

## Agilent Technologies 33120A Option 001 External Clock Reference

### Can my 33120A be retrofit with the Option 001 External Clock Reference?

All instruments shipped after August, 1994 may be updated. To be certain, find the serial number on the rear panel of the unit. If it is less than serial number US34004078, your unit is not able to accept the retrofit.

### What do I order?

Ask for the 33120-80001 timebase retrofit kit.

### Can I install the retrofit myself?

The actual installation can be done by most people, however the 33120A requires a frequency adjustment to complete the procedure. The 1 kHz frequency measurement should be done with an accuracy of at least 8 digits (0.01 ppm). [Retrofit instructions](#)

### What are the key specifications?

The option will allow the 33120A timebase to lock to a 10 MHz signal ( $\pm 50$  Hz) with a level range of  $-10$  dBm to  $+15$  dBm into  $50\Omega$ . For more complete specifications, see the [33120A data sheet](#).

### How do I use the option?

The retrofit for the option comes with a [User's and Service Guide](#). Here are some steps to help get you started.

- To phase lock to an external clock signal  
Attach the 10 MHz clock signal to the rear-panel *Ext Ref In* BNC terminal. The 33120A's internal 40 MHz timebase is now synchronized to the 10 MHz clock signal and will not drift.
- To phase lock multiple function generators  
Attach a BNC from the 10 MHz clock source of one generator (labeled *Ref Out* on the 33120A) to the reference input on the second (labeled *Ext Ref In* on the 33120A). These are now your Master and Slave units, respectively. The units are synchronized and will not drift, however the initial phase offset relationship is random.
- To adjust phase  
Real-time phase adjustments can be made on sine, square, ramp, or triangle waveforms only. Adjustments made on arbitrary waveforms will only be implemented when the value is entered.
  1. Turn on the menu by pressing *Shift* and *Menu On/Off*
  2. Press the right or left arrow keys to move to *G: PHASE MENU*
  3. Press the down arrow key to move down a level.
  4. Press the right or left arrow keys to move to *1: ADJUST*
  5. Press the down arrow key to move down a level to adjust the phase offset.
  6. Using the arrow keys and/or the knob or the numeric entry method, adjust the phase to any value between  $-360$  degrees and  $+360$  degrees.
  7. Press *Enter* to turn off the menu and save your changes.
- To begin the 33120A and another unit (either a 33120A or 33250A) simultaneously
  1. Connect the *Ext Trig* between the two units.
  2. Setup both units with the desired waveform, frequency, amplitude, and offset.
  3. Enable the burst mode on both instruments. On the 33120A, press *Shift* and then *Burst*
  4. Set the burst count to the desired number of cycles or infinite to output the desired waveform until the waveform key is pressed. On the 33120A Master unit, Press *Shift* and

- then *Recall Menu* to be brought immediately to the Burst Count (4: *BURST CNT*) command in the modulation menu. Press the down arrow key and set the number of cycles, or press the right arrow key until the *CYC* units are flashing. Then, press the down arrow key to display *INFINITE*. Press *Enter* to save the change and turn off the menu. Repeat on the slave unit.
5. Set the burst phase on each waveform. On the 33120A Master unit, press *Shift* and then *Recall Menu* to be brought to the Burst Count command again (4: *BURST CNT*). Press the right arrow to reach the Burst Phase command (6: *BURST PHAS*). Press the down arrow then adjust the phase to any value between  $-360$  degrees and  $+360$  degrees using the arrow keys and/or the knob or the numeric entry method. Press the *Enter* key to save the change and exit the menu. Repeat on the slave unit.
  6. Set up the trigger to output on the Master unit. On the 33120A, turn on the menu by pressing *Shift* and *Menu On/Off*. Press the right or left arrow keys to move to G: *PHASE MENU*. Press the down arrow key to move down a level. Press the right or left arrow keys to move to 3: *TRIG OUT*. Move down a level by pressing the down arrow, then enable the trigger output by pressing the right or left arrow keys until the display reads *ENABLE*. Press *Enter* to save the change and exit the menu.
  7. Execute a single trigger on the Master unit to initiate the triggered burst. On the 33120A, press the *Single* trigger key on the front panel of the unit. The 33120A will trigger itself and also output a trigger pulse from the rear-panel *Ext Trig* terminal. At this point, the function generators should be synchronized with the specified phase relationship.
- The 33120A can be configured to generate an error condition whenever the clock reference is lost. To be notified when the unit is unlocked
    1. Turn on the menu by pressing *Shift* and *Menu On/Off*
    2. Press the right or left arrow keys to move to G: *PHASE MENU*
    3. Press the down arrow key to move down a level.
    4. Press the right or left arrow keys to move to 4: *UNLOCK ERR*
    5. Press the down arrow key to move down a level and then press the right or left arrow keys until the display reads *ENABLE*
    6. Press *Enter* to turn off the menu and save your changes.