

General Information

Thanks for joining the growing ranks of broadcasters employing Harris Corporation products designed by PR&E. Our mission: provide the finest quality products, systems, documentation and after-sale support.

The *BMXdigital* is a very sophisticated console with an extensive range of features contained in a compact design. To obtain maximum benefit from the console's capabilities, read the *Installation* and *Operation* sections prior to product installation.

Product Overview

Each *BMXdigital* console ships with the following installed into the mainframe assembly:

- **Microphone Preamplifier Module**
(1 Mic Preamp standard, 1 optional)
- **Universal Input Modules** (as ordered)
- **Telco/Codec Modules** (up to 6, as ordered)
- **Remote Line Selector modules** (as ordered)
- **Session Module** (1 standard)
- **Control Room Module** (1 standard)
- **Studio Module** (1 optional)
- **Output Modules** (3 standard)
- **DSP Cards** (1 to 5, depending on frame size)
- **Net Card** (1 optional)
- **Blank Panels** (as required)

The *BMXdigital's* motherboard and module/card area is surrounded by a sheet metal and ex-

truded aluminum chassis for strength and RFI immunity. The meter panel—hinged at the rear, closes over the upper part of the modules, covering the audio and logic connectors, the DIP switches and DSP and Net Cards. Cable access to modules is done from below the meter panel.

MODULE & CARD DESCRIPTIONS

Full-featured Input modules are described throughout this manual. Limited-function versions (minus the Send or Utility bus controls), Net-only versions (no connectors) and Limited-function Net-only versions (no connectors nor Send and Utility bus controls) are also available.

Microphone Preamplifier Module

Five mic preamps, each with a trim pot under a security cover, come standard on the *BMXdigital-8* and *-14*. Ten preamps come standard on the other frame sizes. A second five or ten input Mic Preamp Module can be field installed.

Mic preamps take balanced input signals (from -65 dBu to -30 dBu) and output balanced +4 dBu outputs for direct connection to a Universal Input module or to outboard processing equipment.

Universal Input Module

This module features two inputs (A and B), each can come from an analog or a digital source (source selection is set via a module DIP switch). DIP switches also set the analog input level or the digital attenuation. Each input has a fully independent parallel logic circuit for remote control of the module and/or module control of the source equipment. Each module has independent mic/

line logic functions for both inputs, also set using the module's Setup DIP switches.

The Universal Input module has controls for the following functions: A/B input selection, input mode selection, channel on/off, fader level, solo, cue, pan/balance, two Send selectors and level controls, and ten output bus selectors (four program, four utility, and two off-line buses). A two-line display shows the A and B input source names.

Two 24-pin connectors connect logic wiring to/from external peripherals or control panels for the A and B inputs. Two 14-pin connectors allow remote talkback (active when microphone logic is selected) for the A and B inputs. Four 8-position DIP switches set logic and module function options independently for the A and B inputs.

Telco/Codec Input Module

An optional module that provides audio and logic connections for a telephone hybrid or a codec (satellite transceiver, ISDN interface, etc.). Up to six Telco modules can be installed in the frame.

Telco modules have digital and analog inputs (the active input is set via DIP switch) and the same controls as a Universal Input—minus the A/B input selector. Additional module controls include: telco monitor bus and telco record output assignment buttons, a Talk to Codec function, a Source Selector and a Take button (for source selection with a VistaMax, Ext. RLS or a router).

Each Telco module has an associated mix-minus (Foldback) of any combination of the program, utility or send buses and two off-line mix buses. An Auto-Foldback function can automate switching Foldback between an off-line mix and the assigned bus with module off and on.

Remote Line Selector Input Module

An optional module that offers source selection from a VistaMax system, an external remote line selector or a router. Each module has a digital and

an analog input (active input set by module DIP switch). Front panel controls are the same as the Universal Input, minus the A/B selection. Instead, there is a Source Selector and Take button.

