**ISS Multiplexer / Demultiplexer (MDM)**[**Spacewalk set to fix external MDM failure on ISS - NASASpaceFlight.com**](https://www.nasaspaceflight.com/2014/04/imminent-spacewalks-external-mdm-failure-iss/) **A general description of the structure and operation of MDMs on the space station, and how they are replaced in the event of failure.**

[Preparation of Papers for AIAA Technical Conferences](https://ntrs.nasa.gov/api/citations/20190000222/downloads/20190000222.pdf)  
Discusses Timeliner integration into C&C MDM and PL MDM and how commands are automatically managed during periods of ground outage.  
  
SUMMARY :  
**The MDMs (Multiplexer / Demultiplexer units) aboard the ISS are data aggregation and distribution modules. They collect multiple streams of data (from sensors, subsystems, payloads) and route them to the appropriate processors or actuators. They are core elements of the Command & Data Handling (C&DH) architecture in the U.S. segment of the station.**  
The MDMs are organized into hierarchical tiers:  
- Tier 1 (C&C MDMs): handle critical station-level commands, communicate with ground controllers, dispatch commands to other modules, collect station telemetry.

-Tier 2 / Tier 3: distributed control and data processing for subsystems (thermal control, life support, external hardware). Internal (INT) vs External (EXT) variants exist; external ones are exposed to space and must support replacement during EVAs.

Capabilities include:

* Multiple analog/digital I/O to interface with sensors and effectors.
* Enhanced versions with higher computational speed, memory, and high-rate links to payloads and storage.
* The use of **Timeliner UIL** for scripting autonomous operations onboard (especially during ground communication losses).