MODEL SR550/552

Voltage Pre-amplifier

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Rev. 2.6 (08/2001)

MODEL SR550

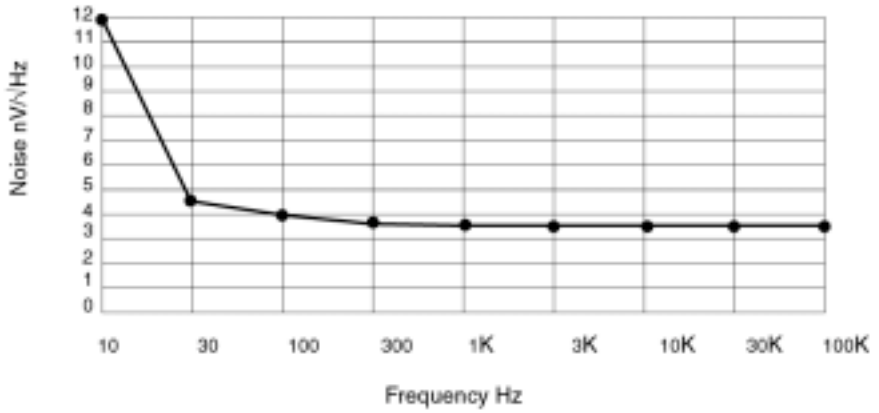
Voltage Pre-amplifier

manual

Stanford Research Systems

SR550 Preamplifier Specifications Summary

Input Impedance	100 MΩ + 25 pF	
Inputs	Single ended or differential (switch selectable)	
Maximum Inputs	250 mV RMS for overload 100 Vdc, 10 Vac damage threshold	
Noise	3.6 nV/√Hz at 1000 Hz 4.0 nV/√Hz at 100 Hz 13 nV/√Hz at 10 Hz (all figures are Typical)	
Common Mode	Range: Rejection:	1 Volt peak 90 dB at 100 Hz
Gain	1,2,5,10 SR510/530 DSP Lock-Ins	 Automatically set by SR510 or SR530 Lock-in depending on full scale sensitivity and dynamic reserve. Sensitivity ranges from 10 nV to 200 mV full scale (expand off) Gain is set to 10. Divide Lock-In reading by 10 for correct amplitude.
Gain Accuracy	2% (2 Hz to 100 kHz)	
Gain Stability	100 ppm/°C	
Outputs	(A) single ended (600Ω impedance) (B) shielded ground	
Maximum Output	7 Volts peak to peak	
Power	Supplied by SRS Lock-in via connector cable.	
Mechanical	1.3" X 3.0" X 5.1", weight 1 lb.	
Warranty	One year parts and labor on materials and workmanship.	



OPERATING INSTRUCTIONS

The SR550 Voltage Pre-Amplifier is designed to be used with either the SR510/530 lock-ins as well as the newer DSP lock-ins. The SR550 reduces the input noise and extends the full scale sensitivity to 10 nV (without expand). When used as a remote pre-amplifier, the SR550 can eliminate the effects of noise pickup on long signal cables.

Power and control are supplied to the SR550 via the 9 pin cable which is supplied with the unit. Attach one end of the cable to the connector on the rear of the SR550. With the lock-in power off, connect the other end of the cable to the PRE-AMP connector on the rear of lock-in. Both ends of the cable are equivalent. If a longer cable is required, any standard 9 pin cable will suffice since all connections are straight through. When the lock-in power is on, the POWER indicator on the SR550 will light.

CONNECTING THE SR550

The (A) Output of the SR550 should be connected to the (A) Input of the lock-in. For most applications, this single connection will be adequate. The lock-in Input Selector should be set to (A). For situations where there may be noise pick-up on this cable, it is better to connect the SR550 (B) Output (shielded pre-amp ground) to the (B) Input of the lock-in as well. The (A) and (B) cables should be twisted together to prevent inductive pick-up. The lock-in Input Selector should then be set to (A-B).

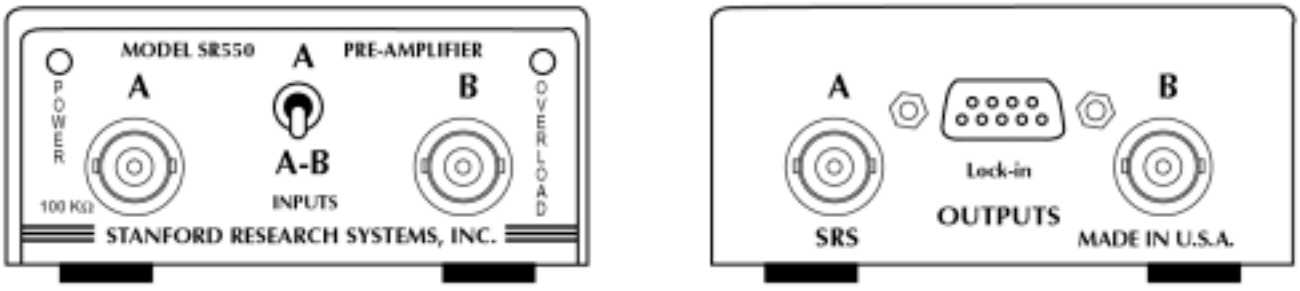
The SR550 (A) and (B) Inputs should now be used as the lock-in voltage inputs. The input switch selects single ended, (A), or differential, (A-B), operation. The input impedance is 100 MΩ, 25 pF. The connector shields are isolated from the chassis ground by 10 Ohms. These inputs are protected to 100 Vdc but the ac input should never exceed 10 V peak. The maximum input before overload is 350 mV peak (250 mV RMS). The OVERLOAD indicator will light whenever the pre-amplifier overloads. Note that overloads that occur after the pre-amplifier are indicated by the lock-in's overload indicator.

