M-DSP

MICRO DIGITAL SIGNAL PROCESSOR

TECHNICAL
DOCUMENTATION

Wheatstone Corporation
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Micro Digital Signal Processor

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Introduction

The Wheatstone M-DSP Micro Digital Signal Processor is a 1RU rack mountable unit that provides the required DSP hardware for a Wheatstone E-Series Digital Control Surface when that surface is part of a Wheatstone Bridge system or a Wheatstone Wheatnet system but does not contain the normal E-SAT cage. The M-DSP is essentially an E-SAT without any audio or logic inputs and outputs.

The unit functions as a mix engine DSP for the surface, combining all of the console audio signals as directed by a console's faders, knobs, and switches to produce the various Program, Aux Send, Mix Minus, and Monitor output mixes. The DSP receives instructions from control surfaces in real time over a Mixer Transport using the "MIXER LINK" RJ-45 connector on the rear panel.

The front panel PWR 1 indicator lights up to indicate the presence of voltage at power input jack number 1, and PWR 2 provides the same function for power input jack number 2. The LINK 1 LED indicates a good connection to the Wheatnet or Bridge via the rear panel AT LINK 1 connector. Use of the LINK 2 LED is reserved.

Rack Mounting

The M-DSP is designed to fit into an industry standard 19" equipment rack, and requires one rack unit (1.75 inches) of vertical space. Vertical slots positioned in the side panels allow air flow to and from the M-DSP. When installing it is important to avoid restricting air flow to the side vents.

The M-DSP may be mounted between other devices in the equipment rack and in accordance with good engineering practice should not be mounted directly above devices that generate significant amounts of heat. If such a location is unavoidable then it is advisable to utilize an extra 1RU blank rack panel between the M-DSP and devices immediately above and/or below it.

WARNING! **Under no circumstances should the M-DSP unit be opened! The unit has no user-serviceable parts inside! If you have a problem the unit must be returned to Wheatstone Corporation for repair.**

Power Supply

The M-DSP is powered by a factory supplied power adapter with 100-240V/50-60Hz input, 90W maximum output power, and a 4 foot long output cable. Input AC current to the power supply is less than 3.75A. The output cable can be plugged into either the POWER A or the POWER B connector on the M-DSP rear.

A second, redundant, power adapter is available. When using two supplies one output cable is plugged into the POWER A connector and the other output cable is plugged into the POWER B connector.

When required, the M-DSP may be powered up or down by utilizing the AC connection to the power supply (or supplies). DO NOT plug or unplug the DC connection(s) while AC power is applied.

The power feed recommended in the text is often installed and referred to in studios as an "isolated AC ground" outlet. It is usually orange in color.

The power supply adapter is supplied with a 3-wire grounded AC cord that should be plugged into a "clean" AC power source, that is, an AC source that feeds only the control room audio gear. This source should be a separate feed from those powering lighting, air-conditioning, or any other non-audio machinery.

Energizing

Assuming the M-DSP is correctly rackmounted, you may now energize it. There is no power switch.

Aggressive AC input filtering is utilized at the AC input of the M-DSP; however, it is always advisable to use external surge protection and/or an uninterruptible power supply (UPS), especially where AC power quality is questionable, such as at a remote transmitter site.

Power conditioning, surge suppression, and even power backup devices are wise investments when using sensitive modern electronic devices that use an internal computer.

Use of a UPS (uninterruptible power supply) is a good idea and will protect the M-DSP from short duration power interruptions which may cause it to reboot. During boot up, audio control is interrupted for approximately 40 seconds.

I/O Connections

All user wiring to and from the M-DSP is made via connectors located on the rear panel. Two jacks on right are for power supply connections. There are three RJ-45 connectors; the one labeled MIXER connects to an E-Series control surface MIXER port or to the AT LINK port on a Virtual Mixer Interface (VMI) unit. The second, labeled AT LINK1, connects to a specific AT port in the Bridge or Wheatnet system. The third, labeled not used, is reserved. The pinout drawing on page 6 shows all wiring connections at a glance.

