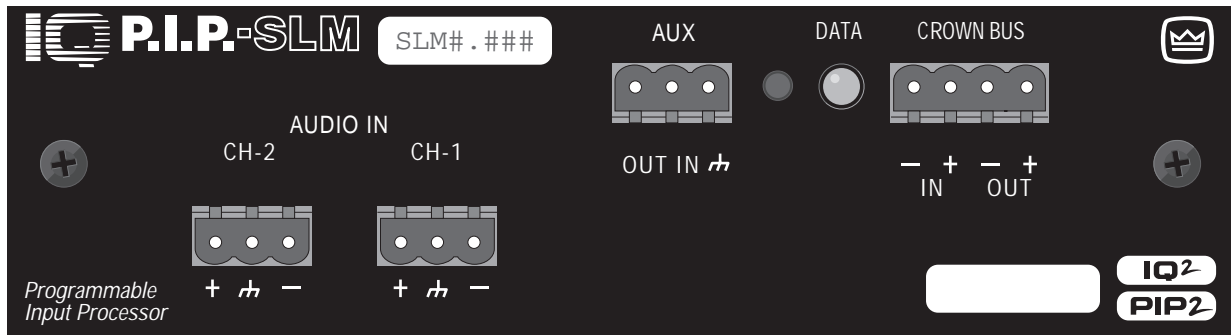# IQ System P.I.P.-SLM

P.I.P.-SLM

OVERVIEW

An IQ System amplifier is a Crown amplifier (MA Series, CT Series, or Reference Series) that is equipped with an IQ P.I.P.® Programmable Input Processor input module. The IQ P.I.P.-SLM is one such input module. The P.I.P.-SLM includes the "basic" and "SLM" feature sets, auto-standby and EEPROM memory backup. The P.I.P.-SLM is fully PIP^2 compatible. The P.I.P.-SLM is an IQ^2 component and requires an IQ^2 compatible interface for communication with a computer.

CROWN AMPLIFIERS

There are three families of Crown amplifiers which are fully IQ System compatible. They include the Macro-Tech Series for professional PA, the Com-Tech Series for commercial installations, and the Reference Series for studio applications. In the case of the P.I.P.-SLM, however, it should only be installed in a PIP^2 amplifier such as the CT "10" Series.

P.I.P.-SLM PROCESSING

The P.I.P.-SLM allows you to communicate directly with an amplifier whether it is sitting on a bench next to you or mounted in rack hanging from a loft. Before the advent of IQ, it was impossible to directly control and monitor amplifiers unless you were physically present at the amplifier. Even then your abilities were limited by the physical features of the amplifier. Today you can control amplifier attenuation in half dB steps, and control a host of other functions. Unlike other amplifiers, you also have access to thermal headroom infor-

mation and visual status of signal level and distortion.

The P.I.P.-SLM module includes EEPROM memory backup. This feature allows the onboard processor to maintain its memory in the event that main AC power is lost, disconnected, or switched off at the front panel.

The System and Load Monitor feature set adds the ability to perform reference and test sweeps and plot results, then report the results as pass-fail based on your defined criteria. Additional automation includes auto-standby for energy conservation.

PHYSICAL ATTRIBUTES

All P.I.P.-SLM is about the size of a 3 x 5 card, and the panel face (shown above) mounts flush with the rear panel of the amplifier.

Front Panel

• Euro-style 3-pin barrier block audio input connections per channel.
• Euro-style 4-pin barrier block connector for Crown Bus data loop.

• Euro-style 3-pin barrier block connector to send or receive external control voltages.
• DSPI (data) LED informs you when the unit is receiving data, and can also be used for troubleshooting.
• Dual function memory reset switch is accessible from the front panel, however it is recessed and unmarked to prevent unintended operation. Press once to reset unit to custom default, press and hold to reset to factory default.

