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**P**ROFESSIONAL  
**U**NIVERSITY

# CA 3

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# INDEX

## 1. Introduction

- 1.1 Objective of the project
- 1.2 Description of the project
- 1.3 Scope of the project

## 2. System Description

- 2.1 Target system description

## 3. Analysis Report

- 3.1 System snapshots and full analysis report

## 4. Reference/ Bibliography

# 1. Introduction

## 1.1 Objective of the project

Use any Open Sources Software Displays details about various system information tools, like the CPU, motherboard, monitor audio, network and other components. Also display the current and average speed/rate of the memory, hard drive, and CPU.

## 1.2 Description of the project

One popular open-source software that displays system information is called "HWINFO" It is available for Windows and Linux operating systems and can provide detailed information about various system components, including: CPU , Motherboard, Monitor, Audio, Network, etc.

## 1.3 Scope of the Project

HWINFO can display real-time and average speed/rate of the memory, hard drive, and CPU. It can show the current usage and performance metrics such as CPU temperature, clock speed, memory usage, disk I/O speed, and network bandwidth.

CPU: information about the processor model, clock speed, core count, and usage

Motherboard: details about the motherboard model, chipset, and BIOS version

Monitor: specifications of the connected display(s), such as resolution, refresh rate, and supported features

Audio: information about the audio device(s) installed in the system

Network: details about the network interfaces, including IP address, MAC address, and speed

# 2. System Description

## 2.1 Target system description

The target is to have accurate support for latest technologies and standards even before the products reach the market.

HWINFO for DOS is in development since 1995 and was one of the first tools of its kind providing accurate hardware information. HWINFO for DOS reaches its limit in size and available system (DOS) memory. The development has been ceased due to a low demand.

HWiNFO32 development started around 1999 and it was one of the first tools being able to give precise hardware information on the Windows NT/2000 platforms. It is still under heavy development (daily basis) adding new features, improvements and fixes. A stable release is available approximately every month, beta pre-releases are available more frequently (~ every week).

In 2011 HWiNFO32 has been ported to 64-bits, so HWiNFO64 was created. HWiNFO64 is a native x64

application and has some advantages over the 32-bit version: especially it's not limited to 64 logical CPU units as HWiNFO32 is. HWiNFO64 is currently able to support up-to 512 logical CPUs and this limit can be raised if needed.

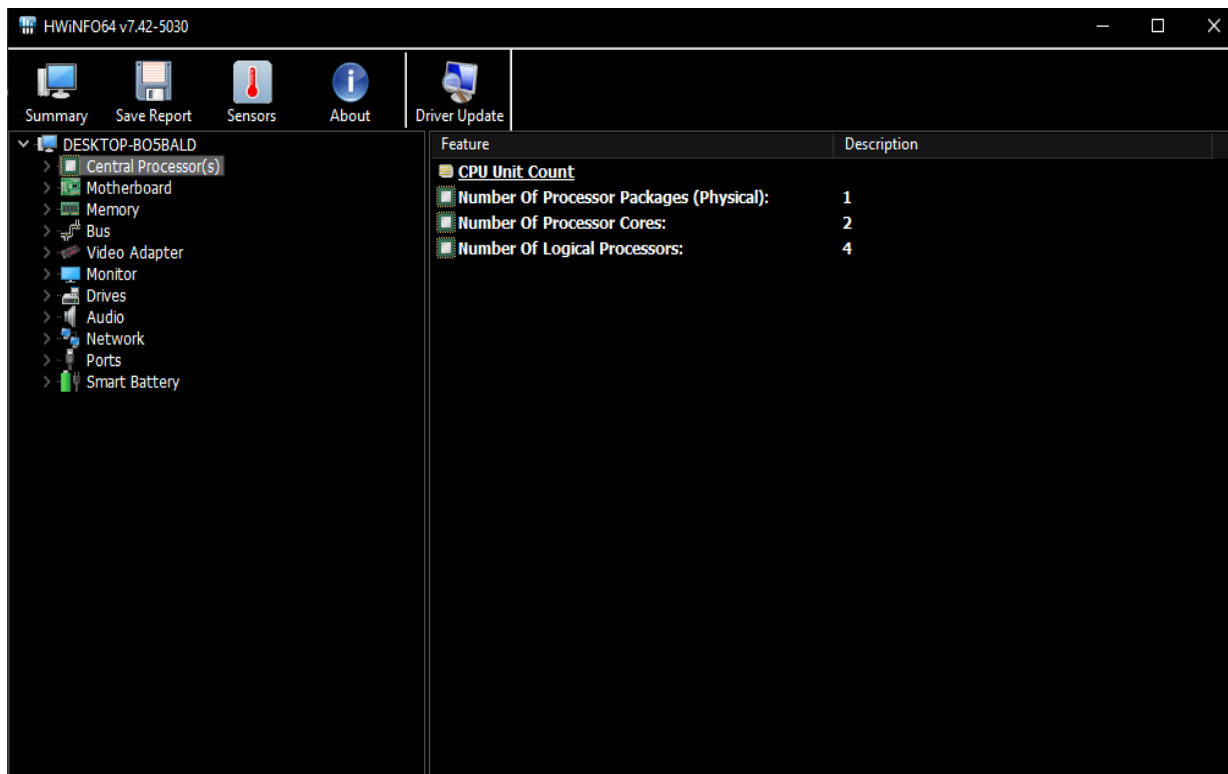
Both HWiNFO32 and HWiNFO64 require a kernel mode driver to work, as this is the only way how to access hardware. This driver is used only to obtain precise hardware information for HWINFO and Administrative rights are required to install it.

