How to make a pulsed sweep measurement

This material shows how to perform a pulsed sweep measurement through an example of the LED IV measurement. Figure 1 illustrates the connection and condition supposed in the example of measuring LED using the B2901/02/11/12A.

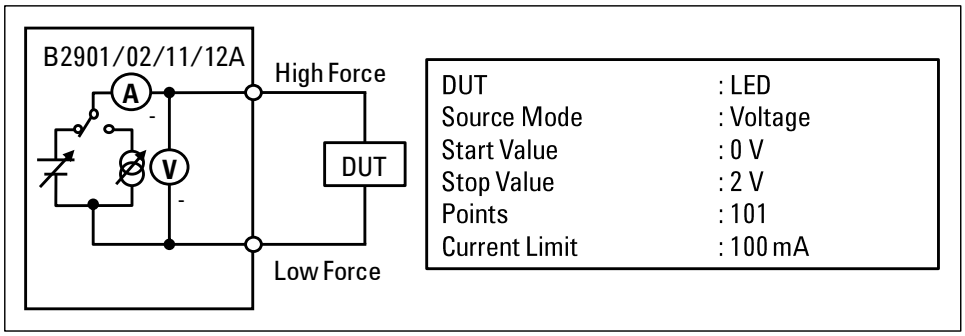
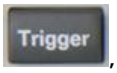


Figure 1. Connection and condition supposed in the example

Figure 2 shows the timing chart for the pulsed sweep measurement with the front panel operation. In this case, the specified source value is sourced immediately after turning on 

. Then, when you press 

, the instrument will make a pulsed sweep measurement. If it is necessary, you can specify any measurement trigger delay time which is the wait time after sourcing each source value and before making a measurement. If you configure the pulsed sweep source, the measurement will be made with FIXED measurement range operation automatically. The measurement range is selected by Limit value. The measurement time consists of Measurement Speed and some overhead time. Measurement Speed is the parameter specified by the user. Overhead time includes the time to change the measurement range, etc.

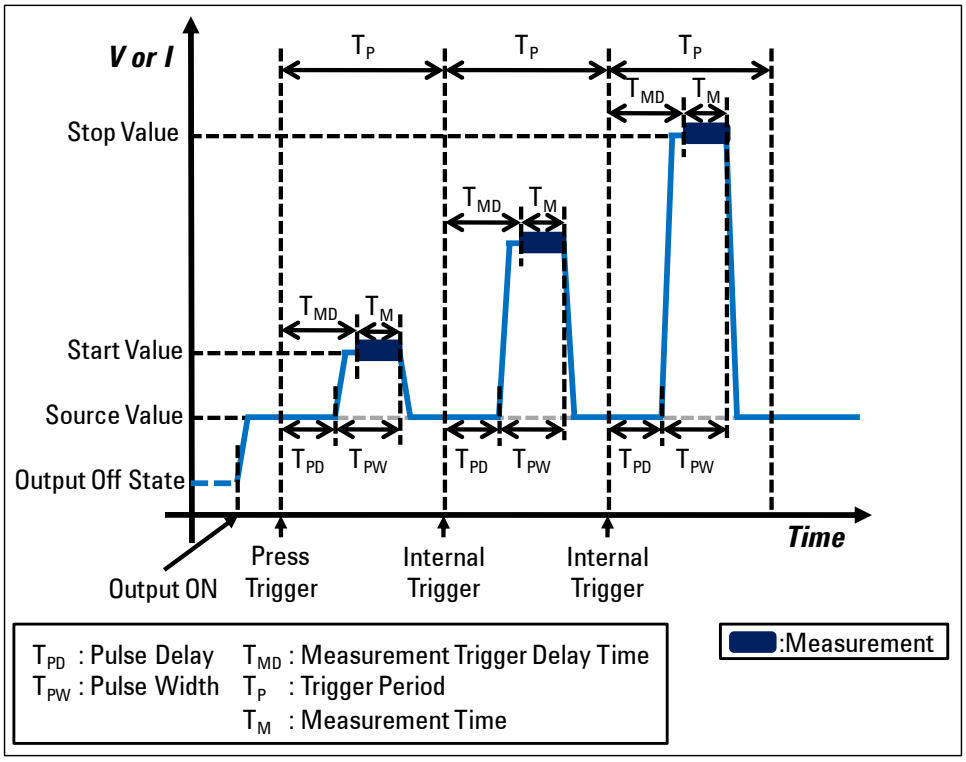
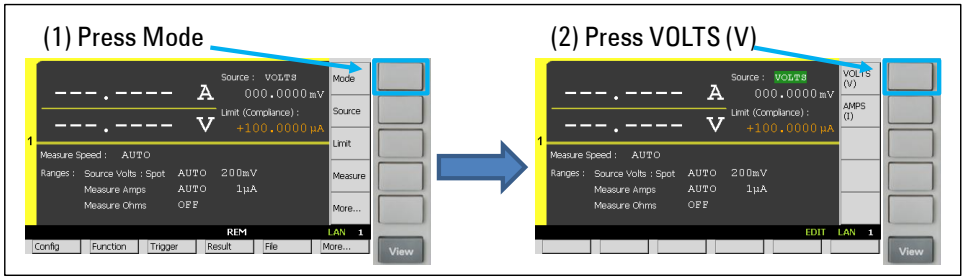


