

Tektronix DMM4050 Programming Experience

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Tektronix DMM4050 programming, use experience

Refer to the DMM4040 and DMM4050 Digital Multimeter Programmer Manual for details .

The simple acquisition procedure is described in the document " Optimization System Speed for I/O Operation " (page 6).

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*cls # This clears all error prior to initiating readings

Conf:volt:dc 0.1 # Set the DC range to manual and 100 mV.

Volt:dc:nplc 0.02 # Set the NPLC to faster reading rate 4 1/2 digits.

Zero:auto 0 # Turn Autozero off.

Trig:sour imm # Set immediate trigger.

Trig:del 0 # Set trigger delay to zero.

Trig:coun 1 # Set trigger count to one or specify a larger number.

Disoff off # Turn display off. This may slightly improve reading rate.

Syst:rem # Put the DMM4050 in remote. Only needed for RS-232 or Ethernet
#(required for READ? or MEAS?)

Samp:coun 100 # Set the sample count from 1 to 5000.

INIT

*OPC? # "*OPC?" returns 1 indicating that the measurements have been
#taken and are ready to be transferred to the computer using
the
#FETCH? command.

FETCH?

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Under simple analysis:

1. The commands of the DMM4050 are not case sensitive.

2 , plc 0.02 meaning: In the measurement of DC voltage, DC current and resistance can choose the following combination:

Function	Digits	Setting	Integration Time 60 Hz (50 Hz)	Measurements per Second
DC Volts, DC Current, And Resistance	6.5	100 NPLC	1.67 (2) s	0.6 (0.5)
	6.5	10 NPLC	167 (200) ms	6 (5)
	5.5	1 NPLC	16.7 (20) ms	60 (50)
	5.5	0.2 NPLC	3.3 ms	270
	4.5	0.02 NPLC	500 us	995

PLC refers to the power line cycle, which is the period of 50Hz AC in China.

The higher the sampling accuracy, the lower the front-end sampling rate.

For example, 10 NPLC is selected , that is, the sampling precision is 6 and a half, and the front end is sampled once. If a high sampling rate is required, select 0.02 NPLC and get 995 4.5 -bit precision sampling points per second.

3, zero: auto enable it will reduce the data rate.

4, trigger delay refers to the delay after the trigger arrives to start collecting.

5, trigger count and sample count : cycle the trigger count "waiting for trigger, continuous acquisition of sample count sample points after the trigger " action. Due to the buffer capacity limit, the trigger count multiplied by the sample count must be less than or equal to 5000 , otherwise the acquisition will stop immediately after the INIT .

6, READ? and MEAS? Only one acquisition, MEAS? is equivalent to conf plus READ?. To perform continuous acquisition, you must use INIT plus FETCH?

7. The multimeter receives the INIT instruction, and cyclically counts the actions of "waiting for triggering, continuously collecting sample count samples after triggering", and then sending the data into the buffer.

If the *OPC? command is received during this process , the multimeter is used. Will return 1 after the end of all acquisitions . At this point, the PC program can send the FETCH? Collect all the data points and the data points end with the "\r\n" representation. If the FETCH? command is sent after all the acquisitions have not been completed , the multimeter will send the collected data in the buffer, how much, how much.

If the FETCH? command is sent again , the multimeter will resend the collected data in the buffer. Therefore, only the INIT instruction can refresh the buffer. The continuous acquisition can only be a loop of INIT , *OPC?, FETCH?, INIT , *OPC?, FETCH? ..., but the multimeter stops collecting between FETCH? and the next INIT .

This brings dead time. As above (except samp: coun 5000), the multimeter stops after collecting 5.025s (5000/995) , and then spends about 2 seconds to transmit data. After receiving the next INIT, it takes about 20ms to enter the trigger acquisition.

I don't know why Tektronix does not make the buffer into ping-pong, and transmits the last data while collecting to eliminate the dead time.

8. If the telnet connection is not closed after receiving the data after FETCH?, the telnet function of the multimeter may not be connected again, or even crash (can only be powered off and restarted).

[Bug, it looks like Tektronix doesn't have the function of restarting the multimeter here.](#)

Attached: DMM4050 TELNET mode collection of Labview program.

The network interface of the DMM4050 does not support automatic TX/RX polarity conversion. Pay attention to the connection mode of the network cable when using.

DMM4050 telnet mode collection labview2009 program