Session Module

This module provides session control, auxiliary meter source selection, and event timer controls. There are eleven Aux Meter selector buttons (for viewing any External Input, Send, Utility bus, or Telco Record output) and two Main Meter selectors (PGM 1-4 and UTL 1-4) for viewing the Program or the Utility buses on the four Main Meters (on the BMX*digital*-8, the two buttons cycle through the buses to show one at a time on the Main meter).

The session control section has a Session Selector and two buttons: Take and Save. A two-line display shows the session currently being used and either the next session to be loaded, or when the Session Selector is being turned, the various sessions available in alphanumeric order.

The Timer Control section has the event timer controls: Start, Stop, Hold, and Reset, as well as the Auto Reset control, which adds automatic module on resetting of the event timer.

Control Room Module

This module has the monitor selection and control facilities for the console operator. It has parallel logic control for control room speaker dim and mute, and to provide a control output for the Control Room warning lamp controller.

The Control Room module has independent monitor and headphone source selectors and monitor and headphone fader level controls. The module also has input mode controls, Cue and talkback level controls and a solo clear button. Additional headphone controls include an Autocue selector and a button to force the headphones to follow the monitor source selection.

Studio Module

This optional module has the monitoring and talkback controls for two separate studios or voice booths, plus talkback audio and control inputs for a producer/call screener position and for an external position.

The Producer and External audio inputs are line level. The Mic Preamp module may be used as needed for these inputs. A Producer Talkback / IFB Panel (PRE99-1188) is also available. It provides a mic and preamp for the Producer along with Talk buttons for thirteen locations.

The Studio module has two parallel logic connectors for the Studio 1 and 2 dim, mute, and Studio Warning Lamp interface controls.

The Studio module also has monitor and talkback selector controls, and monitor and talkback level controls. All of the controls operate independently for each studio.

Output Modules

There are three Output modules. The Output 1 module has the digital-to-analog converters and mix matrices for creating mix-minus foldbacks to support up to six Telco/Codec modules. It also contains individually mixed outputs for Telco monitoring and recording. Two monaural mix-minus outputs for each Telco/Codec module, one with talkback (IFB) and one with a clean feed, are on this module.

Digital and analog outputs are provided for the mix-minus and recorder feed outputs. For digital outputs, sample rates of 48 kHz and 44.1 kHz are supported. The mix-minus analog outputs are fixed at +4 dBu. This module features output sample rate selectors for digital outputs and gain trim controls for the analog Telco record mix output and IFB level.

The Output 2 and Output 3 modules contain the AES digital output drivers, digital-to-analog converters, and analog line amplifiers for the Pro-

gram, Utility, and Send outputs. For digital outputs, sample rates of 48 kHz and 44.1 kHz are supported. These modules feature output sample rate selectors for the Program auxiliary outputs and the Utility and Send outputs, as well as gain trim controls for the Program, Utility, and Send analog outputs.

DSP Cards

The number of standard DSP (Digital Signal Processor) cards installed is frame-size dependent (BMXd-8 has one DSP Card, BMXd-14 has two, and so on up to the BMXd-38 with five cards).

DSP cards plug into the motherboard behind the input modules, hidden below the meter panel in normal use. Each card has a “heartbeat” LED to indicate operation. An optional External Input DSP (99-1355-1) adds an external AES-3 reference input for the first DSP Card position.

Net Card

This optional card allows the BMXdigital to directly interface to a VistaMax Audio Management System. It plugs into the motherboard behind the Output modules, hidden below the meter panel in normal use. There are eight VistaMax inputs and outputs on the card for connecting intercom, external monitors and other in-room equipment that does not need to have local module control.

POWER SUPPLY

The separate rack-mount power supply (99-1205) supplies +48 VDC and a voltage monitor signal to the console. One supply comes standard. An optional second 99-1205 supply and a +48 VDC Coupler (99-1203) can be installed for redundant supply operation. Each power supply has its own AC input, On/Off switch and LED power good indicator. Each power supply is fully regulated and protected against excessive current by internal fuses and electronic safeguards.

