How to configure trigger output signals

This material shows how to configure the instrument to output the trigger signals at the specified timing using a member of the B2900A Series of SMU, through example to source the trigger output signal before the transient device action.

Figure 1 shows the B2901/02/11/12A's advanced trigger operation flowchart. During the trigger operation, the B2900A Series of SMU can output trigger signals at the following six timings to synchronize the other channels or instruments. Please note that the B2900A Series of SMU has the independent trigger system for both Transient (Source) and Acquire (Measure) actions respectively and the capability to control both actions individually.
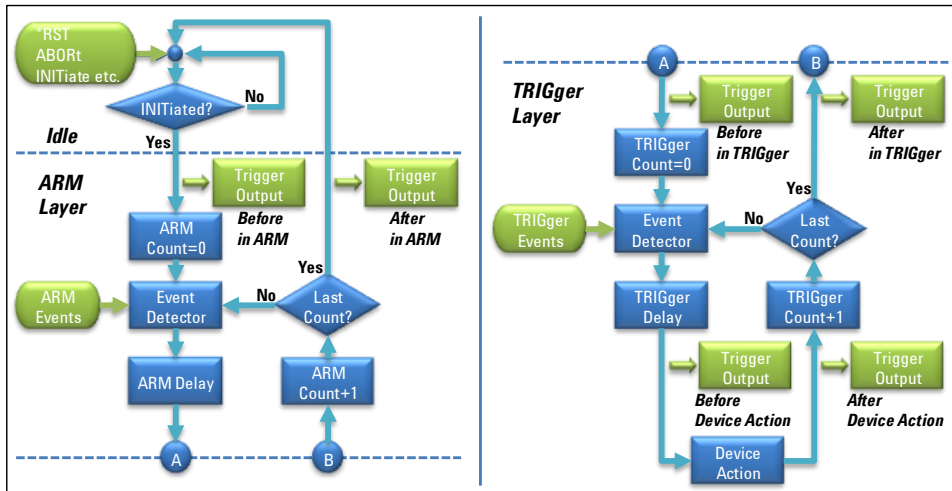

Figure 1. B2901/02/11/12A's advanced trigger operation flowchart

In order to output the trigger signals, it is required to specify the timing to output the trigger signals, the digital I/O pin number and the digital I/O properties such as the polarity, the trigger type, etc. The level of the signal is fixed to 5 V. The digital I/O properties define the actual waveform of the trigger output signals. Figure 2 shows the examples of the trigger signal to be outputted by specifying the digital I/O properties.
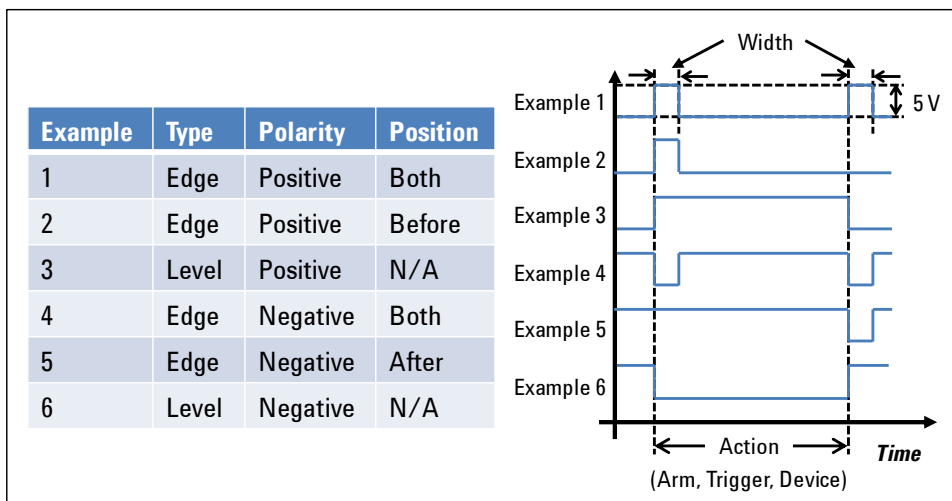

Example	Type	Polarity	Position
1	Edge	Positive	Both
2	Edge	Positive	Before
3	Level	Positive	N/A
4	Edge	Negative	Both
5	Edge	Negative	After
6	Level	Negative	N/A