Figure 2. Timing chart for the pulsed sweep measurement

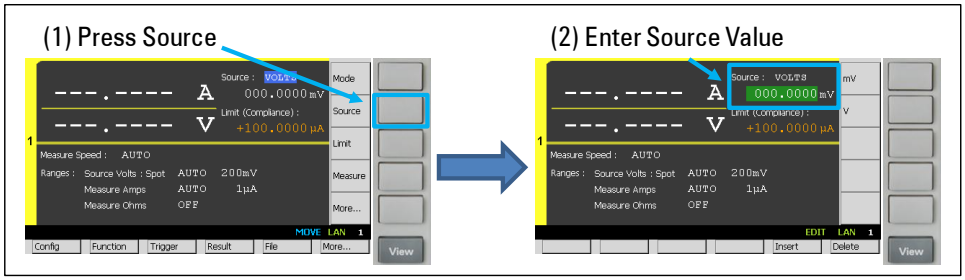
Performing a pulsed sweep measurement

Step 1. Press View repeatedly until Single View for Channel 1 is shown in the display.

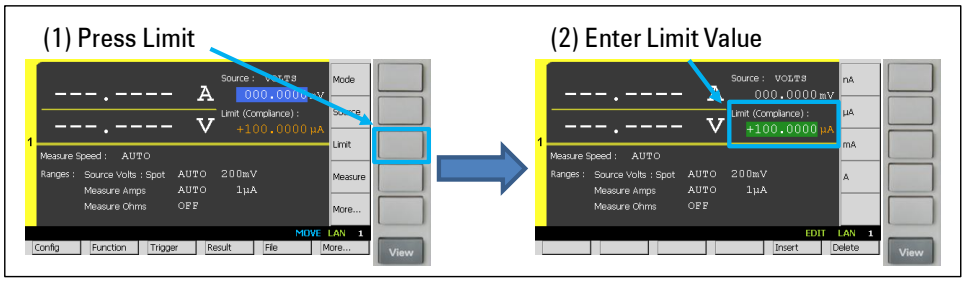
Step 2. Press Mode to edit the source function, and then select VOLTS (V) to set the source function to the voltage source.



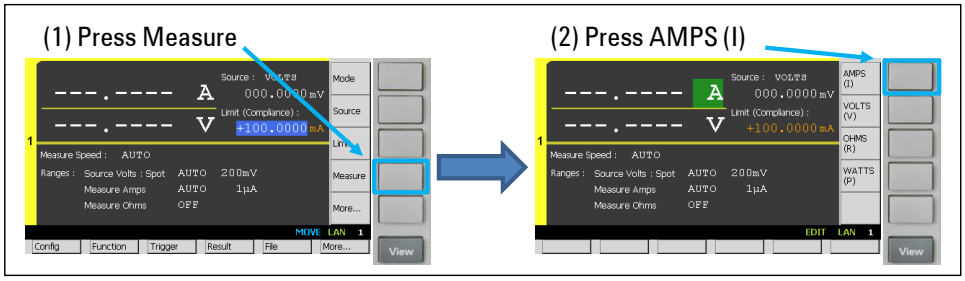
Step 3. Press Source to edit the source value, and then enter 0 V to set the source value to 0 V.



