# Summary of Interface Requirements

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## Top-Level Interface Requirements

- **Requirements Source:**
  - LIS on TRMM ICD (TRMM-490-022)
- **Mass:** **21 kg**
- **Power:**
  - Non-essential (operational): 45 W peak, 42 W on-orbit avg
  - Maximum survival heater power: TBS W peak, TBS W avg
- **Clear FOV:** **105°**
- **Thermal:** **(per ICD Section 4.0)**
- **Mechanical:** **(per ICD Section 3.2)**
- **Electrical:** **(per ICD Section 7.0 & 8.0)**
- **Data rate:**
  - 8 kbps peak
  - 6 kbps orbit average

## Mechanical Interfaces

- **Mounting**
  - Drill template provided by MSFC (sensor only)
  - Interface fasteners to be provided by MSFC (NA0045010 Bolts)
- **Alignment**
  - Placement accuracy: +/- 12 arcmin to s/c reference axes
  - Placement knowledge: +/- 30 arcsec
  - Spacecraft pointing accuracy: +/- 24 arcmin
  - Pointing knowledge: +/- 12 arcmin
  - Stability: 12 arcmin/sec (peak-to-peak)
- **Environments**
  - Tested to ICD specified levels (sine vibration, random vibration)
- **Mass Properties**
  - Total mass allocation: 21 Kg; Current estimate 19.93 Kg (92% measured)
  - Center-of-mass & Moments of Inertia to be determined post-assembly



## Electrical Interfaces

- **Power Allocations** → IT IS ESSENTIAL IF WE ARE OPERATING & TRYING TO OBTAIN DATA!

OPERATING PWR: – Non-essential: 42 W orbit average, 45 W peak

HEATER PWR: – Maximum survival heater power TBS

- **Power Interface (primary & redundant essential & non-essential)**
  - 28 VDC (+/- 7VDC)
  - TRMM to provide power switching and fusing
- **1 Hz Clock (redundant)**
- **Passive Analog Telemetry**
  - Four prime; four redundant
- **Command & Data**
  - MIL-STD-1773 (redundant transmit and receive pairs)
- **LIS Data Rate**
  - 8 kbps peak
  - ~~6~~ 8 kbps orbit average (MSFC has requested 8 kbps average)

## Thermal Interfaces

- **Heat transfer requirements**
  - Conduction: < 5 W across LIS mounting interface
  - Radiation: < 480 W/m$^2$
- **Thermal models**
  - MSFC to provide reduced geometric (TRASYS) and thermal (SINDA) models
  - GSFC to provide integrated spacecraft thermal environments for LIS



## Contamination Interfaces

- **LIS on TRMM ICD (TRMM-490-022)**
  - Materials
    - » TML <1.0%
    - » VCM <0.1%
  - Thermal bake-out of MLI, wire harness, and others as appropriate before final assembly
  - Certification requirements
    - » External surfaces visibly clean highly sensitive per JSC-SN-C-0005 (white light inspection at GSFC)
    - » Solvent wash test: <1.0 mg/ft$^2$
    - » Offgass <TBD g/cm$^2$/hr during last hot T/Vac cycle
- **Verification program covers all interface contamination requirements**