Figure 2. Examples of the trigger signal to be outputted

In order to know how to set up the trigger output signals with front panel operation, the procedure is shown to configure the instrument to output the trigger signal from the digital I/O pin 1 at the beginning of the transient device action. (Please see Figure 3)
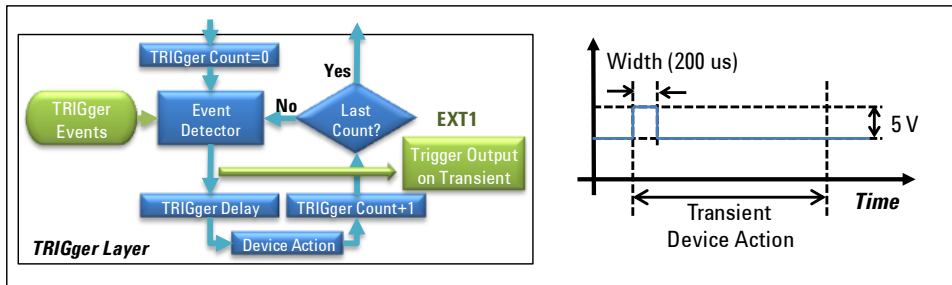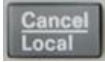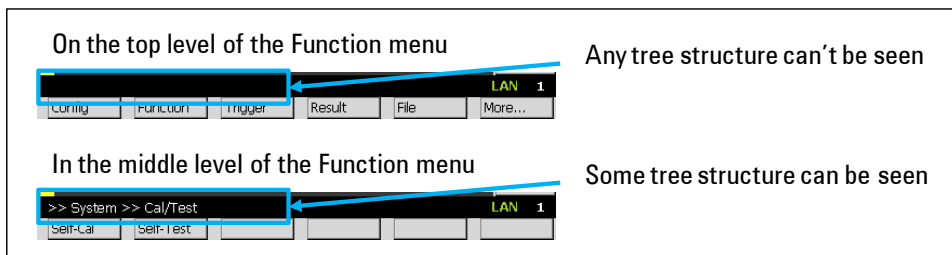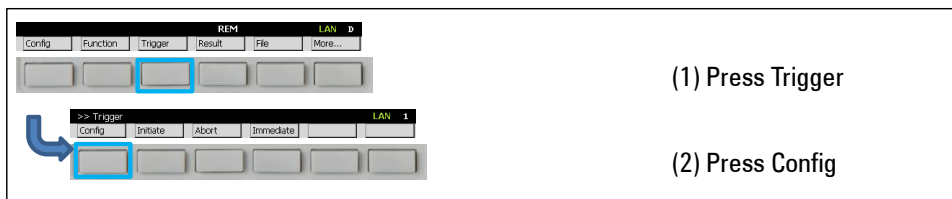

Figure 3. Example to output the trigger signal

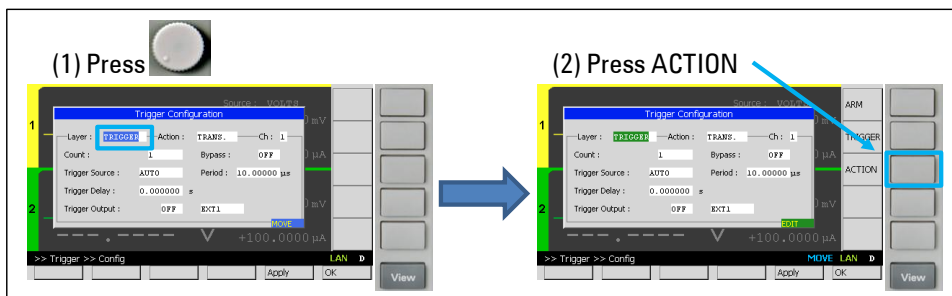## Setting on the trigger output at the beginning of the transient device action

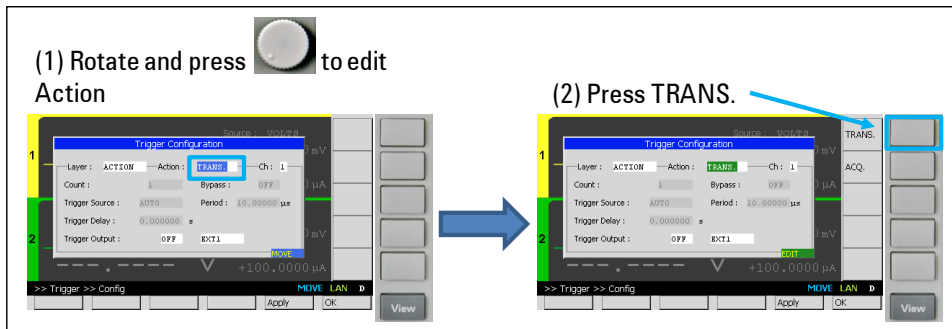Step 1. If you aren't on the top of the Function menu, press [Cancel Local] repeatedly to return to the top level.