Circuit Boards

• Two multi-layer printed circuit boards.
• Loop address eight segment DIP switch. Up to 250 IQ amplifiers may operate on a single data loop.
• PIP^2 Jumpers (set to OUT position when used in a PIP^2 amplifier) to compensate output meter scaling depending on amplifier type.
• PIP^2 Resistor Packs must be installed when the module is installed in a PIP^2 amplifier and must be removed if used in a non-PIP^2 amplifier. *Note: The primary purpose of this module is to support internal load monitoring. This can only be done with a PIP^2 amplifier.*
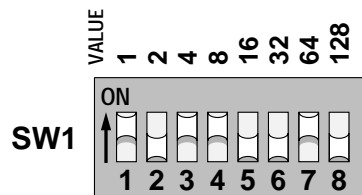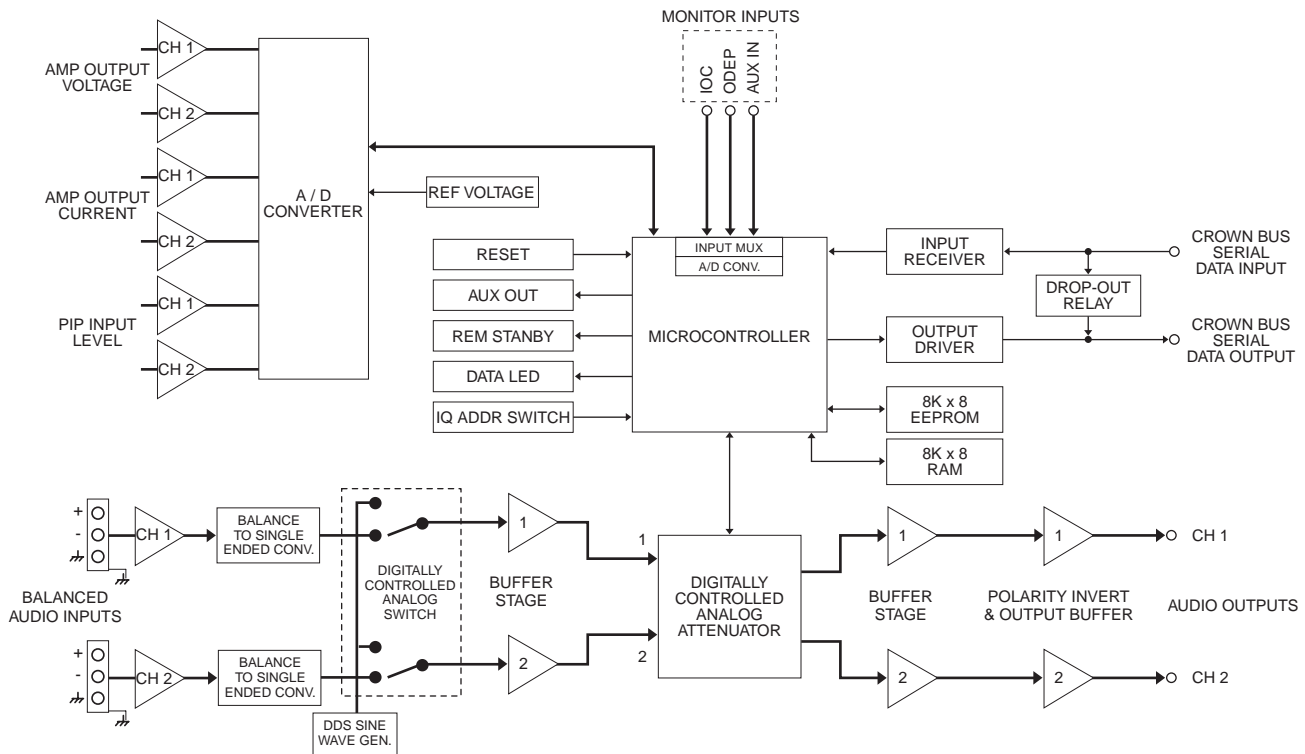