HWiNFO32/64 public beta pre-releases are fully functioning.

# 3. Analysis Report

## 3.1 System snapshots and full analysis report

CPU info:



The screenshot shows the HWiNFO64 v7.42-5030 application window. The interface is dark-themed. On the left, a tree view shows the system components: DESKTOP-BO5BALD, Central Processor(s), Motherboard, Memory, Bus, Video Adapter, Monitor, Drives, Audio, Network, Ports, and Smart Battery. The 'Central Processor(s)' item is selected. On the right, the 'CPU Unit Count' section is expanded, showing a table with the following data:

Feature	Description
Number Of Processor Packages (Physical):	1
Number Of Processor Cores:	2
Number Of Logical Processors:	4

## Motherboard info:

The screenshot shows the HWiNFO64 v7.42-5030 application window. The left sidebar lists system components, with 'Motherboard' selected. The main pane displays a table of motherboard features and their descriptions.

Feature	Description
<b>Computer</b>	
Computer Brand Name:	DELL Inspiron 3542
<b>Motherboard</b>	
Motherboard Model:	DELL 0XJTP0
Motherboard Chipset:	Intel Lynx Point-LP (Premium)
Motherboard Slots:	2xPCI Express x1, 1xPCI Express x4, 1xPCI Express ...
PCI Express Version Supported:	v2.0
USB Version Supported:	v3.0
<b>PCH Features</b>	
SATA Port 3 6 Gb/s:	Supported
SATA Port 2 6 Gb/s:	Supported
SATA Ports 2 and 3:	Supported
RAID Capability:	RAID0/1/5/10 + Smart Response Technology
Intel PCI Express Storage Technology:	Not Supported
USB Redirect (USB <sup>®</sup> ):	Supported
PCH PEG/DMI Ratio:	5/5
<b>BIOS</b>	
BIOS Manufacturer:	American Megatrends
BIOS Date:	01/30/2018
BIOS Version:	A13
UEFI BIOS:	Capable
Super-I/O/LPC Chip:	Unknown
Trusted Platform Module (TPM) Chip:	Not Found

## Monitor info:

The screenshot shows the HWiNFO64 v7.42-5030 application window. The left sidebar lists system components, with 'Monitor' selected. The main pane displays a table of monitor features and their descriptions.