On the top level of the Function menu — Any tree structure can't be seen

In the middle level of the Function menu — Some tree structure can be seen

Step 2. Press [Trigger] and then press [Config] to open Trigger Configuration dialogue.

(1) Press Trigger

(2) Press Config

Step 3. Press [knob] and select [ACTION] to specify the device action, the trigger output of which is configured.

(1) Press [knob]

(2) Press ACTION

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Step 4.   Rotate ⊙ to select the action and press ⊙ to edit it. Then press **TRANS.** to specify the

transient action, the trigger output of which is configured.

(1) Rotate and press ⊙ to edit Action
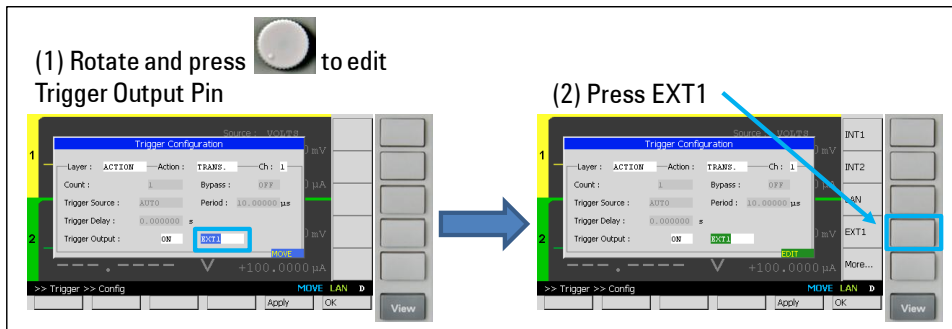
(2) Press TRANS.

Step 5.   Rotate ⊙ to select the channel and press ⊙ to edit it. Then press **Ch 1** to select the

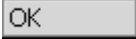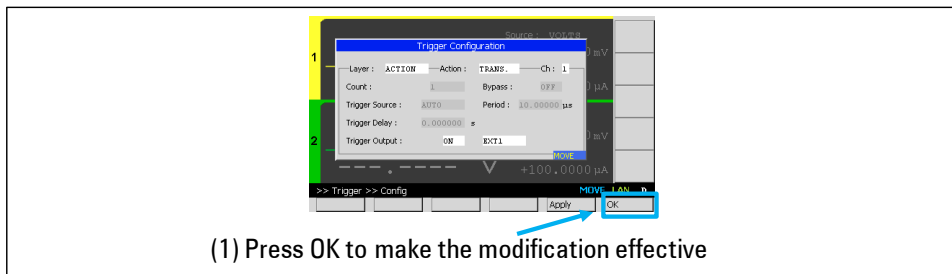channel 1 as the channel, the trigger output of which is configured.

(1) Rotate and press ⊙ to edit Channel

(2) Press Ch 1
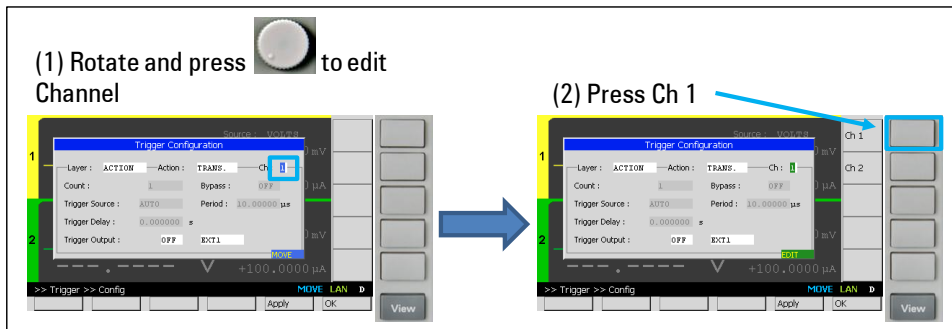
Step 6.   Rotate ⊙ to select the trigger output status and press ⊙ to edit it. Then press **ON** to set it

on.