USING THE SR550 WITH THE SR510/530

The SR550/552 lock-ins sense the presence of the SR550 through the power cable and takes it into account when setting the gain of its own amplifiers. Thus, to obtain the correct overall gain, the SR550 output must be connected to the voltage inputs of the lock-in.

The overall sensitivity of the lock-in plus the pre-amplifier is displayed as the sensitivity on the lock-in front panel. It is NOT necessary to divide the displayed sensitivity by 10. When setting the sensitivity, the presence of the SR550 is transparent.

The gain of the SR550 is 1, 2, 5, or 10. The gain is controlled by the lock-in and is set to maximize the pre-amplifier gain while maintaining the selected dynamic reserve. For most sensitivities, the pre-amplifier gain will be 10. The following table summarizes the gain allocation.



SR550 Pre-Amplifier Front Panel and Rear Panel

DYN RES	FS Sensitivity	SR550 Gain
LOW	> 50 mV	1
20 db	50 mV	2
	20 mV	5
	< 20 mV	10
NORM	> 5 mV	1
40 db	5 mV	2
	2 mV	5
	< 2 mV	10
HIGH	> 500 μV	1
60 db	500 μV	2
	200 μV	5
	< 200 μV	10

When the SR550 is connected, the full scale sensitivity can extend to 10 nV (no expand). The 10, 20, 50 nV sensitivities can be reached using the normal lock-in controls. If the SR550 is disconnected while the sensitivity is below 100 nV, the sensitivity will revert back to 100 nV.

From the computer interface, the presence of the SR550 can be determined using the 'H' command. Also, gain codes 1-3 are acceptable in the 'G' command to set sensitivities below 100 nV. Pre-amplifier overloads are not detectable via the computer interface.

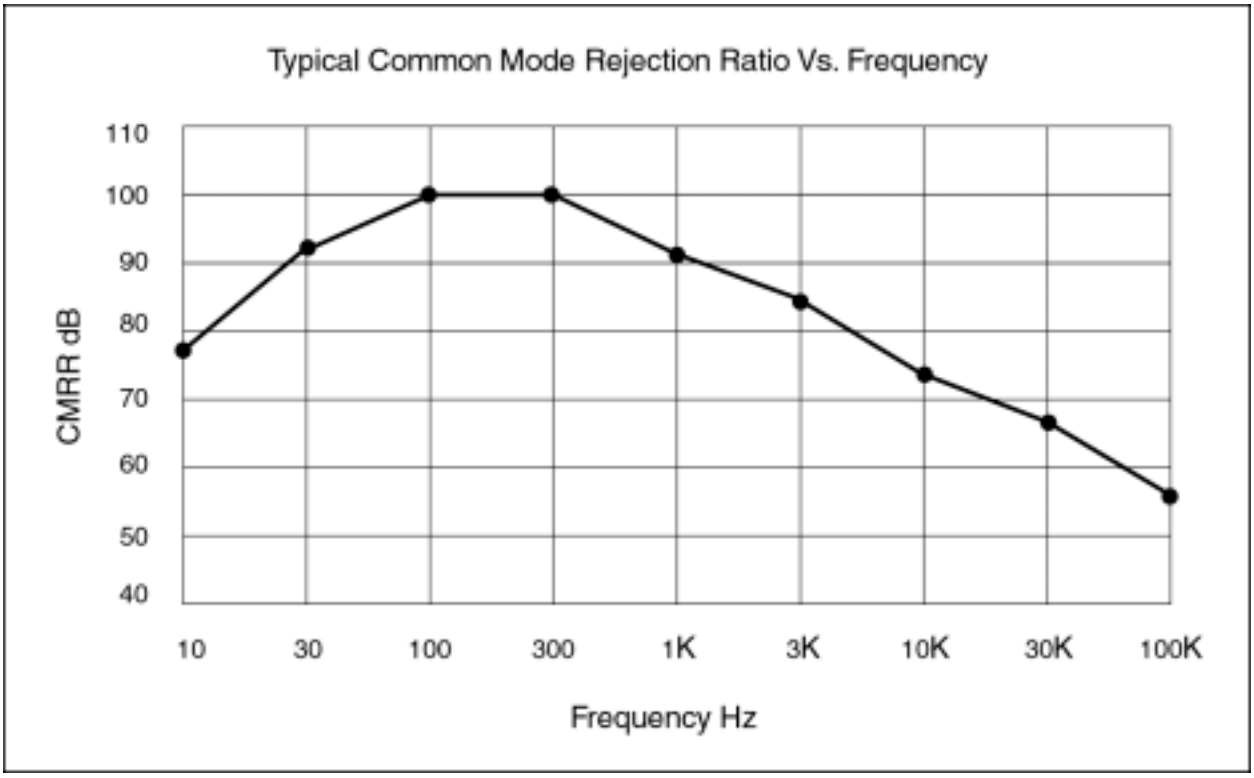
USING THE SR550 WITH SRS DSP LOCK-INS

The SR550 is not sensed by the DSP lock-ins. The DSP lock-in does NOT compensate for the gain of the preamp. The gain of the preamp is set to 10. Measurements made with the preamp need to be divided by 10.

