

THE SYMETRIX 421M IS A SOPHISTICATED AUDIO GAIN CONTROLLER, but what it does is simple: it makes quiet sounds louder and loud sounds quieter - just like a skilled audio engineer. Set the desired, "target" output level and the 421m gently boosts signals that drop below your target, and smoothly pulls back those that rise above it. Operation is automatic, precise, and completely transparent - no pumping or breathing. The user sets the range of control and the 421m works exactly as instructed - automatically.

Any audio application where clarity and intelligibility are important can benefit from a 421m Everybody speaks at different levels and works at varying distances from the microphone. Intelligibility can vary from person to person or moment to moment. How do you put everyone on the same level? Hire a trained sound engineer... or use a 421m. The 421m is equally well suited to processing program material (for stereo applications two 421m's may be linked). Program levels from soundtracks, CD jukeboxes, or broadcast audio go up and down unpredictably. The 421m gently and unobtrusively raises the low level audio and compresses the high level audio without side effects. It's flexible input configuration will handle just about any audio source, from studio microphones to telephone-based paging systems. Installed sound systems, recording studios, and broadcast facilities all benefit from increased intelligibility – and that's what the 421m is all about.

Here's how it's done. The 421m's Automatic Gain Control (AGC) section incorporates a smooth-acting leveling amplifier working in conjunction with a make-up gain stage coupled to the ratio control. Increasing the ratio on the leveling amplifier makes your program denser, but your output level stays constant no matter what happens at the input. Roughly translated, this means that you could speak two feet from a microphone and have the same volume output that you had at 6 inches (and vice versa). To deal with existing system or program noise, the 421m offers a full-featured downward expander section to effectively quiet the output when input signal is absent. A separate "brick wall" peak limiter provides speaker protection in PA systems and overload prevention in broadcast or transmission applications. Last but not least, switchable speech curve filters have been incorporated to optimize the 421m for voice range performance.

What really sets the 421m apart is the way it's "smart" circuitry reacts to real-world situations. Previous AGC designs often proved troublesome because they would confuse noise and feedback with the desired program signal, boosting noise or cutting off soft-spoken phrases. These problems are eliminated by the 421m's proprietary Auto Release Monitor circuit, which instantly distinguishes the difference between "real" signals (music and speech), noise and feedback.

The 421m's metering system is one key to its simple setup and operation. Parallel LED displays show input compared to output. It is quickly obvious if the 421m is adding gain to your signal or subtracting. Because you can hear and see the net results of the leveling action the guess work is taken out of setup.

Flexible, accurate and trouble-free automatic gain control has always been a good idea. Now, with the pace-setting 421m, Symetrix makes it a cost-effective reality. Please call or email today for more information on how to use a 421m in your next project. •

APPLICATIONS

House of Worship

Auditorium

Public Address and Paging

Teleconferencing

Radio and TV Broadcast

Tape Duplication

FEATURES

Target oriented AGC-Leveler

Final stage limiter

Downward expander with Auto Threshold

Line and Mic inputs

125Hz and 6kHz speech curve filters

Parallel input and output metering

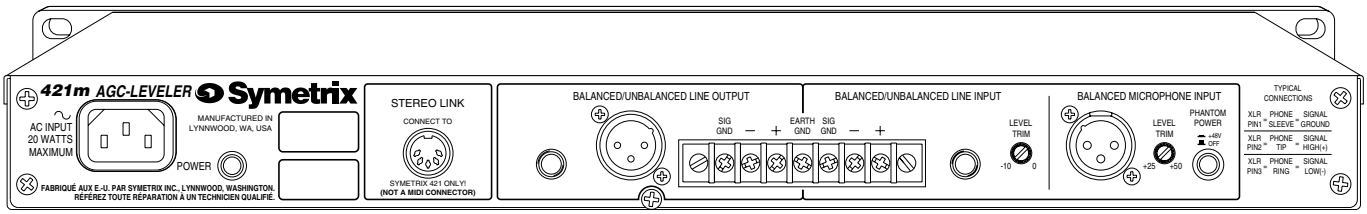
Stereo linkable

421m

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1-800-426-8664 or visit www.ccisolutions.com

421m AGC-Leveler with Mic/Line Input

Symetrix



SPECIFICATIONS

Specifications subject to change without notice.

Connectors	
Line Inputs	¼" TRS jack and screw terminals, 20k Balanced Bridging
Mic Input	XLR-female, 10k Balanced Bridging
Outputs	XLR-male, screw terminals, 200 Ohm Source Impedance, Differentially Balanced, +23 dBm maximum level TS phone, Unbalanced, +18 dBm maximum level
Bypass	Relay controlled, hard-wire bypass in power off and bypass conditions
Sidechain	TRS phone, Unbalanced Send and Receive, 1000 Ohm Source Impedance, 10k Input Impedance Tip=Receive, Ring=Send

Downward Expander	
Ratio	1:2
Threshold	-50VU (bypass) to -20VU (Auto Threshold)
Attack Time	1 ms
Release Time	Program dependant, 0.3 - 3.5 seconds depending on amount and duration

AGC-Leveler	
Ratio	1:1 to 4:1
Auto Release Threshold	-70 dBu to -30 dBu
Attack Time	approximately 1 ms
Release Time	Program dependant, 500 ms - 5 seconds depending on amount and duration

Target Output	
Range	+20 dB
Peak Limiter Ratio	10:1
Threshold	-15VU to +23VU (bypass)
Attack Time	1 ms for 90% gain reduction
Release Time	0.8 seconds

