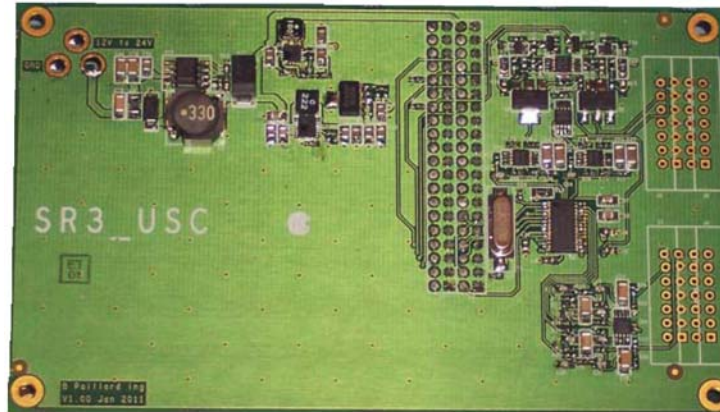


SR3_USC

User's Manual



by

Soft dB

In association with



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1 Main Features

SR3_USC adds the following functions to the *Signal_Ranger_mk3* DSP board:

- 2 fixed-gain analog inputs that can be configured for:
 - AC coupling
 - ICP sensor
- 2 analog outputs.
- One 9V to 24V power supply input capable of powering both SR3 and SR3_USC

2 Technical Data

2.1 ICP-Capable Analog Inputs

- Number of inputs: 2
- Input type: Single Ended
- Linear input range: +-2.5V
- Safe input range: 25 V pk-pk
- Resolution: 24 bits
- Input Coupling: AC, ICP
- Noise: 10 μ V RMS (106 dB dynamic range) @ 48 kHz
15 μ V RMS (102 dB dynamic range) @ 96 kHz
200 μ V RMS (80 dB dynamic range) @ 192 kHz
- Harmonic distortion: 115 dB @ 1 kHz – 500 mV RMS @ 48 kHz
- Sampling rate: 48 kHz, 96 kHz, 192 kHz
- Analog input bandwidth: up to 96 kHz
- Anti-aliasing filter: Integrated
- Input impedance: 10 $k\Omega$
- Low-Frequency Cutoff: 4 Hz
- Group-delay: 12 samples @ 48 kHz
10 samples @ 96 kHz
9 samples @ 192 kHz

2.2 Analog Outputs

- Number of outputs: 2
- Output type: Single Ended
- Linear output range: +-2.2 V
- Resolution: 24 bits
- Output coupling: AC
- Noise: 9 μ V RMS (104 dB dynamic range) @ 48 kHz
80 μ V RMS (85 dB dynamic range) @ 96 kHz
1.2 mV RMS (62 dB dynamic range) @ 192 kHz
- Harmonic distortion: 115 dB @ 1 kHz – 500 mV RMS @ 48 kHz
- Sampling rate: 48 kHz, 96 kHz, 192 kHz
- Analog input bandwidth: up to 96 kHz
- Anti-aliasing filter: Integrated
- Low-Frequency Cutoff: 6.5 Hz (on 10 $k\Omega$ load)
- Output impedance: 50 Ω
- Source/Sink ability: +-2 mA @ 25 degC
+-1 mA @ 100 degC

- Group-delay: 12 samples @ 48 kHz
10 samples @ 96 kHz
9 samples @ 192 kHz

3 Hardware Installation

- Remove the power connector from the SR3 board.
- Add a power connector to the SR3_USC board
- Insert the SR3_USC board on top of the *Signal_Ranger_mk3* DSP board. Make sure that:
 - All connectors are properly aligned. There is no key on the connectors so it is possible to misalign the connectors.
 - All connectors are fully inserted.
 - The boards must be powered from SR3_USC and NOT from SR3.

4 Hardware Description

4.1 Connector Map

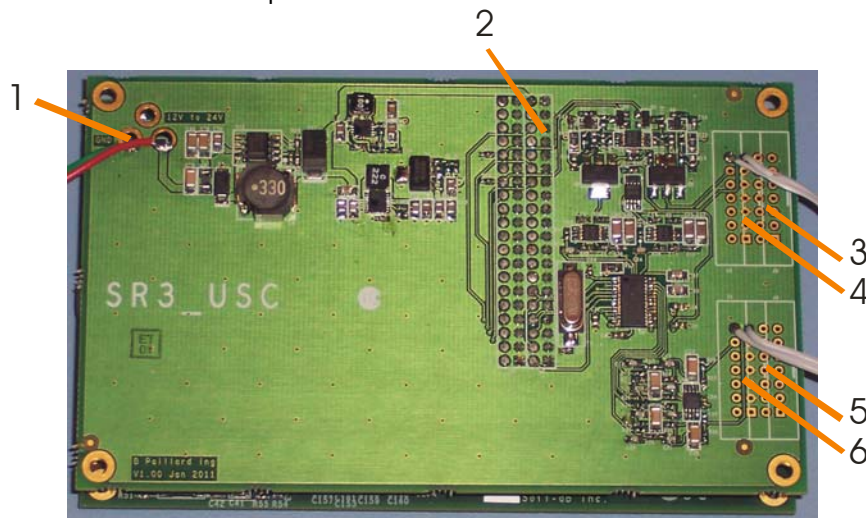


Figure 1 SR3_USC board

Legend:

1. Power Connector
2. J6, J7 SR3 Mating Connectors
3. J5 SR3 Mating Connector
4. Analog Input Connector J2
5. J4 SR3 Mating Connector
6. Analog Output Connector J1



The board stack should be powered from the SR3_USC power connector (1). **Never power the stack from the SR3 power connector.** The SR3_USC power connector land-area is designed to insert a power connector on the reverse side of the board. When soldered this way the power connector's opening is in exactly the same location as a connector soldered on SR3. Alternately a pair of wires can be soldered in the same location.



The board stack can be powered from a 9V to 24V source.

4.2 Analog Connectors J1 and J2

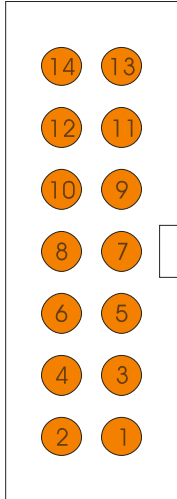


Figure 2: Analog Connector J1 and J2

4.2.1 J1 Pinout

No	Function	No	Function
14	OUT_1	13	Gnd
12	OUT_2	11	Gnd
10	NC	9	Gnd
8	NC	7	Gnd
6	NC	5	Gnd
4	NC	3	Gnd
2	NC	1	NC

Table 1 Analog Output Connector J1

4.2.2 J2 Pinout

No	Function	No	Function
14	IN_1	13	Gnd
12	IN_2	11	Gnd
10	NC	9	Gnd
8	NC	7	Gnd
8	NC	5	Gnd
4	NC	3	Gnd
2	NC	1	NC

Table 2 Analog Input Connector J2

4.2.3 Coupling Control

Each input coupling is controlled using a pair of DSP GPIOs. The power-up state is indicated in the following table.

Input	Controls	Function	Power-Up State
1	GPIO24	0: AC coupling 1: ICP coupling	AC coupling (0)
2	GPIO26	0: AC coupling 1: ICP coupling	AC coupling (0)

Table 3 **Coupling Control**