The SR550 is AC coupled from 1 Hz to 100 kHz. Set the lock-in input to AC coupled since the signal must be above 1 Hz. Frequencies below 1 Hz will not be detected by the SR550.

COMMON MODE ADJUST

The common mode rejection of the SR550 is adjusted by the small screw on the right side of the enclosure. The CMR is set at the factory, however, it may be necessary to re-adjust it, particularly if there is one specific frequency which is important. The easiest way to peak the CMR is to use the internal oscillator of the lock-in (or any signal generator). Apply a reference signal to the lock-in REFERENCE INPUT. Apply a 100 mV signal to both the (A) and (B) inputs of the SR550. Check the SR550 connections by switching the input selector to (A). The lock-in should read 100 mV (with the phase adjusted on the SR510). Now switch the SR550 to (A-B). Adjust the lock-in sensitivity to obtain a 50% output. Adjust the CMR screw on the SR550 to minimize the lock-in output. On the SR510, it is necessary to check the output when 90° of phase shift is added as well. On a dual phase lock-in, use the R output to avoid phase shifts.



THE SR550 WITHOUT A LOCK-IN

The SR550 can be powered with an external power supply. Power is applied through the 9 pin connector as described below.

Pin	Voltage	Current
1	+20 V	100 mA
2	+5 V	10 mA
6	-20 V	100 mA
7	Ground	
8	Ground	

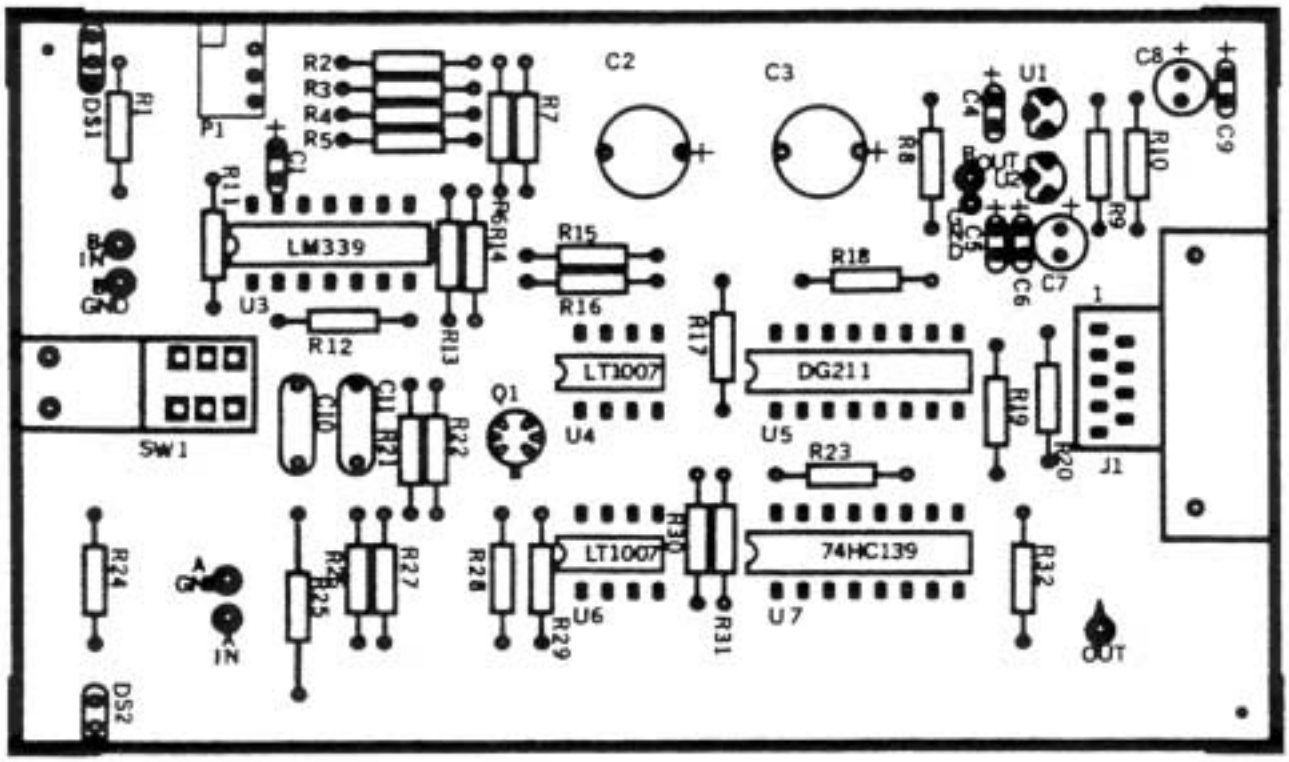
All three voltages are required. Pins 7 and 8 should be tied together. All other pins should be left open. The gain will be 10 in this configuration. Grounding pin 3 will change the gain to 5, and grounding pin 4 will change the gain to 2. Grounding both pins 3 and 4 will change the gain to 1.

