

Read This
FIRST

Quick Start Guide

**Agilent Technologies Models
6811B - 6814B, 6834B, and 6843A
AC Power Solutions**



Documentation Map	
<i>Quick Start Guide</i> (this document) Condensed overview of ac source operation. Read this to quickly get started.	<i>Quick Reference Card</i> Memory jogger for front panel and remote programming commands. Use this if you are already familiar with programming the ac source.
<i>User's Guide</i> Includes the following information: Description and installation, Checkout and operation Specifications and calibration	<i>Programmer's Guide</i> Includes the following information: Introduction to SCPI, SCPI command reference dictionary Application examples



Agilent Technologies

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Safety Notice

The beginning of the User's Guide has a Safety Summary page for this instrument. Familiarize yourself with the contents of that page. The following safety precautions must be observed.

WARNING: LETHAL VOLTAGES

Ac sources can supply 425 V peak at their output. DEATH on contact may result if the output terminals or circuits connected to the output are touched when power is applied.

BEFORE APPLYING POWER

Verify that the product is set to match the available line voltage, the correct fuse is installed, and all safety precautions are taken. Note the instrument's external markings described under "Safety Symbols".

GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

FUSES

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuseholders. To do so could cause a shock or fire hazard.

DO NOT REMOVE THE INSTRUMENT COVER

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel.

DO NOT EXCEED INPUT RATINGS

This instrument may be equipped with a line filter to reduce electromagnetic interference and must be connected to a properly grounded receptacle to minimize electric shock hazard. Operation at line voltages or frequencies in excess of those stated on the line rating label may cause leakage current in excess of 5.0 mA

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The front panel - at a glance

14-character display shows menu commands and measured values.

- ◆ Annunciators indicate operating modes and status conditions.

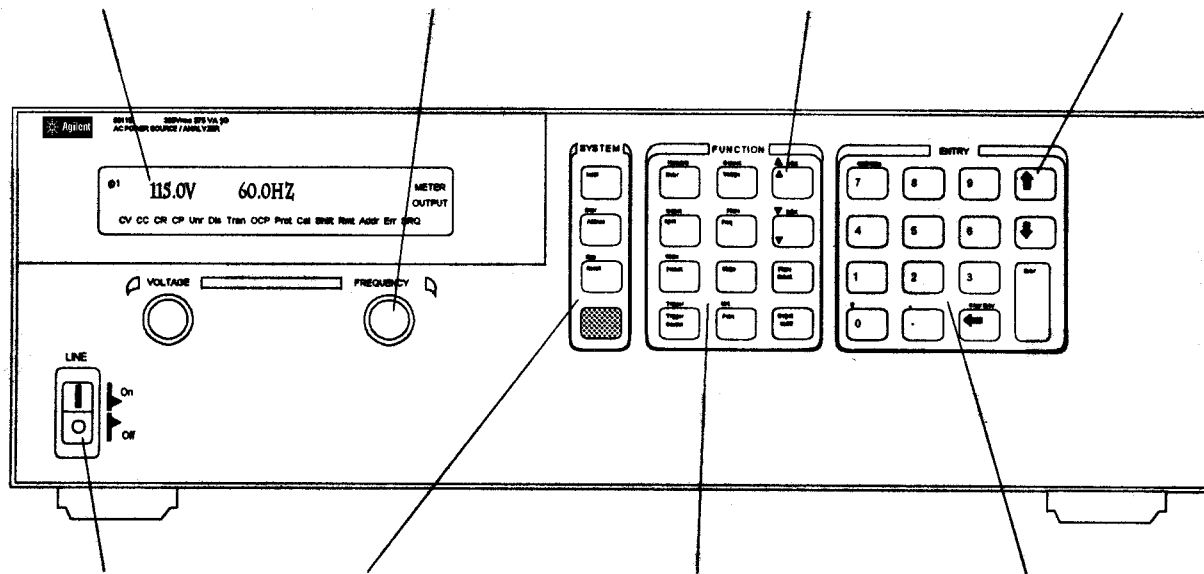
Rotary controls set voltage and frequency when ac source is in local mode.

- ◆ Turn rapidly for coarse control
- ◆ Turn slowly for fine control.

▼ and ▲ scroll through menu commands.

▼ index and ▲ index scroll through lists and harmonic arrays.

↓ and ↑ scroll through command parameters.



Turns the ac source on or off

System keys:

- ◆ Return to Local mode
- ◆ Set the GPIB address and other system parameters
- ◆ Set the RS-232 interface
- ◆ Display SCPI error codes
- ◆ Save and recall instrument states

Function keys:

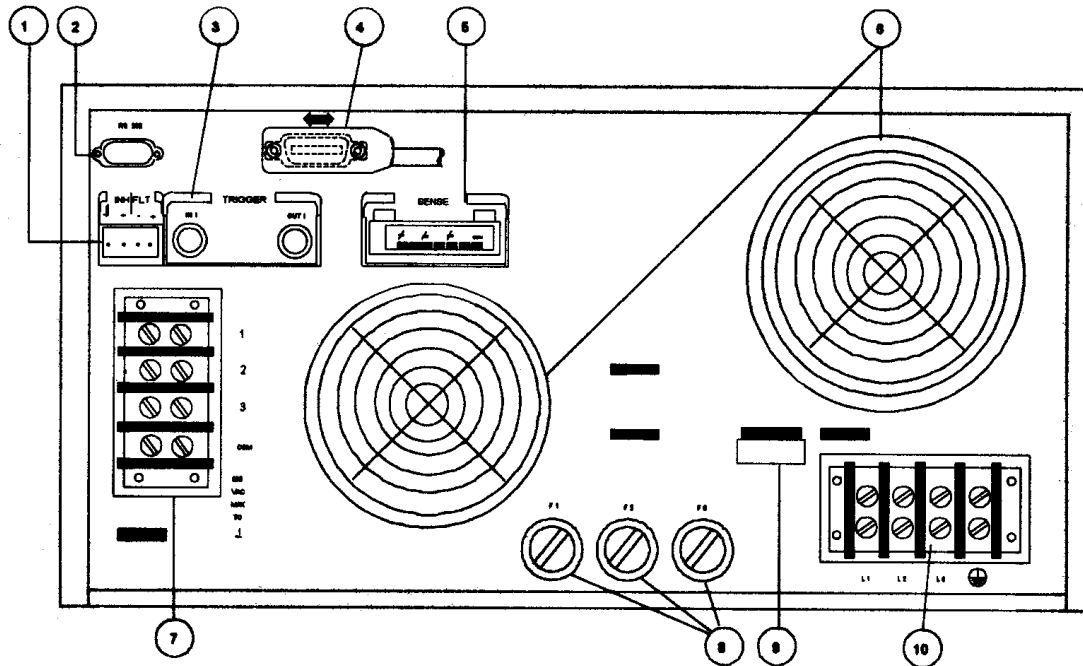
- ◆ Enable/disable the output
- ◆ Select output phases
- ◆ Select front panel metering and harmonic analysis functions
- ◆ Program voltage, frequency, phase, current limit, pulse parameters, and waveform shapes
- ◆ Set and clear protection functions
- ◆ Select output and input coupling
- ◆ Monitor status
- ◆ Scroll through front panel menu commands.

