



General Description

Combining familiar front panel controls with the accuracy and performance of digital signal processing, Rane’s full-featured, high performance G4 Quad Gate is suitable for use in a variety of demanding dynamics processing applications. Gating, ducking and downward expansion modes are offered, together with internal high- and low-cut filters and external side-chain inputs. It is the ideal tool for front of house, monitor, instrument and voice processing, broadcast and recording.

The G4 is a member of Rane’s analog-controlled digital family of products, which includes the C4 compressor, AC 24 crossover, DEQ 60 / 60L graphic equalizers, and the PEQ 55 parametric equalizer.

Analog-Controlled Digital

Analog controls (knobs, sliders) allow a performer or sound engineer to make precise adjustments, in real time. Digital signal processing (DSP) provides a degree of accuracy, consistency and flexibility that simply can not be matched with a traditional analog design.

The G4 combines the best of both worlds by using analog controls and high performance digital processing to achieve an unprecedented feature set. Benefits of this approach:

- Look Ahead Gating with Pre-Ramp: Never miss a transient.
- Improved accuracy and repeatability.
- Exceptional immunity to RF and electromagnetic interference.
- Lower cost per channel.

Features

Dynamics controls include:

- Gate / Expand / Duck Modes
- Look-ahead Gating
- Stereo Link
- Adjustable Threshold, Attack, Release, Hold, Depth and Ratio
- Gain Reduction / Gate meter
- Bypass

Side-chain processing includes:

- Side-Chain metering
- Internal Low- and High-Cut Filters
- Internal / External switch
- Listen switch

Plus:

- XLR and ¼" TRS input/output connectors
- Universal internal switching power supply

