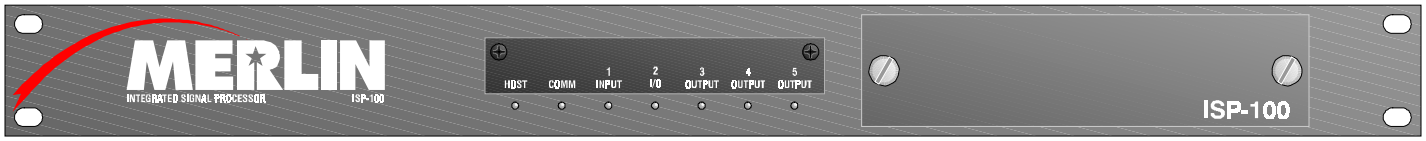
MERLIN
INTEGRATED SIGNAL PROCESSING

ISP-100

Integrated Signal Processor



- **24-Bit A/D and D/A converters**
- **24-Bit data processing**
- **Ergonomically designed software**
- **Up to eight configurable GPIs**
- **I/O hardware configurable**
- **Analog and/or digital**
- **Customized signal paths**

Description

The MERLIN ISP-100 provides the tools the contractors need to get the job done. They are tools designed to make the user successful at audio, not computer programming. The ISP-100 is designed with flexibility in mind, providing a powerful tool which allows you to adapt to ever-changing applications.

A versatile platform utilizing the latest in DSP technology allows the ISP-100 to quickly adapt to new market demands and continually changing improvements and advancements in semiconductors.

A series of predefined, signal path topologies, called QuickMAP™s are offered, which enable the designer to quickly define the processing structure of the system. This approach allows for a continuation of new processing solutions and/or variations, providing "market-specific" templates to help minimize your design time and increase your profit. In addition, we offer a stand alone program, QuickBUILD™, which allows system designers to modify or create their own QuickMAPs.

Integrated operations and functions simplify the total audio system design. Integration eliminates extensive cabling, connectors and components, along with minimized noise and failures due to cables and solder joints. The result of this consolidation of processing is overall system performance and audio integrity being greatly increased.

An ergonomically designed software interface called VUE-IT™ for the ISP-100 provides graphic control panels with the "conventional" look and feel of signal processors. As well, the advanced and easy-to-use filter tool graphically displays the configuration of your filter block settings.

The ISP-100 is designed with modular inputs and outputs. This feature allows the designer or installer to select between analog input or output modules and/or a digital input/output combination module. The modules are two channel units and can be intermixed between analog and digital providing a variety of I/O combination possibilities.

The ISP-100 supports a maximum of four inputs with a maximum of eight outputs. Combinations such as 2x2, 2x4, 2x6, 2x8, 4x2, 4x4, 4x6, or, for example, two in digital by eight out analog could all be accommodated by simply varying the I/O modules within the same ISP-100 chassis. Our QuickMAP software topologies support most of the configurations with more in development continually based on market demand.

The ISP-100 provides a dynamic range which rivals anything currently on the market. The Audio Precision System II (the testing standard for digital audio equipment) resolves signals down to -128 dBFS; at this level the ISP-100 is still performing exceptionally. The ISP-100 noise floor measures -110 dB, typical, and maintains a THD+N of less than 0.003%, typical. Due to the design efficiencies, propagation time is minimized in the ISP-100. Less than two milliseconds of inherent delay is introduced from any analog input to any analog output with full processing.

Another measure of the flexibility designed into the ISP-100 is the General Purpose Inputs (GPI). GPIs allow multiple system configurations to be selected without the need for a PC to control the unit. GPIs are programmable dry contact closure interfaces which allow user-supplied contact closures to switch system settings directly to a defined program and/or scroll through system settings as desired.

Architects' and Engineers' Specifications

The specified audio digital signal processor shall implement signal amplitude modifications via 24-bit data paths without truncation of values during processing via three 66 MHz DSPs. Component emulation algorithms shall be performed on the motherboard independent of any analog-to-digital, digital-to-analog and/or any digi-

tal signal input or output. Motherboard shall provide means to connect up to five, two-channel, I/O modules. Any conversions to or from the digital domain of the audio signal shall be performed by said modules. Mathematical calculations shall be implemented as such that resultant precision exceeds current industry standard test equipment abilities to measure processing noise floor. The unit shall be of a design and implementation process which limits any and all signal degradation between 20 Hz and 20 kHz to signal I/O conversion. The efficiency of the processor shall be as such that the inherent delay of the unit will be no more than two milliseconds from any analog input to any analog output with full processing.