Entry keys:

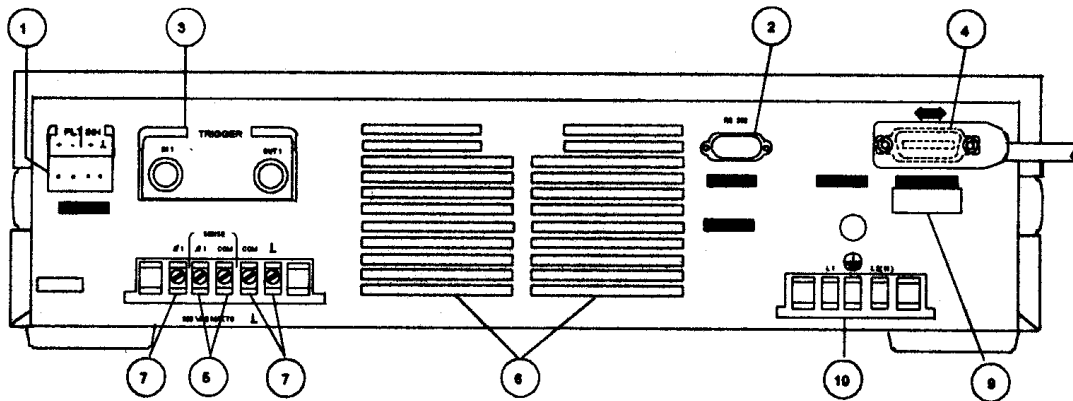
- ◆ Enter values
- ◆ Increment or decrement values
- ◆ Scroll through command parameters.
- ◆ Calibrate the ac source.

The rear panel - at a glance

Agilent Models 6814B 6834B 6843A



Agilent Models 6811B 6812B 6813B



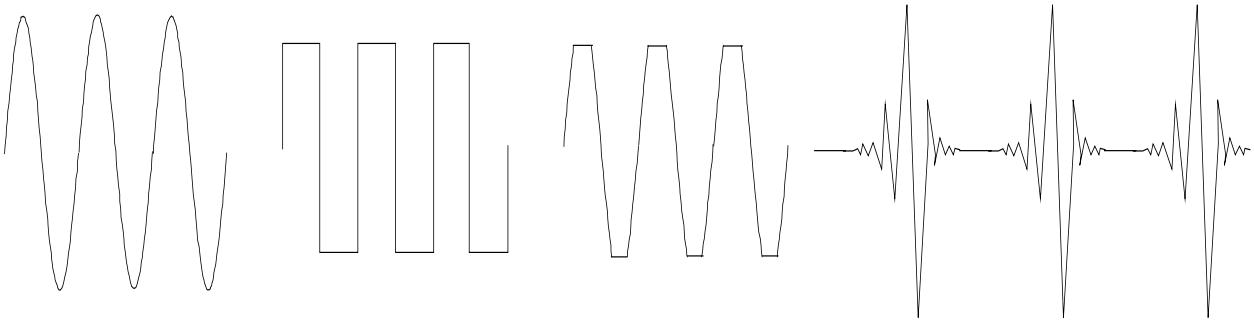
Rear Panel Connections (see Chapter 3 in the User's Guide for details)

- 1 INH (Remote Inhibit) TTL input signal for externally disabling the power source.
FLT (Discrete Fault Indicator) TTL output signal when there is a device fault.
- 2 RS-232 connector for remote controller.
- 3 TRIGGER BNC connectors for external trigger inputs and outputs.
- 4 GPIB connector and GPIB cable for remote controller.
- 5 SENSE connections for remote voltage sensing at the load.
- 6 Airflow Vents (do not block).
- 7 OUTPUT power connections to the load. ($\phi 2$, $\phi 3$ connections available on Agilent 6834B only.)
- 8 AC Input Line Fuses (Agilent 6814B/6834B/6843A only. Other models have internal fuses).
- 9 LINE RATING label specifies power source required by the power source.
- 10 AC Line Input connections from the power source.

What the ac source can do

Generate waveform shapes

- ◆ Sinewave
- ◆ Squarewave
- ◆ Clipped sinewave
- ◆ User-definable waveforms



Program the output

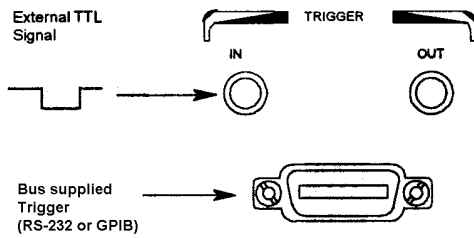
- | | |
|---|---|
| <ul style="list-style-type: none"> ◆ Phase ◆ Ac rms voltage ◆ Distortion ◆ Frequency ◆ Voltage and frequency slew rates ◆ Rms current limit | <p>Agilent Models 6811B, 6812B, 6813B program the following additional output functions:</p> <ul style="list-style-type: none"> ◆ Dc voltage ◆ Peak Current limit ◆ AC coupling ◆ Impedance |
|---|---|

