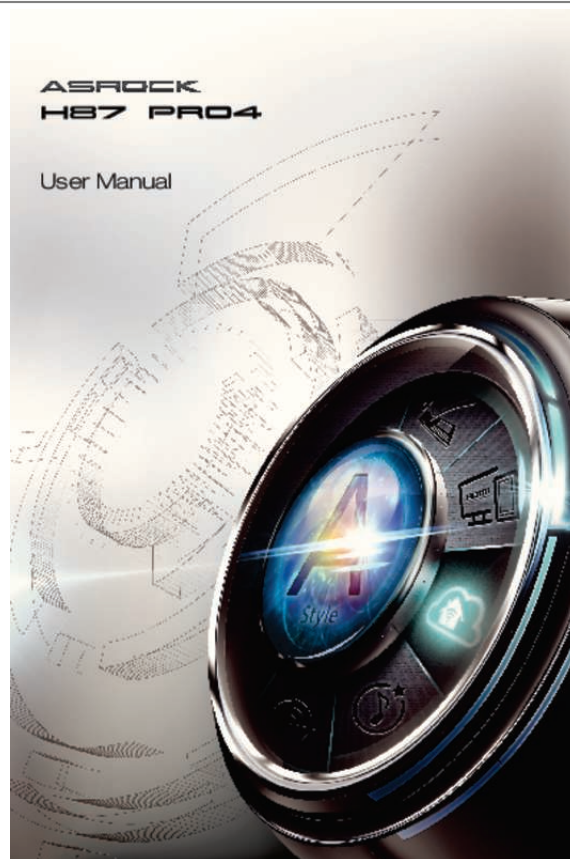




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You can read the recommendations in the user guide, the technical guide or the installation guide for ASROCK H87 PRO4. You'll find the answers to all your questions on the ASROCK H87 PRO4 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

User manual ASROCK H87 PRO4
User guide ASROCK H87 PRO4
Operating instructions ASROCK H87 PRO4
Instructions for use ASROCK H87 PRO4
Instruction manual ASROCK H87 PRO4



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Manual abstract:

In no event shall ASRock, its directors, officers, employees, or agents be liable for any indirect, special, incidental, or consequential damages (including damages for loss of profits, loss of business, loss of data, interruption of business and the like), even if ASRock has been advised of the possibility of such damages arising from any defect or error in the documentation or product. The terms HDMI™ and HDMI High-Definition Multimedia Interface, and the HDMI logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. CALIFORNIA, USA ONLY The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. @@@@ Chapter 3 contains the operation guide of the software and utilities. Chapter 4 contains the configuration guide of the BIOS setup. Because the motherboard specifications and the BIOS software might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock's website without further notice. If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

You may find the latest VGA cards and CPU support list on ASRock's website as well. ASRock website <http://www.asrock.com>. 1.

1 Package Contents • ASRock H87 Pro4 Motherboard (ATX Form Factor) • ASRock H87 Pro4 Quick Installation Guide • ASRock H87 Pro4 Support CD • 2 x Serial ATA (SATA) Data Cables (Optional) • 1 x I/O Panel Shield 1 English 1.2 Specifications Platform • ATX Form Factor • All Solid Capacitor design th TM • Supports 4 Generation Intel® Core i7 / i5 / i3 / Xeon® / Pentium® / Celeron® in LGA1150 Package • Digi Power Design • 4 Power Phase Design • Supports Intel® Turbo Boost 2.0 Technology CPU Chipset • Intel® H87 • Supports Intel® Small Business Advantage 2.0 • Dual Channel DDR3 Memory Technology • 4 x DDR3 DIMM slots • Supports DDR3 1600/1333/1066 non-ECC, un-buffered memory • Max. capacity of system memory: 32GB (see CAUTION) • Supports Intel® Extreme Memory Profile (XMP)1.

3/1.2 • 1 x PCI Express 3.0 x16 slot (PCIe2: x16 mode) • 3 x PCI Express 2.0 x1 slots • 2 x PCI slots • Intel® HD Graphics Built-in Visuals and the VGA outputs can be supported only with processors which are GPU integrated. • Supports Intel® HD Graphics Built-in Visuals : Intel® Quick Sync Video with AVC, MVC (S3D) and MPEG-2 Full HW Encode1, Intel® InTru™ 3D, Intel® Clear Video HD Technology, Intel® Insider™, Intel® HD Graphics 4600 • Pixel Shader 5.0, DirectX 11.1 • Max. shared memory 1792MB • Three VGA Output options: D-Sub, DVI-D and HDMI • Supports Triple Monitors Memory Expansion Slot Graphics English 2 H87 Pro4 • Supports HDMI Technology with max. resolution up to 1920x1200 @ 60Hz • Supports DVI-D with max. resolution up to 1920x1200 @ 60Hz • Supports D-Sub with max.