Step 4. Press Limit to edit the limit value, and then enter 100 mA to set the limit value to 100 mA.



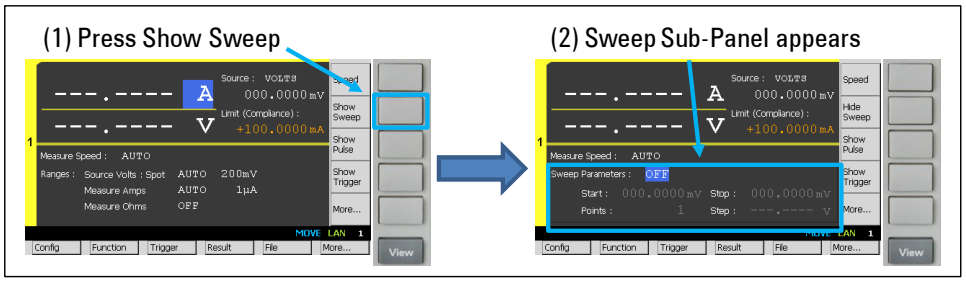
Step 5. Press Measure to configure the measurement parameter, and then select AMPS (I) to set the measurement parameter to the current.



Step 6. Press 

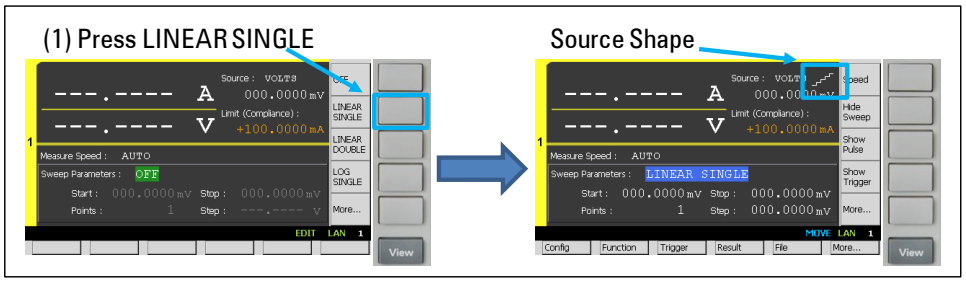
to change the keys shown in Assist keys, and then press 

to show Sweep Sub-Panel.



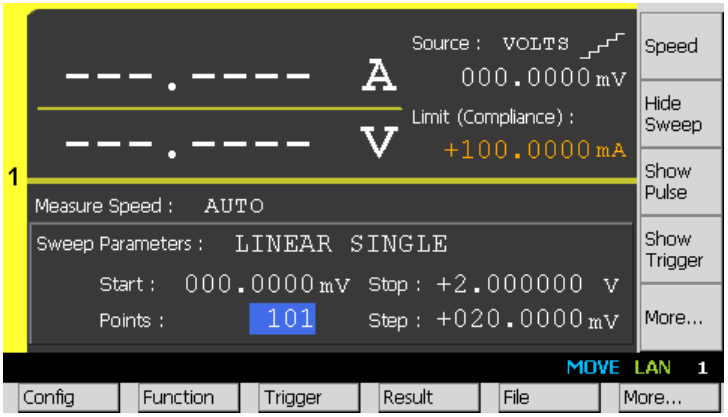
Step 7. Press 
, then press 

to turn on Single Linear Sweep Mode. After turning on Single Linear Sweep Mode, you can see Source Shape which shows the single linear sweep mode.