(1) Rotate and press ⊙ to edit Trigger Output State
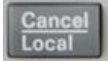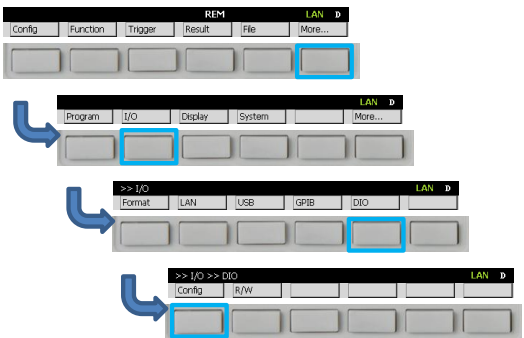
(2) Press ON

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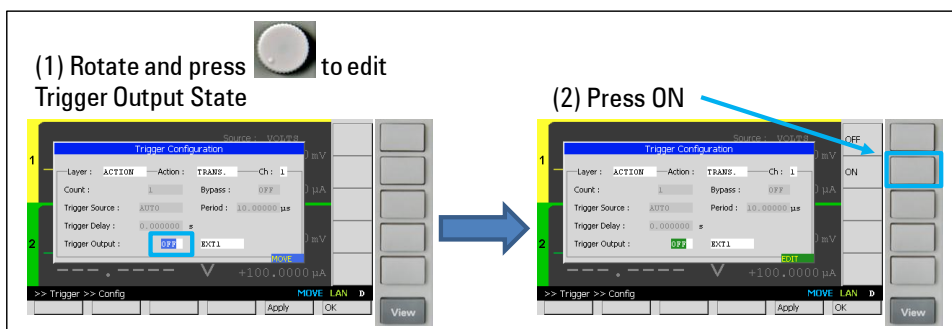
Step 7.   Rotate ⏺ to select the trigger output pin and press ⏺ to edit it. Then press [EXT1] to select

the digital I/O pin 1 as the trigger output pin.

(1) Rotate and press ⏺ to edit
Trigger Output Pin

(2) Press EXT1

Step 8.   Press [OK] to make the modification effective.

(1) Press OK to make the modification effective

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Setting the digital I/O pin properties for trigger output

Step 9.   If you aren't on the top of the Function menu, press [Cancel Local] repeatedly to return to the top level.

On the top level of the Function menu

Any tree structure can't be seen

In the middle level of the Function menu

Some tree structure can be seen

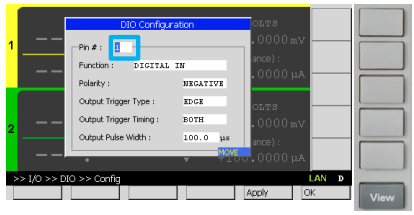Step 10.   Press [More...], [I/O], [DIO], and then press [Config] to open DIO Configuration dialogue.
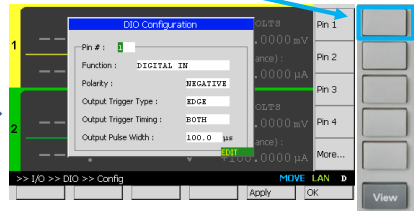
(1) Press More...

(2) Press I/O

(3) Press DIO

(4) Press Config

Step 11.   Press [knob] and select [Pin 1] to specify the digital I/O pin number, the properties of which is configured.

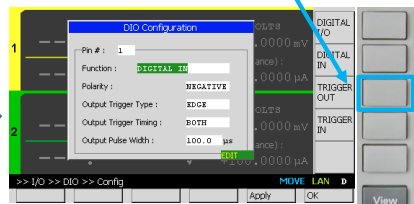(1) Press [knob]
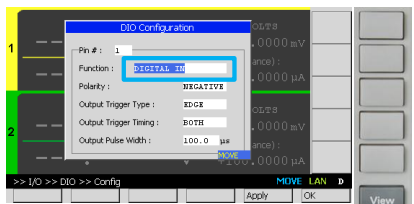
(2) Press Pin 1

Step 12.   Rotate [knob] to select the input/output function and press [knob] to edit it. Then press [TRIGGER OUT] to set it to the trigger output.
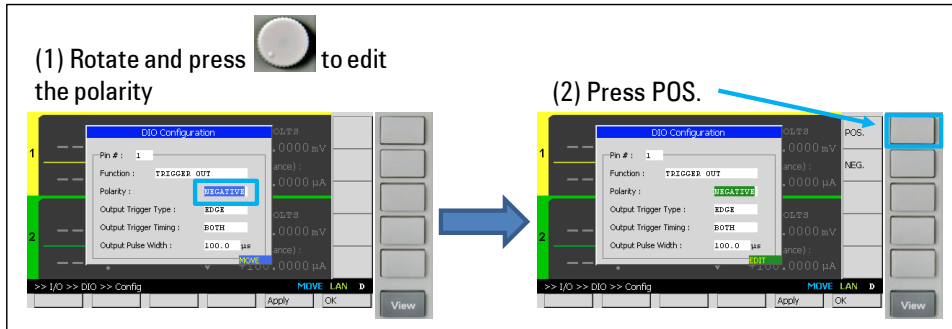
(1) Rotate and press [knob] to edit the input/output function

(2) Press TRIGGER OUT

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Step 13.   Rotate [knob] to select the polarity and press [knob] to edit it. Then press [POS.] to set it to positive polarity.