The specified unit shall provide a single chassis capable of being hardware configured for 2x2, 2x4, 2x6, 2x8, 4x2, 4x4 or 4x6 signal path operation. The specified unit shall offer 24-bit A/D and D/A converters with a minimum noise floor of -110 dB and no more than 0.003% THD+N. The unit shall have a 1k measurement for THD+N of 0.002%. The chassis shall be capable of accepting an AES/EBU (SPDIF) digital I/O module for signal input and output. Both digital and analog modules shall be able to be used simultaneously within the same chassis in any compliant I/O configuration as stated above.

Communication exchange between the unit and PC shall be conducted via RS232 serial port. Unit shall provide a DB-9 connector accessible from the front of the unit and a RJ-45 connector on the rear of the unit for serial connection to the PC. The unit shall provide a selector switch allowing the operator to choose front or rear communication connection. The unit will accept up to eight independent dry contact closures via screw terminal connector. The unit will provide the means for these General Purpose Inputs (GPI) to interact with the software program allowing the operator to switch between programmed presets using said contact closures without a PC connected to the unit. GPIs shall be able to switch system settings to any user defined preset programmed into the unit. There shall be no immediately accessible buttons, knobs or switches on the front or rear of the unit. The unit shall provide a hot-swappable battery and tool for battery removal and installation. The unit will provide front panel LEDs which will indicate I/O modules installed, power on/off, signal clipping and host communications status. The unit shall be self-contained within a 19-inch, single rack space (1 RU) chassis.

The unit shall be compatible with AMX® RS-232 controls and networks.

Software environment for configuration and operation of the processor shall provide static signal path topologies which provide direct access to displayed processor options and the means to save multiple component configuration settings for said topology in presets independently which shall then be accessible via the GPI. The software shall provide a stable interface environment in Windows 3.1/3.11® and Windows 95®. Audio component emulation within the program shall incorporate readily noticeable means of component operation. All displayed metering during online operation shall incorporate ballistics. Software shall provide the means to save all programmed settings to the PC hard disk. Software program capable of generating custom signal path topologies for use in application software shall be made available to qualified system designers.

The specified signal processor unit shall be the MERLIN ISP-100.

Limited Warranty

MERLIN products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Telex Communications, Inc. Service or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Telex Communications, Inc. Service or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Telex Communications, Inc. Service by mail at 9600 Aldrich Avenue South, Minneapolis, MN 55420 or by phone at 612/884-4051**. Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Merlin shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Speakers and Speaker Systems are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Electronics are guaranteed against malfunction due to defects in materials or

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Figure 1—Front View of ISP-100 with Cover Removed