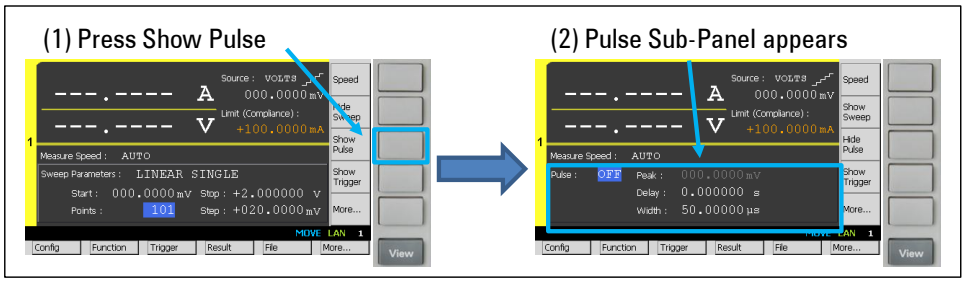
Step 8. Rotate 
to select Channel 1 Sweep Parameters and set them up as below.

(Start: 0 V, Stop: 2 V, Points: 101, Step: 20 mV)



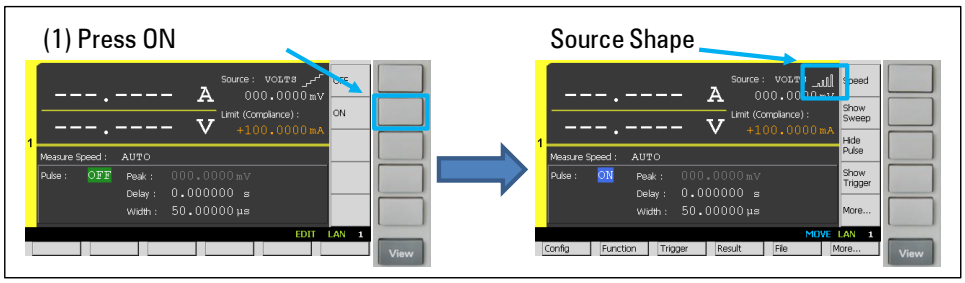
Step 9. Press 

to show Pulse Sub-Panel.



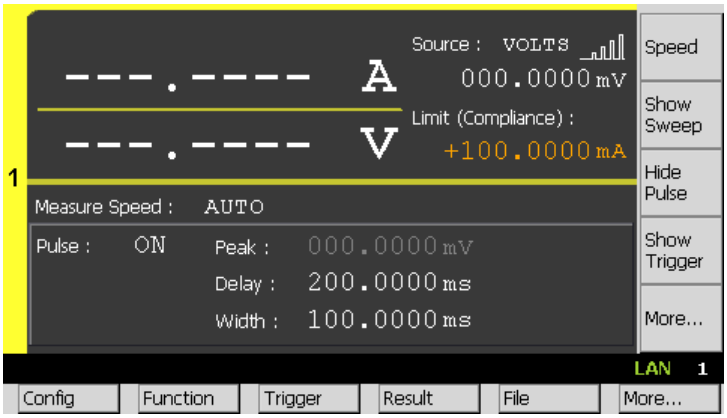
Step 10. Press  , then press 

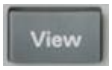
to set the pulse source ON. After turning on the pulse source, you can see Source Shape which shows the pulsed sweep source mode.



Step 11. Rotate  to select Channel 1 Pulse Parameters and set them up as below.

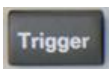
(Delay: 200 ms, Width: 100 ms)



Step 12. Press 

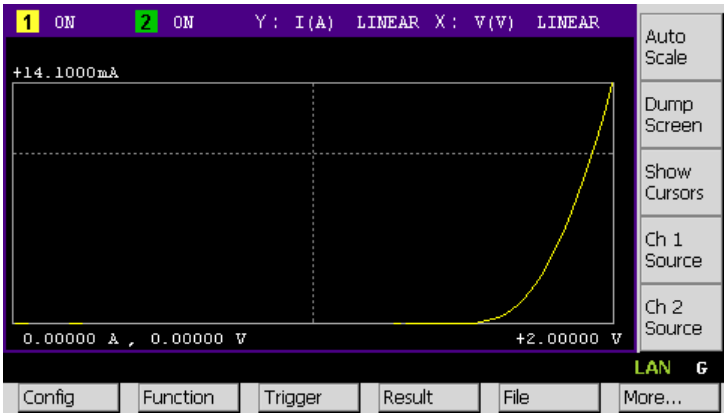
repeatedly until Graph View is shown in the display.