Make the following measurements

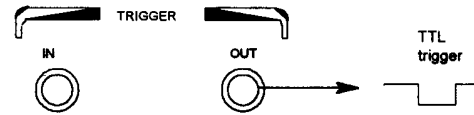
- | | |
|---|---|
| <ul style="list-style-type: none"> ◆ Ac rms, ac + dc rms voltage ◆ Ac rms, ac + dc rms current; plus repetitive and non-repetitive peak current ◆ Real, reactive, and apparent power ◆ Harmonic analysis of voltage and current waveforms giving amplitude, phase, and total harmonic distortion results of up to the 50th harmonic. ◆ Triggered acquisition of digitized voltage and current with extensive post-acquisition calculations | <p>Agilent Models 6811B, 6812B, 6813B make the following additional measurements:</p> <ul style="list-style-type: none"> ◆ Dc voltage ◆ Dc current <p>Agilent Model 6834B makes the following additional measurement:</p> <ul style="list-style-type: none"> ◆ Total power and neutral current |
|---|---|

Synchronize transient events or measurements with external signals

- ◆ Triggers applied to the unit

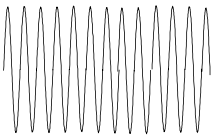


- ◆ Triggers generated by the unit

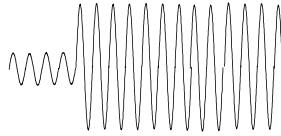


Operate in four transient modes

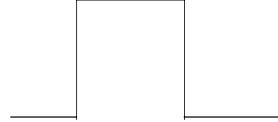
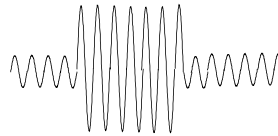
- ◆ Fixed



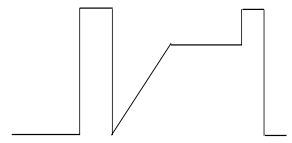
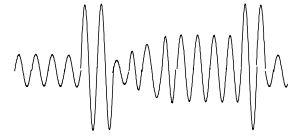
- ◆ Step



- ◆ Pulse



- ◆ List



Operate under local or remote control

- ◆ From the front panel keys
- ◆ Through the built-in GPIB or RS-232 interfaces

Implement protection features

- ◆ Over-voltage
- ◆ Over-current
- ◆ Over-power
- ◆ Over-temperature
- ◆ User-defined external events (via a FLT shutdown signal)

How to use the front panel

Make sure the unit is turned on.

From the System key group

Local

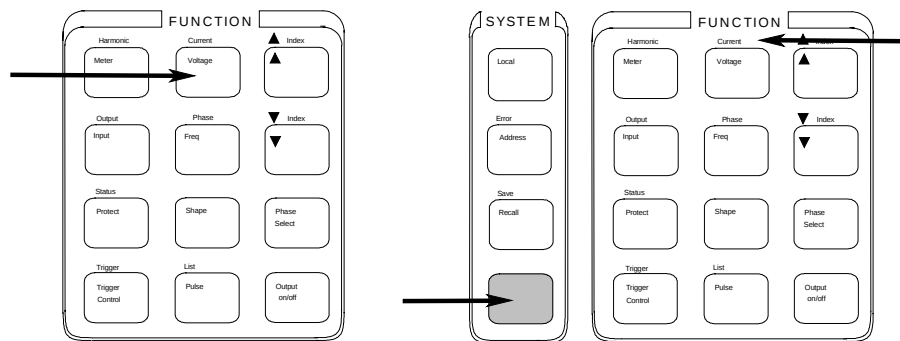
Press **Local** to activate the front panel keypad if the unit is not already in local mode. (If the Local Lockout command is in effect, cycle power to return the unit to local mode.)

From the Function key group

Voltage

Press **Voltage** to select the voltage function. To select a different function, simply press the appropriate key.

To select a function appearing above a key (such as **Current**), first press the blue shift key, then press the key below the function.

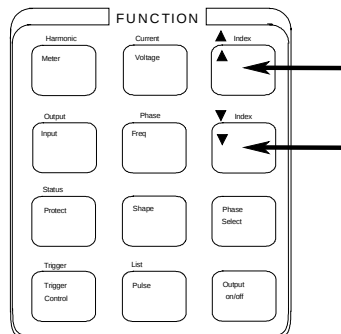


NOTE:

Pressing Output on/off, Phase Select, or (Shift) + Trigger immediately implements the function. Display annunciators indicate that an immediate action has occurred. All other function keys have command menus underneath them that are accessed via the ▲ and ▼ keys after the function key is pressed. Refer to “The front panel menus- at a glance”.



Use these keys to move through the command menus of the selected function.



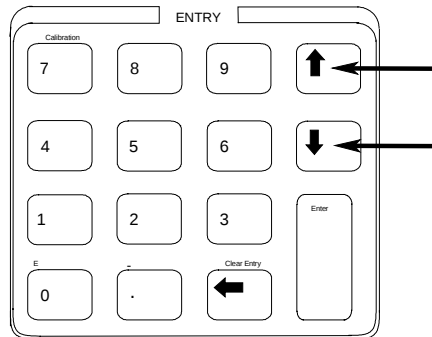
The following chart shows the commands in the Voltage function menu. Some commands may not appear on all models. Menus are circular, you can return to the starting position by continuously pressing ▲ or ▼.

Key	Display	Command Function
Voltage	VOLT <value>	Set immediate rms output voltage
▼	VOLT:T <value>	Set triggered rms output voltage
▼	VOLT:M FIXED	Select the voltage mode
▼	OFFSET <value>	Set immediate dc offset voltage
▼	OFFSET:T <value>	Set triggered dc offset voltage
▼	OFFSET:M FIXED	Select the dc offset voltage mode
▼	RANGE 150	Selects the voltage range
▼	SLEW <value>	Set immediate voltage slew rate in volts/second
▼	SLEW:T <value>	Set triggered voltage slew rate in volts/second
▼	SLEW:M FIXED	Select the voltage slew mode
▼	ALC INT	Select the voltage sense source
▼	ALC:DET RMS	Select the voltage sense detector

From the Entry key group



Use these keys to increment/decrement or select the command parameters to be executed. If the parameter is a number, use these keys to make minor changes to the value. **Enter** enters the selection and returns to the Meter function.



Key	Display	Description
Voltage , ▼	VOLT:M FIXED	Sets fixed mode
▼	VOLT:M STEP	Sets step mode
▼	VOLT:M PULSE	Sets pulse mode
▼	VOLT:M LIST	Sets list mode

1 to 9

Use the numeric Entry keys to directly enter a value for the command parameter. For example, to enter a value for the voltage parameter:

Key	Display	Description
Voltage	VOLT 0	0 volts
6	VOLT 60	60 volts
Enter	60 V 60 Hz	enters the value and returns to the Meter function

Some basic operations

Make sure the unit is turned on. Use either the front panel keys or the corresponding SCPI commands.

