Keysight Technologies
Customizing the B2900A SMU's Default Boot-Up Settings

Application Brief

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Introduction

Every application requires a specific set of instrument settings to make that particular measurement. However, the factory default boot-up conditions may be very different from those of your commonly used applications. If your most common measurements require many changes to the default settings, then it can be very annoying and tedious to modify them every time you power up the instrument.

One example of this is a low resistance measurement made using a Source/Measure Unit (SMU). An accurate measurement of this type requires you to place the SMU into current source mode and measure using a 4-wire (Kelvin) connection scheme. Unfortunately, the SMU's default boot-up state is to be in voltage source mode and a 2-wire connection configuration. Therefore, if you frequently make low resistance measurements every time you power up the instrument you have to change the source mode from voltage to current and the connection setting from 2-wire to 4-wire.

Keysight's B2900A Precision Source/Measure Unit (SMU) has the capability to circumvent these annoying repeated steps using its "Power-On State" function. This application brief explains the "Power-On State" function for the low resistance measurement example mentioned above, and shows how to use it to make the instrument boot-up in current source mode and 4-wire connection scheme.

Procedure to Configure the "Power-On State"

The "Power-On State" function enables you to store a customized boot-up state into the instrument's non-volatile memory and configure the instrument to power up into that state. The procedure to do this is outlined step-by-step below.
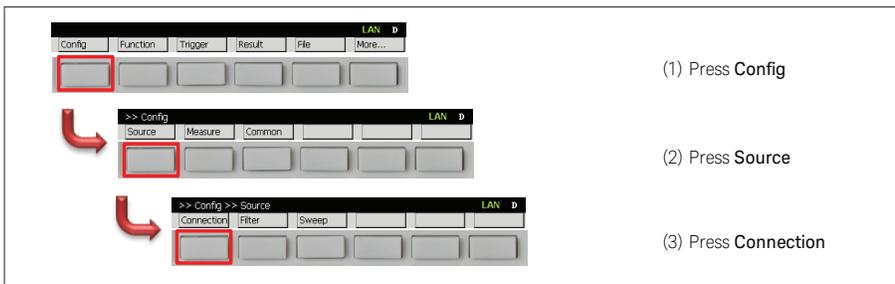
1. Configure the instrument to boot-up into your preferred state
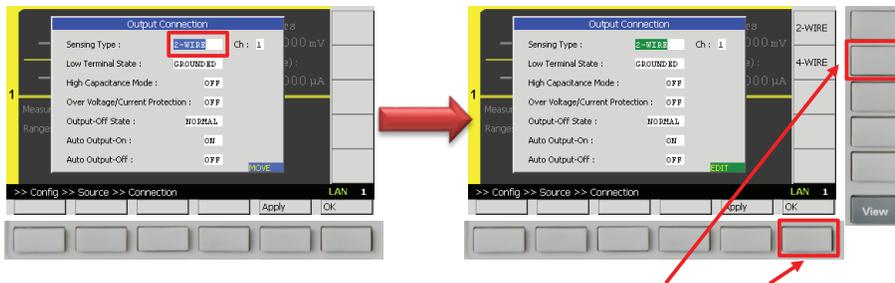
1) Press Line Switch ⏻ to turn on the B2900A SMU.

2) Press `View` repeatedly until the Channel 1 **Single View** is displayed.

3) Press `Config` , `Source` , and then press `Connection` to open the **Output Connection** dialogue.

(1) Press **Config**

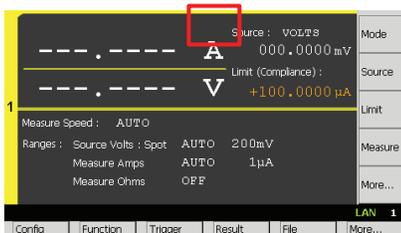(2) Press **Source**

(3) Press **Connection**

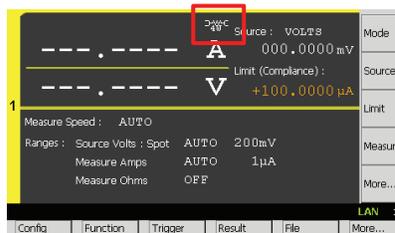4) Press ⬤ and select `4-WIRE` , and then press `OK` to configure the SMU to use a **4-wire connection**.

If you have correctly configured the channel to use a 4-wire connection scheme, then you will see the status indicator as shown below in the right screen shot.