resolution up to 1920x1200 @ 60Hz • Supports Auto Lip Sync, Deep Color (12bpc), xvYCC and HBR (High Bit Rate Audio) with HDMI (Compliant HDMI monitor is required) • Supports HDCP function with DVI-D and HDMI ports • Supports Full HD 1080p Blu-ray (BD) playback with DVI-D and HDMI ports Audio • 7.1 CH HD Audio with Content Protection (Realtek ALC892 Audio Codec) P • Premium Blu-ray audio support • • • • • Gigabit LAN 10/100/1000 Mb/s Giga PHY Intel® I217V Supports Intel® Remote Wake Technology Supports Wake-On-LAN Supports Energy Efficient Ethernet 802.3az Supports PXE LAN Rear Panel I/O 3 English 1 x PS/2 Keyboard Port 1 x D-Sub Port 1 x DVI-D Port 1 x HDMI Port 2 x USB 2.0 Ports 4 x USB 3.0 Ports 1 x RJ-45 LAN Port with LED (ACT/LINK LED and SPEED LED) • HD Audio Jack: Side Speaker / Rear Speaker / Central / Bass / Line in / Front Speaker / Microphone Storage • 6 x SATA3 6.0 Gb/s connectors, support RAID (RAID 0, RAID 1, RAID 5, RAID 10, Intel Rapid Storage Technology 12 and Intel Smart Response Technology), NCQ, AHCI and "Hot Plug" • • • • • 1 x IR header 1 x COM port header 1 x Power LED header 2 x CPU Fan connectors (1 x 4-pin, 1 x 3-pin) 2 x Chassis Fan connectors (2 x 4-pin) 1 x Power Fan connector (3-pin) 1 x 24 pin ATX power connector 1 x 8 pin 12V power connector 1 x Front panel audio connector 1 x SPDIF Out connector 2 x USB 2.0 headers (support 4 USB 2.0 ports) 1 x USB 3.0 header (supports 2 USB 3.0 ports) 64Mb AMI UEFI Legal BIOS with Multilingual GUI support ACPI 1.

1 Compliance Wake Up Events SMBIOS 2.3.1 Support CPU, DRAM, PCH 1.05V Voltage Multi-adjustment Connector BIOS Feature Support CD • Drivers, Utilities, AntiVirus Software (Trial Version), CyberLink MediaEspresso 6.5 Trial, Google Chrome Browser and Toolbar, Start8, MeshCentral, Splashtop Streamer, Intel® Extreme Tuning Utility (IXTU) • CPU/Chassis Temperature Sensing • CPU/Chassis/Power Fan Tachometer • CPU/Chassis Quiet Fan (Allow Chassis Fan Speed AutoAdjust by CPU Temperature) • CPU/Chassis Fan Multi-Speed Control • Voltage Monitoring: +12V, +5V, +3.3V, CPU Vcore • Microsoft® Windows® 8 / 8 64-bit / 7 / 7 64-bit compliant Hardware Monitor English 4 OS H87 Pro4 Certifications • FCC, CE, WHQL • ErP/EuP Ready (ErP/EuP ready power supply is required) * For detailed product information, please visit our website: <http://www.asrock.com> Please realize that there is a certain risk involved with overclocking, including adjusting the setting in the BIOS, applying Untied Overclocking Technology, or using thirdparty overclocking tools. Overclocking may affect your system's stability, or even cause damage to the components and devices of your system. It should be done at your own risk and expense.

We are not responsible for possible damage caused by overclocking. Due to limitation, the actual memory size may be less than 4GB for the reservation for system usage under Windows® 32-bit operating systems. Windows® 64-bit operating systems do not have such limitations. You can use ASRock XFast RAM to utilize the memory that Windows® cannot use. 5 English 1.



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3 Unique Features ASRock A-Tuning A-Tuning is ASRock's multi purpose software suite with a new interface, more new features and improved utilities, including XFast RAM, Dehumidifier, Good Night LED, FAN-Tastic Tuning, OC Tweaker and a whole lot more. ASRock Instant Flash ASRock Instant Flash is a BIOS flash utility embedded in Flash ROM. This convenient BIOS update tool allows you to update the system BIOS in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Just save the new BIOS file to your USB storage and launch this tool by pressing <F6> or <F2> during POST to enter the BIOS setup menu to access ASRock Instant Flash. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system.

ASRock APP Charger Simply by installing the ASRock APP Charger makes your iPhone/iPad/iPod Touch charge up to 40% faster than before on your computer. ASRock APP Charger allows you to quickly charge many Apple devices simultaneously and even supports continuous charging when your PC enters into Standby mode (S1), Suspend to RAM (S3), hibernation mode (S4) or power off (S5). ASRock XFast USB ASRock XFast USB can boost the performance of your USB storage devices. The performance may depend on the properties of the device. ASRock XFast LAN ASRock XFast LAN provides faster internet access, which includes the benefits listed below. LAN Application Prioritization: You can configure your application's priority ideally and add new programs to the list. Lower Latency in Game: After setting online game's priority higher, it can lower the latency in games. Traffic Shaping: You can watch Youtube HD videos and download simultaneously. RealTime Analysis of Your Data: With the status window, you can easily recognize which data streams you are currently transferring. English 6 H87 Pro4 ASRock XFast RAM ASRock XFast RAM is included in A-Tuning.

It fully utilizes the memory space that cannot be used under Windows® 32-bit operating systems. ASRock XFast RAM shortens the loading time of previously visited websites, making web surfing faster than ever. And it also boosts the speed of Adobe Photoshop 5 times faster. Another advantage of ASRock XFast RAM is that it reduces the frequency of accessing your SSDs or HDDs in order to extend their lifespan. ASRock Crashless BIOS ASRock Crashless BIOS allows users to update their BIOS without fear of failing.