The column on the left indicates the front panel keys that program the indicated action. If the SCPI programming syntax is substantially different from the front panel menu command, it is shown inside parentheses ().

The text to the right describes the result. If appropriate, the resultant output waveshape is shown underneath the description.

Enable the output

Output On/Off

When the output is enabled, the programmed voltage appears at the output and the Dis annunciator turns off.

Select the output phase (Agilent 6834B only)

Phase Select

(INST:NSEL)

You can specify phases individually, or you can couple the phases. When phases are coupled, all three phase annunciators ($\phi 1$, $\phi 2$, $\phi 3$) on the front panel are on, indicating that commands will be sent to all three phases. Note that front panel metering is only done one phase at a time (except for the total power and neutral current measurements).

Set the voltage

Voltage

1

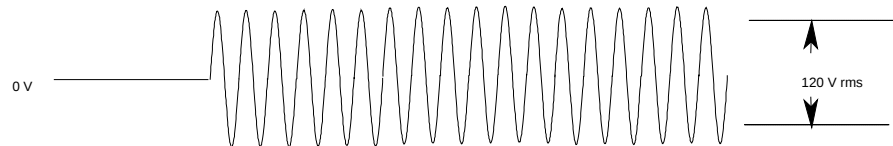
2

0

VOLT 120

Enter

When this command is sent, the output voltage is set to 120 V rms.



Set the frequency

Freq

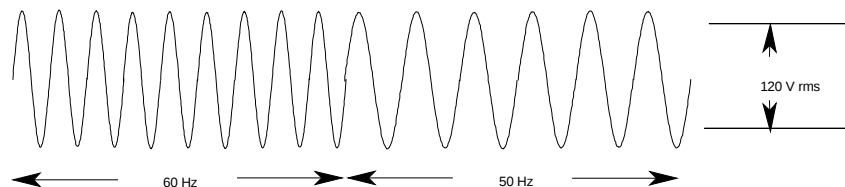
5

0

FREQ 50

Enter

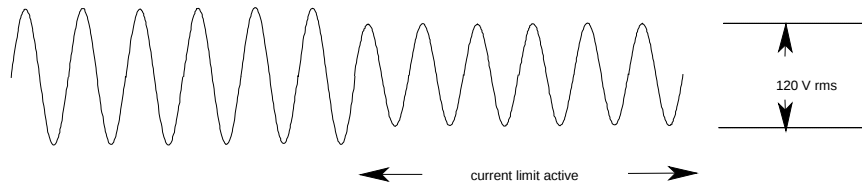
When this command is sent, the output frequency is set to 50 Hz.



Set the rms current limit (and peak current on Agilent 6811B/6812B/6813B units)

Shift
Current
1
0
CURR:LEV 10
Enter

When this command is sent, the rms current limit is set to 10 A. If more current than the programmed limit is drawn, the output voltage amplitude is reduced to keep the rms current within the specified limit. Press **Shift Current** and ▼ to access CURR:PEAK, which lets you set the peak current limit on Agilent 6811B/6812B/6813B units. Note that the peak current limit circuit on these units acts instantly and clips the output voltage to maintain the programmed peak limit.

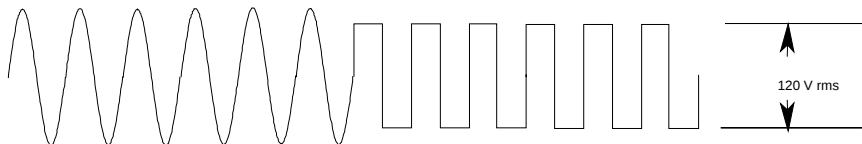


NOTE: The rms current limit circuit is slower than the peak current limit circuit and, depending on the setting of the peak current limit and the load on the output, your unit may generate momentary peak currents that can well exceed the rms current limit.

Select a waveshape

Shape
↓
SHAPE SQUARE
Enter

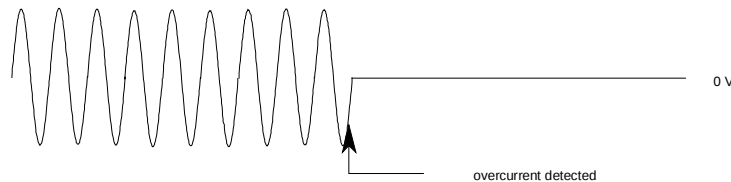
When this command is sent, the output generates a squarewave. Note that the peak-to-peak amplitude of the squarewave is less than that of a sinewave when it is programmed to the same rms voltage amplitude.



Program a protection function

Protect
CURR:LEV 10
Enter
Protect
▼
↓
CURR:PROT ON
Enter

These commands clear all previously set protection functions and then set the current protection, which disables the output when an overcurrent condition is detected. The OCP annunciator will light when this command is programmed.



Measuring the output

All measurements are based on acquiring and subsequently processing output waveform information. When the ac source is on, it takes measurements and updates the front panel meter continuously. The **Meter** key accesses the measurement functions from the front panel.

The SCPI MEASure command acquires **new** waveform information each time it is executed. The SCPI FETCh command does not acquire new waveform information but extracts the desired information from previously acquired waveform data. SCPI commands let you measure phases individually or simultaneously measure all phases using the FETCh command.

Measurement functions

The following example illustrates the measurements that can be returned by the front panel of the ac source when sourcing power to a typical non-resistive load such as a power supply. The ac source output voltage and current waveforms are shown on the next page.

NOTE: On Agilent 6811B, 6812B, and 6813B units, the **Input** key selects the meter coupling and hence, what the meter will measure. The choices are: AC only, DC only, or AC + DC.