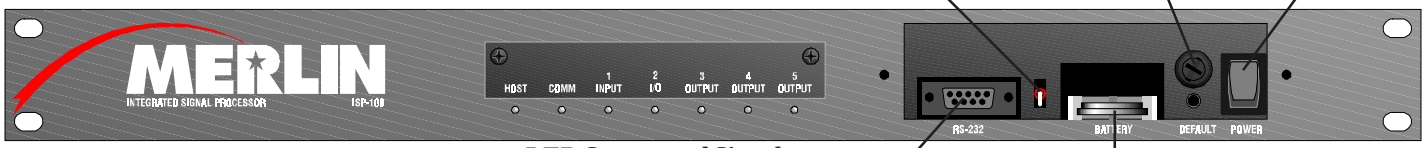


Figure 2—Rear View of ISP-100

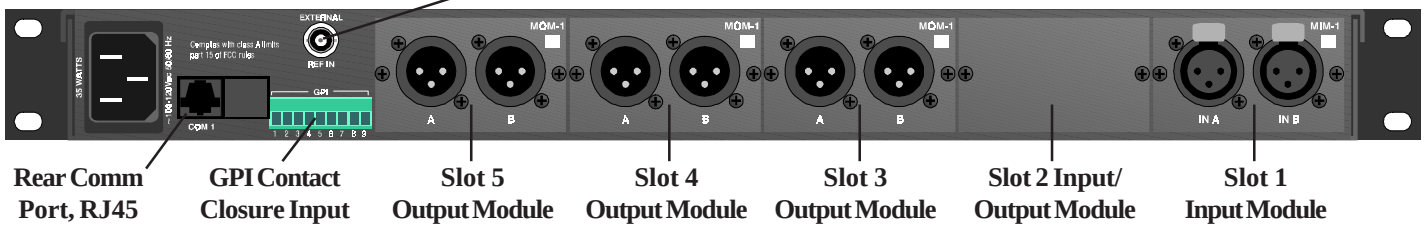


Figure 3—Linkwitz-Riley 3-Way Crossover

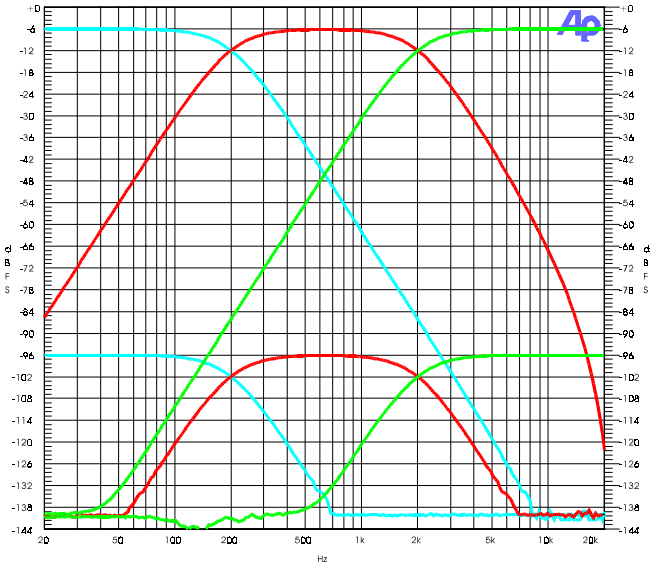


Figure 4—Compressor (multiple ratio and knee

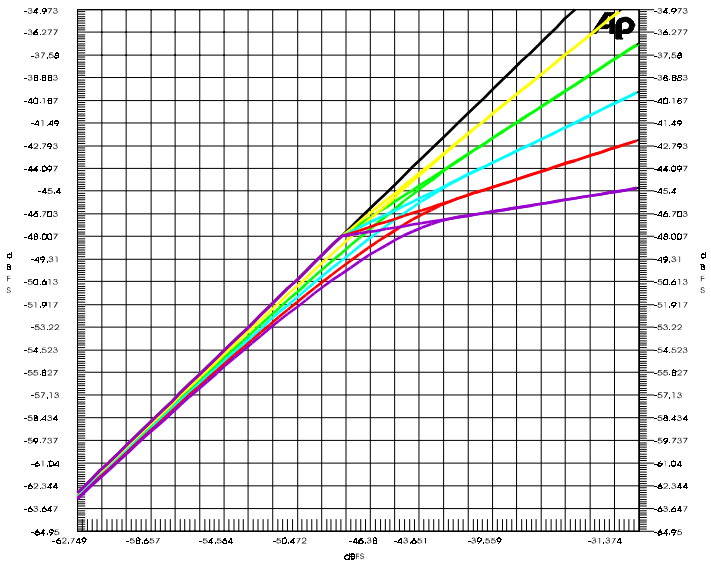
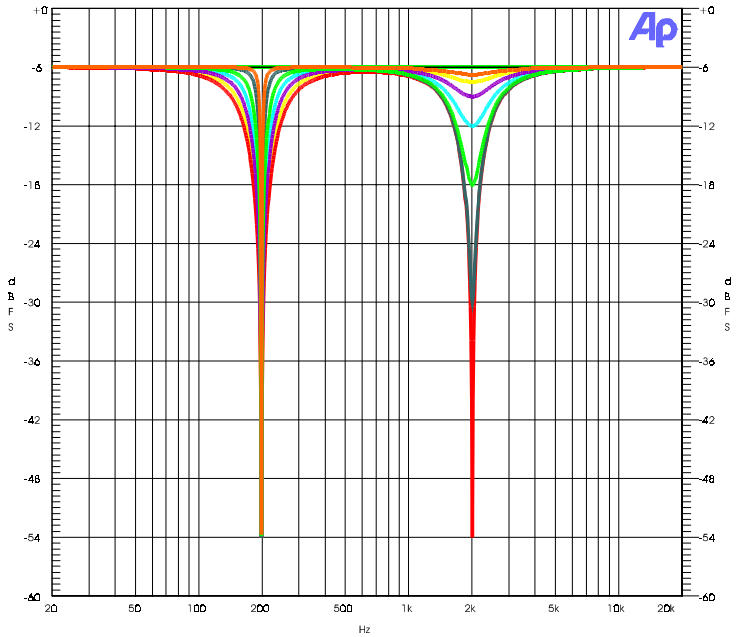


Figure 5—Notch Filter (multiple cut and "Q")



workmanship for a period of three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

For warranty repair, service information, or a listing of the repair facilities nearest you, contact the service repair department at: 612/884-4051.

For technical assistance, contact Technical Support at 612/884-4051, M-F, 8:00 a.m. to 5:00 p.m. Central Standard time.

Specifications subject to change without notice.