PARTS LIST

REF.	SRS part#	VALUE	DESCRIPTION
C 1	5-00040-509	1.0U	Capacitor, Electrolytic, 50V, 20%, Rad
C 2	5-00030-520	2200U	Capacitor, Electrolytic, 16V, 20%, Rad
C 3	5-00030-520	2200U	Capacitor, Electrolytic, 16V, 20%, Rad
C 4	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 5	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 6	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 7	5-00035-521	47U	Capacitor, Electrolytic, 25V, 20%, Rad
C 8	5-00035-521	47U	Capacitor, Electrolytic, 25V, 20%, Rad
C 9	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 10	5-00056-512	.1U	Cap, Stacked Metal Film 50V 5% -40/+85c
C 11	5-00056-512	.1U	Cap, Stacked Metal Film 50V 5% -40/+85c
DS1	3-00011-303	RED	LED, T1 Package
DS2	3-00010-303	GREEN	LED, T1 Package
J 1	1-00014-160	9 PIN D	Connector, D-Sub, Right Angle PC, Female
P 1	4-00304-445	10	Pot, Multi-Turn, Side Adjust
P 2	4-00011-441	10K	Pot, Multi-Turn Trim, 3/8" Square Top Ad
PC1	7-00099-701	SR550-1	Printed Circuit Board
Q 1	3-00545-323	2N5564	Transistor, TO-71 Package
R 1	4-00093-401	6.2K	Resistor, Carbon Film, 1/4W, 5%
R 2	4-00047-401	2.2	Resistor, Carbon Film, 1/4W, 5%
R 3	4-00047-401	2.2	Resistor, Carbon Film, 1/4W, 5%
R 4	4-00027-401	1.5K	Resistor, Carbon Film, 1/4W, 5%
R 5	4-00027-401	1.5K	Resistor, Carbon Film, 1/4W, 5%
R 6	4-01609-408	106	Resistor, Metal Film, 1/8W, 0.1%, 25ppm
R 7	4-01609-408	106	Resistor, Metal Film, 1/8W, 0.1%, 25ppm
R 8	4-00141-407	100	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 9	4-00052-401	20	Resistor, Carbon Film, 1/4W, 5%
R 10	4-00052-401	20	Resistor, Carbon Film, 1/4W, 5%
R 11	4-00061-401	240K	Resistor, Carbon Film, 1/4W, 5%
R 12	4-00102-401	75K	Resistor, Carbon Film, 1/4W, 5%
R 13	4-00061-401	240K	Resistor, Carbon Film, 1/4W, 5%
R 14	4-00081-401	470	Resistor, Carbon Film, 1/4W, 5%
R 15	4-01608-408	988	Resistor, Metal Film, 1/8W, 0.1%, 25ppm
R 16	4-01608-408	988	Resistor, Metal Film, 1/8W, 0.1%, 25ppm
R 17	4-00180-407	301	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 18	4-00141-407	100	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 19	4-00032-401	100K	Resistor, Carbon Film, 1/4W, 5%
R 20	4-00032-401	100K	Resistor, Carbon Film, 1/4W, 5%
R 21	4-00080-401	47	Resistor, Carbon Film, 1/4W, 5%
R 22	4-00080-401	47	Resistor, Carbon Film, 1/4W, 5%
R 23	4-00193-407	499	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 24	4-00305-401	4.3K	Resistor, Carbon Film, 1/4W, 5%
R 25	4-00107-402	10	Resistor, Carbon Comp, 1/2W, 5%
R 26	4-00306-407	100M	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 27	4-00306-407	100M	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 28	4-00217-408	1.000K	Resistor, Metal Film, 1/8W, 0.1%, 25ppm
R 29	4-00217-408	1.000K	Resistor, Metal Film, 1/8W, 0.1%, 25ppm
R 30	4-00159-407	2.10K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 31	4-00130-407	1.00K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 32	4-00095-401	620	Resistor, Carbon Film, 1/4W, 5%

R 33	4-00102-401	75K	Resistor, Carbon Film, 1/4W, 5%
SW1	2-00022-217	DPDT	Switch, On-None-On, Toggle, Right Angle
U 1	3-00124-325	79L15	Transistor, TO-92 Package
U 2	3-00118-325	78L15	Transistor, TO-92 Package
U 3	3-00193-340	LM339	Integrated Circuit (Thru-hole Pkg)
U 4	3-00106-340	LT1007	Integrated Circuit (Thru-hole Pkg)
U 5	3-00076-340	DG211	Integrated Circuit (Thru-hole Pkg)
U 6	3-00106-340	LT1007	Integrated Circuit (Thru-hole Pkg)
U 7	3-00038-340	74HC139	Integrated Circuit (Thru-hole Pkg)
Z 0	0-00025-005	3/8"	Lugs
Z 0	0-00043-011	4-40 KEP	Nut, Kep
Z 0	0-00079-031	4-40X3/16 M/F	Standoff
Z 0	0-00122-053	2-1/4" #24	Wire #24 UL1007 Strip 1/4x1/4 Tin
Z 0	0-00140-009	SHEET	Mylar Sheet
Z 0	0-00149-020	4-40X1/4PF	Screw, Flathead Phillips
Z 0	0-00188-000	SR550FOOT	Hardware, Misc.
Z 0	1-00003-120	BNC	Connector, BNC
Z 0	1-00041-170	DB9-DB9/MM	Cable Assembly, Multiconductor
Z 0	1-00073-120	INSL	Connector, BNC
Z 0	7-00097-720	SR550-2	Fabricated Part
Z 0	7-00098-720	SR550-3	Fabricated Part