Meter	120V 60HZ	rms voltage and frequency
(FETC/MEAS)		
▼	120V 1.925A	rms voltage and current
▼	1.93A 60HZ	rms current and frequency
▼	120V 150.5W	rms voltage and power
▼	2.82 CREST F	current crest factor
▼	5.379A PK REP	peak current, repetitive
▼	36.83A PK NR	peak current, non repetitive
▼	230.6VA	apparent power
▼	175.2 VAR	reactive power
▼	0.65 PFACTOR	power factor

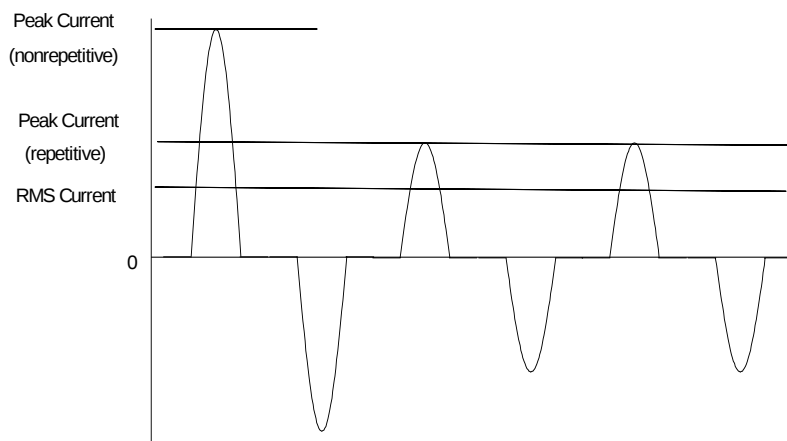
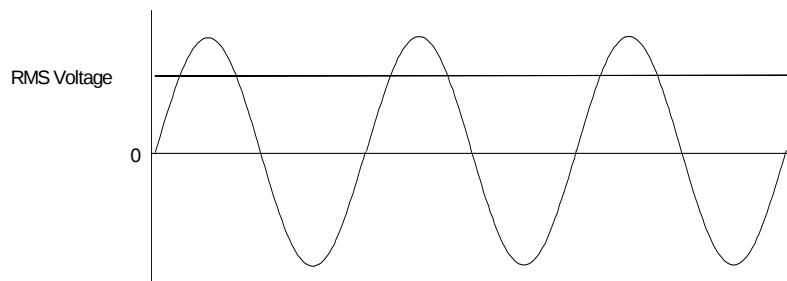
Note that in addition to the measurement functions listed above, the Agilent 6834B unit can also measure total power of all phases and neutral rms current.

Harmonic measurements

Use the harmonic menu to make harmonic measurements of the output current. The following example illustrates the current magnitude measurements returned at harmonics 0 to 5. Note that harmonic 1 is the fundamental. Harmonic 0 is the dc component.

Shift	Harmonic	0.01A I:MAG:0	current amplitude at harmonic 0
(FETC/MEAS)			
Shift	▲Index	1.43A I:MAG:1	current amplitude at harmonic 1
Shift	▲Index	0.01A I:MAG:2	current amplitude at harmonic 2
Shift	▲Index	0.91A I:MAG:3	current amplitude at harmonic 3
Shift	▲Index	0.01A I:MAG:4	current amplitude at harmonic 4
Shift	▲Index	0.74A I:MAG:5	current amplitude at harmonic 5

Output voltage and current waveforms



Programming output transients

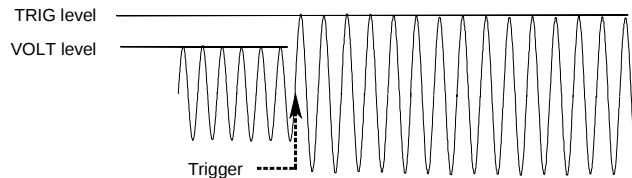
Up to now the ac source has been programmed with the transient system in Fixed mode. The following examples briefly describe the transient system's Step, Pulse, and List modes, which require the application of a trigger to implement the transient mode.

NOTE: For the examples that follow, press **Shift Output**, scroll to *RST and press **Enter** to reset the unit prior to each example. Also press **Enter** to enter or activate each selection.

Program an output step

Voltage
VOLT:M STEP
VOLT 120
VOLT:T 150
Trigger Control
INIT IMMED
Shift Trigger

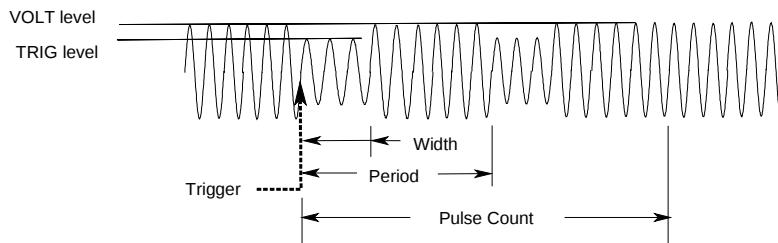
Step transients transition to a new output level upon receipt of a trigger. When these commands are sent, the voltage amplitude is stepped from its previous setting to 150 V rms upon receipt of a trigger.



Program an output pulse

Voltage
VOLT:M PULSE
VOLT 120
VOLT:T 90
Pulse
WIDTH .01
PER .03
COUNT 2
Trigger Control
INIT IMMED
Shift Trigger

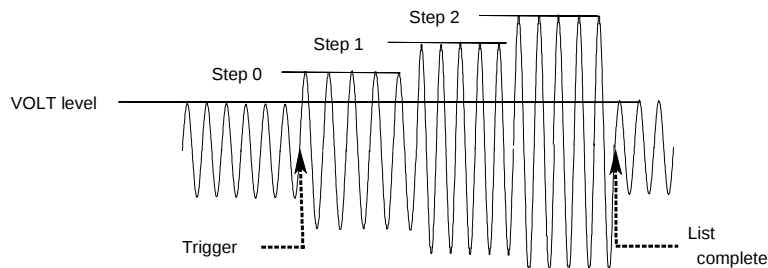
Pulse transients transition to a new output level upon receipt of a trigger and return to the original level after a specified time, repeating this action by the number of times specified by the count. When these commands are sent, two output pulses step the voltage amplitude from its previous setting to 90 V rms upon receipt of a trigger. At the end of the specified period (multiplied by the count), the voltage returns to its original level.



Program an output list

Voltage
VOLT: M LIST
VOLT 120
Shift List
DWELL [0] .5
DWELL [1] .5
DWELL [2] .5
VOLT [0] 130
VOLT [1] 140
VOLT [2] 150
STEP AUTO
Trigger Control
INIT IMMED
Shift Trigger

List transients generate complex output sequences. When these commands are sent, the voltage amplitude is sequentially stepped to three levels upon receipt of a trigger, and then returns to the original voltage level. The output remains at each list step for .5 seconds. The values inside the brackets ([]) are the list index references. Use **Clear Entry** to clear a list.