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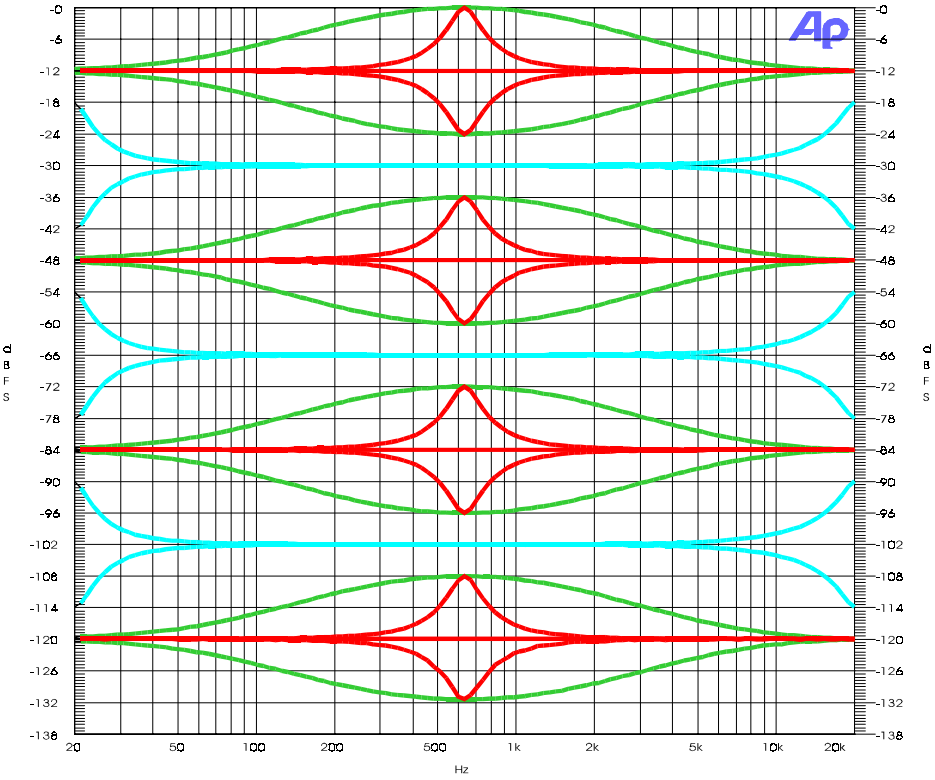
Figure 6—Parametric Equalizer (multiple input Level and "Q")



Specifications

General Specifications

Analog Input/Output Modules
Modular, 2-Channel, 24-bit Converters
Digital Input/Output Modules
Modular, 2-in x 2-out,
AES/EBU (SPDIF)
Noise Floor
-110 dB, typical
THD+N
0.003%, typical
0.002% at 1 kHz
Inherent Delay
Less than 2 msec, analog to analog, with full processing

Compressor/Limiter Components

Threshold
0 dB to -60 dB
Attack Time
20 usec to 50 msec
Release Time
20 usec to 5 sec
Knee Selection
Hard/soft
Detection Window
20 usec to 5 sec
Crest Factor Sensitivity
average to peak
Compression Ratio
1.2 to 24.0
Sidechain Channel Selection
Available; refer to QuickBUILD

Delay Components

Maximum Delay Time
Topology dependent,
typically 650 msec, minimum
Adjustment Increments
20 usec

Gate Components

Threshold
0 dB to -60 dB
Attack Time
20 usec to 50 msec
Release Time
20 usec to 5 sec
Attenuation
0 dB to -100 dB
Detection Window
20 usec to 5 sec
Sidechain Channel Selection
Available; refer to QuickBuild

Crossovers, 2-Way, 3-Way, 4-Way

Bandpass Gain per Band
0 dB to -96 dB
Filter Types
Bessel, Butterworth, Linkwitz-Riley
Slopes
Bessel/Butterworth
6dB/oct, 12dB/oct, 18dB/oct, 24dB/oct
Linkwitz-Riley
12dB/oct, 24 dB/oct
Cutoff Frequency (all bands)
20 Hz to 20 kHz

Filter Bank Components

Available Filter Types
low pass, high pass, low shelf, high shelf, notch, parametric eq, peaked high pass, all pass
Filter Bank Gain Trim
+12 dB to -12 dB
Slopes
6 db/oct, 12 dB/oct
Center/Corner Frequencies
20 Hz to 20 kHz
Boost/Cut
+12 dB to -12 dB,
notch: 0 dB to -50 dB
PEQ Bandwidth
measured 3 dB from peak
1/12 to 3 octave
Notch Bandwidth
measured 3 dB down from unaffected signal
1/12 to 1 octave

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