

Lime Technologies

Lime

VCX

Automatic Volume Limiter

Technologies

User's Manual

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VCX Automatic Volume Limiter

Introduction

The VCX is designed to control the sound level of a stereo audio system by either reference to a monitoring microphone or by calibrating the maximum signal level to the amplifiers.

The recommended configuration is microphone mode, where a microphone is connected to the VCX which measures the sound level against the set maximum. When the set maximum level is reached the VCX allows no further increase in sound level by reducing its gain.

In microphone mode the amplifier setting is not critical, however a microphone will pick up all sound sources so that if, for example, someone were to shout into the microphone the system sound level could be reduced. For this reason the microphone should be sited near to the speakers.

In calibrated mode the amplifiers are either set to maximum or locked away so that volume controls cannot be altered. The VCX is set to a signal level that equates to the required sound level. Once that signal level is reached the VCX will allow no further increase in signal level (and therefore sound level) by reducing its gain. The VCX is optimised for use in microphone mode and if the input level is increased so that it is driven past 'limit' in calibrated mode the output volume may actually be reduced.

In calibrated mode the signal level to the amplifiers is controlled, this means to control the maximum sound level there can be no change in the gain of the amplifiers hence the amplifiers must be set to maximum or locked away.

Usually microphone mode is preferred unless there is a significant amount of ambient noise which may be picked up. Microphone mode is the most reliable way to limit noise.

A mute facility which will reduce the audio signal by 20dB allows interfacing with a fire alarm to reduce the music volume level if the alarm sounds.

Installation

The VCX has balanced XLR inputs / outputs (may be strapped for unbalanced operation) and is connected between the sound source (for example a mixer, zoner, computer or ipod) and the amplifiers.

When wiring to balanced circuits for stereo operation both left and right channels should be identical to maintain phase. To avoid ground loop problems, the audio common (cable screen) in this equipment is NOT connected to mains earth within the unit. The mains lead earth wire is only connected to the case and this must always be connected to MAINS EARTH.

The unit should ideally be mounted where the operator can see the indicator LEDs on the front panel.

The signal level into the VCX should normally be around line level however if it is much lower an internal jumper plug is used to select a higher gain to compensate.

Microphone or calibrated signal modes are selected by a recessed switch on the rear panel, in microphone mode there is a gain trim control and phantom power switch which should normally be on.

Setting of the maximum sound level is accomplished by playing music through the system and either adjusting the microphone gain on the rear panel or, in calibrated mode, the output level.

When using microphone mode, locate the microphone near to the speakers at a height of 2.5 to 5 metres. There should be no other sound sources close to the microphone (a suspended ceiling makes an ideal mounting surface).

The front panel 'Warning' LED denotes when the control level is being approached and 4 additional LEDs indicate the level of attenuation being applied to hold the sound level at the set maximum.

The mute facility on the rear panel may be connected to a fire alarm; the connection must be via isolated relay contacts that close to mute. In mute mode the audio level is reduced by 20dB.

An optional security panel is available for the rear of the unit to prevent alteration of the settings or removal of the connections.

OPERATION AND SETUP

Microphone mode

To select microphone mode depress the switch on the rear panel marked "MIC SELECT". Phantom power is usually required and should be selected using the switch on the rear panel marked "PHTM POWER". Connect the correct microphone to the "MIC INPUT" socket.

The microphone should be located out of reach and near to the speakers or sound source.

Play music through the system and turn the mixer or other sound source to three quarters volume, switch off "MIC SELECT" on the rear panel and check the VCX "LIMIT" LED is illuminated on the front panel, if it is not illuminated then you have a low drive level and you will need to change the range setting to low input. See INTERNAL ADJUSTMENTS Fig 1A.

Press "MIC SELECT" again on the rear panel.

Play music at the maximum allowable volume level and adjust the "MIC GAIN" on the rear panel of the VCX so that the "Warning" LED on the front panel lights. Slowly increase the mic gain until the Limit LED just lights. The microphone gain adjustment requires a small flat bladed screwdriver. It is a multiple turn potentiometer with a travel of 20 turns and it will continue to rotate even when the end is reached in order to prevent damage. When making fine adjustments, turn the control no more than half a rotation and wait for several seconds for the change to take effect.