PC Layout



MODEL SR552

Voltage Pre-amplifier

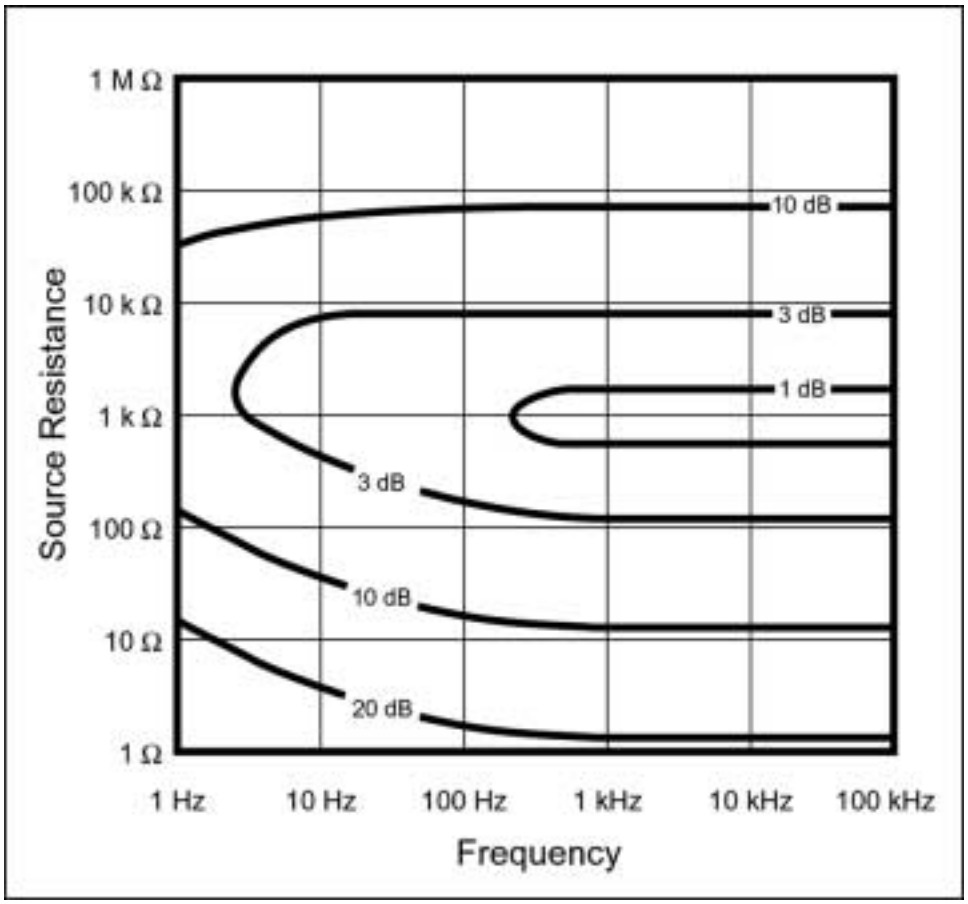
manual

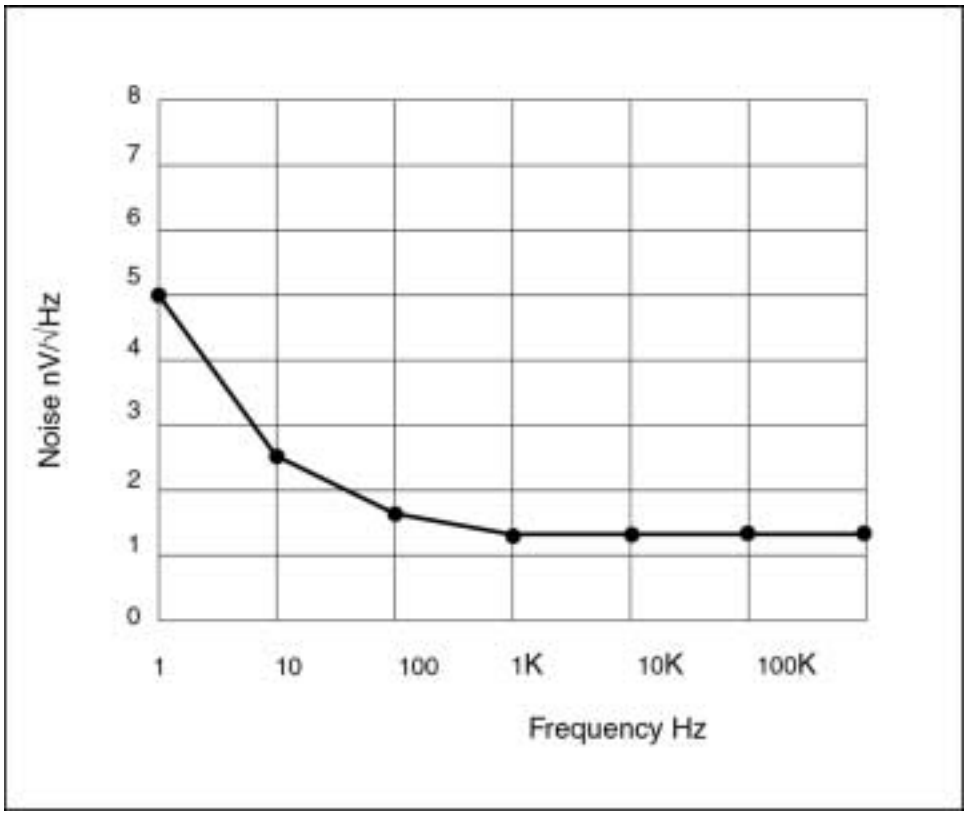
Stanford Research Systems

SR552 Preamplifier Specifications Summary

IInput Impedance	100 KΩ + 25 pF	
Inputs	Single ended or differential (switch selectable)	
Maximum Inputs	70 mV rms for overload Damage threshold: 20 Vac, 50 Vdc	
Noise	1.4 nV/√Hz at 1000 Hz 1.6 nV/√Hz at 100 Hz 2.5 nV/√Hz at 10 Hz (all figures are Typical)	
Common Mode	Range: Rejection:	1 Volt peak 100 dB at 100 Hz
Gain	10,20,50,100 SR510/530 DSP Lock-Ins	 Automatically set by SR510 or SR530 Lock-In depending on sensitivity and dynamic reserve. Sensitivity ranges from 10 nV to 200 mV full scale (with expand off). Note: Lock-in readings must be divided by 10. Gain is set to 100. Divide lock-in recordings by 100 for correct amplitude.
Gain Accuracy	2% (2 Hz to 100 kHz)	
Gain Stability	200 ppm/°C	
Outputs	(A) single ended (600Ω impedance) (B) shielded ground	
Maximum Output	10 Volts peak	
Power	Supplied by SRS Lock-In via control cable.	
Mechanical	Size 1.3" X 3.0" X 5.1" Weight 1 lb.	
Warranty	One year parts and labor on materials and workmanship.	

Noise Figure Contour





OPERATING INSTRUCTIONS

The SR552 Voltage Pre-Amplifier is designed to be used with either the SR510/530 lock-ins as well as the newer DSP lock-ins. The SR552 reduces the input noise and extends the full scale sensitivity to 10 nV (without expand). When used as a remote pre-amplifier, the SR552 can eliminate the effects of noise pickup on long signal cables.

Power and control are supplied to the SR552 via the 9 pin cable which is supplied with the unit. Attach one end of the cable to the connector on the rear of the SR552. With the lock-in power off, connect the other end of the cable to the PRE-AMP connector on the rear of lock-in. Both ends of the cable are equivalent. If a longer cable is required, any standard 9 pin cable will suffice since all connections are straight through. When the lock-in power is on, the POWER indicator on the SR552 will light.