Specifications

The specifications for the BMXdigital are significantly more complete, and the related test conditions are more defined, than those usually shown for consoles in this class. Be sure to follow the test conditions and measure in the units as stated.

The specifications are for a fully loaded BMXdigital 38-input mainframe.

Test Conditions:

Specifications are for the basic signal paths, per channel, with >1 k ohm loads connected to the analog main outputs.

0 dBu corresponds to an amplitude of 0.775 volts RMS regardless of the circuit impedance. This is equivalent to 0 dBm measured into a 600 ohm circuit for convenient level measurement with meters calibrated for 600 ohm circuits. Noise specifications are based upon a 22 kHz measurement bandwidth. The use of a meter with 30 kHz bandwidth will result in a noise measurement increase of approximately 1.7 dB.

Total Harmonic Distortion (THD+N) is measured at a +18 dBu output level using a swept signal with a 22 kHz low pass filter.

FSD = Full Scale Digital, +24 dBu

Microphone Preamplifiers

Source Impedance: 150 ohms

Input Impedance: 5 k ohms minimum, balanced

Input Level Range: Adjustable, -65 to -30 dBu

Input Headroom: >20 dB above nominal input

Output Level: +4 dBu, nominal

Analog Line Inputs

Input Impedance: >40 k ohms, balanced

Input Level Range: Selectable, -10 dBv, +4 dBu, +6 dBu, +8 dBu

Input Headroom: 20 dB above nominal input

Analog Main Outputs

Output Source Impedance: <3 ohms balanced

Output Load Impedance: 1 k ohms minimum

Nominal Output Levels: Program, Utility, Send, Telco/Codec Mix-Minus, Telco Record Mix Feed: +4 dBu, adjustable between +3 dBu and +9 dBu

Maximum Output Levels: Program, Utility, Send, Telco/Codec Mix-Minus, Telco Record Mix Feed: +24 dBu; +28 dBu with nominal output level adjusted to +8 dBu

Digital Inputs and Outputs

Reference Level: +4 dBu (-20 dB FSD)

Digital I/O: Thru digital input and digital Program, Utility, Send, Telco/Codec Mix-Minus outputs

Signal Format: AES-3, S/PDIF (input only)

AES-3 Input Compliance: 24-bit sample rate conversion available, individually switch selectable

AES-3 Output Compliance: 24-bit

Digital Reference: Crystal (internal) or AES-3 (external) at 48 kHz \pm 100 ppm

Internal Sample Rate: 48 kHz

Output Sample Rates: Program Main outputs are 48 kHz; Program Aux, Utility, Mix-Minus and Telco Record Mix outputs, individually DIP switch set for 48 kHz or 44.1 kHz

Processing Resolution: 24-bit fixed with extended precision accumulators

Conversions: A/D 24-bit, Delta-Sigma, 128x oversampling on all digital inputs; D/A 24-bit, Delta-Sigma, 128x oversampling

Latency: <1.6 ms, mic in to monitor out

Monitor Outputs

Output Source Impedance: <3 ohms, balanced

Output Load Impedance: 1 k ohms minimum

Output Level: +4 dBu nominal, +24 dBu maximum

Frequency Response

Microphone or Line Input to Program, Utility, or Send

Output: +0 dB/-0.5 dB, 20 Hz to 20 kHz

Dynamic Range

Analog Input to Analog Output: 105 dB referenced to FSD, 108 dB "A" weighted to FSD

Analog Input to Digital Output: 109 dB referenced to FSD

Digital Input to Analog Output: 107 dB referenced to FSD, 110 dB "A" weighted to FSD

Digital Input to Digital Output: 138 dB

Equivalent Input Noise

Microphone Preamp: -127 dBu, 150 ohm source

Total Harmonic Distortion + Noise

Mic Pre Input to Mic Pre Output: <0.005%, 20 Hz to 20 kHz, -38 dBu input, +18 dBu output