Feature	Description
<b>General Information</b>	
Monitor Name:	LG Philips LP156WHB-TPA1
Monitor Name (Manuf):	156WHB [DELL P/N: DCR74]
Serial Number:	Unknown
Date Of Manufacture:	Week: 0, Year: 2014
Monitor Hardware ID:	Monitor/LGD0456
Max. Vertical Size:	19 cm
Max. Horizontal Size:	34 cm
<b>Advanced parameters</b>	
Input Signal:	Digital
Color Bit Depth:	6 Bits per Primary Color
Digital Video Interface Standard Supported:	DisplayPort
Gamma Factor:	2.20
<b>DPMS Modes</b>	
Standby:	Not Supported
Suspend:	Not Supported
Active Off:	Not Supported
Standard Colour Space (sRGB) Default:	Not Supported
Preferred Timing Mode:	Supported
Default GTF (Continuous Frequency):	Not Supported
DFP 1.x Compatible:	Yes
<b>Supported Video Modes</b>	
1366 x 768	344 x 194 mm, Pixel Clock 76.32 MHz
1366 x 768	344 x 194 mm, Pixel Clock 61.05 MHz
<b>Driver Information</b>	
Driver Manufacturer:	(Standard monitor types)
Driver Description:	Generic PnP Monitor

DESKTOP-BO5BALD -> Monitor -> LG Philips LP156WHB-TPA1



# Memory info:

Summary

Save Report

Sensors

About

Driver Update

DESKTOP-BO5BALD

Central Processor(s)

Motherboard

Memory

Row: 0 - 8 GB PC3-12800 DDR3 SDRAM A-DAT

Bus

Video Adapter

Monitor

Drives

Audio

Network

Ports

Smart Battery

Feature	Description
General Information	
Total Memory Size:	8 GBytes
Current Performance Settings	
Maximum Supported Memory Clock:	800.0 MHz
Current Memory Clock:	798.1 MHz (8 : 1 Ratio)
Current Timing (tCAS-tRCD-trP-tRAS):	11-11-11-28
Memory Channels Supported:	2
Memory Channels Active:	1
Command Rate (CR):	1T
Read to Read Delay (tRDRD_SG/TrdrdScL) Same Ban...	4T
Read to Read Delay (tRDRD_DG/TrdrdScDr) Differen...	6T
Read to Read Delay (tRDRD_DD) Different DIMM:	6T
Write to Write Delay (tWRWR_SG/TwrwrScL) Same ...	4T
Write to Write Delay (tWRWR_DG/TwrwrScDr) Diffe...	7T
Write to Write Delay (tWRWR_DD) Different DIMM:	7T
Read to Write Delay (tRDWR_SG/TrdwrScL) Same B...	11T
Read to Write Delay (tRDWR_DG/TrdwrScDr) Differe...	11T
Read to Write Delay (tRDWR_DD) Different DIMM:	11T
Write to Read Delay (tWRRD_SG/TwrrdScL) Same B...	20T
Write to Read Delay (tWRRD_DG/TwrrdScDr) Differe...	3T
Write to Read Delay (tWRRD_DD) Different DIMM:	4T
Read to Precharge Delay (tRTP):	6T
Write to Precharge Delay (tWTP):	24T
Write Recovery Time (tWR):	23T
RAS# to RAS# Delay (tRRD):	5T
Refresh Cycle Time (tRFC):	208T
Four Activate Window (tFAW):	24T

DESKTOP-BO5BALD -> Memory

# Network info:

Summary

Save Report

Sensors

About

Driver Update

DESKTOP-BO5BALD

Central Processor(s)

Motherboard

Memory

Bus

Video Adapter

Monitor

Drives

Audio

Network

DELL Wireless 1704 802.11b/g/n (2.4GHz) Wi...

