



# ULINK DA Drive Analyzer

Predict Drive Failure and Minimize Downtime for your QNAP NAS

# Agenda

---



- Problem
- Who will suffer
- Current Solution
- Insufficiency of the current solution
- New Solution from ULINK
- Who is ULINK
- What is DA Drive Analyzer
- The QPKG
- The Web Portal
- Additional functionality
- Security of the service
- Summary





Disk failed.  
Service stopped.  
Raid rebuilding (0% complete)

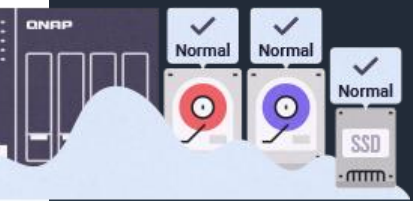
Please wait for 4 days 14 hours to resume the trading system,  
after the disk is replaced.

# Drive Replacement Needs A Plan.



- Backup data.....60 hrs
- Plan B for the service.....8 hrs
- Announcement for maintenance.....144 hrs
- Get a new disk.....72 hrs
- RAID Rebuild.....110 hrs
- Service resume test.....4 hrs

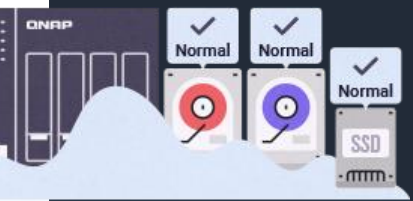
It may take more than a week to complete. Are you ready for the **sudden** downtime?



# What Industries Can Wait For Days Of Downtime?

- Design studio?
- Legal firm?
- Medical Clinics?
- Factory production line?
- Trading business?
- Data Center?
- ....

**WIN  
TS-231K**



# How Do They Handle The Issue Now?

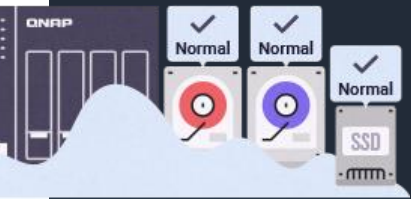


## Non IT users:

- Not aware of the seriousness since the probability of failure is 1% per drive, but if you have 8 bays, then it's 8% you may encounter the failure EVERY YEAR.
- Counting on an expensive failover system or Plan B service, which SMB might not afford.
- Depending on IT delegating Service.

## IT users:

- Judge by experiences and knowledge of drive metadata (S.M.A.R.T).
- Loose standard on judging and replace ASAP when data is much more important than the drives.



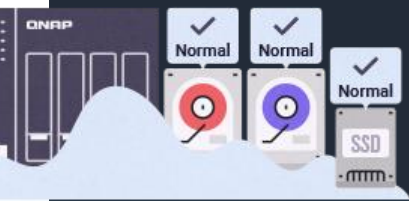
# Why S.M.A.R.T IS NOT Enough



- S.M.A.R.T values are defined by the drive brands without strict standards; each vendor has its own interpretation and thresholds.
- Wikipedia "S.M.A.R.T"--

"A field study at [Google\[4\]](#) covering over 100,000 consumer-grade drives from December 2005 to August 2006 found correlations between certain S.M.A.R.T. information and annualized failure rates"

"the research showed that a large proportion (56%) of the failed drives failed without recording any count in the 'four strong S.M.A.R.T. warnings' identified as scan errors, reallocation count, offline reallocation and probational count."



<https://en.wikipedia.org/wiki/S.M.A.R.T.>

The background features a faint, light-colored illustration. On the left, a hand is shown holding a tablet computer. On the right, a stylized world map is visible. The overall aesthetic is clean and modern, with a focus on technology and global connectivity.

# Can an IT expert judge a deteriorating drive by the drive daily behaviors?

Maybe. If he has the knowledge and energy to summarize the historic patterns that the drive has been behaving.