Step 13. Press 

to source the voltage, and then press 

to perform a measurement.
(The status information will show ARM during the measurement.)

Step 14. Press Auto Scale to adjust the scale of the graph after finishing the measurement. Now you can see the measurement result on the GUI of the B2901/02/11/12A as bellow.



Please note that FIXED current measurement range operation will be used when you configure the pulsed sweep source. The measurement range is selected by Limit value. In this example, 100 mA measurement range should be used.

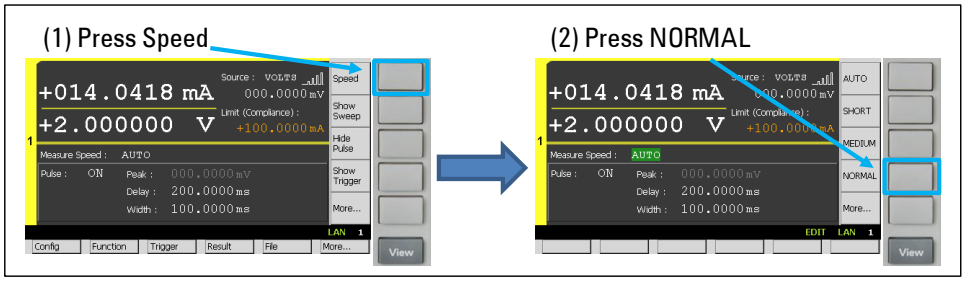
Configuring the measurement speed

In the default setting, the instrument selects the appropriate measurement speed automatically to get the fine accuracy. However, you can also specify it on the GUI of the B2901/02/11/12A to meet a variety of the requirement to the measurement conditions.

For example, let's try to change the measurement speed to NORMAL to make a measurement more carefully. If you select NORMAL, the aperture time is set to 1 PLC. Here, PLC stands for power line cycle and the specified number of power line cycles is used per a measurement.

Step 1. Press View repeatedly until Single View for Channel 1 is shown in the display.

Step 2. Press Speed to edit the measurement speed, and then select NORMAL to set the measurement speed to NORMAL. (If you can't see Speed in Assist keys, press More... to change the keys shown in Assist keys.)

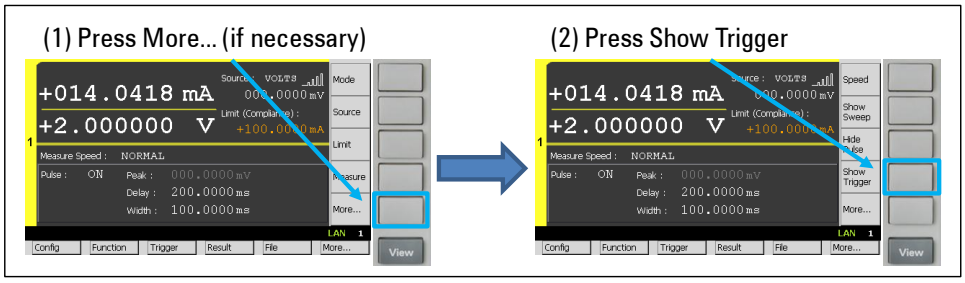


Configuring the measurement trigger delay time

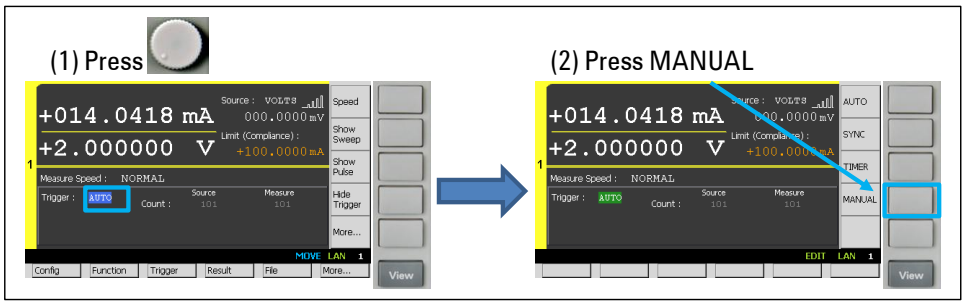
The trigger parameters including the measurement trigger delay time and the trigger period can be displayed in Trigger Sub-panel in Single View, although Pulse Sub-Panel is shown at this moment. In the default setting, the trigger type is set to the automatic trigger type (AUTO) so that you don't need to specify these trigger parameters.