RealTek Semiconductor RTL8101/2/3 Family Fa

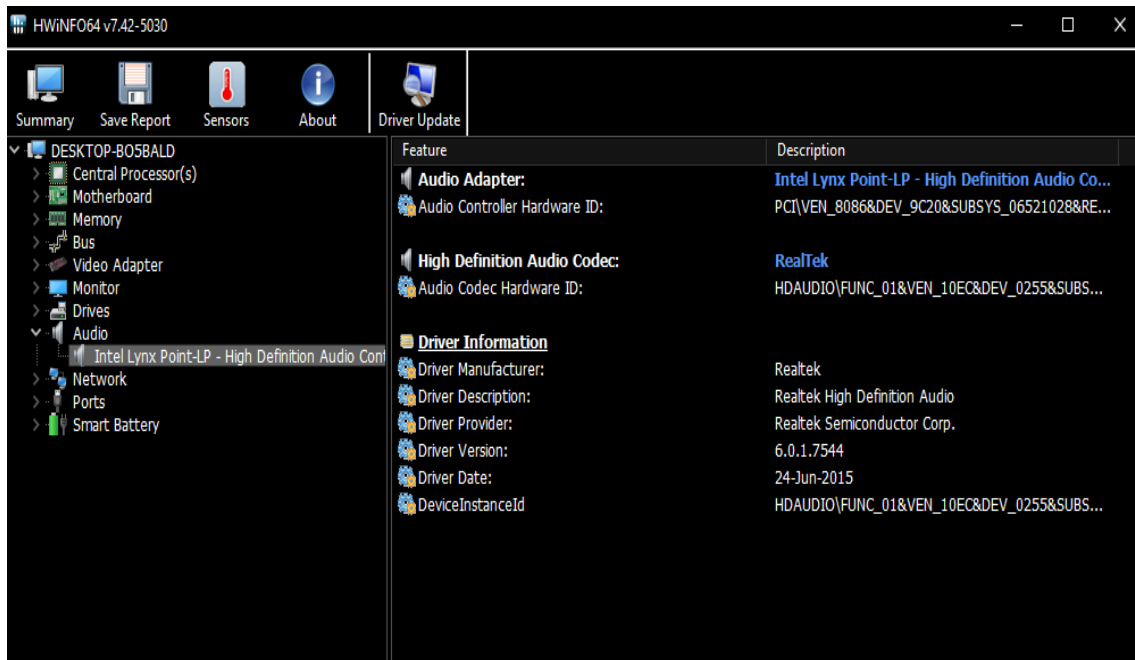
Ports

Smart Battery

Feature	Description
General Information	
Network Card:	DELL Wireless 1704 802.11b/g/n (2.4GHz) Wi...
Vendor Description:	Microsoft
MAC Address:	18-4F-32-F8-B9-8B
Capabilities	
Maximum Link Speed:	26 Mbps
Transmit Buffer Size:	Unknown
Receive Buffer Size:	Unknown
Hardware ID:	PCI\VEN_14E4&DEV_4365&SUBSYS_00161028&RE...
Driver Information	
Driver Manufacturer:	Broadcom
Driver Description:	Dell Wireless 1704 802.11b/g/n (2.4GHz)
Driver Provider:	Broadcom
Driver Version:	7.35.352.0
Driver Date:	22-Nov-2016
DeviceInstanceId	PCI\VEN_14E4&DEV_4365&SUBSYS_00161028&RE...
Location Paths	PCIROOT(0)#PCI(1C02)#PCI(0000)

DESKTOP-BO5BALD -> Network -> DELL Wireless 1704 802.11b/g/n (2.4GHz) Wireless Network Adapter

