

SM5 Signal Mixer



SM5 Overview

The SM5 is a three-channel signal mixer. The relative contribution of the three inputs to the final output can be adjusted using a variable gain for two of the inputs. In addition, the signal on the two adjustable channels can be inverted before addition. The input signal range is ± 10 V for each channel, with the additional caveat that the amplified signal for each channel may not exceed ± 10 V without clipping. The range for the summed output is ± 10 V.

Power

The SM5 Signal Mixer is powered via the System 3 zBus (ZB1PS). No PC interface is required.

SM5 Features

The SM5 Signal Mixer is a three-channel weighted summer with variable input weighting and channel inverting. The SM5 is a zBus rack mounted device, through which it receives power.

Inputs

Three signals input channels (A, B, and C), with a range up to ± 10 V peak, are accessed through front panel BNC connectors. Input channels A and B are multiplied by a weighted, signed constant, K , before being added to the final output. The weighting range for these two channels is adjustable from -20 dB to $+20$ dB (i.e. $|K| = 0.1$ to 10) using a GAIN knob on the front panel. The sign of K for channels A and B can also be selected using front panel toggle switches, labeled INV-A and INV-B.

If an input is not being used, it should be grounded by attaching a shorted BNC cable. This will prevent unwanted noise from being added to the output.

Clipping

The variable weighting provides a great deal of flexibility in input and output signals. However, care should be taken to avoid clipping any signal component. The SM5 output signal = $(K_a * A) + (K_b * B) + C$ is limited to $\pm 10V$ peak. In addition, the raw inputs, A, B, and C, as well as the weighted inputs, $K_a * A$, and $K_b * B$, are limited to $\pm 10V$ peak.

SM5 Technical Specifications

Input Signal Range	± 10 V peak
Weighting Range	-20.0 to +20.0 dB
Max Output	± 10 V
Spectral Variation	< 0.1 dB from 10 Hz to 200 kHz
S/N (typical)	111 dB (20 Hz to 80 kHz)
THD	< 0.002% (1kHz tone +/- 7V peak)
Noise Floor	19 μ V rms
Output Impedance	20 Ohm
Input Impedance	10 kOhm
Inversion	Channels A & B

