INTRODUCTION

Devices with only one single channel provide one source and one output programming node. The [:SOURce]:... and :OUTPut:... ranges of command enable remote programming of reference configuration, source setup (frequency, power, modulations etc.) and output state (RF on/off).

Figure 1: Single channel device configuration

Multi-channel devices provide multiple [:SOURce]:... and :OUTPut:... programming nodes, each of it dedicated to one of the channels. However, some sub-nodes are common to all channels. For example, frequency, power and modulations can be set per channel while the reference part is common to all channels.

Figure 2: Multi channel device configuration

This application note describes how to program the model series 855 instruments featuring multiple output channels.

The basic multi-channel programming command syntax is introduced.

An example shows how to configure multiple channels individually.
CHANNEL SELECTION

The channel can be selected in two different ways.

- Append a channel index to the [:SOURce] and :OUTPut nodes: [:SOURce#] and [:OUTPut#], e.g. :SOURce1.
- Select the default source and output nodes. Commands within the [:SOURce] or OUTPut nodes will apply to a selected default source if no channel index is appended.

INDIVIDUAL AND SHARED SETTINGS

Some [:SOURce] and :OUTPut sub-nodes are common to all channels. Programming such sub-nodes will affect all channels at once. Channel index and default source selection won’t have any effect. This applies to the following sub-nodes:

- [:SOURce]:ROSCillator
  Reference configuration. Common for all sources.
- [:SOURce]:SELect
  Default source selection.

QUICK COMMAND REFERENCE

This quick command reference covers basic multi-channel functionality: reference configuration, channel selection, per-channel frequency, power and output state settings. Please refer to the signal generator programmer’s manual for a complete command reference.

[:SOURce]:SEL?
[:SOURce]:SEL? MINimum
[:SOURce]:SEL? MAXimum
[:SOURce]:SEL <x>
Gets or sets default source and output channel selection. Range 1...number of channels. The MAXimum query returns the number of sources available. Reset (*RST) default: 1.

[:SOURce#]:FREQuency?
[:SOURce#]:FREQuency <x>

Gets or sets source frequency. Applies to currently selected default source if [:SOURce#] node or source index # is omitted. Applies to source # (range 1...number of channels) otherwise.

[:SOURce#]:POWer?
[:SOURce#]:POWer <x>

Gets or sets source power. Applies to currently selected default source if [:SOURce#] node or source index # is omitted. Applies to source # (range 1...number of channels) otherwise.

[:SOURce]:ROSCillator:SOURce?
[:SOURce]:ROSCillator:SOURce INTernal|EXTernal

Gets or sets reference source. Applies to all channels. Reset (*RST) default: INTernal.

[:SOURce]:ROSCillator:OUTPut[:STATe]?
[:SOURce]:ROSCillator:OUTPut[:STATe] 0|1|OFF|ON

Gets or sets reference output state. Reset (*RST) default: 0|OFF.

:OUTPut#[:STATe]?
:OUTPut#[:STATe] 0|1|OFF|ON

Gets or sets output state. Applies to currently selected default output if the output index # is omitted. Applies to output # (range 1...number of sources) otherwise. Reset (*RST) default: 0|OFF.
Programming of the following setup:

Reference source external, reference output enabled
Source 1: 0 dBm, 1 GHz, output enabled
Source 2: 5 dBm, 2 GHz, output enabled
Source 3: 6 dBm, 2.1 GHz, output enabled

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