Mic Preamp	
Gain Range	+15 dB to +45 dB
Impedance	10k Ohms
Max Input Level	+8 dBu
THD+Noise (gain control fully clockwise)	-85 dBu
Phantom Power	48V (±2)
CMRR	>80 dB (10 Hz - 20 kHz)

Sonics	
Frequency Response	20 to 50 kHz, +4 dBm (+0, -1 dB), (+0, -3 dB mic)
Harmonic Distortion	<0.05% 20 Hz to 20 kHz, +4 dBm, 30 kHz bandwidth Typically <0.01% @ 1000 Hz
Residual Noise	-90 dBu, 20 kHz noise bandwidth, rms responding meter

Speech Curve	
Type	Switch selected cutoff filters allow tailoring LF and/or HF response for speech applications
Frequencies	LF=125 Hz, 12 dB/octave; HF=6 kHz, 24 dB/octave

Input/Output Metering	
Type	LED Bar Graph, 12 steps + clip
Range (min to max)	66 dB
Ballistics	Peak
Calibration	0 dB=0VU=+4 dBm=1.23V

Physical	
Size (hwd)	1.72 x 19 x 6.25 inches, 4.37 x 48.26 x 15.875 centimeters
Shipping Weight	8 lbs (3.63kg) net

Electrical	
Connector	EC 3-pole
Power Requirements	117V nominal, 107 to 125V AC, 50 to 60 Hz, 10 watts 220V AC, 50 Hz, 10 watts

421m ARCHITECTS AND ENGINEERS SPECIFICATIONS

The Automatic Gain Control (AGC) shall be a single channel model that reduces the dynamic range of wide range, wideband audio signals, providing peak limiting, downward expansion and bandpass limiting filters. The AGC shall occupy one rack space (1U).

The AGC shall be capable of controlling audio signals ranging from -70 dBu to +24 dBu and reducing their range by an input/output ratio ranging from 1:1 to 4:1. The input/output ratio shall be adjustable via a front-panel control. Response speed switching shall be provided to accommodate speech and music sources. A target output level control shall be provided to shift the level of the output signal over a nominal ±20 dB range. The release time of the AGC shall be controlled by the presence of input signal and the signal sensor shall be capable of discriminating between music/speech and random noise or pure tones. The threshold level of the signal sensor shall be adjustable via a front panel control and the presence of signals above the threshold setting shall be indicated via a green LED.

The AGC shall also contain an integral peak limiter having at least a 10:1 ratio and adjustable threshold level. A green LED indicator shall be provided to indicate peak limiter activity. The peak limiter threshold shall determine the absolute maximum output amplitude of the AGC-Leveler regardless of other conditions.

The AGC shall also contain an integral downward expander having a 1:2 expansion ratio with threshold and release time controls. Furthermore, the downward expander shall be capable of operating automatically via the signal sensor circuitry. A green LED indicator shall be provided to indicate downward expander circuit activity.

Bandpass limiting filters shall be provided having a low-pass characteristic of 24 dB/octave at 6 kHz and a high-pass characteristic of 12 dB/octave at 125 Hz. Both filters shall be capable of being used individually or simultaneously.

The AGC shall provide identical peak responding input and output level meters. These meters shall be capable of responding to signals ranging from -54 VU to +12 VU (-50 dBu to +16 dBu). An output clipping indicator shall be provided.

The AGC shall provide facilities for stereo-coupling two units via a shielded 5-pin DIN male-to-male cable. A front panel switch shall designate which unit is the master and which unit is the slave.

The line level inputs shall be active balanced bridging designs terminated with 1/4" TRS female and screw terminals. The mic level input shall also be an active balance bridging design using a three pin XLR female (AES/IEC standard wiring). The input circuitry shall incorporate RFI filters. The outputs shall be active balanced designs having equal source impedances and terminated with 3-pin XLR (AES/IEC standard wiring), and screw terminals. A separate 1/4" TRS jack shall provide an unbalanced output.

The balanced line level inputs shall accommodate +24 dBu signals without distortion, and the balanced outputs shall be capable of delivering +23 dBm into a 600-ohm load. The mic level input shall accommodate +8dBu signals. There shall be separate gain trim controls for the mic and the line inputs and the mic input shall provide 48v phantom power.

Overall frequency response shall be 20 Hz to 20 kHz, ±1dB, measured at +4 dBm output. There shall be no more than 0.02% harmonic distortion, measured under the following conditions: +4 dbu input, +4 dBm output, BYPASS switch out, 1000 Hz. Residual noise output shall be no greater than -90 dBm, measured with a 20 kHz noise bandwidth.

When the unit is inoperative (either by loss of power, or via the BYPASS switch), the inputs and outputs shall be wired together. There shall be no transients transmitted to the output terminals during either turn-on, turn-off, or bypass operation.

Access to the AGC's sidechain shall be provided via a single 1/4" TRS female connector. The ring connection shall be the sidechain output and the tip connection shall be the sidechain return.

The AGC shall be capable of operating by means of its own built-in power supply connected to 117V nominal AC (105 to 130V) 50/60 Hz (230V nominal, 207 to 253V AC, 50 Hz where applicable). The AGC shall be listed by Underwriters Laboratories Inc. (UL) or other equivalent nationally recognized safety testing agency.

The unit shall be a Symetrix Incorporated model 421m AGC-Leveler.

421m

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