If power loss occurs during the BIOS updating process, ASRock Crashless BIOS will automatically finish the BIOS update procedure after regaining power. Please note that BIOS files need to be healthy. 9 English 1.4 Motherboard Layout DDR3_A1 (64 bit, 240-pin module) USB 3.0 T: USB0 B: USB1 DDR3_A2 (64 bit, 240-pin module) DDR3_B1 (64 bit, 240-pin module) DDR3_B2 (64 bit, 240-pin module) USB 3.

0 T: USB2 B: USB3 Top: RJ-45 CPU_FAN2 CHA_FAN2 CPU_FAN1 H87 Pro4 Fast LAN X Fast RAM USB3_4_5 PCIE1 X X Fast USB LAN PCIE2 PCI Express 3.0 CMOS Battery Front USB 3.0 64Mb BIOS RoHS Audio CODEC HD_AUDIO1 1 PCI2 COM1 SPDIF1_OUT1 SATA3_5 USB4_5 CLRCMOS1 SPEAKER1 USB2_3 PLED1 PLED PWRBTN CHA_FAN1 IRI 1 1 1 1 1 1 1 1 HDLED RESET PANEL1 15 10 SATA3_4 PCI1 SATA3_3 SATA3_2 PCIE4 Super I/O SATA3_1 SATA3_0 PCIE3 Intel H87 1 ATXPWR1 PS2 Keyboard USB 2.0 T: USB0 B: USB1 PWR_FAN1 ATX12V1 HDM11 DV11 Center: REAR SPK Center: FRONT Top: SIDE SPK Top: LINE IN VGA1 Bottom: CTR BASS Bottom: MIC IN English H87 Pro4 No. Description 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Unplug all power cables before installing the CPU. 1 A B 2 15 English 4 3 5 English 16 H87 Pro4 Please save and replace the cover if the processor is removed. The cover must be placed if you wish to return the motherboard for after service. 17 English 2.2 Installing the CPU Fan and Heatsink 1 2 18 CP U_ FA N English H87 Pro4 2.3 Installing Memory Modules (DIMM) This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology.

1. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pairs. 2. It is unable to activate Dual Channel Memory Technology with only one or three memory module installed. 3. It is not allowed to install a DDR or DDR2 memory module into a DDR3 slot; otherwise, this motherboard and DIMM may be damaged. Dual Channel Memory Configuration Priority 1 2 3 DDR3_A1 Populated Populated DDR3_A2 Populated Populated Populated Populated DDR3_B1 DDR3_B2 Populated Populated The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation. 19 English 1 2 3 English 20 H87 Pro4 2.4 Expansion Slots (PCI and PCI Express Slots) There are 2 PCI slots and 4 PCI Express slots on the motherboard.

Before installing an expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation. PCI slot: The PCI1 and PCI2 slots are used to install expansion cards that have 32-bit PCI interface. PCIe slots: PCIE1 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards.

PCIE2 (PCIe 3.0 x16 slot) is used for PCI Express x16 lane width graphics cards. PCIE3 (PCIe 2.0 x1 slot) is used for PCI Express x1 lane width cards. PCIE4 (PCIe 2.

0 x1 slot) is used for PCI Express x1 lane width cards. 21 English 2.5 Jumpers Setup The illustration shows how jumpers are setup. When the jumper cap is placed on the pins, the jumper is "Short". If no jumper cap is placed on the pins, the jumper is "Open". The illustration shows a 3-pin jumper whose pin1 and pin2 are "Short" when a jumper cap is placed on these 2 pins. Clear CMOS Jumper (CLRCMOS1) (see p.10, No. 20) Default Clear CMOS CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply.

After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, and user default profile will be cleared only if the CMOS battery is removed.

English 22 H87 Pro4 2.6 Onboard Headers and Connectors Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage to the motherboard. System Panel Header (9-pin PANEL1) (see p.10, No.

14) 1 PLED+ PLEDPWRBTN# GND GND RESET# GND HDLEDHDLED+ Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below.



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Note the positive and negative pins before connecting the cables. PWRBTN (Power Switch): Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch. RESET (Reset Switch): Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart. PLED (System Power LED): Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED): Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data. The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly. 23 English Power LED Header (3-pin PLED1) (see p.10, No. 15) 1 PLEDPLED+ PLED+ Please connect the chassis power LED to this header to indicate the system's power status. These six SATA3 connectors support SATA data cables for internal storage devices with up to 6.0 Gb/s data transfer rate.

Serial ATA3 Connectors (SATA3_0: see p.10, No. 8) (SATA3_1: see p.10, No. 7) (SATA3_2: see p.10, No. 9) (SATA3_3: see p.10, No. 12) (SATA3_4: see p.10, No.

10) (SATA3_5: see p.10, No. 11) SATA3_1 SATA3_3 USB 2.0 Headers (9-pin USB2_3) (see p.10, No.

16) (9-pin USB4_5) (see p.10, No. 17) SATA3_5 SATA3_4 SATA3_2 SATA3_0 USB_PWR PP+ GND DUMMY 1 GND P+ PUSB_PWR Besides two USB 2.0 ports on the I/O panel, there are two headers on this motherboard. Each USB 2.