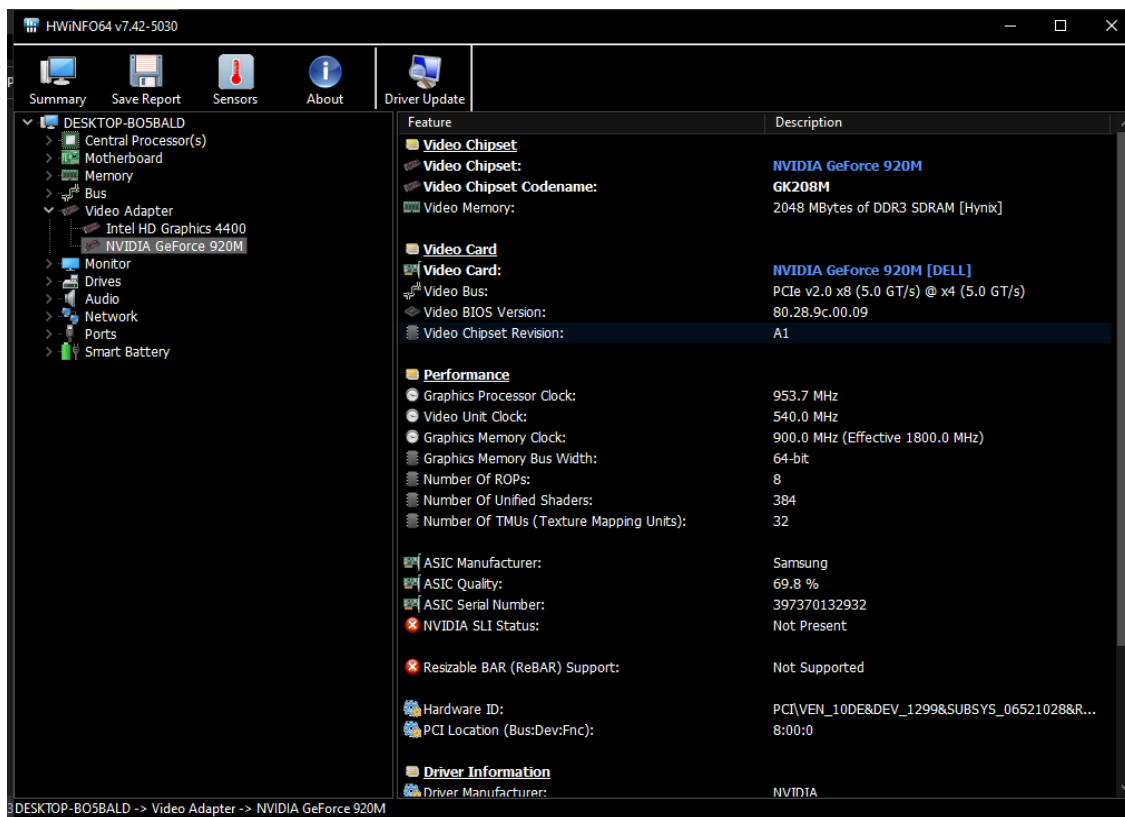
## Audio info:



The screenshot shows the HWiNFO64 v7.42-5030 application window. The 'Audio' section is selected in the left-hand tree view. The main panel displays the following information:

Feature	Description
<b>Audio Adapter:</b>	Intel Lynx Point-LP - High Definition Audio Co...
Audio Controller Hardware ID:	PCI\VEN_8086&DEV_9C20&SUBSYS_06521028&RE...
<b>High Definition Audio Codec:</b>	RealTek
Audio Codec Hardware ID:	HDAUDIO\FUNC_01&VEN_10EC&DEV_0255&SUBS...
<b>Driver Information</b>	
Driver Manufacturer:	Realtek
Driver Description:	Realtek High Definition Audio
Driver Provider:	Realtek Semiconductor Corp.
Driver Version:	6.0.1.7544
Driver Date:	24-Jun-2015
DeviceInstanceId	HDAUDIO\FUNC_01&VEN_10EC&DEV_0255&SUBS...

## GPU info:



The screenshot shows the HWiNFO64 v7.42-5030 application window. The 'Video Adapter' section is selected in the left-hand tree view. The main panel displays the following information:

