TeachLogic™ *Application Note*

MAXIM™ (IMA-540) and SPECTRUM™ (IMA-840) Features Explained

The Maxim™ and Spectrum™ namesakes have been the hub for TeachLogic's classroom audio solutions for more than a decade. Now in their 4th generation, the flagship Maxim™ and its more powerful (100 W vs. 50 W) clone, Spectrum™, have received a fresh look and significant updates. This is a summary of those updates.

IMA-540

IMA-840

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ConferenceLink Feature w/ EchoGuard™

The pandemic increased the importance of synchronized audio between the in-person and online classroom environment. New models have front panel “Conference Input” and “Conference Output” ports for connection to a personal computer, interactive display, ChromeBox or similar device used to conduct remote teaching.

When these ports are connected to the computing device’s output and input, classroom audio including TeachLogic microphones are provided to remote learners, and remote learner audio is played over the speakers in the classroom while mixed with the connected classroom audio sources.

The line outputs of conventional classroom audio amplifiers include signals of all the inputs of the amplifier (wireless mics, computer audio, and other program audio). Because conference applications (Google Meets, Zoom, MS Teams, etc.) provide amplifier inputs and also receiver amplifier outputs, there is an opportunity for looped back audio and resulting echo in the video conferencing session.

TeachLogic’s **EchoGuard™** feature eliminates the possibility of looped back audio and its echo. With a selection at a side-panel switch, the Conferencing Output can be made to include all the audio signals except for that of the Conferencing Input. By isolating this “input” signal (audio from the video conference application itself) from being reinjected into the conference, the opportunity for echo is eliminated. The problem is more prevalent with higher volume settings. Echo cancellation software in the conference applications often reduces the occurrence of echo, but this feature fully prevents it from being introduced at the classroom.

The feature may be switched off such that all audio is present on Conference Output port. This would be advised if the port were used for other purposes such as lesson recording, classroom monitoring, or assistive listening audio feeds. The amplifiers ship with the EchoGuard™ feature switched on. See Table 2.

Field Firmware Upgradability

Firmware can now be upgraded by using USB port on back panel and use of power button on front panel. Benefit: field upgrades are easily accomplished if needed for functional upgrades or future customization.

Noise Gating Added

When no audio signals are being passed, amplifier gain is automatically decreased for quietness and restored again when audio present.

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Sleep mode Altered

Front panel control to place unit in standby – two quick presses of power button, then observe amber LED color. Time of inactivity until entering standby now 2 hours to minimize the times the unit may need to be awakened from standby state. Time delay was formerly 11 minutes.

Page-Pass-Through Function Changed

Page-Pass-Through (or "PPT") is a feature that passes an audio paging signal through the amplifier and to the connected loudspeakers. This may be switched on or off as a new feature controlled by a side panel switch. See Table 2. Also note that the system does not pass-through paging audio signal to the speakers when the amplifier is powered off (or no power is available). Formerly, PPT did function when no power was present.

PPT is on ALS output

Unlike competitive classroom audio products, the amplifier routes the paging input signal by passing it through to the assistive listening system (ALS) output (and Conference Output) so that students using ALS products will hear broadcast paging announcements.

Page Input interface more versatile

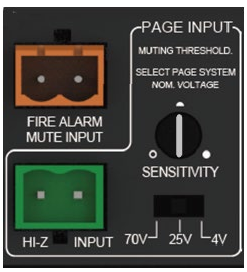
Page Muting causes the amplifier to silence the microphones and audio sources connected to the amplifier when a page signal is detected on the Page Input terminal. When muted, the only audio allowed to pass through is from the paging system, i.e. Page-Pass-Through Function.

Page Input sensitivity has been enhanced with wider range and greater sensitivity in the detection of page input voltage to trigger muting.

The amplifier can integrate with constant voltage analog paging systems (70V and 25V) as well as low power VOIP amplifiers (as low as 1/8 watt). A new setting for interfacing with low power VOIP amplifiers at their analog output has been added. See Table 1.

Table 1. Impedance of Page Input interface and Sensitivity for Page Mute function

Switch Position	Nominal Impedance /Power Draw	Maximum Sensitivity (minimum threshold for muting)	Minimum Sensitivity
4V	92 Ω / 0.17W	51 mV	1.0V
25V	44 kΩ / 0.01W	430mV	6.5V
70V	403 kΩ / 0.01W	1.2V	18.3V



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Higher impedance Page Input interface

When interfaced to 25V or 70V analog paging system, the wattage draw is only a fraction of a watt and insignificant for power budgeting.

Lower EMI

These amplifiers meet stringent European standards for electromagnetic interference emissions making this an exportable product.

Security Alert pulses changeable with slide switch

TeachLogic supports flexible interfaces to work with leading paging and call alerting systems in the education market. Systems with Security Alert can provide 1 or 4 pluses of relay on dry contacts with either or both normally-open or normally-closed.

The pulse change can be made with a dedicated switch to select either 1-pulse or 4-pulse mode as required by different security monitoring systems. The mode can be checked with a press of the power switch and observing a flashing LED. See Table 2.

Table 2. Side switches.

SWITCHS ON LEFT SIDE OF DEVICE

VISIBLE BEHIND VENTILATION GRILL

SWITCH POSITION	LEFT SWITCH SECURITY ALERT:# OF PULSES	MIDDLE SWITCH PAGING PASS THROUGH TO SPEAKERS	RIGHT SWITCH CONFERENCE ECHO GUARD
UP	1	OFF	ON
DOWN	4	ON	OFF

Equalization +/- 10dB vs 12 dB

The 5-band equalizer with adjusting controls on the back panel has been modified to result in more natural sound, with better adjusted contours for tailoring the sound to room acoustics or personal preferences.

Finer digital gain adjustments

The gain controls, both the front panel knobs and remote adjustments via RS-232, are made in finer increments with new digital controls.