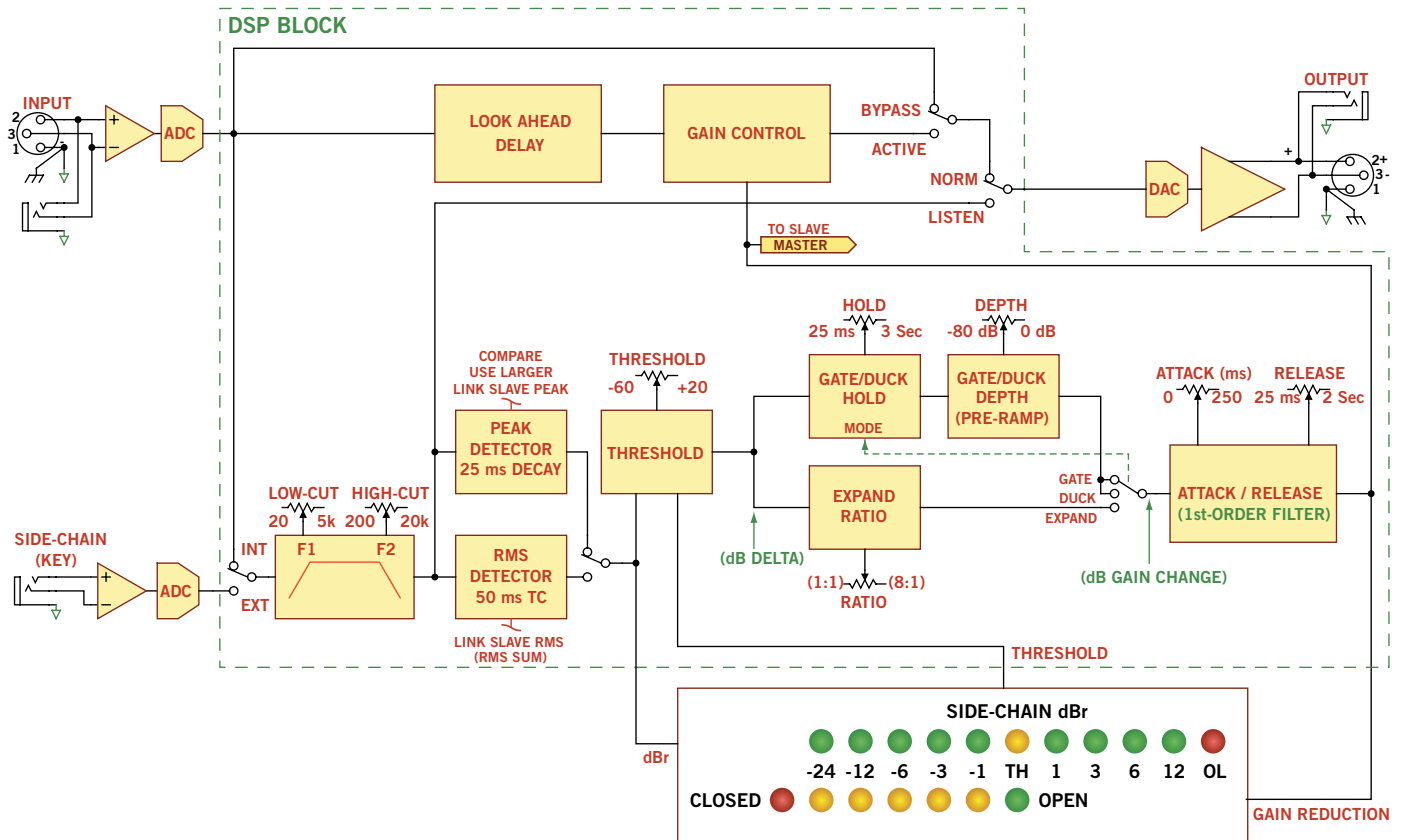
Features and Specifications

Parameter	Specification	Limit	Units	Conditions/Comments
Inputs: Type	Active Balanced			Auto balanced/unbalanced
.....Maximum Input	+22	1	dBu	1 kHz
.....Common Mode Rejection	60	typ.	dB	1 kHz
.....Input Impedance	10k	1%	Ω	Each leg to ground @ 1 kHz
.....Main Input Connectors	XLR, ¼" TRS			XLR pin 2 hot per AES standards
.....Side-Chain In Connectors	¼" TRS			Tip = hot, ring = negative
Digital Processing				
Converters: Sample Rate	48		kHz	24-bit
.....Dynamic Range	106	typ.	dB	A-weighted (input to output); unity
.....Propagation Delay	1.62	typ.	ms	Converter delay plus look ahead
.....Fixed-Point DSP	48-bit double precision			
Dynamics Processing	Gate/Expand/Duck			LED mode indicators
Side-chain detect: Peak				16-sample look ahead, 25 ms hold
.....RMS				True rms, 50 ms average RC
Dynamics Controls				All pots 8-bit resolution or 256 steps
.....Bypass	toggle switch			Active/Bypass LED indicators
.....Threshold Range	+20 to -60	1	dB	
.....Attack	0 to 250		ms	Settle to 85% of final value
.....Release	0.025 to 2.0		Sec.	For 10 dB step
.....Hold	0 to 3		Sec.	Gate and Duck modes only
.....Depth	0 to 80		dB	Gate and Duck modes only
.....Ratio	1:1 to 8:1			Expand mode only
.....Low Cut	20 to 5000		Hz	2nd-order Butterworth (12 dB/oct.)
.....High Cut	200 to 20,000		Hz	2nd-order Butterworth (12 dB/oct.)
.....Internal / External	Toggle switch			LED indicator (side-chain key source)
.....Normal / Listen	Toggle switch			LED indicator (listen to side-chain)
Meter: Gain Reduction	Closed, -24, -12, -6, -3, -1, Open		dB	Each channel
.....Side-chain level	Relative to Threshold setting		dB	Peak dBu for Gate/Duck, 11-segment
.....Side-chain level	Relative to Threshold setting		dB	RMS dBu for Expander, 11-segment
Outputs:	Active Balanced			Auto balanced/unbalanced
.....Connectors	XLR, ¼" TRS			XLR pin 2 hot per AES standards
.....Impedance	100	1%	Ω	Each leg to ground
.....Maximum Output	+22	1	dBu	600 Ω or greater
EMI Filters	Yes			Inputs and Outputs
Frequency Response	15 Hz to 20 kHz	+0/-3	dB	
THD+Noise	.02	typ.	%	+4 dBu, 20-20 kHz, 20 kHz BW
THD+Noise	.006	typ.	%	+4 dBu, 1 kHz, 20 kHz BW
Crosstalk	<-100	typ.	dB	2 kHz
Power Supply Requirement				100 to 240 VAC, 50/60 Hz, 20 W
Unit: Agency Listing				UL/cUL/CE
Unit: Construction	All Steel			
.....Size	3.5" H x 19" W x 8.25" D (2U)			(8.9 cm x 48.3 cm x 21 cm)
.....Weight	7.3 lb			(3.3 kg)
.....Shipping: Size	4.5" x 20.3" x 13.75"			(11.5 cm x 52 cm x 35 cm)
.....Weight	12 lb			(5.5 kg)