CONNECTING THE SR552

The (A) Output of the SR552 should be connected to the (A) Input of the lock-in. For most applications, this single connection will be adequate. The lock-in Input Selector should be set to (A). For situations where there may be noise pick-up on this cable, it is better to connect the SR552 (B) Output (shielded pre-amp ground) to the (B) Input of the lock-in as well. The (A) and (B) cables should be twisted together to prevent inductive pick-up. The lock-in Input Selector should then be set to (A-B).

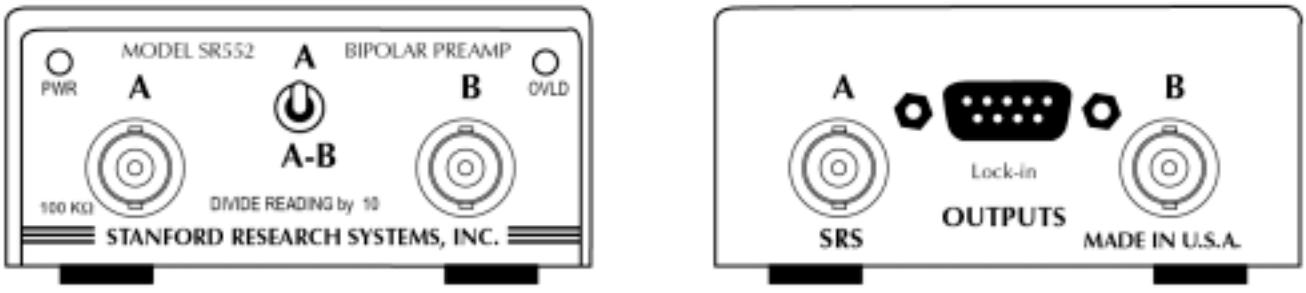
The SR552 (A) and (B) Inputs should now be used as the lock-in voltage inputs. The input switch selects single ended, (A), or differential, (A-B), operation. The input impedance is 100 kΩ, 25 pF. The connector shields are isolated from the chassis ground by 10 Ohms. These inputs are protected to 100 Vdc but the ac input should never exceed 10 V peak. The maximum input before overload is 70 mV rms. The OVERLOAD indicator will light whenever the pre-amplifier overloads. Note that overloads that occur after the pre-amplifier are indicated by the lock-in's overload indicator.

USING THE SR550 WITH THE SR510/530

The SR510/530 lock-ins sense the presence of the SR552 through the power cable and takes it into account when setting the gain of its own amplifiers. Thus, to obtain the correct overall gain, the SR552 output must be connected to the voltage inputs of the lock-in.

The overall sensitivity of the lock-in plus the pre-amplifier is displayed as the sensitivity on the lock-in front panel. It is necessary to divide the displayed sensitivity by 10.

The gain of the SR552 is 10, 20, 50, or 100. The gain is controlled by the lock-in and is set to maximize the pre-amplifier gain while maintaining the selected dynamic reserve. For most sensitivities, the pre-amplifier gain will be 100. The following table summarizes the gain allocation.



