sweep of the laser operating point. For example, in Constant Current mode, we set initial laser current at 25 mA and turn laser output ON. Through remote interfaces - RS232, GPIB or Ethernet, we send command **SCAN 100, 3, 50**. We'll get a stair-step output current shown in Figure 1. CH2 (red trace) shows the laser current output starting from 25 mA, then 125 mA, through 325 mA in 3 steps. The time interval of each step is 50 ms. CH1 (blue trace) shows the 10 μs negative-going TTL synchronizing pulses at the SYNC OUT BNC connector on the rear panel.
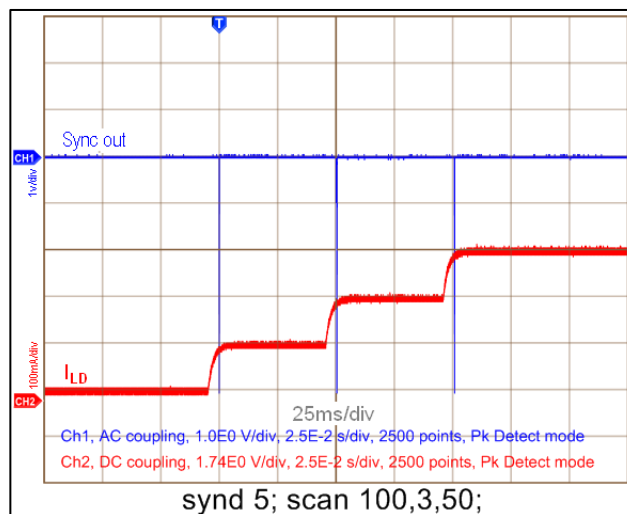
Figure 1: Current output with the SCAN function
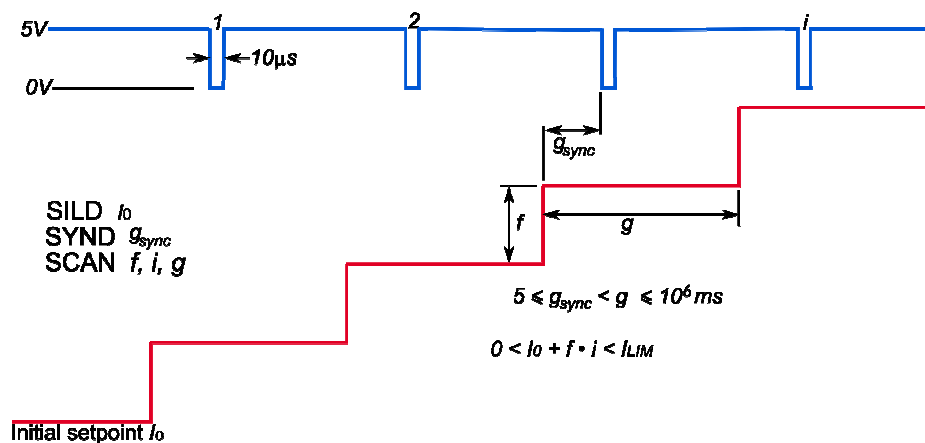
Figure 2: SCAN function parameters

As shown in Figure 2, the sync pulse delay can be changed by the command:

SYND g_{sync}**;**

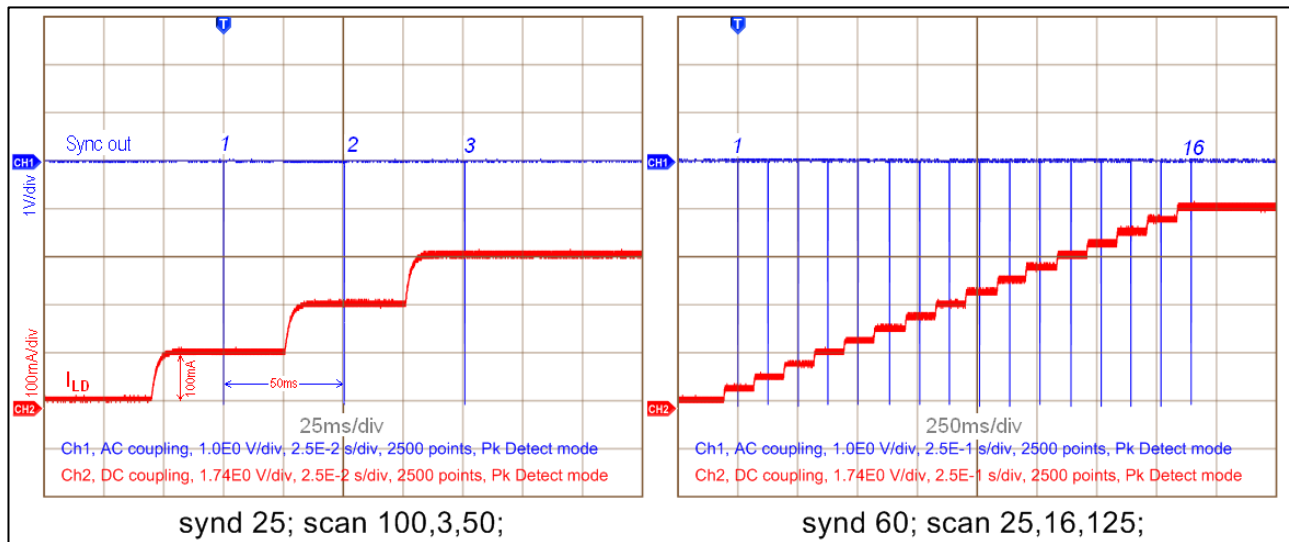where g_{sync} is the delay from the beginning of the change. The scan function has three parameters: f, i, g.

SCAN f, i, g **;**

The first parameter f, is the increment (or decrement, if negative) in the setpoint variable currently in use. If the instrument is in CC mode, f is a current step in mA; if in CP mode, it is raw photodiode current step (in μA), regardless of the value of PDMW. The scan begins immediately after receipt of the **SCAN** command, starting at the previous setpoint.

The second parameter, i, gives the total number of steps. Note that if $I_0 + i \cdot f > I_{LIM}$ or $I_0 + i \cdot f < 0$, where I_0 is the starting operating point, then the **SCAN** command will generate an execution error and no changes in output will occur.

The third parameter, g, is the dwell time for each step in the scan, in ms. It's maximum is 10^6 ms. The dwell time must be set larger than the sync delay g_{sync}, which is set by the **SYND** command.

Figure 3 illustrates two different delays and scans.

Figure 3: Two examples of output