If the volume will not reach the level you require and the VCX is not indicating that it is limiting, then you have a low drive level and you will need to change the range setting to low input. See INTERNAL ADJUSTMENTS Fig 1A.

The VCX is slow acting to differentiate between dynamic peaks of music and an increase in average level. Bear this in mind when making adjustments.

Calibrated mode

As supplied the unit is adjusted to operate at an average nominal programme line level of 0VU (+4dBu) and in most cases will not need any adjustment. This is the level that a standard VU meter will read before going into the red (end section), therefore the operator can use the readings on the VU meters fitted to their mixer as an indication of maximum permitted volume level.

Play music and turn the mixer or other sound source to three quarters volume, set the amplifiers to full volume (or if the amplifiers are to be locked away set the amplifiers to the required volume).

If the sound level is not reaching the level you require and the VCX is showing it is limiting then increase the output level of the VCX by using the output control on the rear panel (accessible through a small hole located between the input and output connectors).

If the sound level is not reaching the level you require and the VCX is **not** showing it is limiting then you have a low drive level and you will need to change the range setting to low input. See INTERNAL ADJUSTMENTS Fig 1A.

Adjust the output level (rear panel) for the required system sound level.

Check the level by driving the system until the LIMIT LED illuminates on the attenuation meter on the front panel of the VCX and readjusting the output level as necessary.

For specific applications the unit may be set to operate at different levels using internal adjustments. See later section INTERNAL ADJUSTMENTS.

The VCX is slow acting to differentiate between dynamic peaks of music and an increase in average level. Bear this in mind when making adjustments.

Mute

The mute facility is operated through the mute connection on the rear panel, shorting the pins on the mute connection will cause the VCX to reduce the signal level by 20dB.

The mute facility may be used to connect to a fire alarm; an isolated set of relay contacts is required. Some fire alarms have such contacts while others may have a signal that can be used to switch a relay. Connect the isolated relay contacts to the mute connection. The connection will carry low voltage DC (<18V) and low current (<10mA) and the cable may be up to 30 metres in length.

INTERNAL ADJUSTMENTS

Do not attempt to carry out any internal adjustments unless you are qualified to do so.

ALWAYS DISCONNECT POWER BEFORE REMOVING COVERS.

Access is gained by removing the top cover. Remove 3 screws from either side of the case. Remove 2 screws from the top and lift top cover off. When the adjustments are completed refit the case top.

FIG 1A. shows the position of the range setting jumper. This sets high (0dBu) and low (-10dBu) operating ranges for the unit.

FIG 1B. shows the position of the sensitivity adjustment preset. This is a multi-turn preset. Use this if you wish to change the operating threshold of the unit (calibrated mode only). Use in conjunction with the range setting jump plug to increase or decrease the sensitivity of the unit.

FIG 1C. shows the position of the 230V / 115V setting switch.

FOR GENERAL PURPOSE USE, LEAVE ALL INTERNAL ADJUSTMENTS AT FACTORY SETTING.

ALL OTHER PRESETS AND JUMPERS ARE FOR ALIGNMENT AND TEST PURPOSES AND ARE FACTORY SET. DO NOT TOUCH.