If you'd like to specify the measurement trigger delay time, take the following steps.

Step 1. Press [Show Trigger] to show Trigger Sub-Panel. (If you can't see [Show Trigger] in Assist keys, press [More...] to change the keys shown in Assist keys.)

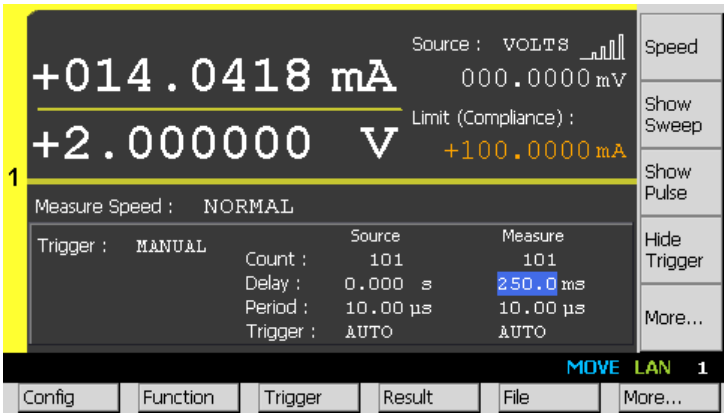


Step 2. Press [knob] to edit the trigger type, and then select [MANUAL] to set the trigger type to MANUAL.



Step 3. Rotate [knob] to select Channel 1 Trigger Parameters and set them up as below.

(Source Trigger Count: 101, Measurement Trigger Count: 101, Measurement Trigger Delay Time: 250 ms)



Note) Source and Measurement Trigger Count should be the same number as Sweep Points.

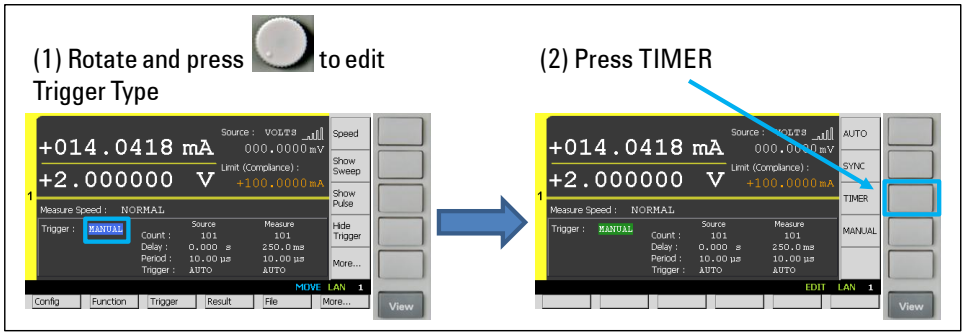
Now you've configured 250 ms measurement trigger delay time.

Configuring the trigger period

If you need to control the source and measurement period strictly, the trigger period is useful to make it. In order to specify the trigger period, take the following steps.

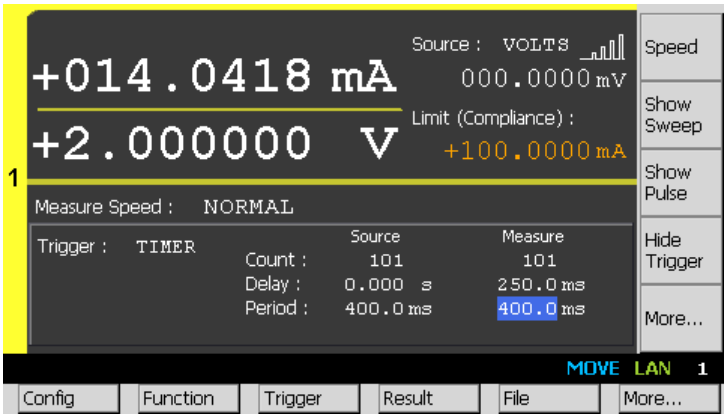
Step 1. Rotate and press  to edit the trigger type, and then select 

to set the trigger type to TIMER.



