

# Expedite the Processing of Experiments to Space Station (EXPRESS) Rack Overview



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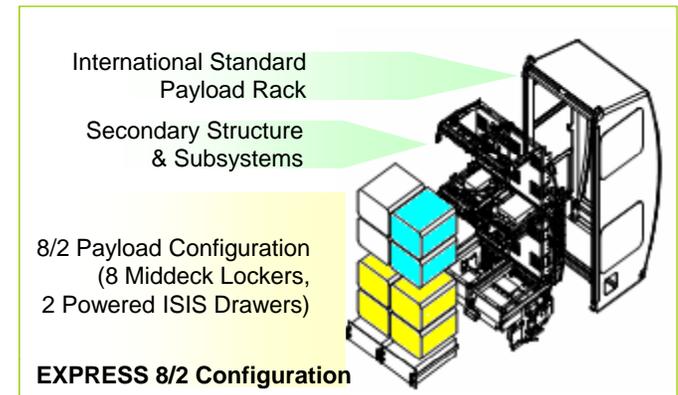
Huntsville, AL



# EXPRESS Facility Overview



- Philosophy is to get small payloads to ISS with a shortened integration time
- Multiple payload disciplines supported
- Standard interfaces and resources for payloads
- 50+ EXPRESS payloads integrated (6A to 1E)
- 3 Racks located in International Partner modules



EXPRESS Launches	EXPRESS Transportation Rack	Integrated Rack
ER1 6A		
ER2A 6A		
ER3A UF2		
ER4 7A.1		
ER5 7A.1		
ER6 ULF2		

Interfaces
Structural & Mechanical QD (Water, GN2, Vacuum) Power & Data Connectors Cables & Hoses

Resource
Power Data & Video Thermal Control Vacuum Exhaust Nitrogen

Derivatives	
HRF	WORF

# EXPRESS-Provided Payload Interfaces and Resources



## Power

- Solid State Power Controller Module (SSPCM) converts station power for payload use
- 28Vdc Power (+1.5, -2.5 Vdc) provided to payloads
- Current limiting available at 5, 10, 15, 20 amp settings

## Thermal

- Avionics Air Assembly (AAA) ducted cooling at 15 (+/-3) cfm provides 1200 W total heat rejection for all air-cooled payloads in the rack.
- Moderate Temp Loop (MTL) water cooling (50-200 lbm/hr) is available for 500 W heat rejection using either of the connections on the rack front.
- Smoke detection available for air-cooled payloads