SR552 Pre-Amplifier Front Panel and Rear Panel

DYN RES	FS Sensitivity	SR552 Gain
LOW	> 50 mV	10
20 db	50 mV	20
	20 mV	50
	< 20 mV	100
NORM	> 5 mV	10
40 db	5 mV	20
	2 mV	50
	< 2 mV	100
HIGH	> 500 μV	10
60 db	500 μV	20
	200 μV	50
	< 200 μV	100

When the SR552 is connected, the full scale sensitivity can extend to 10 nV (no expand). The 10, 20, 50 nV sensitivities can be reached using the normal lock-in controls. If the SR552 is disconnected while the sensitivity is below 100 nV, the sensitivity will revert back to 100 nV.

From the computer interface, the presence of the SR552 can be determined using the 'H' command. Also, gain codes 1-3 are acceptable in the 'G' command to set sensitivities below 100 nV. Pre-amplifier overloads are not detectable via the computer interface.

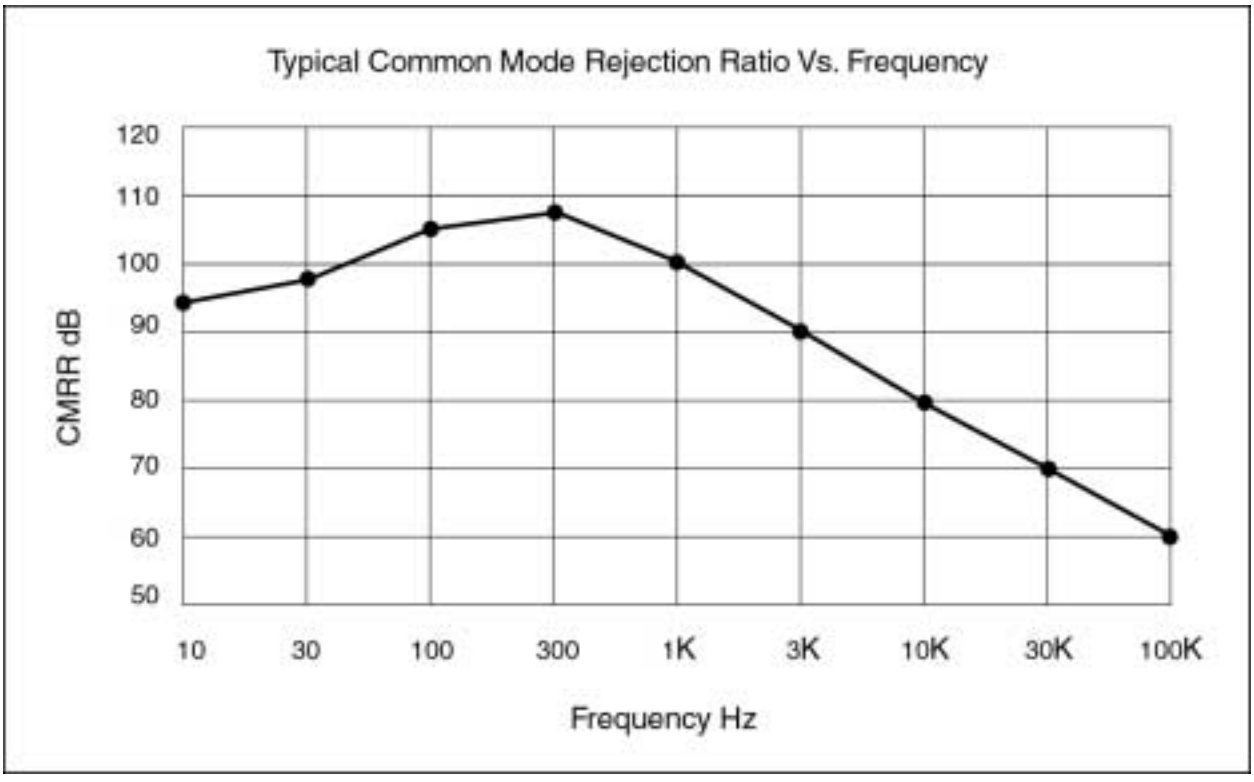
USING THE SR552 WITH SRS DSP LOCK-INS

The SR552 is not sensed by the DSP lock-ins. The DSP lock-in does NOT compensate for the gain of the preamp. The gain of the preamp is set to 10. Measurements made with the preamp need to be divided by 100.

The SR552 is AC coupled from 1 Hz to 100 kHz. Set the lock-in input to AC coupled since the signal must be above 1 Hz. Frequencies below 1 Hz will not be detected by the SR552.

COMMON MODE ADJUST

The common mode rejection of the SR552 is adjusted by the small screw on the right side of the enclosure. The CMR is set at the factory, however, it may be necessary to re-adjust it, particularly if there is one specific frequency which is important. The easiest way to peak the CMR is to use the internal oscillator of the lock-in (or any signal generator). Apply a reference signal to the lock-in REFERENCE INPUT. Apply a 100 mV signal to both the (A) and (B) inputs of the SR552. Check the SR552 connections by switching the input selector to (A). The lock-in should read 100 mV (with the phase adjusted on the SR510). Now switch the SR552 to (A-B). Adjust the lock-in sensitivity to obtain a 50% output. Adjust the CMR screw on the SR552 to minimize the lock-in output. On the SR510, it is necessary to check the output when 90° of phase shift is added as well. On a



dual phase lock-in, use the R output to avoid phase shifts.

The SR552 without a lock-in

The SR552 can be powered with an external power supply. Power is applied through the 9 pin connector as described below.

