



Datasheet

Nano SmartPack Release Nut (nD3SP)

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Last updated on:
30.05.2023

Description

The DCUBED Nano SmartPack Release Nut (nD3SP) is a Shape Memory Alloy (SMA) based release actuator which locks sensitive equipment during launch and safely releases it on orbit. It is one of the flattest, yet powerful HDRM solutions on the market. Moreover, it is easily resettable, easy-to-use and readily available as a COTS component.

Specifications	Nano SmartPack Release Nut (nD3SP)
Body Size (L x W x H)	74 x 35 x 4 mm (Standard Interface)
Mass	50 grams
Material	Aluminum 7075-T73 (TBC)
Operating Temperature Range	-65°C to +80°C (TBC)
Nut Dimensions	Ø8 mm x 3.5 mm Length
Max Preload (Axial)	200 N (TBC)
Max Angular Deviation	≥ 75 mm lever arm (TBC)
Max Sideload Angle	±TBD° Cone
Max Nut Push-out Force	TBD N
Rapid Resetability	Yes
Redundancy	TBD
Release Shock	<300g (Ultra-Low-Shock)
Reset Cycles	TBD
TRL	4 (8 in 2023)

Interfaces

Mechanical Interfaces

The standard mechanical mounting configuration for the nD3SP is comprised of four 3.3mm holes as shown in Figure 1.

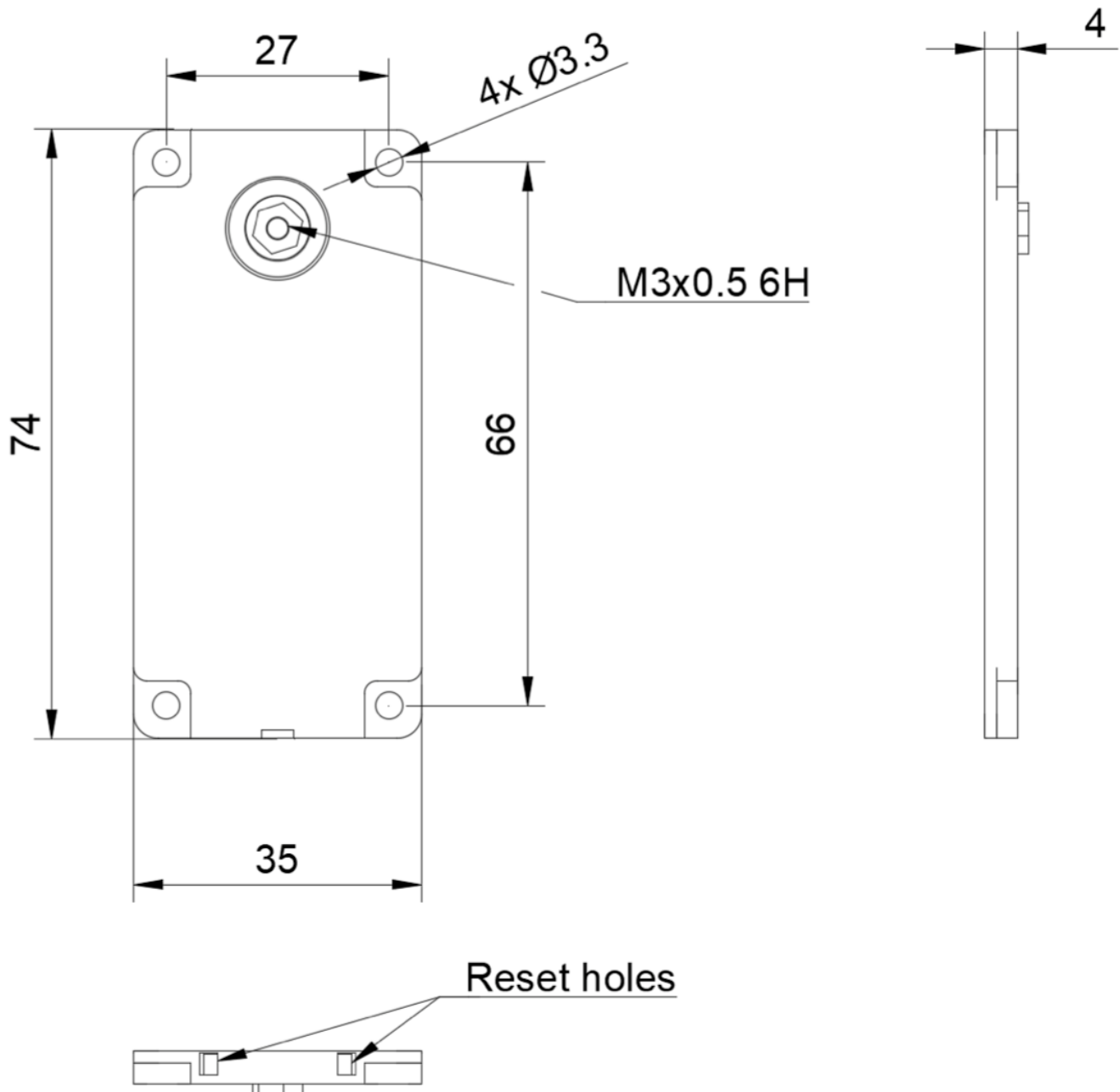


Figure 1: Dimensions and standard mechanical interfaces.

Electrical Interfaces

The standard electrical interface of the nD3SP is shown in Figure 2.



Figure 2: Electrical wiring of the nD3SP.

To trigger the release nut, a current must be applied across of its actuation line. The actuation line behaves like a simple resistor (see the table below), with no specific polarity.

Electrical Details	
Activation Leads	2 (Primary Pair)
Wire Length	>200 mm
Material	Silver-plated Copper, PTFE
Wire Gauge	TBD
Actuation Current	0.8 A (TBC)
Voltage	3.3 V (TBC)

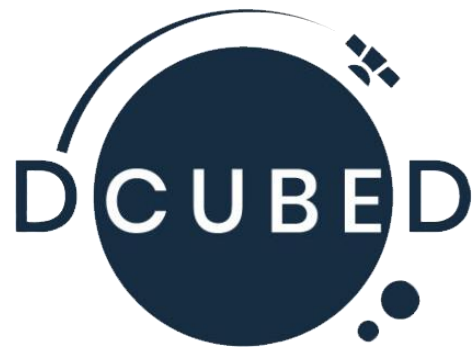
Loads

The nD3SP is designed to survive the following mechanical loads.

Details	Load Level	Note
Random Vibration (X, Y, Z)	22 GRMS (PSD)	1st Eigenfrequency: >3kHz
Sinusoidal Vibration (X, Y, Z)	20 g	20-130 Hz
Shock (X, Y, Z)	100 Hz: 100 g 1000 Hz-10000 Hz: 1000 g	SRS
Max Preload (Axial)	200 N	-
Survival Loads	TBD N Pull-out TBD N Shear	Using a Stainless Steel M3 Bolt

Disclaimer

Please note, this is **not** the user manual. The more elaborate, user manual will be made available by DCUBED upon placement of an order.



**Contact us,
we'd love to hear from you!**

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