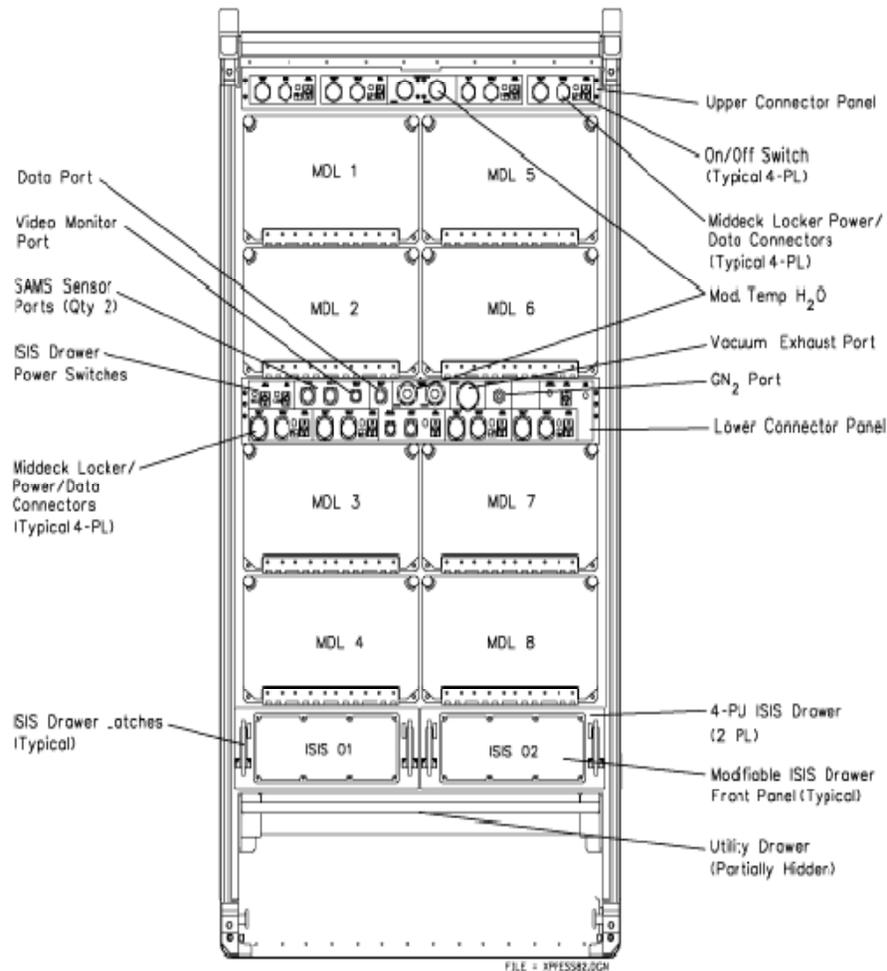
## Data

- Each data connector includes pins for 1553, RS-422, Ethernet, NTSC RS-170A Video
- 5 Vdc bi-directional differential discrete
- +/- 5Vdc differential analog
- EXPRESS Laptop Computer available for payload-specific software and/or crew interfaces
- Parameter monitoring available for water-cooled payloads

## Other

- Vacuum Exhaust is available for payload use through connector on front of EXPRESS Rack
- Nitrogen is available at 0.5 lb/min
- Each EXPRESS Rack has 1 Vacuum and 1 Nitrogen connection for shared payload use.

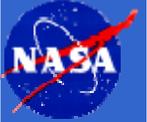
# Payload Interfaces and Resources



NOTE: SAMS interface available in ARIS Rack only.