0 header can support two ports. USB 3.0 Header (19-pin USB3_4_5) (see p.10, No. 6) Vbus Vbus IntA_PA_SSRXIntA_PA_SSRX+ GND

IntA_PA_SSTXIntA_PA_SSTX+ GND IntA_PA_DIntA_PA_D+ 1 IntA_PB_SSRXIntA_PB_SSRX+ GND IntA_PB_SSTXIntA_PB_SSTX+ GND

IntA_PB_DIntA_PB_D+ Dummy Besides four USB 3.0 ports on the I/O panel, there is one header on this motherboard. Each USB 3.0 header can support two ports. English 24 H87 Pro4 Front Panel Audio Header (9-pin HD_AUDIO1) (see p.10, No.

23) 1 GND PRESENCE# MIC_RET OUT_RET This header is for connecting audio devices to the front audio panel. OUT2_L J_SENSE OUT2_R MIC2_R MIC2_L 1. High Definition Audio supports Jack Sensing, but the panel wire on the chassis must support HDA to function correctly. Please follow the instructions in our manual and chassis manual to install your system. 2. If you use an AC'97 audio panel, please install it to the front panel audio header by the steps below: A. Connect Mic_IN (MIC) to MIC2_L. B. Connect Audio_R (RIN) to OUT2_R and Audio_L (LIN) to OUT2_L. C.

Connect Ground (GND) to Ground (GND). D. MIC_RET and OUT_RET are for the HD audio panel only. You don't need to connect them for the AC'97 audio panel. E.

To activate the front mic, go to the "FrontMic" Tab in the Realtek Control panel and adjust "Recording Volume". Chassis Speaker Header (4-pin SPEAKER1) (see p.10, No. 19) SPDIF Out Connector (2-pin SPDIF_OUT1) (see p.10, No.

22) DUMMY SPEAKER 1 +5V DUMMY Please connect the chassis speaker to this header. 1 GND SPDIFOUT Please connect the SPDIF_OUT connector of a HDMI VGA card to this header with a cable. Please connect fan cables to the fan connectors and match the black wire to the ground pin. Chassis and Power Fan Connectors (4-pin CHA_FAN1) (see p.10, No. 13) (4-pin CHA_FAN2) (see p.10, No. @@@@25) (3-pin CPU_FAN2) (see p.10, No. @@@@26) This motherboard provides an 8-pin ATX 12V power connector.

@@@@2) 8 5 4 1 Infrared Module Header (5-pin IR1) (see p.10, No. @@@@27) If the Main Menu does not appear automatically, locate and double click on the file "ASRSETUP.EXE" in the Support CD to display the menu. Drivers Menu The drivers compatible to your system will be auto-detected and listed on the support CD driver page. Please click Install All or follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly. Utilities Menu The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it. To improve Windows 7 compatibility, please download and install the following hot fix provided by Microsoft.

@@@@@28) Double click on the value Start and change the value from 3 into 0. @@@@29) Press F10 to save changes and exit. Enter Windows 8/7. @@@@30) Drag the slider to configure the time. @@@@31) If the timer is set to 0 minutes, Windows will immediately enable Rapid Start mode as it enters sleep state.

Using Rapid Start 1. You may shut down the computer without terminating the applications or files you are executing currently. Click on Windows Start -> the arrow next to Shut down, and click on Sleep. 2. 3.

Windows system will enter sleep state. According to your settings in Rapid Start Technology Manager, the system will automatically wake up and enable Rapid Start mode after entering sleep 35 English state for a period of time. The power of the computer in Rapid Start mode can be cut off, it will not cause data loss of the programs or files you were executing before entering sleep state. 4. When you wish to continue to use the computer just hit the power button, the system will rapidly return to Windows, the programs and files which you were using before entering sleep state will be accessible immediately. English 36 H87 Pro4 3.4 Intel® Smart Connect Technology Intel® Smart Connect Technology is a feature that periodically wakes your computer from Windows® sleep state to refresh email or social networking applications. It saves your waiting time and keeps the content always up-to-date. 3.4.

1 System Requirements ••• Confirm whether your motherboard supports this feature. @@@@32) Double click on the value Start and change the value from 3 into 0. Click on OK. 37 English 3.4.2 Setup Guide Installing ASRock Smart Connect Utility Step 1 Install ASRock Smart Connect Utility, which is located in the folder at the following path of the Support CD: \ASRock Utility > Smart Connect. Step 2 Once installed, run ASRock Smart Connect from your desktop or go to Windows Start -> All Programs -> ASRock Utility. English 38 H87 Pro4 Step 3 Click the Add button. Take Foxmail as an example, add Foxmail to the Application list. Step 4 Select Foxmail from the Application List, then click the arrow pointing right to add this application to the Smart Connect List.

Click Apply to enable Smart Connect. 39 English Step 5 Step 6 Double-click the Intel® Smart Connect Technology Manager icon Windows system tray. Step 7 Drag the slider to configure how often the system will connect to the network to download updates.



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Shorter durations will provide more frequent updates, but may cause more power consumption. in the Using Smart Connect I. Keep the applications which you wish to connect to the internet and receive updates while the system is in sleep state running. Foxmail for instance, keep Foxmail running. Click on Windows Start -> the arrow next to Shut down, and click on Sleep. 2. English 3.