# Let the Expert Helps!



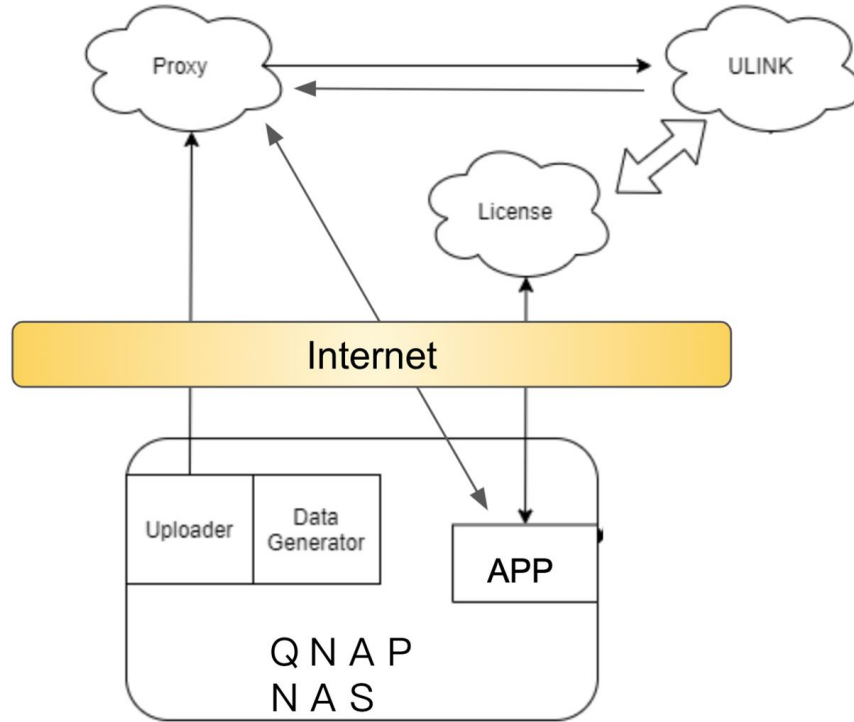
## ULINK Technology

Expert of storage interface testing. Founded in 2001, the world leader in providing IT storage interface test tools. <https://ulinktech.com/>

Test Software	Hardware	Test Suites	ULINK Test Lab	Test Reporter	DA Drive Analyzer
DriveMaster 8 NVMe	PCIe-SSD Power Adapter Plus Gen4	ULINK NVMe Test Suites	TCG Storage Test House		
DriveMaster 8 Professional SATA	SATA/SAS Power Hub	ULINK SATA/ATA Test Suites	Storage Test Services		
DriveMaster 8 Enterprise SAS	Device Sleep Test Platform	SATA-IO Test Suites	Other Consulting Services		
DriveMaster Network License		TCG Storage Certification Test Suite			
		ULINK TCG Test Suites			
		ULINK SAS/SCSI Test Suites			

# Service Structure

WIN  
TS-231K

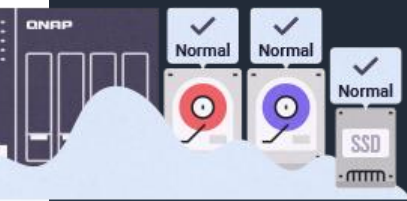


# ULINK DA Drive Analyzer: QPKG APP in the NAS

WIN  
TS-231K



Monitor the host  
NAS where the app  
installs, and its  
Expansion Units



DA Drive Analyzer

## DA Drive Analyzer

- Overview
- Drive Prediction
- Email Alerts
- Additional Information
- Prediction History

### Drive Prediction

Host NAS

3.5" Slots

- Slot 1: HDD
- Slot 2: HDD
- Slot 3: HDD
- Slot 4: HDD
- Slot 5: Empty
- Slot 6: Empty
- Slot 7: Empty
- Slot 8: HDD

M.2 SSD Slots

- Slot 9: Empty
- Slot 10: Empty

Legend: Faulty, Critical, Warn..., Norm..., Data ..., Unsu...

### Drive Information

Host NAS(TVS-872XT)  
172.17.30.59

Drive location: 3.5" Slot 1  
Drive manufacturer: WDC  
Drive model number: WD20EFRX-68EUZNO  
Drive serial number: WD-WCC4M0LNR9T6  
Drive capacity: 1.82 TB  
Drive type: SATA

### Drive Life Prediction Score

Normal

Prediction score: 10

Drive(s) are functioning normally.  
The drives are operating within normal parameters.

Extra Cloud Report

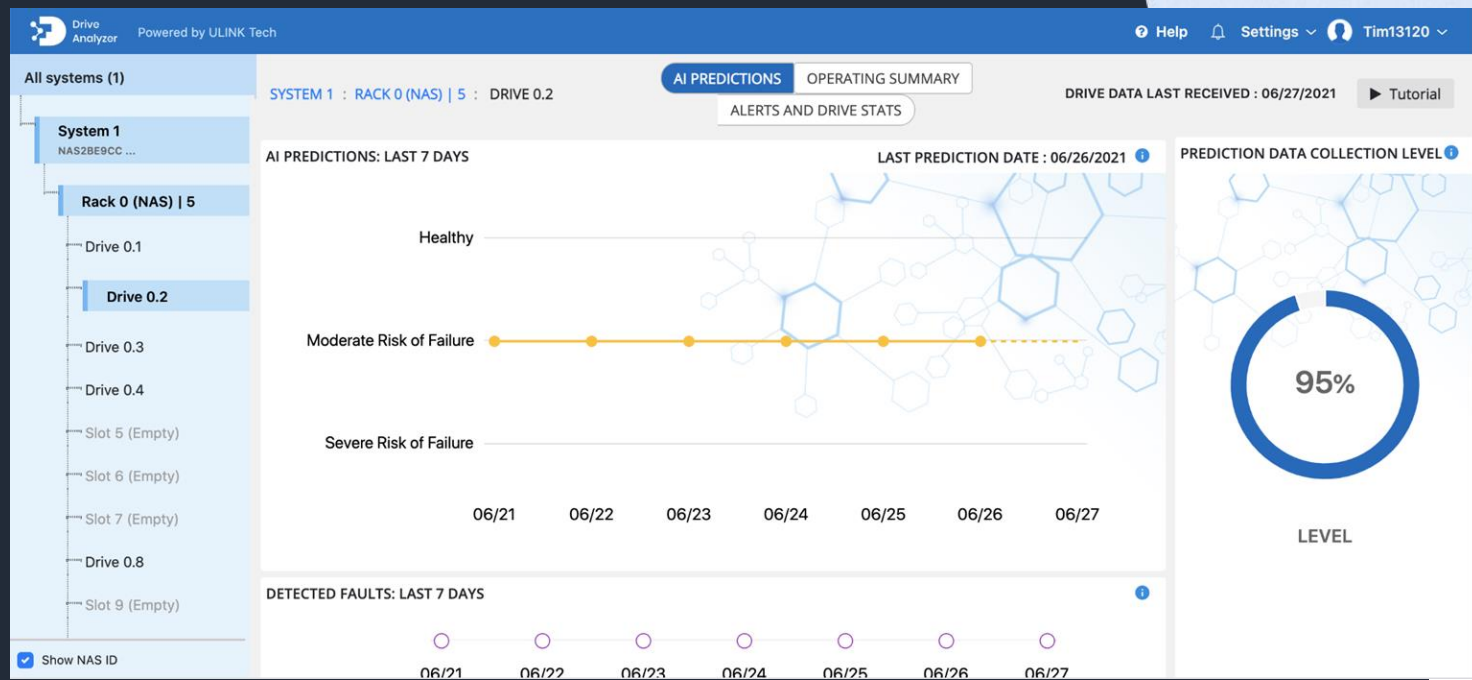
Date	Prediction score
06/22	10
06/23	10
06/24	10
06/25	10
06/26	10
06/27	10
06/28	10