SW1 Address Switch
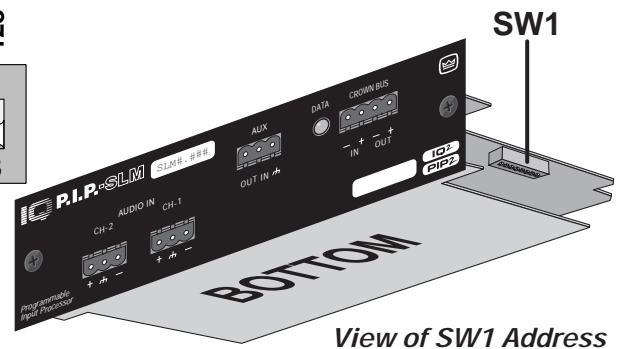
View of SW1 Address Switch

P.I.P.-SLM (Page 2 of 3)

P.I.P.-SLM Basic Block Diagram

Installation

Before installing the P.I.P.-SLM into the amplifier you must first configure the switches, jumpers, and install or remove the PIP[2] resistor packs as needed. When initial configuration is complete, remove the existing P.I.P. from the amplifier and move the P.I.P. connector to the P.I.P.-SLM. Set the amplifier sensitivity to the desired position. The ribbon cable folds up as you insert the module.

IQ MONITORING

Refer to the P.I.P.-SLM Block Diagram.
• Pre-fade input levels (+20 to –40 dBu).
• Amplifier output signal level (0 to –40 dB re scaled rated output).
• IOC (Input/Output Comparator) indicates distortion >0.05%.
• ODEP (Output Device Emulation Protection). ODEP is an amplifier circuit that calculates thermal headroom of an amplifier and is reported in IQ as a percentage of thermal headroom used.
• Aux Port input sense.

IQ CONTROL

Refer to the P.I.P.-SLM Block Diagram. The P.I.P.-SLM supports the complete basic feature which consists of:
• Power (high voltage rails).
• Mute.
• Attenuation (0.5 dB steps from 0 to 80 dB).
• Polarity (XLR pins 2 and 3).
• Aux Port output voltage.
• DSPI/Data LED.
• Memory backup.
• User defined default memory.
• Output meter scaling.

AUTO STANDBY

Energy conservation is automated with this function that allows the amplifier to idle at a fraction of its normal idle draw. Per channel with the following variables:
—On-Off
—Threshold (input)
—Turn-off Delay (minutes)
—Turn-on Delay (one switch for both channels, when on adds a delay based on address and when off the amplifier powers up within 8 msec after breaking threshold)
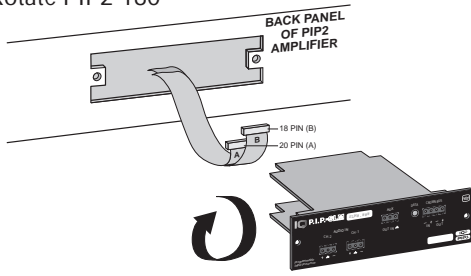
SLM FUNCTIONS

System and Load monitoring is the major feature benefit of the P.I.P.-SLM. The purpose of the SLM function is to verify repeatability of performance of the audio system. Reference data is first established and subsequent test sweeps are performed to prove that system operation is constant. The impedance response test proves that the load performance is constant while frequency response proves that the electronics are a constant. When syncronized with an external sweep generator (such as the SLM-8) full system frequency response can be measured.