Windows system will enter sleep state. 40 H87 Pro4 4. The system will wake up from sleep state periodically, and then start to update Foxmail. The screen will not display anything so the computer can maintain minimum power usage. Afterwards, the system will automatically return to sleep state again. Upon waking up the system, you will find the new mail that were sent to you during sleep state are already updated and ready to be read in Foxmail. 5. 41 English 3.5 Intel® Remote Wake Technology Intel® Remote Wake Technology allows you to use programs or services over the Internet to wake up your home computer from energy efficient sleep mode. Before configuring this feature, verify the following.

- Remote Wake has been enabled in "Intel® Smart Connect Technology Manager". Make sure that the "PCI Device Power On" is enabled in UEFI SETUP UTILITY > Advanced > ACPI Configuration. 3.5.1 Configuring and Using MeshCentral MeshCentral allows you to remotely wake up a PC from any network using a single web site. Just download and install the mesh agent on your computers and your computers will show up in the "My Devices" section of MeshCentral.com. Creating a Mesh Step 1 Login to Meshcentral.com. @@@@Enter a mesh name and password.

@@@@@Step 2 Select a Machine. @@@@Then enter your Splashtop Account. If you have not created a Splashtop account, create one.

@@@@@It should be done at your own risk and expense. We are not responsible for the possible damage caused by overclocking.

3.6.1 UI Overview Navigation Panel Adjustment Panel Information Panel System Monitoring Screen Navigation Panel: Provides access to the functions of this tuning utility. Adjustment Panel: Provides tuning options. Information Panel: Displays readouts, such as clock speeds and turbo boost power capacities. System Monitoring Screen: Provides a graph for you to track CPU usage, memory usage, and CPU temperature. English 50 H87 Pro4 System Information

Displays the major information of your system. Manual Tuning Manual Tuning shows the major readings of your system and allows you to tune the parameters, including voltage for the CPU core, GPU, and TurboBoost functions. Click Apply to apply the settings. Click Save to save your current settings as a profile. Stress Test Stress Test allows maximum load testing on both CPU and memory. Specify the duration and click Start Testing. Benchmarking With Benchmarking, you can share and compare the scores online with other users in the HWBot community. Click Run to benchmark your current settings. Click Compare Online to upload your score.

Profiles Profiles shows a list of profiles for your overclocking settings and Benchmark results, which can be exported to share with other overclockers. 51 English 3.7 Start8 For those Windows 8 users who miss the Start Menu, Start8 is an ideal solution that brings back the familiar Start Menu along with added customizations for greater efficiency. 3.7.1 Installing Start8 Install Start8, which is located in the folder at the following path of the Support CD: \ASRock Utility > Start8. 3.7.2 Configuring Start8 Style Select between the Windows 7 style and Windows 8 style Start Menu. Then select the theme of the Start Menu and customize the style of the Start icon.

English 52 H87 Pro4 Configure Configure provides configuration options, including icon sizes, which shortcuts you want Start Menu to display, quick access to recently used apps, the functionality of the power button, and more. Control 53 English Control lets you configure what a click on the start button or a press on the Windows key does. Desktop Desktop allows you to disable the hot corners when you are working on the desktop. It also lets you choose whether or not the system boots directly into desktop mode and bypass the Metro user interface. About Displays information about Start8.

English 54 H87 Pro4 Chapter 4 UEFI SETUP UTILITY 4.1 Introduction ASRock Interactive UEFI is a blend of system configuration tools, cool sound effects and stunning visuals. Not only will it make BIOS setup less difficult but also a lot more amusing. This section explains how to use the UEFI SETUP UTILITY to configure your system. You may run the UEFI SETUP UTILITY by pressing <F2> or right after you power on the computer, otherwise, the Power-On-Self-Test (POST) will continue with its test routines.

If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on. Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. 4.1.1 UEFI Menu Bar The top of the screen has a menu bar with the following selections: Main OC Tweaker Advanced Tool H/W Monitor Boot Security Exit For setting system time/date information For overclocking configurations For advanced system configurations Useful tools Displays current hardware status For configuring boot settings and boot priority For security settings Exit the current screen or the UEFI Setup Utility 55 English 4.1.2 Navigation Keys Use <> key or <> key to choose among the selections on the menu bar, and use <> key or <> key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item. Please check the following table for the descriptions of each navigation key.

Navigation Key(s)	Description
<PgUp>	To change option for the selected items
<PgDn>	Switch to next function
<Home>	Go to the previous page
<End>	Go to the next page
<F1>	Go to the top of the screen
<F4>	Go to the bottom of the screen
<F7>	To display the General Help Screen
<F9>	Toggle sound on/off
<F10>	Discard changes and exit the SETUP UTILITY
<F12>	Load optimal default values for all the settings
<Esc>	Save changes and exit the SETUP UTILITY
<PgUp>	Print screen
<PgDn>	Jump to the Exit Screen or exit the current screen

English 56 H87 Pro4 4.2 Main Screen When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview. Active Page on Entry Select the default page when entering the UEFI setup utility. UEFI Guide UEFI Guide is a quick tutorial for ASRock's UEFI setup Utility. You may abort the tutorial by pressing "esc".



