Model: MXB-8

±5A@ 24VDC

Fully Integrated Shim Amplifier System

- Up to 8 channels of highly stable, low noise current sources used to drive shim coils in MRI and NMR applications
- Fully integrated with bulk DC power source and complete digital control allowing for out of the box functionality
- System is packaged in an industry standard 3U: 19'' rack-mountable stainless-steel chassis
- Digital display allows for quick status viewing or troubleshooting

THE CHALLENGE

Provide a stable current source with high output compliance for control of multiple shim channels in a modern MRI or NMR system

Shimming Technology

The MXB shim system is designed to shim magnets under static and dynamic updating and is capable of real-time shimming on multiple slices, voxels or regions of interest with simultaneous compensation of shim induced eddy currents. (DSU unit required for real-time applications)

FLEXIBLE CONTROLS

Digital protocol with optional analog control from the MRI or NMR console for static and dynamic operation. A true Turn-Key shim solution. Try the ShimApp for quick start-up digital control.

Resonance Research, Inc
31 Dunham Rd, Suite 1
Billerica, MA 01844
USA
Phone: +1 (978) 671-0811
Email: rricorp.com

www.rricorp.com

SYSTEM OVERVIEW:

The MXB-8 is a complete shim power supply package. It contains the bulk DC power sources required to drive up to 8 channels of shim amplifiers. These amps are typically used to drive shim coils in an MRI or NMR application but can also be utilized in numerous industrial applications that require stable, low noise, programmable current. The unit can be used as a benchtop power supply or installed into a standard 19" cabinet. Its 3U footprint frees up valuable space in an otherwise crowded equipment cabinet.

Theory of Operation:

The master controller module runs embedded software that interprets high-level non-proprietary communication protocols. This computer controls the entire system and communicates with the amplifier modules in order to monitor the system status and control the current output cannels. The 8CH amplifier bank is controlled by an integrated microcontroller that communicates with the master controller through an internal data bus. The amplifier bank controller accepts, executes, and responds to commands issued by the master controller.

The MXB system has a linear amplifier output stage that utilizes a single +/- voltage rail. It has a modest transient response that can be expanded with the use of a second rail system (MXD)

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Specifications

INPUT CHARACTERISTICS	
Input Voltage/Freq	1-Phase, 100-240VAC, 50/60Hz
Input Current	10A
Analog Control Input	+/- 5V or +/- 10 V differential (factory set)
OUTPUT CHARACTERISTICS	
Maximum current output	5A DC per channel
Maximum voltage output	DC compliance +/-24V
Rated Output Power	500W from each +/- DC source per bank, 1000W total
Current Stability	50 ppm/day
Output Non-linearity	<0.1%
LOAD SPECIFICATION	
Resistance Range	2 ohm-4 ohm (including output cabling) for 5A
Inductance Range	100uH to 10mH
COMMUNICATION	
Setup control	Ethernet TCP/IP (Optional USB, CAN, Fiber Optic, RS-232)
Digital resolution	16-bit, +/-32767 DAC Counts
Software Protocol	Hex based format (non-proprietary), RS-232 ASCII option for legacy systems available
User Interface	Software application (ShimAppTCP) included for basic control
AMPLIFIER TOPOLOGY	
System Bulk DC sources	Switch-mode
Amp Operation	Linear output stages, single DC rail.
THERMAL MANAGEMENT	
Cooling	Internal PWM controlled fans
Thermal stability	Max 50 ppm/degree C (after start-up)
TRIM	
DC offset trim	+/- 1% (on board trim-pot for each channel)
MECHANICAL	
Width (inches / millimeters):	19in / 482.6mm
Depth:	24.75 / 628.4 including front handles
Height 3U:	5.25 / 133.35
APPROVALS	
Regulatory compliance	Compliant to UL/EN/IEC/CSA C22.2 60601
OPTIONS	
Digital Tuning	Complete digital control over PID parameters for each channel including offset adjustment
Expandable interface	Dynamic Shimming Unit (DSU)
Optional filter unit	5A capacity and 8-32 channels (dual 5A filters per channel with common-mode choke)

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Indicators / Display

Display/Buttons	
Digital Display	4 x 20 Characters, LCD
Backlight	Yellow/Green
Buttons:	
← / → Left/Right	Navigates display screen pages left and right
⏻ Power	Controls main AC relay, Short press ON – Long Press OFF

System Screen

Channel Screen

Interlock System Protection

Error reporting	
All errors are displayed on screen and can be polled via software	
Channel Error:	Overcurrent, Overpower, Over-dissipation, Overdrive
Bank Error:	Voltage Rail thresholds, Heatsink Overtemp
System Error;	Bank/Channel Error, Comm error, Interlock error, Fatal error
Interlocks	
External	Contact Closure required

Connections

Current Output	
37P	AMP PN: 206306-1
Analog Input	
Vin Control	D-Sub 50 Male
Z0 input	Floating BNC or TWINAX
Analog Output – Monitoring	
Current	Floating BNC
Voltage	Floating BNC
Power	
MAIN AC	IEC 320 C14 Inlet with integrated EMI filter and fuses
Communication	
RS-232	D-Sub 9 Male
USB	Type B
TCP/IP	RJ45 (standard)
Interlocks	
External	AMP 172168-1 6P Mini Mate-N-Lok

Full system

Resonance Research, Inc. strives to conduct its business with a total commitment to our customers and their requirements. We define quality as conformance to our customer's needs, both internal and external, and full compliance to all Quality Management System requirements.

We at Resonance Research understand that in order to achieve this goal, we need the cooperation and effort of the entire company. We must function as a team in our efforts to give our customers what they need every time.

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