DATASHEET

TRRUST-Stor® SATA/NVMe Secure Solid State Drive (SSD)

Model: MSD01TAS4M-000I00-01 (SATA)
*MVB01TAS4M-000I00-02 (NVMe) (planned)***

- **1 TB Secure SSD featuring MLC flash technology**
- **-40 to +85°C operating temperature**
- **Designed and manufactured in a DMEA-trusted US facility**
- **Ideal for high-speed, heavy-duty read/write applications**

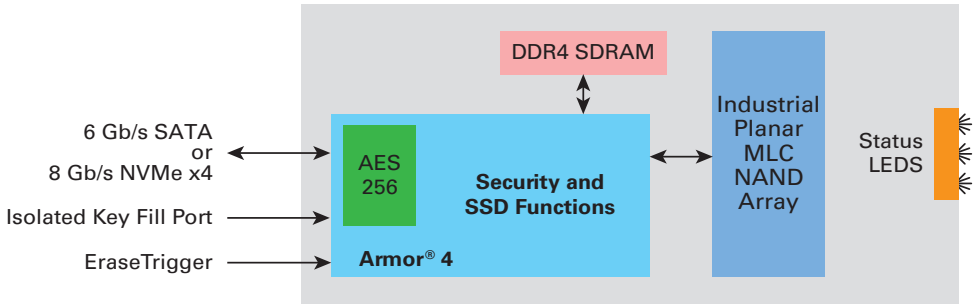
PRELIMINARY*

Mercury Systems leverages its microelectronics packaging expertise to commercialize innovative solutions addressing the most challenging problems in the defense and avionics industries. The TRRUST-Stor® family of Secure Solid State Drives has been adopted by numerous military programs of record for air, land, and sea applications where security, data integrity, and physical ruggedization are mission-critical requirements that cannot be compromised.

The TRRUST-Stor 1 TB Secure SATA/NVMe SSDs utilizes the latest generation 2D Planar MLC NAND flash memory technology to maximize storage capacity. As such, these drives are the ideal solution for applications demanding high-capacity, sustained high-speed operations.

Designed and manufactured in the United States, all TRRUST-Stor drives feature an Armor® controller developed by Mercury in its DMEA-trusted US facility. Unlike off-the-shelf ASIC-based controllers manufactured overseas for commercial and enterprise-grade SSDs, Mercury incorporates sophisticated security and performance algorithms optimized for the unique needs of defense applications, including:

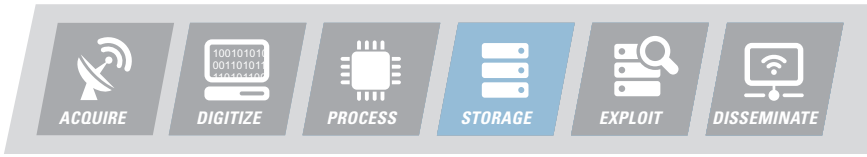
- AES-256 encryption with XTS block cipher mode
- Industry's widest range of key management options, including: user controlled Boot image, randomly generated keys, user-filled permanent keys, BLACK key with KEK, ATA password option, or external key fill via DS-101.
- User-definable sanitization modes, ranging from TRRUST-Purge® (key purge) in <30ms to industry standard sanitization protocols
- Strong LDPC error correction code (ECC) and NAND overprovisioning to ensure stable long-term performance under sub-optimal operating conditions
- Optimized garbage collection algorithms to maximize write performance
- Robust power interruption solutions to prevent data loss or corruption



TRRUST-Stor SSD with Armor 4 Controller

** This product is under development, is not qualified or characterized and is subject to change without notice.*
*** Contact factory for details.*

Mercury Systems is a leading commercial provider of secure sensor and safety-critical processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.



www.mrcy.com

DATASHEET

Features

1 TB raw capacity

800 GB user capacity, MLC Mode
(1 GB = 1,000,000,000 bytes)
(1 TB = 1,000,000,000,000 bytes)

Commands: ATA–7, ATA–8

Media: 128 Gb Planar MLC NAND flash

Form factor: 2.5" (100.45 × 69.85 × 9.5 mm)

Voltage: 5V +/- 10%; 7W standby power (SATA)
12V ± 15% 7W standby (NVMe)

Operating temperature: -40° C to +85° C

Interfaces

SATA at 1.5 GB/s, 3 Gb/s, or 6 Gb/s

NVMe 1.3, PCIe Gen3.0 x4 at 8 Gb/s

Performance

Sustained 128 Kbytes sequential reads and writes:

- 540 MB/s SATA
- 1 GB/s NVMe

Reset-to-ready time: < 2s

Data Management and Protection

ECC: LDPC

UBER: 1e-18

Write endurance: 1.5 PB $\left(\frac{\text{Capacity x PE}}{4}\right)$

Silent data corruption protection: Dual 32-bit CRC

No forced EOL from firmware/controller availability

Mean time between failures: >2,000,000 hours

Operational stability during power interruptions

SMART attributes (self-monitoring, analysis, and reporting technology)

Built-in self-test

Security

AES encryption with a 256-bit key with XTS BCM

FIPS 197 Certified Encryption

FIPS 140-2, CSfC (planned)

Multiple Key management modes

Isolated key fill port

TRRUST-Purge® destroys key in less than 30 ms

Hardware based erase in less than 10 seconds

Industry Standard sanitization protocols

US-made with full BOM and assembly control

Mechanical

Component staking and under fill

100% dynamic factory burn-in

Conformal Coating

Operating shock:

- 1500 G, 0.5 ms, 1/2 sine, 6 shocks per axis
- 60 G, 11 ms, 1/2 sine, 6 shocks per axis

Vibration:

- 22 Grms, Mil-STD-810F, method 514.5C-8, 15-2000 Hz, 3 axes (6 hrs each axis)

Additional Options

Extended burn-in

OEM customization

Ruggedized interface connectors

Custom labeling

Environmental Specifications

Condition	Limits, standards	Comments
Operating temperature	-40° C to +85° C *	Planar 2D MLC NAND flash
Storage temperature	-40° C to +105° C *	non-condensing
Humidity	5% - 95%	non-condensing
Weight	129 gm	

**Data retention can diminish with extended storage or operations above 85° C.*

Typical Applications

The Mercury TRRUST-Stor is ideal for critical applications, including:

- Storage Area Networks
- Surveillance
- Data recorders
- Field computers
- Digital map storage
- Communications systems

All design and manufacturing for the TRRUST-Stor is done in the U.S.A. in a trusted facility. Mercury has a long history as an industry-leading manufacturer of innovative, high-reliability data storage solutions.

Standard Model Numbers

MSD01TAS4M-000I00-01 (SATA)
MVB01TAS4M-000I00-02 (NVMe)

Part Numbering *(dashes in the part number are required)*

x xx 01T A x 4 M - 0 x x x xx - aa

Product Series
M = Mercury Systems, (TRRUST-Stor® standard series)
A = Mercury Systems, (ASURRE-Stor® certified series)

Form Factor
SD = 2.5" SATA 9.5 mm
VB = 2.5" U.2 NVMe 9.5 mm

NAND Capacity
01T = 1 TB Raw capacity, 800 GB host capacity

Encryption
A = AES-256 XTS
N = No Encryption

Media Manufacturer
M = Engineering Samples
S = Standard Product

Media Type
4 = 2-bit MLC Planar NAND

Mode
M = MLC mode

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Customizable Features field one
0 = Standard product

Customizable Features field two
0 = Standard product.
1 = Electrically isolate (float) the enclosure from ground

Customizable Features field three
0 = Standard product
2 = Hypertronics (Smith's Connectors) ruggedized SATA Connector
8 = Amphenol ruggedized SATA connector

Operating Temperature
I = Industrial (-40 °C to +85 °C)
C = Commercial (0 °C to +70 °C)

Classification *(Note: Must be ASURRE-Stor if selecting C or F options)*
00 = Standard Product
ES = Engineering Sample
C = CSfC and FIPS-140-2 certified
F = FIPS-140-2 certified

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Attribute Field

- 01	Construction:	Lead Free (R)
	Interface Structure:	1 Lane (1)
	Interface Type:	SATA 6 Gb/s
- 02	Construction:	Lead Free (R)
	Interface Structure:	4 Lane (4)
	Interface Type:	NVMe (NV)

Example part Number: MSD01TAS4M-000I00-01 (SATA, NAND, 1TB, MLC)

Need More Help?
Need a Variant of This Product?

Contact Mercury's Secure SSD application engineering team at secure.ssd@mrcy.com

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Full Disk Encryption
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Data Storage

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Quick Reference Guide

5015.08E 0218 TRRUST-Stor 1TB MLC NAND SATA-NVMe

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