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57 English 4.3 OC Tweaker Screen In the OC Tweaker screen, you can set up overclocking features. Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. CPU Configuration CPU Ratio The CPU speed is determined by the CPU Ratio multiplied with the BCLK. Increasing the CPU Ratio will increase the internal CPU clock speed without affecting the clock speed of other components.

Intel SpeedStep Technology Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. Intel Turbo Boost Technology Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state. English 58 H87 Pro4 Filter PLL Frequency CPU BCLK Filter Frequency. Choose 1.6 for better overclocking capabilities.

Long Duration Power Limit Configure Package Power Limit 1 in watts. When the limit is exceeded, the CPU ratio will be lowered after a period of time. A lower limit can protect the CPU and save power, while a higher limit may improve performance. Long Duration Maintained Configure the period of time until the CPU ratio is lowered when the Long Duration Power Limit is exceeded. Short Duration Power Limit Configure Package Power Limit 2 in watts. When the limit is exceeded, the CPU ratio will be lowered immediately. A lower limit can protect the CPU and save power, while a higher limit may improve performance. Primary Plane Current Limit Configure the current limit of the CPU under Turbo Mode in ampere. A lower limit can protect the CPU and save power, while a higher limit may improve performance. GT Frequency Configure the frequency of the integrated GPU. GT Voltage Mode Auto: For optimized settings. Adaptive: Add voltage to the integrated GPU when the system is under heavy load. Override: The voltage is fixed. GT Adaptive Voltage Configure the fixed voltage added to the integrated GPU. GT Voltage Offset English 59 Configure the voltage added to the integrated GPU when the system is under heavy load.

DRAM Timing Configuration Load XMP Setting Load XMP settings to overclock the DDR3 memory and perform beyond standard specifications. DRAM Reference Clock Select Auto for optimized settings. DRAM Frequency If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically. DRAM Configuration DRAM Tweaker Fine tune the DRAM settings by leaving marks in checkboxes. Click OK to confirm and apply your new settings. CAS# Latency (tCL) The time between sending a column address to the memory and the beginning of the data in response. English 60 RAS# to CAS# Delay (tRCD) The number of clock cycles required between the opening of a row of memory and accessing columns within it. H87 Pro4 Row Precharge Time (tRP) The number of clock cycles required between the issuing of the precharge command and opening the next row. RAS# Active Time (tRAS) The number of clock cycles required between a bank active command and issuing the precharge command. Command Rate (CR) The delay between when a memory chip is selected and when the first active command can be issued. Write Recovery Time (tWR) The amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged. Refresh Cycle Time (tRFC) The number of clocks from a Refresh command until the first Activate command to the same rank. RAS to RAS Delay (tRRD) The number of clocks between two rows activated in different banks of the same rank. Write to Read Delay (tWTR) The number of clocks between the last valid write operation and the next read command to the same internal bank. Read to Precharge (tRTP) The number of clocks that are inserted between a read command to a row precharge command to the same rank.

Four Activate Window (tFAW) The time window in which four activates are allowed the same rank. CAS Write Latency (tCWL) Configure CAS Write Latency. tREFI Configure refresh cycles at an average periodic interval. 61 English tCKE Configure the period of time the DDR3 initiates a minimum of one refresh command internally once it enters Self-Refresh mode. tRDRD Configure between module read to read delay. tRDRDDR Configure between module read to read delay from different ranks. tRDRDDD Use this to change DRAM tRWSR Auto/Manual settings. The default is [Auto]. tWRRD Configure between module write to read delay. tWRRDDR Configure between module write to read delay from different ranks. tWRRDDD Use this to change DRAM tRRSR Auto/Manual settings. The default is [Auto]. Configure between module write to read delay from different DIMMs. tWRWR Configure between module write to write delay. tWRWRDR Configure between module write to write delay from different ranks.

tWRWRDD Configure between module write to write delay from different DIMMs. tRDWR Configure between module read to write delay. tRDWRDR Configure between module read to write delay from different ranks. English 62 tRDWRDD Configure between module read to write delay from different DIMMs. H87 Pro4 RTL (CHA) Configure round trip latency for channel A. RTL (CHB) Configure round trip latency for channel B. IO-L (CHA) Configure IO latency for channel A. IO-L (CHB) Configure IO latency for channel B. ODT WR (CHA) Configure the memory on die termination resistors' WR for channel A. ODT WR (CHB) Configure the memory on die termination resistors' WR for channel B.

ODT NOM (CHA) Use this to change ODT (CHA) Auto/Manual settings. The default is [Auto]. ODT NOM (CHB) Use this to change ODT (CHB) Auto/Manual settings. The default is [Auto]. Command Tri State Enable for DRAM power saving.

MRC Fast Boot Enable Memory Fast Boot to skip DRAM memory training for booting faster. FIVR Configuration FIVR Switch Frequency Signature Select whether to boost or lower the FIVR Switch Frequency. Configure the percentage of frequency boost or deduction. 63 English FIVR Switch Frequency Offset CPU Voltage Mode Auto: For optimized settings. Adaptive: Add voltage to the CPU when the system is under heavy load.