More transient examples

The previous examples showed how the transient system can be used to control the output voltage amplitude. The transient system can also control output frequency, phase, waveform shape, voltage and frequency slew rates, offset voltage, and peak current limit. The following examples illustrate how the transient system's Pulse mode can generate frequency, shape, phase, and voltage slew pulses.

Freq

FREQ:M PULSE

FREQ 60

FREQ:T 50

Pulse

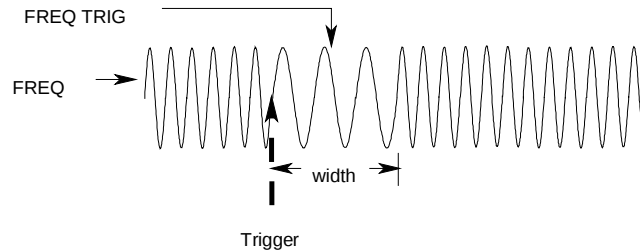
WIDTH .1

Trigger Control

INIT IMMED

Shift

Trigger



Shape

SHAPE:M PULSE

SHAPE SINE

SHAPE:T SQUARE

Pulse

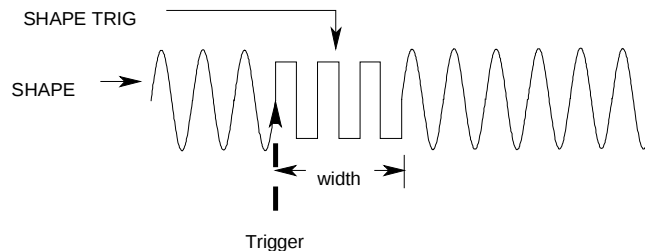
WIDTH .05

Trigger Control

INIT IMMED

Shift

Trigger



Shift

Phase

PHASE:M PULSE

PHASE 0

PHASE:T 180

Pulse

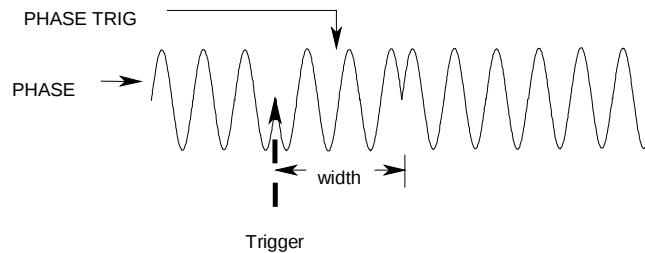
WIDTH .05

Trigger Control

INIT IMMED

Shift

Trigger



Voltage

VOLT:M PULSE

VOLT 120

VOLT:T 150

SLEW:M PULSE

SLEW 10000

SLEW:T 1000

Pulse

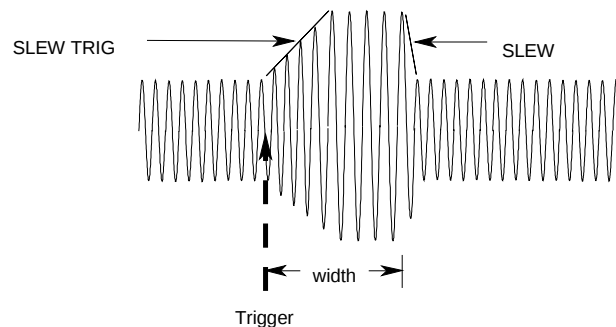
WIDTH .1

Trigger Control

INIT IMMED

Shift

Trigger



Programming trigger synchronization and delays

The previous transient examples were programmed to respond to immediate triggers. However, delayed and phase synchronized triggers can also be programmed as shown in the following examples.

No delay; no phase synchronization

Voltage

VOLT:M STEP

VOLT 120

VOLT:T 150

Trigger Control

DELAY 0

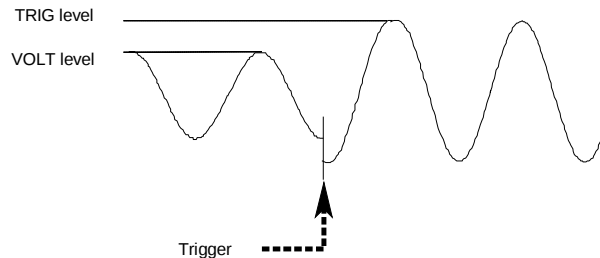
SYNC:SOUR IMM

INIT:IMMED

Shift

Trigger

When these commands are sent, the voltage amplitude changes immediately upon the receipt of a trigger.



No delay; 90 degrees phase synchronization

Voltage

VOLT:M STEP

VOLT 120

VOLT:T 150

Trigger Control

DELAY 0

SYNC:SOUR PHAS

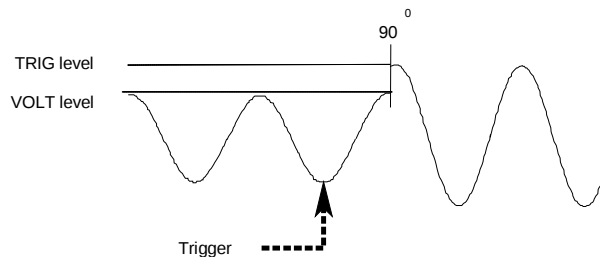
SYNC:PHAS 90

INIT:IMMED

Shift

Trigger

When these commands are sent, the voltage amplitude changes at the next 90 degree phase angle that occurs following the receipt of a trigger.



Trigger delay; no phase synchronization

Voltage

VOLT:M STEP

VOLT 120

VOLT:T 150

Trigger Control

DELAY .0167

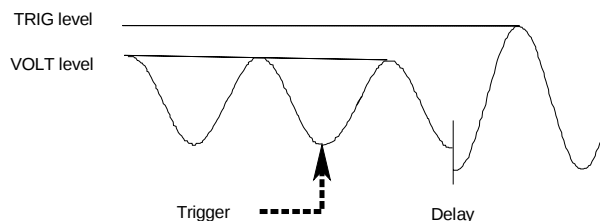
SYNC:SOUR IMM

INIT:IMMED

Shift

Trigger

When these commands are sent, the voltage amplitude changes .0167 seconds after the receipt of a trigger.