Analog Input to Analog Output: <0.005%, 20 Hz to 20 kHz, +18 dBu input, +18 dBu output

Digital Input to Digital Output: <0.00016%, 20 Hz to 20 kHz, -20 db FSD input, -20 db FSD output

Digital Input to Analog Output: <0.005%, 20 Hz to 20 kHz, -6 db FSD input, +18 dBu output

Crosstalk Isolation

Program-to-Program or to-Utility or to-Send: >95 dB, 20 Hz to 20 kHz

A Input to B Input, B Input to A Input: >110 dB, 20 Hz to 20 kHz

Stereo Separation

Analog Program Outputs: >86 dB, 20 Hz to 20 kHz

Console Power Requirements

Fully configured BMXdigital 22: 250 watts at 115/230 VAC, $\pm 12\%$, 50/60 Hz

Fully configured BMXdigital 30: 285 watts at 115/230 VAC, $\pm 12\%$, 50/60 Hz

Fully configured BMXdigital 38: 320 watts at 115/230 VAC, $\pm 12\%$, 50/60 Hz

Power Supply Voltage

Console power: +48 VDC at 6.25 Amps, optional redundant supply can be added with 48 volt coupler

Power Supply Ground

Rack mounted power supply: grounded thru AC cord

Power Supply Connection

AC input: IEC power cord, one per plug-in power supply

DC output: Keyed multi-pin connectors

Dimensions

BMXd-8: 9.8" [249] x 29.2" [742] x 33.4" [848]

BMXd-14: 9.8" [249] x 42.0" [1067] x 33.4" [848]

BMXd-22: 9.8" [249] x 54.8" [1392] x 33.4" [848]

BMXd-30: 9.8" [249] x 67.6" [1717] x 33.4" [848]

BMXd-38: 9.8" [249] x 80.4" [2042] x 33.4" [848]

48V Power Supply (Rack mount): 2 RU: 3.5" [89] x 19" [483] x 10" [254]

48V Coupler (Rack mount): 1 RU: 1.75" [45] x 19" [483] x 10" [254]

All dimensions are Height, Width, Depth.

Harris Corporation reserves the right to change specifications without notice or obligation.

WARRANTY

The BMX*digital* console and power supply carry a manufacturer's warranty which is subject to the following guidelines and limitations:

- A) Except as expressly excluded herein, Harris Corporation ("Seller") warrants equipment of its own manufacture against faulty workmanship or the use of defective materials for a period of one (1) year from date of shipment to Buyer. The liability of the Seller under this Warranty is limited to replacing, repairing, or issuing credit (at the Seller's discretion) for any equipment, provided that Seller is promptly notified in writing within five (5) days upon discovery of such defects by Buyer, and Seller's examination of such equipment shall disclose to its satisfaction that such defects existed at the time shipment was originally made by Seller, and Buyer returns the defective equipment to Seller's place of business in Mason, Ohio, packaging and transportation prepaid, with return packaging and transport guaranteed.
- B) Equipment furnished by Seller, but manufactured by another, shall be warranted only to the extent provided by the other manufacturer.
- C) Thermal filament devices, such as fuses, are expressly excluded from this warranty.
- D) The warranty period on equipment or parts repaired or replaced under warranty shall expire upon the expiration date of the original warranty.
- E) This Warranty is void for equipment which has been subject to abuse, improper installation, improper operation, improper or omitted maintenance, alteration, accident, negligence (in use, storage, transportation, or handling), operation not in accordance with Seller's operation and service instructions, or operation outside of the environmental conditions specified by Seller.
- F) This Warranty is the only warranty made by Seller, and is in lieu of all other warranties, including merchantability and fitness for a particular purpose, whether expressed or implied, except as to title and to the expressed specifications contained in this manual. Seller's sole liability for any equipment failure or any breach of this Warranty is as set forth in subparagraph A) above; Seller shall not be liable or responsible for any business loss or interruption, or other consequential damages of any nature whatsoever, resulting from any equipment failure or breach of this warranty.