Stanford Research Systems

1290 D Reamwood Avenue, Sunnyvale, CA 94089
Phone: 408-744-9040   FAX: 408-744-9049
email: dan@thinkSRS.com   Web: www.thinkSRS.com

SR510 / SR530 FAST TIME CONSTANT MODIFICATION

The post-demodulator time constants of the SR510 may be removed or shortened by simply changing one capacitor on the main circuit board. Removing this capacitor will reduce the time constant to a few microseconds. Note that the SR510 does NOT use a square wave demodulator. This means that there is always a 2f component to the output signal, which is equal in magnitude to the desired DC output. Removing or shorting the time constant will allow this 2f component to reach the output. In many servo type applications, this is not a problem since the servo loop has a finite response time. In addition, changing the time constant will cause the noise measurement to be wrong since it relies on the time constant to determine the noise bandwidth.

To remove the second pole of the output filter, simply select NONE for the post time constant. To change the PRE time constant, the value of C414 needs to be changed. The standard value is 0.033 microfarads. This capacitor determines the PRE time constant from 1 ms to 300ms. To change these time constants, simply scale the capacitance by the desired amount. For example, to reduce the time constants by 10 (100uS to 30mS), C414 should be changed to 0.0033 microfarads. Removing C414 altogether leaves a time constant of a few microseconds. Note that this change only affects the PRE time constant positions on the front panel from 1ms to 300ms. The time constant positions from 1s to 100s are set by C415 which is normally a 10uF capacitor. This capacitor can be scaled also. For very short time constants however, it is recommended that only C414 be changed and only the ms time constant positions be used.

To change C414, remove the top and bottom panels of the SR510. C414 is mounted at board location F3 (near the front center). Carefully desolder C414 and either leave it open (no time constant) or replace with the desired value. Note that the replacement should be made with a mylar capacitor. C415 is located at G4 (the very large capacitor). Change C415 only if it is necessary to have a wide selection of altered time constants. For the SR530 the y time constants must also be changed. They are located on the quadrature oscillator board.

X Channel	Y Channel
C414 - C415	C1114 - C1115
C416 - C417	C1116 - C1117

Note: For a time constant less than a few hundred microseconds, the output capacitor must be removed. On the SR530 these capacitors are located on the X and Y outputs after U1204 and U1205. Their 0.luF value gives an output time constant of about 220us. On the SR510 this capacitor is C607 on the output of U513.