# ULINK DA Drive Analyzer: Web Portal

WIN  
TS-231K



- Monitor multiple systems
- Use QID to log in



# Additional Functionality on the DA Portal

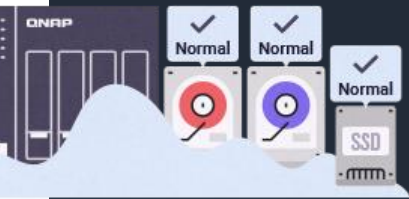


- Operational Threshold Alerts and AI Prediction
- Email notifications
- Encouraging the IT delegating service providers to apply it for your clients.

The screenshot displays the Drive Analyzer (DA) Portal interface, powered by ULINK Tech. The interface is divided into several sections:

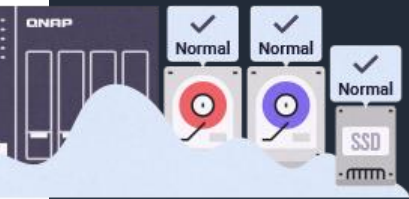
- System Overview:** Shows 'All systems (1)' with a tree view for 'System 1' (NAS2BE9CC ...). Under 'Rack 0 (NAS) | 5', drives 0.1-0.4 are listed, and 'Drive 0.8' is highlighted.
- Alerts and Drive Stats:** Features a line graph titled 'ALERT SUMMARY' showing 'No. of Alerts' over time (06/21 to 06/27). A tooltip explains: 'Alerts are triggered when select Drive Stats surpass certain thresholds. There are two classes of Alerts: General and Warning. General Alerts are assumed to be more benign than Warning Alerts.' Below the graph is a table with columns: Type, Attribute/Name, Value, Date/Time 1. A 'None' entry is shown.
- SMART Stats:** A table titled 'SMART ATTRIBUTES I' with columns: SMART ID (DEC), Normalized (HEX), Worst (HEX), Threshold (HEX), and Raw Values (HEX). The data is as follows:

SMART ID (DEC)	Normalized (HEX)	Worst (HEX)	Threshold (HEX)	Raw Values (HEX)	
Raw Read Data...	1	C8	C8	33	11
Spin-Up Time	3	8C	8A	15	F97
Start/Stop Count	4	55	55	0	3E06
Reallocated Se...	5	A9	A9	8C	29F
Seek Error Rate	7	C8	C8	0	0
Power-On Hour...	9	56	56	0	29C8
Spin Retry Count	10	64	64	0	0
Calibration Retr...	11	64	64	0	0
Power Cycle C...	12	55	55	0	3C39
Power-off Retr...	192	B7	B7	0	342F



# Security of the Service

1. No need to open extra inbound ports, no remote access.
2. The APP receives information from the ULINK cloud is for display only and does not trigger local commands.
3. The API to retrieve information is certified to ensure its origin.
4. The uploaded file is involving drive system data and does not involve user's own data.
5. The uploading is directed to QNAP proxy first and not to an unknown server.
6. ULINK cloud platform applies the complete Amazon AWS infrastructure which is behind the AWS firewall and SSL.



# ULINK DA Drive Analyzer

A cloud service – Internet is required.

---

Drive health data is sent to the cloud AI daily in the late night.

---

After collecting 14 days amount of the drive behavior, AI starts to predict.

---

It will be a subscription service, charges per drive.

---

Will have one slot per NAS for free trial.

---

Public beta program is in progress, welcome to join!

---

(Search "QNAP", "ULINK")

---

