

Multiplexers/ Demultiplexers (MDMs)

Your Solution For
Onboard Processing

AEROSPACE

Honeywell offers a suite of MDMs for a variety of onboard processing applications. This suite, developed by Honeywell and used for the International Space Station, comprises four sizes and more than 17 different configurations.

These flexible MDM designs are qualified for use in the Space environment and can be adapted to internal pressurized and/or external vacuum environments.



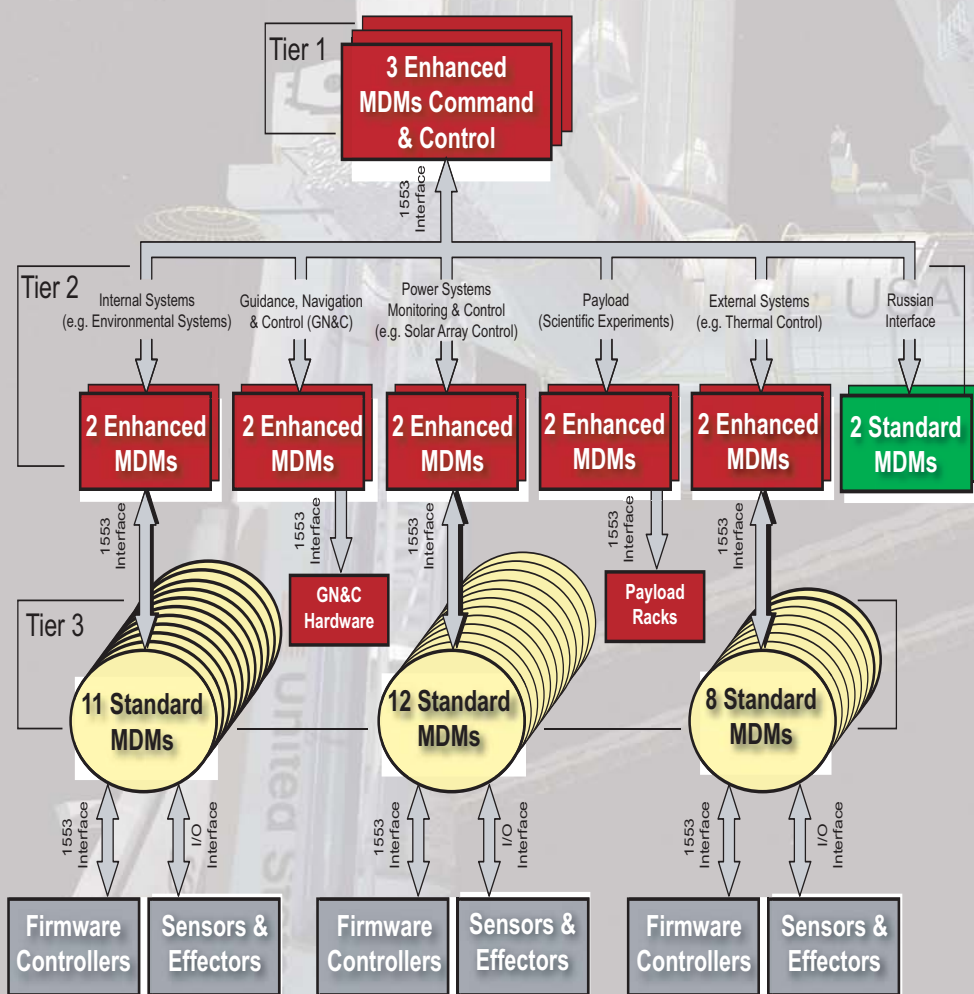
Honeywell Capabilities--Flexible and Reliable

Honeywell's suite of MDMs is the backbone to the International Space Station's command and data handling system and provides access to a multitude of sensors, effectors and firmware controllers. The MDMs also enable the system to perform process control functions and execute critical commands in a fail-safe environment. Reliability is built-in the system for trouble-free and safe operation.

Honeywell's flexible MDM design can accommodate new circuits and functions. Possessing a MIL-STD-1553 databus and fiber-optic I/O capability, the MDMs can easily incorporate other high-speed and wireless communications.

International Space Station Architecture

Three tiers of MDMs make up a distributed control architecture. Operating in both internal and external environments, these MDMs work together to control key functions on the orbiting vehicle.



• **Tier 1 consists of the Command and Control Enhanced MDMs.**

They serve as the "brains" to the on-orbit data networks and provide command and control messages to tier 2 MDMs.

• **Tier 2 also consists of Enhanced MDMs.** These MDMs receive commands from the Command and Control MDMs while controlling the third tier MDMs and other firmware controllers.

• **Tier 3 consists of Standard MDMs.** The MDMs receive command input from Tier 2. Once this information is received, the Standard MDM, acting much like the nervous system in our bodies, executes the commands by controlling all on-board systems through sensors and effectors, located throughout the International Space Station.

International Space Station MDM Architecture

MDM Designs:

MDM-4

Size (in): 6.00 W x 8.02 H x 13.25 D

Cards: four I/O cards maximum

Weight (lb): 17.5 to 22.0

Typical Power Consumption (W)*: 28 to 50

MDM-16

Size (in): 14.40 W x 8.02 H x 13.25 D

Cards: 16 I/O cards maximum

Weight (lb): 47.3 to 54.5

Typical Power Consumption (W)*: 70 to 106

MDM-10

Size (in): 10.20 W x 8.02 H x 13.25 D

Cards: 10 I/O cards maximum

Weight (lb): 36.6 to 39.2

Typical Power Consumption (W)*: 57 to 75

Enhanced MDM

Size (in): 14.40 W x 8.02 H x 13.25 D

Cards: five 1553 cards with optional Fiber Optic High Rate Data Link and Solid State Mass Memory

Weight (lb): 48.3 to 54.3

Typical Power Consumption (W)*: 88 to 102

**Power Consumption is dependent on application loads.*

MDM I/O Modules Available:

Standard MDMs

Serial/Parallel Digital 1553

Analog I/O

Discrete I/O

Solenoid Driver Output

Modular power supply

I/O Control Unit

Enhanced MDMs

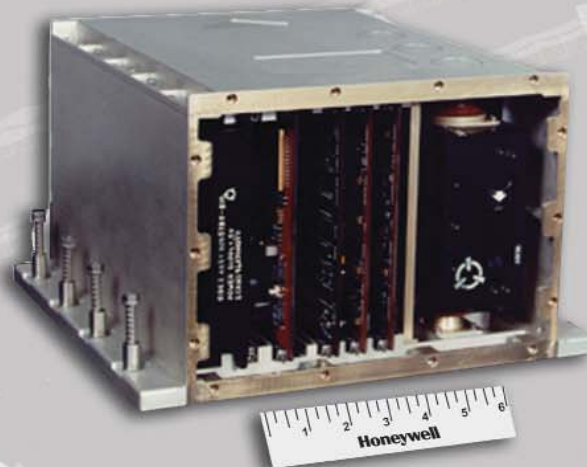
Serial/Parallel Digital 1553

Fiber Optic High Rate Data Link

Solid State Mass Memory

Modular power supply

Enhance I/O Control Unit



MDM Chassis

The MDM chassis comes in three different sizes and is machined from aluminum, using conduction cooling. It is built to allow for a robotic interface that can remove and replace the MDM, increasing service availability and reducing EVA and crew time for MDM maintenance.

Honeywell

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