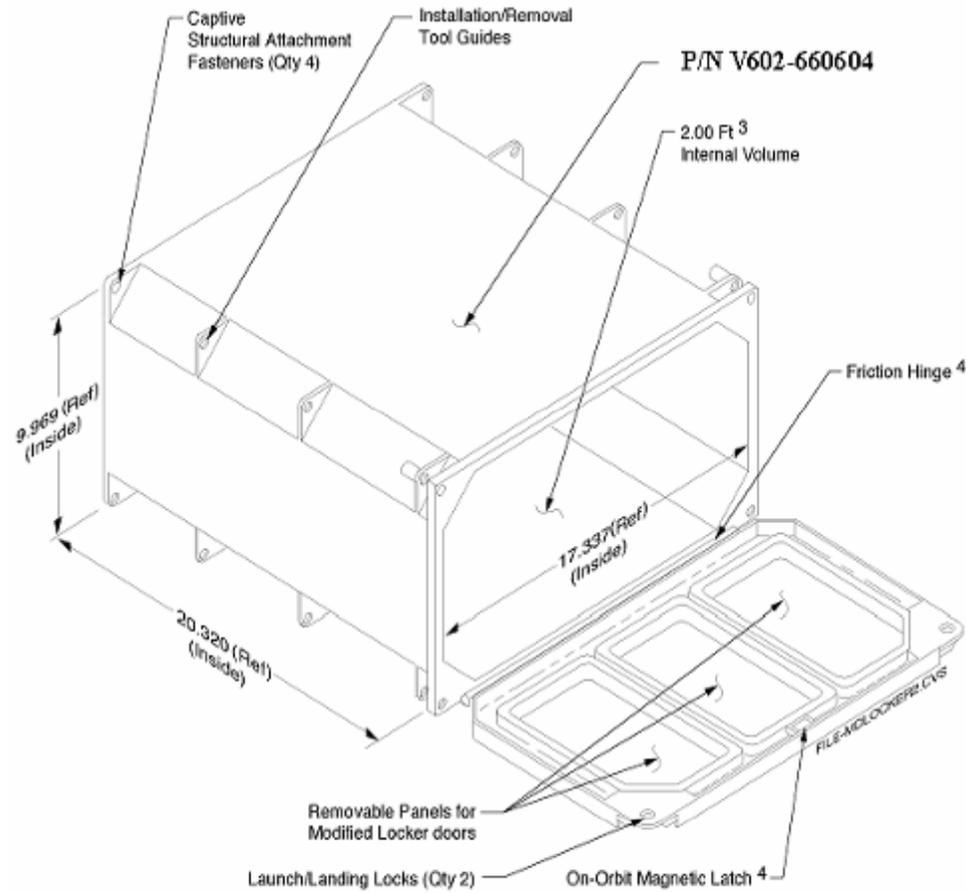


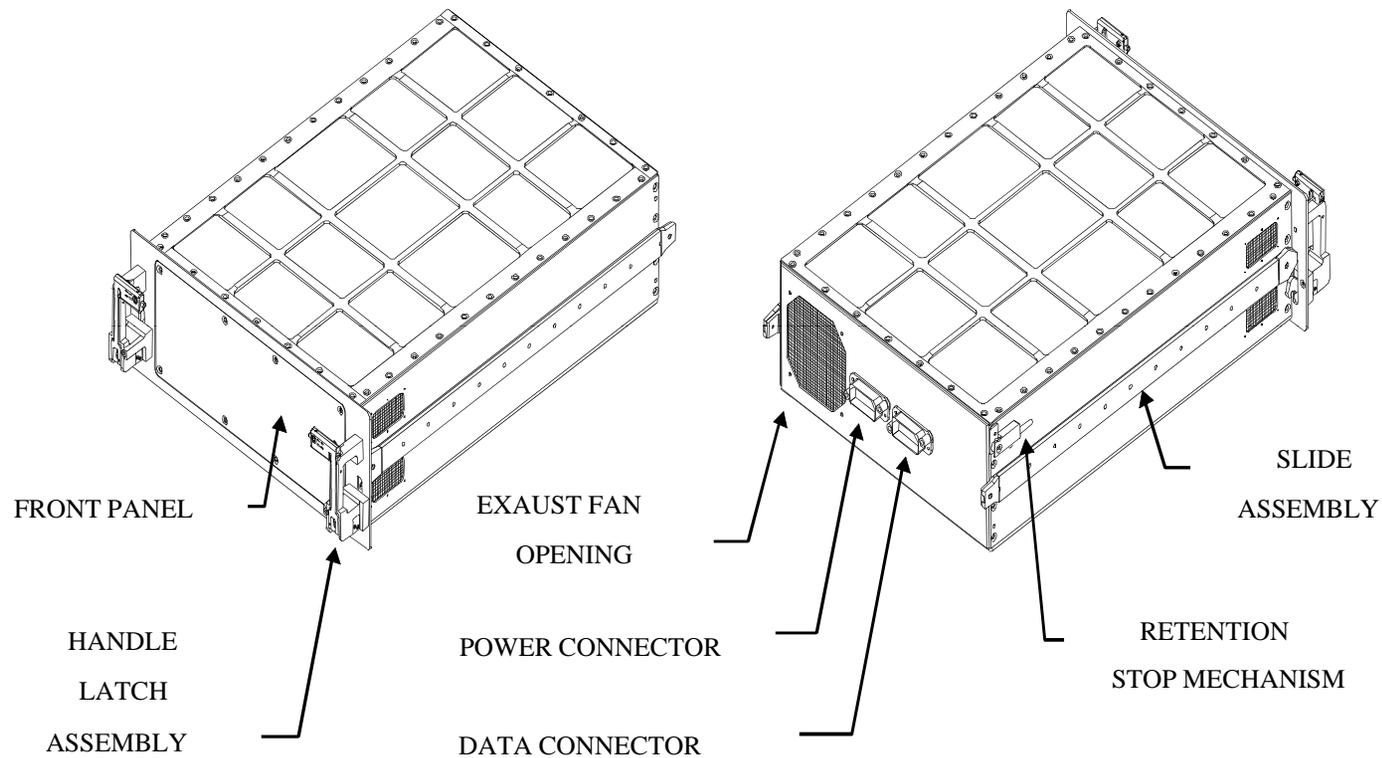
# EXPRESS Locker Interface



Payloads can either be locker “inserts” or locker “replacements”.

## ISS Locker Details





## Powered International Subrack Interface Standard (ISIS) Drawer Details



- Flight Units On-Orbit Located in the US, ESA and JAXA Modules
- Flight Units On-Ground Located at KSC and MSFC
- Ground/Training Units Located at JSC and MSFC
  - Used for Crew Training
- Suit Case Simulators Available for Payload Development Support
  - Used for Payload Development
- Developmental Testing Available at MSFC
  - Used for End-to-End Testing
- Functional Testing Available at KSC
  - Used for End-to-End Testing

# EXPRESS On-orbit