Feature	Description
<b>Video Chipset</b>	
Video Chipset:	NVIDIA GeForce 920M
Video Chipset Codename:	GK208M
Video Memory:	2048 MBytes of DDR3 SDRAM [Hynix]
<b>Video Card</b>	
Video Card:	NVIDIA GeForce 920M [DELL]
Video Bus:	PCIe v2.0 x8 (5.0 GT/s) @ x4 (5.0 GT/s)
Video BIOS Version:	80.28.9c.00.09
Video Chipset Revision:	A1
<b>Performance</b>	
Graphics Processor Clock:	953.7 MHz
Video Unit Clock:	540.0 MHz
Graphics Memory Clock:	900.0 MHz (Effective 1800.0 MHz)
Graphics Memory Bus Width:	64-bit
Number Of ROPs:	8
Number Of Unified Shaders:	384
Number Of TMUs (Texture Mapping Units):	32
ASIC Manufacturer:	Samsung
ASIC Quality:	69.8 %
ASIC Serial Number:	397370132932
NVIDIA SLI Status:	Not Present
Resizable BAR (ReBAR) Support:	Not Supported
Hardware ID:	PCI\VEN_10DE&DEV_1299&SUBSYS_06521028&R...
PCI Location (Bus:Dev:Func):	8:00:0
<b>Driver Information</b>	
Driver Manufacturer:	NVIDIA

DESKTOP-BO5BALD -> Video Adapter -> NVIDIA GeForce 920M

# Battery info:

HWiNFO64 v7.42-5030

Summary

Save Report

Sensors

About

Driver Update

DESKTOP-BO5BALD

Central Processor(s)

Motherboard

Memory

Bus

Video Adapter

Intel HD Graphics 4400

NVIDIA GeForce 920M

Monitor

Drives

Audio

Network

Ports

Smart Battery

Battery #0

Feature

Description

General Properties

Device Name:

Manufacturer Name:

Serial Number:

Unique ID:

Chemistry:

Designed Capacity:

Full Charged Capacity:

Wear Level:

Current Power Status

Power Status:

Current Capacity:

Current Voltage:

Discharge Rate:

DELL 5WFK618

Samsung SD

512

512Samsung SDELL 5WFK618

Lithium Ion

48840 mWh

19037 mWh

61.0 %

Discharging

17449 mWh (91.7 %)

11.876 V

-14685 mW

# Average Speed/Rate of CPU:

HWiNFO64 v7.42-5030

Summary

Save Report

Sensors

DESKTOP-BO5BALD

Central Processor(s)

Motherboard

Memory

Bus

Video Adapter

Intel HD Graphics 4400

NVIDIA GeForce 920M

Monitor

Drives

Audio

Network

Ports

Smart Battery

Battery #0

HWiNFO64 v7.42-5030 - Sensors Status

Sensor	Current	Minimum	Maximum	Average
System: DELL Inspi...				
CPU [#0]: Intel Cor...				
Core VIDs	0.683 V	0.677 V	0.927 V	0.708 V
Core Clocks	798.1 MHz	798.1 MHz	2,693.7 MHz	1,031.2 MHz
Bus Clock	99.8 MHz	99.8 MHz	99.8 MHz	99.8 MHz
Uncore Clock	798.1 MHz	798.1 MHz	2,394.4 MHz	1,012.7 MHz
PCIe Clock	99.8 MHz	99.8 MHz	99.8 MHz	99.8 MHz
Core Effective Cl...	60.6 MHz	18.2 MHz	1,338.4 MHz	237.4 MHz
Average Effective Cl...	60.6 MHz	50.8 MHz	1,108.5 MHz	237.4 MHz
Core Usage	4.6 %	1.7 %	56.3 %	18.1 %
Max CPU/Thread Us...	6.4 %	6.4 %	56.3 %	22.5 %
Total CPU Usage	4.6 %	4.3 %	50.1 %	18.1 %
On-Demand Clock M...	100.0 %	100.0 %	100.0 %	100.0 %
Core Utility	2.9 %	0.8 %	78.1 %	13.0 %
Total CPU Utility	2.9 %	2.5 %	64.9 %	13.0 %
Core Ratios	8.0 x	8.0 x	27.0 x	10.3 x
Uncore Ratio	8.0 x	8.0 x	24.0 x	10.2 x
CPU [#0]: Intel Cor...				
Core Temperatures	41 °C	39 °C	48 °C	41 °C
Core Distance to ...	59 °C	52 °C	61 °C	59 °C
CPU Package	41 °C	41 °C	48 °C	42 °C
Core Max	41 °C	39 °C	48 °C	42 °C
Core Thermal Thr...	No	No	No	
Core Critical Tem...	No	No	No	
Core Power Limit ...	No	No	No	
Package/Ring Therm...	No	No	No	
Package/Ring Critica...	No	No	No	
Package/Ring Power ...	No	No	No	
CPU [#0]: Intel Cor...				
CPU Package	44 °C	41 °C	47 °C	43 °C
CPU IA Cores	44 °C	39 °C	47 °C	42 °C