Note: As shown below on the left screen shot, no status indicator is displayed when the SMU is configured to use a 2-wire connection scheme.
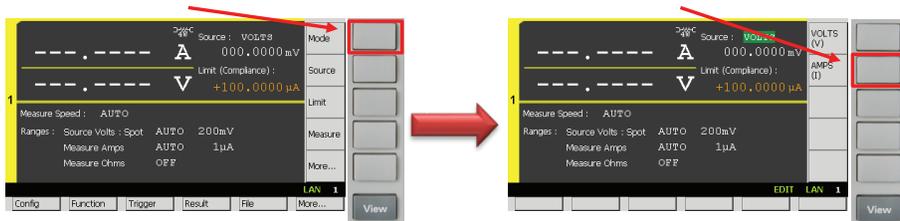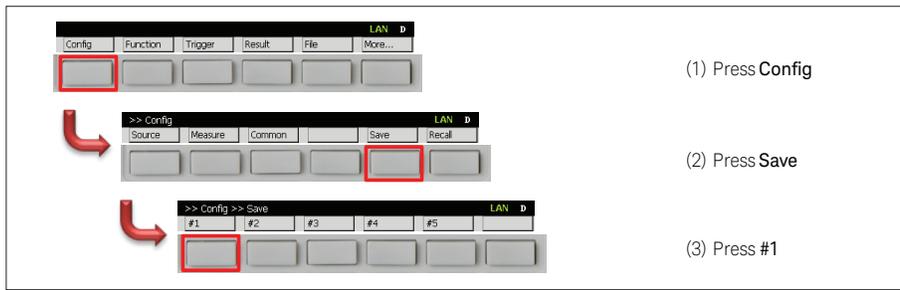

2-wire connection   4-wire connection

5) Next press `Mode` to edit the Source function, and then select `AMPS (I)` to set the **Source function** to **Current source**.
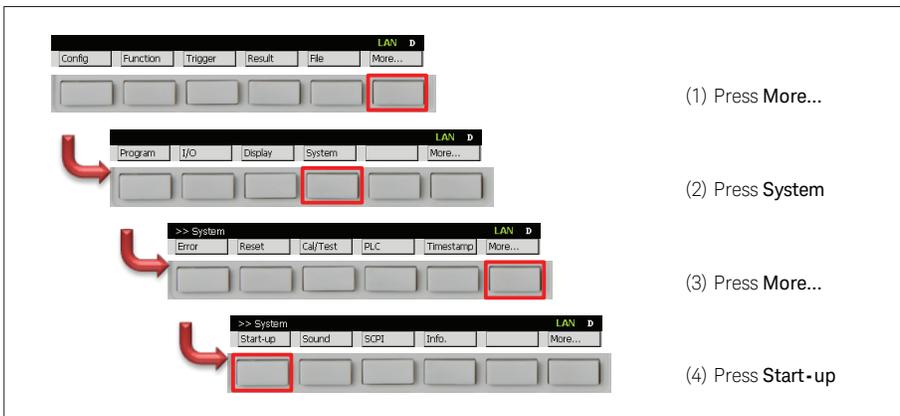

2. Save the state into non-volatile memory

1) Press `Config` , `Save` and then press `#1` to save the current state into non-volatile memory.

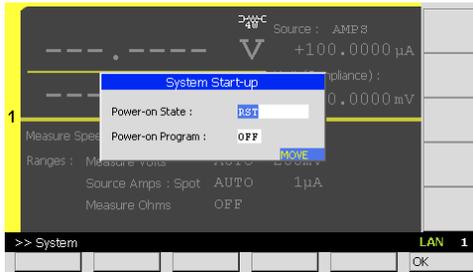(1) Press **Config**

(2) Press **Save**

(3) Press **#1**

3. Enable the "Power-On State" function and specify the stored state you want to use as the start-up state

1) Press `More...` , `System` , `More...` , and then press `Start-up` to open the **System Start-up dialogue**.

(1) Press **More...**

(2) Press **System**

(3) Press **More...**

(4) Press **Start‑up**

The current Power-on State setting is displayed as in the screenshot shown below.
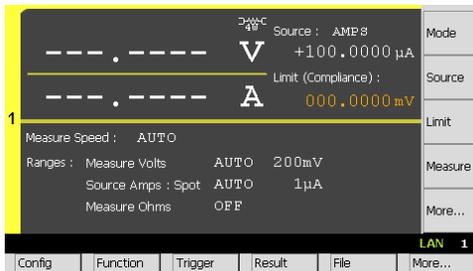

2) Press ⬭ and select [#1 (RCL0)] and then press [OK] to select the **user condition "#1(RCL0)"** as the **Power-on State**.

4. Cycle power on the instrument to make the changes take effect.

1) Press the Line Switch ⏻ to turn off the B2900A SMU, and then press the Line Switch ⏻ again to turn the B2900A SMU back on.

2) Confirm that the B2900A SMU boots-up into the desired state.

Summary

Keysight's B2900A Precision Source/Measure Unit (SMU) has a "Power-On State" function that allows you to customize the boot-up state of the instrument so that you do not have to repeatedly modify instrument settings into the format that you commonly use. It enables you to store a customized state into non-volatile memory and configure the instrument to boot-up using that stored state. Although the example shown in this application brief only modifies two default parameters (source mode and connection setting), most parameters can be configured and stored into non-volatile memory. Using the "Power-On State" feature you can then specify these parameters to take effect during boot-up. This B2900A SMU feature can increase your efficiency by eliminating the time wasted changing default parameter settings that are different from your common use model.

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