Trigger delay; 90 degree phase synchronization

Voltage

VOLT:M STEP

VOLT 120

VOLT:T 150

Trigger Control

DELAY .0167

SYNC:SOUR PHAS

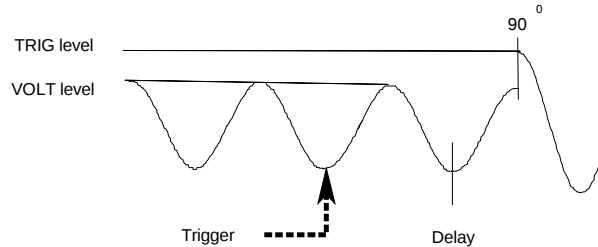
SYNC:PHAS 90

INIT:IMMED

Shift

Trigger

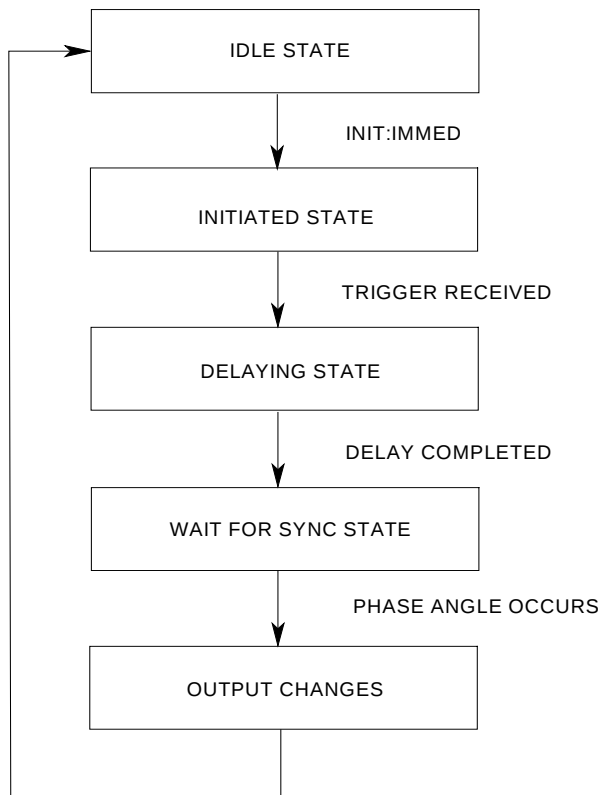
When these commands are sent, the voltage amplitude changes at the next 90 degree phase angle that occurs after the .0167 second delay has expired, following the receipt of a trigger.



More about the trigger system

In the previous examples, a front panel trigger is used to generate the output transients. The trigger is shown occurring at 270 degrees but actual triggers may occur at any phase. Delay and phase synchronization however, will occur as programmed.

Note that trigger system used in the ac source provides great flexibility in generating triggers. The following figure is a simplified model of the trigger system. A complete discussion of the capabilities of the trigger system is found in the ac source Programming Guide.



The front panel menus - at a glance

SYSTEM Keys

Local

Press to change the ac source's selected interface from remote operation to local (front panel) operation. Pressing the key will have no effect if the interface state is already Local, Local-with-Lockout, or Remote-with-Lockout.

Error

Address

Error Functions

ERROR <value> Displays system error codes stored in the SCPI error queue. If no errors exist, a 0 is displayed. The Err annunciator is lit when there are errors.

Address Functions

ADDRESS <value> sets the GPIB address
 INTF GPIB | RS232 selects an interface
 BAUDRATE 300 | 600 | 1200 selects the baud rate
 2400 | 4800 | 9600
 PARITY NONE | EVEN | ODD selects message parity
 LANG SCPI | E9012 selects the language
 NOUTPUTS 1 | 3 selects the number of outputs¹

Save

Recall

Save Functions

Press to save an existing ac source state in nonvolatile memory. Up to 16 states can be saved (0-15).

Recall Functions

Press to place the ac source into a previously saved state. Up to 16 states can be recalled (0-15).

First press and release this blue shift key to select a shifted function. The Shift annunciator lights when this key is pressed.

FUNCTION Keys

Harmonic

Meter

Harmonic Functions

<reading>A I:MAG: <index> current harmonic magnitude
 <reading>° I:PHASE: <index> current harmonic phase
 <reading>V V:MAG: <index> voltage harmonic magnitude
 <reading>° V:PHASE: <index> voltage harmonic phase
 <reading>N N:MAG: <index> neutral current harmonic magnitude
 <reading>° N:PHASE: <index> neutral current harmonic phase
 <reading> CURR:THD current total % harmonic distortion
 <reading> VOLT:THD voltage total % harmonic distortion

Meter functions continued on next column

FUNCTION Keys

Meter Functions

<reading>V <reading>Hz rms voltage and frequency
 <reading>V <reading>A rms voltage and rms current
 <reading>A <reading>Hz rms current and frequency
 <reading>V <reading>W rms voltage and power
 <reading> CREST F current crest factor
 <reading>A PK REP peak current, repetitive
 <reading>A PK NR peak current, nonrepetitive
 <reading>VA apparent power
 <reading> VAR reactive power
 <reading>W TOTAL total power all phases¹
 <reading> PFACTOR power factor
 <reading>A NEUTRAL neutral rms current¹

Output

Input

Output Functions

OUTP:COUP AC | DC select output coupling³
 *RST executes the *RST command
 TTL:SOUR BOT | EOT | LIST select Trigger Out source coupling
 TTL:STATE ON | OFF set Trigger Out state
 IMP:STATE ON | OFF set output impedance programming³
 IMP:REAL <value> set real part of output impedance³
 IMP:REAC <value> set reactive part of output impedance³
 PON:STATE RST | RCL0 select power-on state command
 RI LATCHING | LIVE | OFF sets remote inhibit mode
 DFI ON | OFF sets discrete fault indicator state
 DFI:SOUR QUES | OPER select the DFI source
 ESB | RQS | OFF

Input Functions

INP:COUP AC | DC | ACDC choose meter coupling
 CURR:RANGE HIGH | LOW current measurement range³
 WINDOW KBESSEL | RECT select harmonic measurement window meter

