

STEREO IMPACT IDPU FM1 Mass Properties Report

Document # IMP-613-DOC

Revision: --

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On March 8, 2005, the mass properties of the STEREO IMPACT IDPU FM1 were measured. Mass properties were determined for the IDPU without any connector savers or blankets or bagging material attached. The Kapton tape on the top (+Z) surface of the IDPU was in place.

Mass Measurements were made upon a scale with one gram resolution. CG measurements were made with a scale having a 0.5 mm resolution, though uncertainties in the method are probably closer to 1 mm. MOI calculations are determined from three subsequent measurements of the period of oscilation of a torsional pendulum; all repeated measurements were within .01 seconds per oscilation.

The following results were determined from the measurements.

Mass: 1.863 kg

CG: X, Y, Z = 95.5 mm, 79.0 mm, 36.5 mm

MOI: $I_{xx} = 0.009 \text{ kg m}^2$
 $I_{yy} = 0.005 \text{ kg m}^2$
 $I_{zz} = 0.011 \text{ kg m}^2$

Table 1: MOI Spreadsheet

Item	Axis	# osc. cyc	time(s)	Tau	Tors Sprg K (kg/m)	I/K	Mass (kg)	Radius (m)	I (kg-m ²)
Calibration Cylinder	(Izz)						3.517	0.0508	0.00454
Calibration Mass +Table Mass Inertia Measurements	(Izz)	10	19.59			0.09721			
		10	19.59	1.959	0.7				
Bare Table Inertia Measurements	(Izz)	10	18.96			0.0911			
		10	18.96	1.896					0.067
Unit number IDPU FM1	Ixx	10	20.13			Mass =	1.863		
		10	20.22						
		10	20.22						
		30	60.57	2.019					
	Iyy	10	19.75						
		10	19.66						
		10	19.69						
		30	59.1	1.970					
	Izz	10	20.53						
		10	20.43						
		10	20.5						
		30	61.46	2.049					

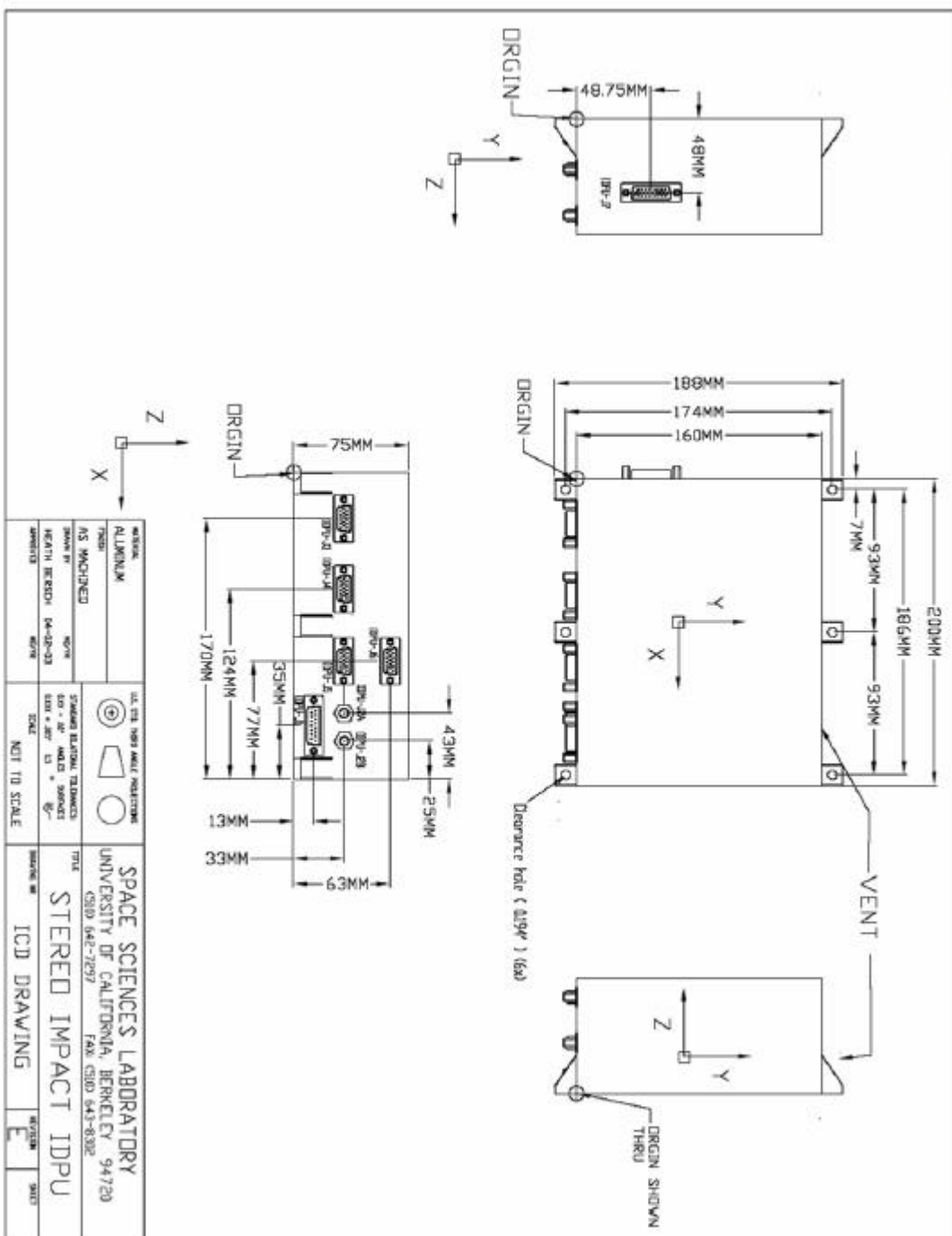


Figure 1: ICD Drawing