Pin	Voltage	Current
1	+20 V	100 mA
2	+5 V	10 mA
6	-20 V	100 mA
7,8	Ground	

All three voltages are required. Pins 7 and 8 should be tied together. All other pins should be left open. The gain will be 100 in this configuration. Grounding pin 3 will change the gain to 50, and grounding pin 4 will change the gain to 20. Grounding both pins 3 and 4 will change the gain to 10.

PARTS LIST

REF.	SRS part#	VALUE	DESCRIPTION
C 1	5-00040-509	1.0U	Capacitor, Electrolytic, 50V, 20%, Rad
C 2	5-00030-520	2200U	Capacitor, Electrolytic, 16V, 20%, Rad
C 3	5-00030-520	2200U	Capacitor, Electrolytic, 16V, 20%, Rad
C 4	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 5	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 6	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 7	5-00044-509	47U	Capacitor, Electrolytic, 50V, 20%, Rad
C 8	5-00044-509	47U	Capacitor, Electrolytic, 50V, 20%, Rad
C 9	5-00100-517	2.2U	Capacitor, Tantalum, 35V, 20%, Rad
C 10	5-00034-526	100U	Capacitor, Electrolytic, 35V, 20%, Rad
C 11	5-00034-526	100U	Capacitor, Electrolytic, 35V, 20%, Rad
C 12	5-00192-542	22U MIN	Cap, Mini Electrolytic, 50V, 20% Radial
C 13	5-00008-501	22P	Capacitor, Ceramic Disc, 50V, 10%, SL
C 14	5-00008-501	22P	Capacitor, Ceramic Disc, 50V, 10%, SL
D 1	3-00011-303	RED	LED, T1 Package
D 2	3-00010-303	GREEN	LED, T1 Package
J 1	1-00014-160	9 PIN D	Connector, D-Sub, Right Angle PC, Female
P 1	4-00354-445	20	Pot, Multi-Turn, Side Adjust
P 2	4-00353-441	100	Pot, Multi-Turn Trim, 3/8" Square Top Ad
PC1	7-00127-701	SR552	Printed Circuit Board
Q 1	3-00231-328	MAT02-EH	Transistor, TO-78 Package
R 1	4-00093-401	6.2K	Resistor, Carbon Film, 1/4W, 5%
R 2	4-00047-401	2.2	Resistor, Carbon Film, 1/4W, 5%
R 3	4-00047-401	2.2	Resistor, Carbon Film, 1/4W, 5%
R 6	4-00356-407	20	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 7	4-00356-407	20	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 8	4-00141-407	100	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 9	4-00052-401	20	Resistor, Carbon Film, 1/4W, 5%
R 10	4-00052-401	20	Resistor, Carbon Film, 1/4W, 5%
R 11	4-00061-401	240K	Resistor, Carbon Film, 1/4W, 5%
R 12	4-00082-401	470K	Resistor, Carbon Film, 1/4W, 5%
R 13	4-00061-401	240K	Resistor, Carbon Film, 1/4W, 5%
R 14	4-00021-401	1.0K	Resistor, Carbon Film, 1/4W, 5%
R 15	4-00351-407	2.32K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 16	4-00351-407	2.32K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 17	4-00180-407	301	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 18	4-00141-407	100	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 21	4-00176-407	3.01K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 23	4-00193-407	499	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 24	4-00093-401	6.2K	Resistor, Carbon Film, 1/4W, 5%
R 25	4-00107-402	10	Resistor, Carbon Comp, 1/2W, 5%
R 26	4-00142-407	100K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 27	4-00142-407	100K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 28	4-00204-407	750	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 29	4-00204-407	750	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 30	4-00158-407	2.00K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 31	4-00178-407	3.83K	Resistor, Metal Film, 1/8W, 1%, 50PPM
R 32	4-00081-401	470	Resistor, Carbon Film, 1/4W, 5%

R 33	4-00082-401	470K	Resistor, Carbon Film, 1/4W, 5%
RU7A	4-00032-401	100K	Resistor, Carbon Film, 1/4W, 5%
RU7B	4-00032-401	100K	Resistor, Carbon Film, 1/4W, 5%
SW1	2-00025-217	SPDT	Switch, On-None-On, Toggle, Right Angle
U 1	3-00124-325	79L15	Transistor, TO-92 Package
U 2	3-00118-325	78L15	Transistor, TO-92 Package
U 3	3-00193-340	LM339	Integrated Circuit (Thru-hole Pkg)
U 4	8-00085-860	SR513 ASSY	SRS sub assemblies
U 5	3-00076-340	DG211	Integrated Circuit (Thru-hole Pkg)
U 7	3-00038-340	74HC139	Integrated Circuit (Thru-hole Pkg)
Z 0	0-00025-005	3/8"	Lugs
Z 0	0-00043-011	4-40 KEP	Nut, Kep
Z 0	0-00079-031	4-40X3/16 M/F	Standoff
Z 0	0-00122-053	2-1/4" #24	Wire #24 UL1007 Strip 1/4x1/4 Tin
Z 0	0-00140-009	SHEET	Mylar Sheet
Z 0	0-00149-020	4-40X1/4PF	Screw, Flathead Phillips
Z 0	0-00188-000	SR552FOOT	Hardware, Misc.
Z 0	1-00003-120	BNC	Connector, BNC
Z 0	1-00041-170	DB9-DB9/MM	Cable Assembly, Multiconductor
Z 0	1-00073-120	INSL	Connector, BNC
Z 0	7-00098-720	SR552-3	Fabricated Part
Z 0	7-00128-720	SR552-2	Fabricated Part

PC Layout