Override: The voltage is fixed. CPU Override Voltage Configure the voltage added to the CPU when the system is under heavy load. CPU Voltage Offset Configure the dynamic CPU voltage added to the CPU. CPU Cache Override Voltage Add voltage to the CPU Cache when the system is under heavy load. CPU Cache Voltage Offset Configure the voltage for the CPU Cache. Setting the voltage higher may increase system stability when overclocking. System Agent Voltage Offset Configure the voltage for the System Agent. Setting the voltage higher may increase system stability when overclocking. CPU Analog IO Voltage Offset CPU I/O Analog Voltage. CPU Digital IO Voltage Offset CPU I/O Digital Voltage.

CPU Integrated VR Faults Disable FIVR Faults to raise the threshold to trigger CPU over current protection and over voltage protection for better overclocking capabilities.



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CPU Integrated VR Efficiency Mode Enable FIVR Efficiency Management for power saving. Disable for better performance and overclocking capabilities. English 64 H87 Pro4 Voltage Configuration CPU Input Voltage Configure the voltage for the CPU. CPU Load-Line Calibration CPU Load-Line Calibration helps prevent CPU voltage droop when the system is under heavy load. DRAM Voltage Use this to configure DRAM Voltage. The default value is [Auto]. PCH 1.05V Voltage Chipset 1.05V Voltage.

Use default settings for best performance. 65 English 4.4 Advanced Screen In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Storage Configuration, Intel® Rapid Start Technology, Intel® Smart Connect Technology, Super IO Configuration, ACPI Configuration and USB Configuration. Setting wrong values in this section may cause the system to malfunction. English 66 H87 Pro4 4.1 CPU Configuration Intel Hyper Threading Technology Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved. Active Processor Cores Select the number of cores to enable in each processor package. CPU C States Support Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving. Enhanced Halt State (C1E) Enable Enhanced Halt State (C1E) for lower power consumption. CPU C3 State Support Enable C3 sleep state for lower power consumption. Enable C6 deep sleep state for lower power consumption. CPU C7 State Support Enable C7 deep sleep state for lower power consumption. 67 English CPU C6 State Support Package C State Support Enable CPU, PCIe, Memory, Graphics C State Support for power saving. CPU Thermal Throttling Enable CPU internal thermal control mechanisms to keep the CPU from overheating. No-Execute Memory Protection Processors with No-Execution Memory Protection Technology may prevent certain classes of malicious buffer overflow attacks. Intel Virtualization Technology Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems. Hardware Prefetcher Automatically prefetch data and code for the processor. Enable for better performance.

Adjacent Cache Line Prefetch Automatically prefetch the subsequent cache line while retrieving the currently requested cache line. Enable for better performance. English 68 H87 Pro4 4.4.2 Chipset Configuration Primary Graphics Adapter Select a primary VGA. VT-d Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance. PCIe2 Link Speed Select the link speed for PCIe2. Share Memory Configure the size of memory that is allocated to the integrated graphics processor when the system boots up. IGPU Multi-Monitor English 69 Select disable to disable the integrated graphics when an external graphics card is installed. Select enable to keep the integrated graphics enabled at all times to support Lucid Virtu. Render Standby Power down the render unit when the GPU is idle for lower power consumption. Onboard HD Audio Enable/disable onboard HD audio. Set to Auto to enable onboard HD audio and automatically disable it when a sound card is installed. Front Panel Enable/disable front panel HD audio. On/Off Play With ASRock On/Off Play users can connect their portable audio devices, such as an MP3 player or a mobile phone to the PC and listen to music through the computer's speakers even when the computer is turned off.

Onboard HDMI HD Audio Enable audio for the onboard digital outputs. Onboard LAN Enable or disable the onboard network interface controller. Deep Sleep Configure deep sleep mode for power saving when the computer is shut down. Restore on AC/Power Loss Select the power state after a power failure. If [Power Off] is selected, the power will remain off when the power recovers.

If [Power On] is selected, the system will start to boot up when the power recovers. Good Night LED By enabling Good Night LED, the Power/HDD LEDs will be switched off when the system is on. It will also automatically switch off the Power and Keyboard LEDs when the system enters into Standby/Hibernation mode. English 70 H87 Pro4 4.4.3 Storage Configuration SATA Controller(s) Enable/disable the SATA controllers. SATA Mode Selection IDE: For better compatibility. AHCI: Supports new features that improve performance. @@@@It is recommended to select auto for ACPI S3 power saving. Check Ready Bit Enable to enter the operating system after S3 only when the hard disk is ready, this is recommended for better system stability.

ACPI HPET Table Enable the High Precision Event Timer for better performance and to pass WHQL tests. PS/2 Keyboard Power On Allow the system to be waked up by a PS/2 Keyboard. PCI Devices Power On Allow the system to be waked up by a PCI device and enable wake on LAN. English 76 Wake From Onboard LAN Allow the system to be waked up by the Onboard Intel I217V LAN. H87 Pro4 Ring-In Power On Allow the system to be waked up by onboard COM port modem Ring-In signals. RTC Alarm Power On Allow the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system. USB Keyboard/Remote Power On Allow the system to be waked up by an USB keyboard or remote controller. USB Mouse Power On Allow the system to be waked up by an USB mouse. 77 English 4.