0:04:35

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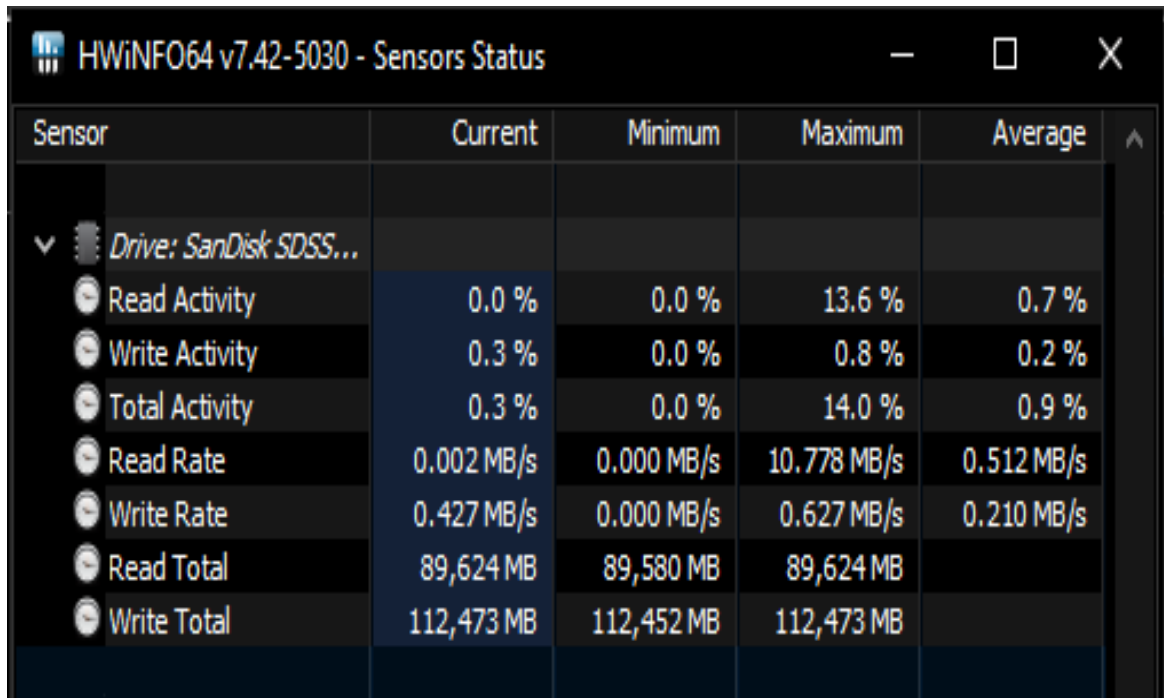
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DESKTOP-BO5BALD -> Central Processor(s)