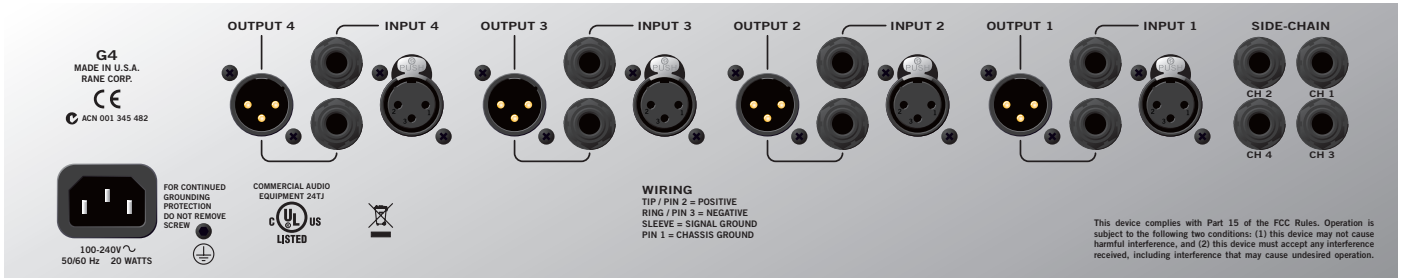
Note: 0 dBu=0.775 Vrms

G4 Block Diagram

All channels identical

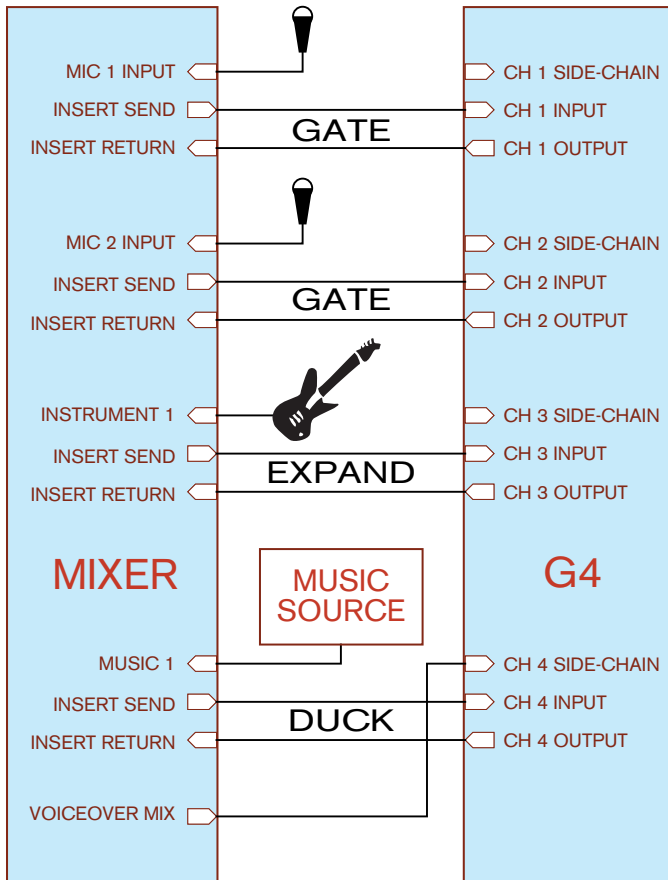


Rear Panel

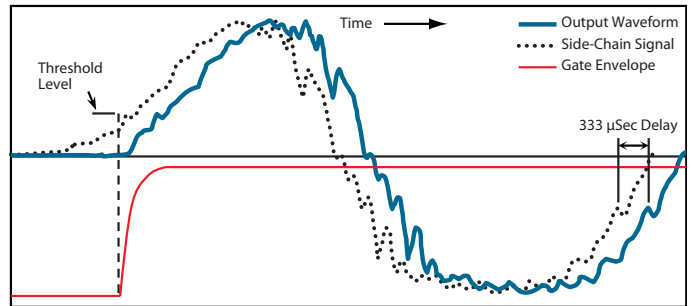


Applications

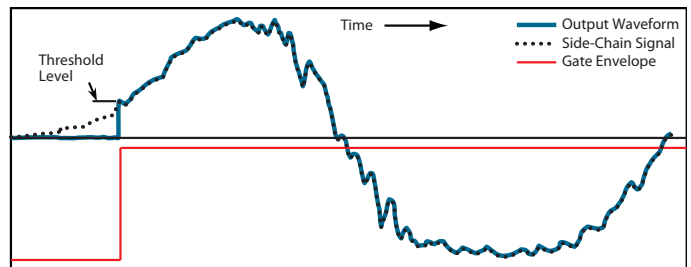
The G4 is ideal for a variety of dynamics applications including gating, ducking and downward expansion. Internal or external side-chain key input, built-in side-chain filtering, side-chain listen, look-ahead signal detection and advanced metering combine with properly defined threshold, attack, decay, hold, and depth controls to provide the necessary tools for unsurpassed flexibility and performance. The G4 is the only quad gate available with this complete set of features.



Look Ahead Gating



The G4 uses a very short look ahead (16 samples, or 333 microseconds) with exponential ramping to ensure accurate clickless gating.



Conventional gates without look ahead or ramping result in audible clicks at fast attack settings.

References

Holden, Jeffs, Bohn, "Dynamics Processors – Technology and Applications," *RaneNote*, (2005).