

**[+90°] and [-90°]**

The [+90°] and [-90°] keys add or subtract 90.000° from the reference phase shift. The phase does not need to be displayed to use these keys.

**Zero Phase**

Pressing the [+90°] and [-90°] keys together will set the reference phase shift to 0.00°.

**[Freq]**

Pressing this key displays the reference frequency in the Reference display.

If the reference mode is external, then the measured reference frequency is displayed. The knob does nothing in this case. If the harmonic number is greater than 1 and the external reference goes above 102 kHz/N where N is the harmonic number, then the harmonic number is reset to 1. The reference will always track the external reference signal.

If the reference mode is internal, then the internal oscillator frequency is displayed. The oscillator frequency may adjusted with the knob. The frequency has 4 1/2 digits or 0.1 mHz resolution, whichever is larger. The frequency can range from 0.001 Hz to 102.00 kHz. **The upper limit is decreased if the harmonic number is greater than 1. In this case, the upper limit is 102 kHz/N where N is the harmonic number.**

**[Amp]**

Pressing this key displays the Sine Output Amplitude in the Reference display. Use the knob to adjust the amplitude from 4 mVrms to 5 Vrms with 2 mV resolution. The output impedance of the Sine Out is 50Ω. If the signal is terminated in 50Ω, the amplitude will be half of the programmed value.

When the reference mode is internal, this is the excitation source provided by the SR830. When an external reference is used, this sine output provides a sine wave phase locked to the external reference.

The rear panel TTL Output provides a TTL square wave at the reference frequency. This square wave is generated by discriminating the zero crossings of the sine output. This signal can provide a trigger or sync signal to the experiment when the internal reference source is used. This signal is also available when the reference is externally provided. In this case, the TTL Output is phase locked to the external reference.

**[Harm #]**

The SR830 can detect signals at harmonics of the reference frequency. The SR830 multiplies the input signal with digital sine waves at a multiple of the reference. Only signals at this harmonic will be detected. Signals at the original reference frequency are not detected and are attenuated as if they were noise.

**Whenever the harmonic detect number is greater than 1, the HARM# indicator in the Reference display will flash to remind you that the SR830 is detecting signals at a multiple of the reference frequency.**

**Always check the harmonic detect number before making any measurements.**