The signal generator is used to performing sweeps or to produce a constant tone. To perform a sweep you must configure the generator and data acquisition. The tolerance criteria you set determines whether the test will pass or fail. The following is a complete list of parameters associated with the SLM functions:
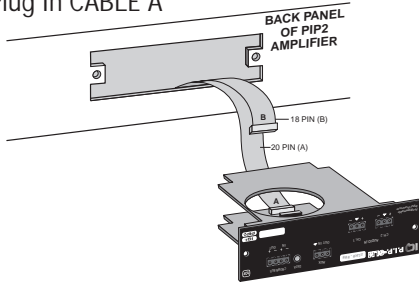—Sweep Enable
—Oscillator Enable
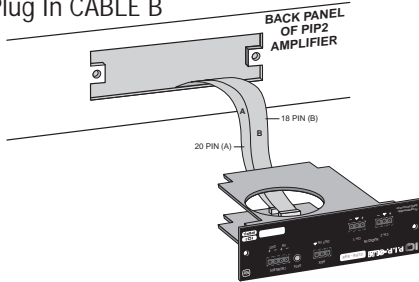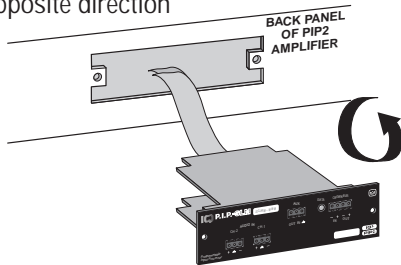
Rotate PIP2 180°

BACK PANEL OF PIP2 AMPLIFIER

18 PIN (B)
20 PIN (A)

Plug In CABLE A

BACK PANEL OF PIP2 AMPLIFIER

18 PIN (B)
20 PIN (A)

Plug In CABLE B

BACK PANEL OF PIP2 AMPLIFIER

18 PIN (B)
20 PIN (A)

Rotate PIP2 180° in opposite direction

BACK PANEL OF PIP2 AMPLIFIER

Slide PIP2 Into Amplifier

BACK PANEL OF PIP2 AMPLIFIER

P.I.P. MODULE
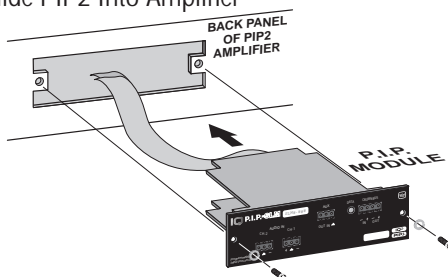
PIP² Installation

—Sweep Resolution
—Sweep Start Frequency
—Sweep Stop Frequency
—Oscillator Frequency
—Generator Amplitude
—Acquisition Mode
—Start/Abort Sweep
—Impedance Response Tolerance
—Frequency Response Tolerance
—Report Pass-Fail at Aux
—Start/Abort Via Aux

SOFTWARE SUPPORT

The P.I.P.-SLM is supported by the Turbo 1.4, and Sys-Config II DOS software packages as well as the IQ For Windows software package.

P.I.P.-SLM SPECIFICATIONS

Audio specifications are referenced to 0 dBu, measurements taken at the edge connector of the module itself.

Aux Port: Pin 1 is tied to ground. Pin 2 is a sensing input capable of sensing an analog voltage or digital state. Pin 3 is high impedance when switched off from software, +15 VDC at 15 ma when switched on from software.

Power Requirements: Unregulated ±24VDC from amplifier.

Memory Backup: EEPROM maintains memory with amplifier power off. Rated at greater than 10,000 writes. Changes are written to EEPROM memory approximately 30 seconds after the last command to change a setting is received.

Data Rate: 38,400 baud.

Data Format: Serial, binary, asynchronous, 1 start bit, 1 stop bit, 8 data bits, no parity.

Data Protocol: IQ² protocol.

Interface Type: Isolated 20 ma current loop.

Operation: Half duplex.

Intelligence: 8 bit processor with 20 KB firmware.

Input Impedance: Nominally 20K Ohm balanced, 10K Ohm unbalanced.

Signal/Noise: >85 dB 20 to 22 kHz.

Frequency Response: ±0.1 dB 20 to 22 kHz.

Crosstalk: >70 dB at 1 kHz, >65 dB at 20 kHz.

T.H.D.: <0.05% 20 to 22 kHz.

50 YEARS
Lasting Values

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