Step 2. Rotate  to select Channel 1 Trigger Parameters and set them up as below.

(Source Trigger Period 400 ms, Measurement Trigger Period: 400 ms)



Note) Source and Measurement Period should be the same as each other.

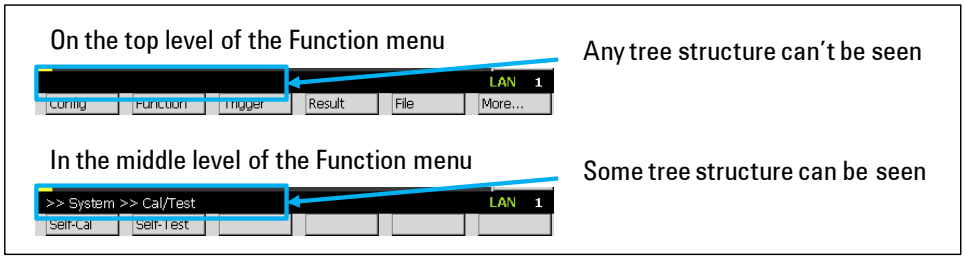
Now you've configured 400 ms trigger period.

Viewing the list of measurement results

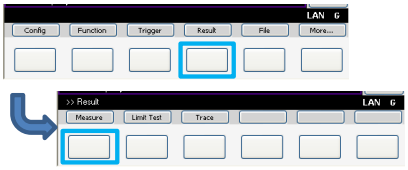
The measurement results including the measurement time stamp can be referred by the following steps.

Step 1. If you aren't on the top of the Function menu, press 

repeatedly to return to the top level.



Step 2. If you'd like to see the list of the measurement result, press Result, then press Measure to open Measure Result dialogue.

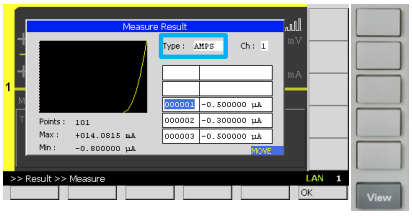


(1) Press Result

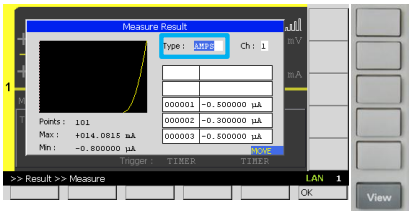
(2) Press Measure

Step 3. Rotate and press  to select Data Type field.

(1) Rotate  to select Data Type field

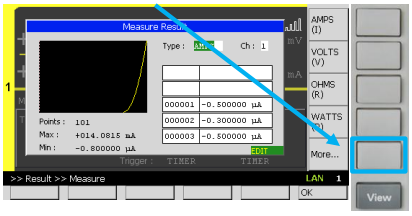


(2) Press  To select Data Type

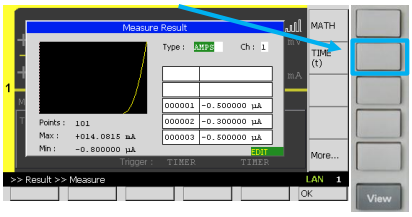


Step 4. Press More... to change the keys shown in Assist keys, and then press TIME (t) to select Time as the data type.

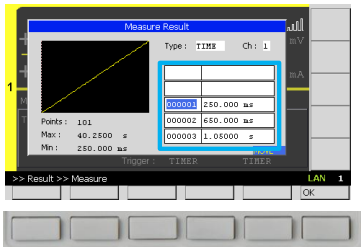
(1) Press More ...



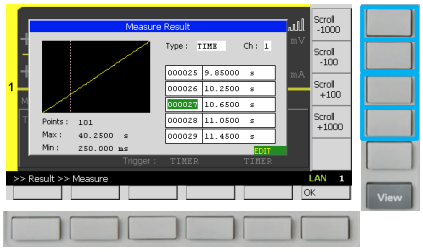
(2) Press TIME (t)



Step 5. Rotate and press  to select Data field. Then rotate  to scroll the data list.



(1) Rotate and press  to select Data field



(2) Rotate  or press Assist key to scroll the list