Audio Network Wiring

This "AT LINK 1" RJ-45 connector provides the control link between the M-DSP and the Bridge Router or Wheatnet system, and for these type of systems all settings and commands generated on the M-DSP pass through this link via a special CAT5 cable wired in "crossover" fashion. This special cable connects the RJ-45 jack on the M-DSP to the matching RJ-45 jack on the Bridge Router or Wheatnet system. Please note that, in a typical system, there will be many RJ-45 jacks in the Bridge Router or Wheatnet system, and for proper operation the M-DSP must be connected to the specific RJ-45 jack defined for it in the system configuration. For crossover CAT5 cable pinouts see page 5.

"AT LINK 1" Connector

Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +
Pin 4 – N/C
Pin 5 – N/C
Pin 6 – RXD -
Pin 7 – N/C
Pin 8 – N/C

Mixer Link Wiring

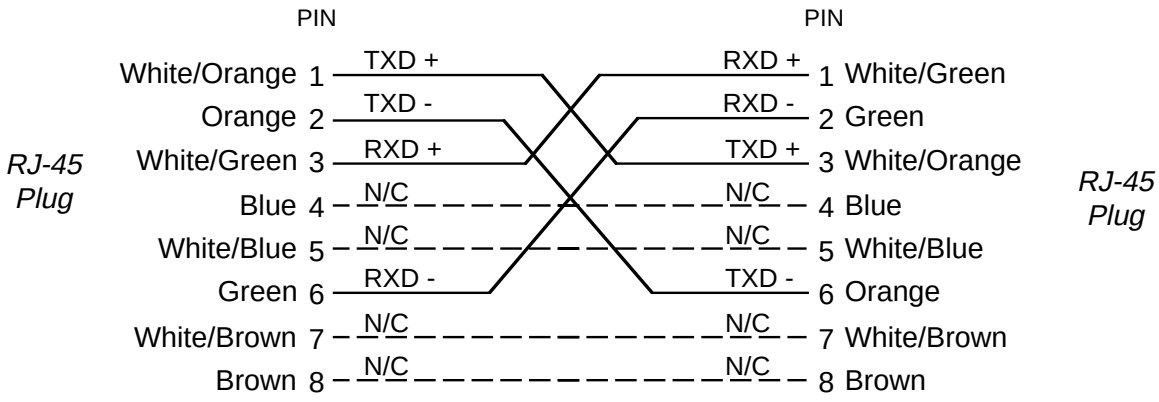
This RJ-45 connection provides the control link between the M-DSP and the control surface or VMI. All settings and commands generated on the control surface pass through this link. A special CAT5 cable wired in "crossover" fashion is used for this link. This special cable connects the RJ-45 jack on the M-DSP to the matching RJ-45 jack on the control surface or VMI. For crossover CAT5 cable pinouts see page 5.

"MIXER" Connector

Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +

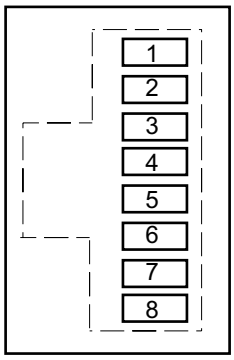
Pin 4 – N/C
Pin 5 – N/C
Pin 6 – RXD -
Pin 7 – N/C
Pin 8 – N/C

Typical Crossover Cable



RJ-45 Connections

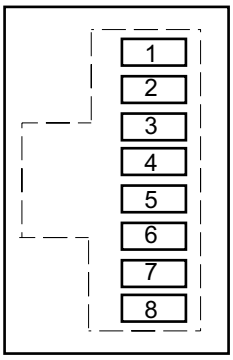
MIXER CAT5
Connector (RJ-45)



TXD +
TXD -
RXD +
N/C
N/C
RXD -
N/C
N/C

(crossover)

AT LINK 1 CAT5
Connector (RJ-45)



TXD +
TXD -
RXD +
N/C
N/C
RXD -
N/C
N/C

(crossover)