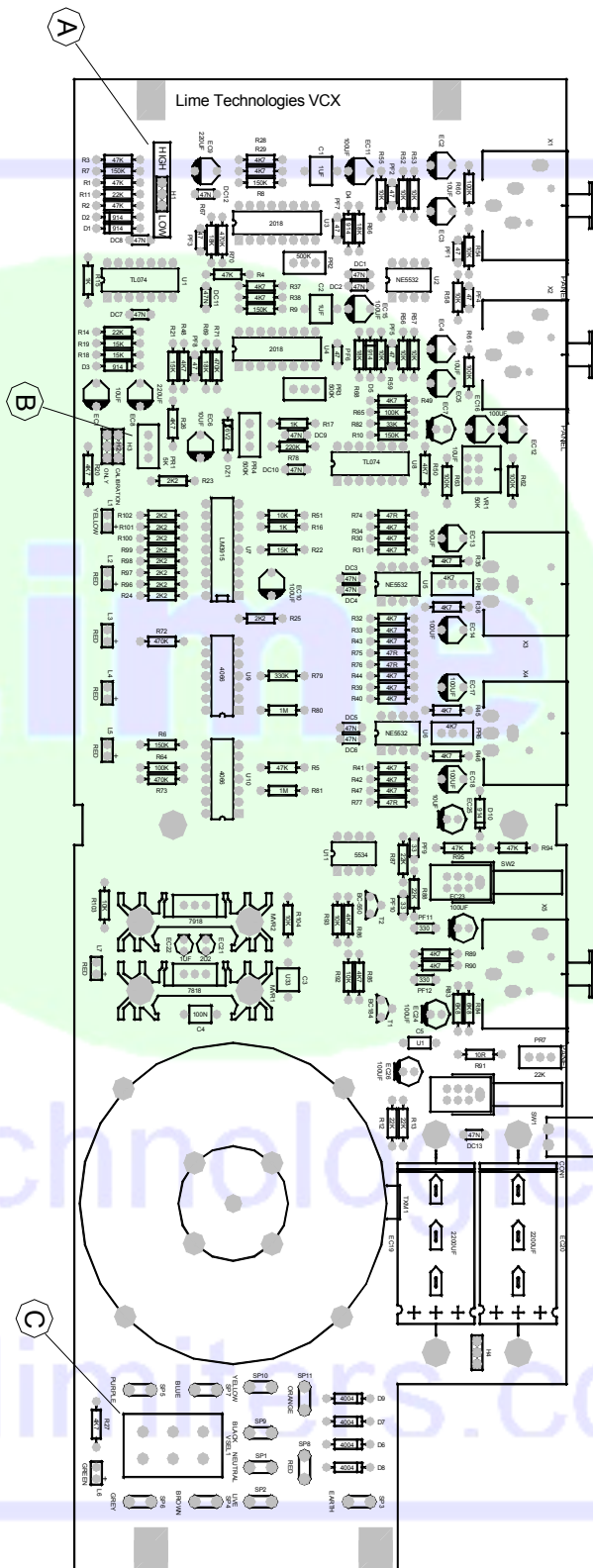
INCORRECT SETTING OF ANY INTERNAL ADJUSTMENT WILL INVALIDATE THE WARRANTY.

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VCX SPECIFICATION

Frequency response	20Hz – 20Khz		+/- 0.5dB
Distortion (THD + noise) 1Khz	Output level	Attenuation	Distortion
	0dBu	0dB	<0.01%
	0dBu	12dB	<0.015%
Noise measured 20Hz-20kHz	Equivalent input noise		< -90dBu
Stereo input	Electronically balanced on XLR connectors		
Input impedance	Balanced		20K
	Unbalanced		10K
Maximum input level			+22dBu
Clip indicator	Indicates at output		+20dBu
Microphone input	Electronically balanced on XLR connectors		
Input impedance	Balanced		20K
Phantom power	Switch selection		18V
Gain	Adjustment range		45dB
Stereo output	Electronically balanced on XLR connectors		
Source impedance			100 Ohms
Minimum load impedance			600 Ohms
Operating threshold range			
High range	Average level	Adjustable	+5dBu to -2dBu
Low range	Average level	Adjustable	-8dBu to -14dBu
Control chain			
The control chain has a linear response.			
Power	IEC mains connector	Switchable	230 V or 115 V
Fuse	230V (110V)		250mA (500mA)
Dimensions	19" rack mounting, 1RU height and 4.9" (125mm) deep		

Lime Technologies reserves the right to change the specification without notice.



- A. High input level (0dB) or low input level (-10dBu) select
- B. PR1 sensitivity adjustment - contact Lime Technologies before adjusting
- C. 230V or 115V select

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TITLE VCX Internal Adjustments

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