Status

Prot

Status Functions

*CLS executes the *CLS command
 STATUS:PRESET executes STATUS:PRESet command
 *ESR? <value> return Event Status register value
 *STB <value> return Status Byte register value
 OPER:EVENT? <value> return STAT:OPER:EVENT? value
 OPER:COND <value> return STAT:OPER:COND? value
 QUES:EVENT? <value> return STAT:QUES:EVENT? value
 QUES:COND <value> return STAT:QUES:COND? value

Protect Functions

PROT:CLEAR clears latched protection signal
 CURR:PROT ON | OFF set overcurrent protection function
 VOLT:PROT ON | OFF set overvoltage protection function³
 VOLT:PROT <value> set overvoltage protection level
 DELAY <value> set a time delay for activating a protection fault

Trigger**Trigger
Control**

Trigger Function	
Pressing the Shift Trigger key generates an immediate trigger	
Trigger Control Functions	
INIT:IMMED	Initiate trigger immediately
INIT:CONT ON OFF	Initiate trigger continuously
TRIG:SOUR BUS EXT	Select transient trigger source
TTLT IMM	
DELAY <value>	Set trigger delay in seconds
ABORT	Abort all trigger sequences
SYNC:SOUR PHASE IMM	Select synchronous trigger source
SYNC:PHASE <value>	Set synchronous phase reference

Current**Voltage**

Current Functions	
CURR:LEV <value>	set immediate rms current limit ⁴
CURR:PEAK <value>	set immediate peak current limit ³
CURR:PEAK:T <value>	set triggered peak current limit ³
CURR:PEAK:M FIXED STEP	select the peak current limit mode ³
PULSE LIST	
Voltage Functions	
VOLT <value>	set immediate ac output voltage ⁴
VOLT:T <value>	set triggered output voltage ⁴
VOLT:M FIXED STEP	select the voltage mode ⁴
PULSE LIST	
RANGE 150 300	set the voltage range ^{2, 4}
OFFSET <value>	set immediate dc offset voltage ³
OFFSET:T <value>	set triggered dc offset voltage ³
OFFSET:M FIXED STEP	select the dc offset voltage mode ³
PULSE LIST	
SLEW <value>	set voltage slew in V/sec ⁴
SLEW:T <value>	set triggered voltage slew in V/sec ⁴
SLEW:M FIXED STEP	select the voltage slew mode ⁴
PULSE LIST	
OFF:SLW <value>	set dc offset slew in V/sec ³
OFF:SLW:T <value>	set triggered dc offset slew in V/sec ³
OFF:SLW:M FIXED STEP	select the dc offset voltage slew mode ³
PULSE LIST	
ALC INT EXT	select the voltage sense source
ALC:DET RTIME RMS	select the voltage sense detector ³

Phase**Freq**

Phase Functions	
PHASE <value>	set immediate output phase ⁴
PHASE:T <value>	set triggered output phase ⁴
PHASE:M FIXED STEP	select the phase mode ⁴
PULSE LIST	
Freq Functions	
FREQ <value>	set immediate output frequency
FREQ:T <value>	set triggered output frequency
FREQ:M FIXED STEP	select the frequency mode
PULSE LIST	
SLEW <value>	set frequency slew in Hz/sec
SLEW:T <value>	set triggered frequency slew Hz/sec
SLEW:M FIXED STEP	select the frequency slew mode
PULSE LIST	

Shape

Shape Functions		
SHAPE	SINE SQUARE	set immediate shape
	CSIN <user>	
SHAPE:T	SINE SQUARE	set triggered shape
	CSIN <user>	
SHAPE:M	FIXED STEP	set shape mode
	PULSE LIST	
CLIP <value>		set clipping level

List**Pulse**

List Functions	
COUNT <value>	number of times a list repeats
DWEL:<index> <value>	list of output dwell times
FREQ:<index> <value>	list of output frequencies
FSLW:<index> <value>	list of output frequency slew rates
IPK:<index> <value>	list of output peak current limits ³
OFFS:<index> <value>	list of dc output voltages ³
OSLW:<index> <value>	dc offset voltage slew rate list ³
PHASE:<index> <value>	list of output voltage phase angles ⁴
SHAP:<index> SINE SQUARE	list of output waveform shapes
CSIN <user>	
STEP ONCE AUTO	set response of list to triggers
TTLT:<index> ON OFF	set trigger out pulse list
VOLT:<index> <value>	list of ac output voltages ⁴
VSLW:<index> <value>	list of output voltage slew rates ⁴
Pulse Functions	
WIDTH <value>	set the pulse width
COUNT <value>	set the number of output pulses
DCYCLE <value>	set the pulse duty cycle
PER <value>	set the pulse period count
HOLD WIDTH DCYCLE	set parameter that is held constant

▼ Index**▲ Index****▼ ▲ Index Functions**

These are Shift Index keys which are used to scroll through indexed functions. Press these keys to step through integers 0 through 50 for a harmonic list, or 0 through 99 for list points. Hold down these keys to rapidly access any harmonic or list point.

▼ ▲ Functions

These keys let you move through the choices in a command list. Command lists are circular; you can return to the starting position by continuously pressing either key.

Phase**Select**

This key applies to 3-phase ac sources only. Pressing this key successively selects phase 1 first, followed by phase 2, phase 3, and then all three phases.

Output**On/Off**

This key toggles the output on and off. When off, the ac source output is disabled and the **Dis** annunciator is on.

ENTRY Keys



These keys let you scroll through choices in a **parameter** list that apply to a specific command. Parameter lists are circular; you can return to the starting position by continuously pressing either key. If the command has a numeric range, these keys increment or decrement the existing value.



The numeric keys 0 through 9 are used for entering numeric values.



Press shift and this key to enter a minus.
Press this key alone to enter a decimal point.

Enter

Until you press the Enter key, the values or parameters you enter with the other Entry keys are displayed but not entered into the ac source.

E



Press Shift and this key to enter an exponent.

Clear Entry



Press Shift and this key to abort a keypad entry and clear the value. **When editing a list**, pressing Clear Entry truncates or clears the list at the presently displayed list point. Press this key alone to backspace and delete the last digit entered

Calibration



Press Shift and this key to access the calibration menu. Refer to appendix B in the user's for more information.

Notes:

- 1 Valid for Model Agilent 6834B only
- 2 Valid for Models Agilent 6814B, 6834B, and 6843A only
- 3 Valid for Models Agilent 6811B, 6812B, and 6813B only
- 4 Phase selectable on Agilent 6834B

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