4.8 USB Configuration USB Controller Enable or disable all the USB 2.0 ports. USB 3.0 Controller Enable or disable all the USB 3.0 ports. Legacy USB Support Enable or disable Legacy OS Support for USB 2.0 devices. If you encounter USB compatibility issues it is recommended to disable legacy USB support. Select UEFI Setup Only to support USB devices under the UEFI setup and Windows/Linux operating systems only. Legacy USB 3.0 Support Enable or disable Legacy OS Support for USB 3.0 devices. English 78 H87 Pro4 4.5 Tools OMG (Online Management Guard) Administrators are able to establish an internet curfew or restrict internet access at specified times via OMG. @@@@Please setup network configuration before using Internet Flash. *For BIOS backup and recovery purpose, it is recommended to plug in your USB pen drive before using this function. Network Configuration Use this to configure internet connection settings for Internet Flash. Internet Setting Enable or disable sound effects in the setup utility. UEFI Download Server Select a server to download the UEFI firmware.

Dehumidifier Function If Dehumidifier Function is enabled, the computer will power on automatically to dehumidify the system after entering S4/S5 state. English 80 H87 Pro4 Dehumidifier Period Configure the period of time until the computer powers on and enables Dehumidifier after entering S4/S5 state.



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Dehumidifier Duration Configure the duration of the dehumidifying process before it returns to S4/S5 state. **Dehumidifier CPU Fan Setting** Configure the speed of the CPU fan while Dehumidifier is enabled. The higher the value, the faster the fan speed. Max: 255 Min: 1 **Save User Default Type** a profile name and press enter to save your settings as user default. **Load User Default** Load previously saved user defaults. **81 English 4.6 Hardware Health Event Monitoring Screen** This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, fan speed and voltage. **CPU Fan 1 & 2 Setting** Select a fan mode for CPU Fans 1&2, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Chassis Fan 1 Setting Select a fan mode for Chassis Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature. **Chassis Fan 2 Setting** Select a fan mode for Chassis Fan 2, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature. **Over Temperature Protection** When Over Temperature Protection is enabled, the system automatically shuts down when the motherboard is overheated. **English 82 H87 Pro4 4.7 Boot Screen** This section displays the available devices on your system for you to configure the boot settings and the boot priority.

Fast Boot Fast Boot minimizes your computer's boot time. In fast mode you may not boot from a USB storage device. Ultra Fast mode is only supported by Windows 8 and the VBIOS must support UEFI GOP if you are using an external graphics card. Please notice that Ultra Fast mode will boot so fast that the only way to enter this UEFI Setup Utility is to Clear CMOS or run the Restart to UEFI utility in Windows. **Boot From Onboard LAN** Allow the system to be waked up by the onboard LAN.

Setup Prompt Timeout Configure the number of seconds to wait for the setup hot key. **Bootup Num-Lock** Select whether Num Lock should be turned on or off when the system boots up. Select whether the Boot Beep should be turned on or off when the system boots up. Please note that a buzzer is needed. **83 English Boot Beep Full Screen Logo** Enable to display the boot logo or disable to show normal POST messages. **AddOn ROM Display** Enable AddOn ROM Display to see the AddOn ROM messages or configure the AddOn ROM if you've enabled Full Screen Logo. Disable for faster boot speed. **Boot Failure Guard** If the computer fails to boot for a number of times the system automatically restores the default settings. **Boot Failure Guard Count** Configure the number of attempts to boot until the system automatically restores the default settings. **CSM (Compatibility Support Module)** CSM Enable to launch the Compatibility Support Module.

Please do not disable unless you're running a WHCK test. If you are using Windows 8 64-bit and all of your devices support UEFI, you may also disable CSM for faster boot speed. **English 84 H87 Pro4 Launch PXE OpROM Policy** Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. **Launch Storage OpROM Policy** Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. **Launch Video OpROM Policy** Select UEFI only to run those that support UEFI option ROM only. Select Legacy only to run those that support legacy option ROM only. **85 English 4.8 Security Screen** In this section you may set or change the supervisor/user password for the system.

You may also clear the user password. **Supervisor Password** Set or change the password for the administrator account. Only the administrator has authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password. **User Password** Set or change the password for the user account.

Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password. **Secure Boot** Enable to support Windows 8 Secure Boot. **English 86 H87 Pro4 4.9 Exit Screen Save Changes and Exit** When you select this option the following message, "Save configuration changes and exit setup?" will pop out.

Select [OK] to save changes and exit the UEFI SETUP UTILITY. Discard Changes and Exit When you select this option the following message, "Discard changes and exit setup?" will pop out. Select [OK] to exit the UEFI SETUP UTILITY without saving any changes. Discard Changes When you select this option the following message, "Discard changes?" will pop out. Select [OK] to discard all changes. **Load UEFI Defaults** Load UEFI default values for all options. The F9 key can be used for this operation. **Launch EFI Shell from filesystem device** English 87 Copy shellx64.efi to the root directory to launch EFI Shell. **Contact Information** If you need to contact ASRock or want to know more about ASRock, you're welcome to visit ASRock's website at <http://www.asrock.com>;

or you may contact your dealer for further information. For technical questions, please submit a support request form at <http://www.asrock.com/support/tsd.asp> ASRock Incorporation 2F., No.37, Sec. 2, Zhongyang S. Rd., Beitou District, Taipei City 112, Taiwan (R.O.C.) ASRock EUROPE B.V.

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