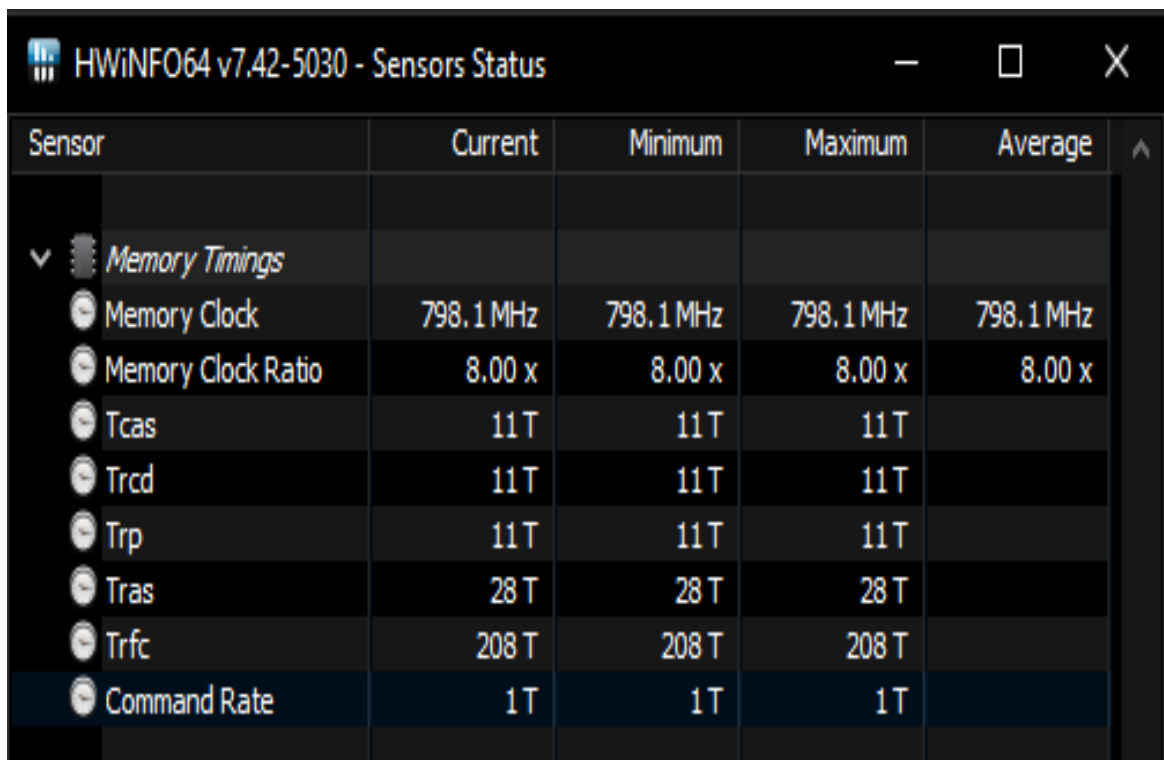
## Average Speed/Rate of Hard drive:



The screenshot shows the HWiNFO64 v7.42-5030 - Sensors Status window. The 'Drive: SanDisk SDSS...' section is expanded, showing various activity metrics. The 'Current' column is highlighted in blue.

Sensor	Current	Minimum	Maximum	Average
Drive: SanDisk SDSS...				
Read Activity	0.0 %	0.0 %	13.6 %	0.7 %
Write Activity	0.3 %	0.0 %	0.8 %	0.2 %
Total Activity	0.3 %	0.0 %	14.0 %	0.9 %
Read Rate	0.002 MB/s	0.000 MB/s	10.778 MB/s	0.512 MB/s
Write Rate	0.427 MB/s	0.000 MB/s	0.627 MB/s	0.210 MB/s
Read Total	89,624 MB	89,580 MB	89,624 MB	
Write Total	112,473 MB	112,452 MB	112,473 MB	

## Average Speed/Rate of Hard drive:



The screenshot shows the HWiNFO64 v7.42-5030 - Sensors Status window. The 'Memory Timings' section is expanded, showing various memory-related metrics. The 'Current' column is highlighted in blue.

Sensor	Current	Minimum	Maximum	Average
Memory Timings				
Memory Clock	798.1 MHz	798.1 MHz	798.1 MHz	798.1 MHz
Memory Clock Ratio	8.00 x	8.00 x	8.00 x	8.00 x
Tcas	11 T	11 T	11 T	
Trcd	11 T	11 T	11 T	
Trp	11 T	11 T	11 T	
Tras	28 T	28 T	28 T	
Trfc	208 T	208 T	208 T	
Command Rate	1 T	1 T	1 T	

## 4.Reference/Bibliography

**<https://www.hwinfo.com/about-software/>**

**<https://www.hwinfo.com/forum/threads/common-q-a.240/>**

**<https://www.lifewire.com/hwinfo-review-2625766>**