(1) Rotate and press [knob] to edit the polarity

(2) Press POS.

Step 14.   Rotate [knob] to select the output trigger type and press [knob] to edit it. Then press [EDGE] to set it to the edge trigger.

(1) Rotate and press [knob] to edit the output trigger type

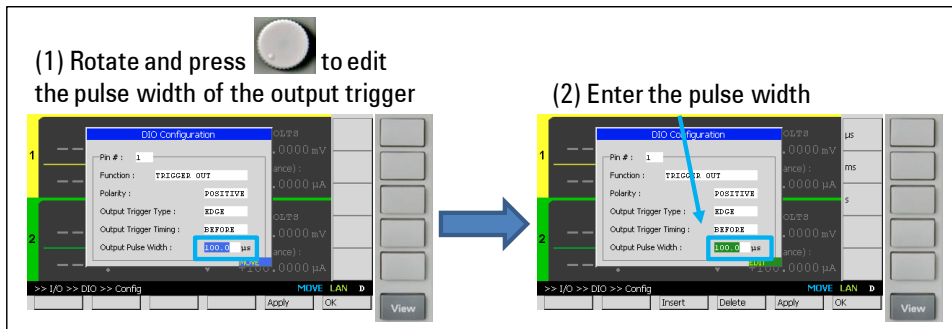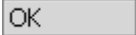(2) Press EDGE
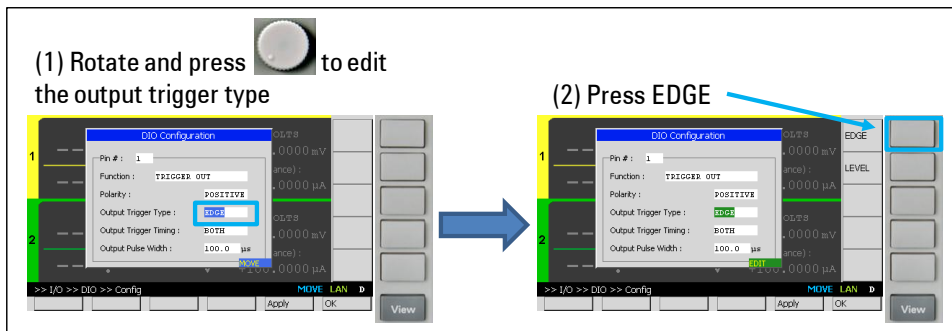
Step 15.   Rotate [knob] to select the output trigger timing and press [knob] to edit it. Then press [BEFORE] to enable the trigger output at the beginning of the specified action.

(1) Rotate and press [knob] to edit the output trigger timing

(2) Press BEFORE
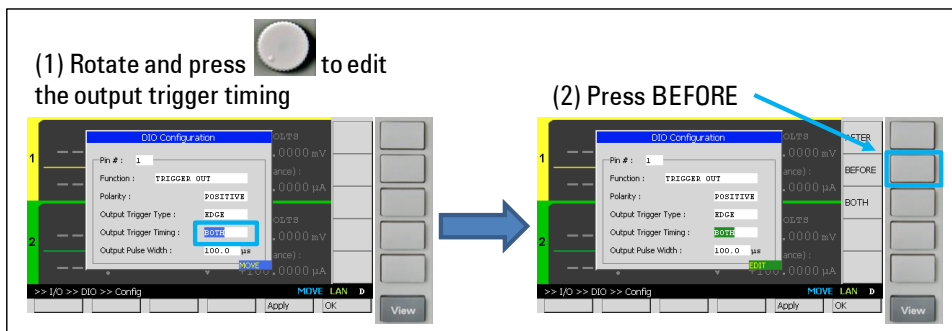
Step 16.   Rotate to select the pulse width of the output trigger and press to edit it.

Then enter 200 us to set the pulse width of the output trigger to 200 us.

(1) Rotate and press to edit
the pulse width of the output trigger

(2) Enter the pulse width

Step 17.   Press OK to make the modification effective.

(1) Press OK to make the modification effective