IOPS-602

Open Pluggable Specification Digital Signage Player

User's Manual

Version 1.0 (May 2018)



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Compliance

CE

The product described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

FC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE



This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green IBASE



This product complies with the current RoHS directives restricting the use of the following substances in concentrations not to exceed 0.1% by weight (1000 ppm) except for cadmium, limited to 0.01% by weight (100 ppm).

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr6+)
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

Important Safety Information

Carefully read the following safety information before using this device.

Setting up your system:

- Put the device horizontally on a stable and solid surface.
- Do not use this product near water or any heated source.
- Leave plenty of space around the device and do not block the ventilation openings. Never drop or insert any objects of any kind into the openings.
- Use this product in environments with ambient temperatures between 0°C and 45°C.

Care during use:

- Do not place heavy objects on the top of the device.
- Make sure to connect the correct voltage to the device. Failure to supply the correct voltage could damage the unit.
- Do not walk on the power cord or allow anything to rest on it.
- If you use an extension cord, make sure the total ampere rating of all devices plugged into the extension cord does not cord's ampere rating.
- Do not spill water or any other liquids on your device.
- Always unplug the power cord from the wall outlet before cleaning the device.
- Only use neutral cleaning agents to clean the device.
- Vacuum dust and particles from the vents by using a computer vacuum cleaner.

Product Disassembly

Do not try to repair, disassemble, or make modifications to the device. Doing so will void the warranty and may result in damage to the product or personal injury.



Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries by observing local regulations.

Warranty Policy

• IBASE standard products:

24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

• 3rd-party parts:

12-month (1-year) warranty from delivery for 3rd-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adaptor, display panel and touch screen.

* PRODUCTS, HOWEVER, THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER INSTALLATION OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES.

Technical Support & Services

- 1. Visit the IBASE website at <u>www.ibase.com.tw</u> to find the latest information about the product.
- 2. If you encounter any technical problems and require assistance from your distributor or sales representative, please prepare and send the following information:
 - Product model name
 - Product serial number
 - Detailed description of the problem
 - Error messages in text or screenshots if any
 - The arrangement of the peripherals
 - Software used (such as OS and application software)
- If repair service is required, please download the RMA form at <u>http://www.ibase.com.tw/english/Supports/RMAService/</u>.
 Fill out the form and contact your distributor or sales representative.

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Chapter 1 General Information

The information provided in this chapter includes:

- Features
- Packing List
- Specifications
- Optional Accessories
- Overview
- Dimensions



1.1 Introduction

The IOPS-602 is a slot-in digital signage player compliant with OPS (Open Pluggable Specification). It is powered by Intel[®] 7th Generation processors and features outstanding performance and HDMI high definition video playback. It supports large format OPS displays and monitors, and allows cableless deployment and easy maintenance.



1.2 Features

- Supports 7th Gen. Intel[®] Core[™] U-series processors
- Intel[®] HD graphics engine
- iAMT compliance for remote management
- 2 x DDR4-2133 SO-DIMM, dual-channel, expandable to 32 GB
- HDMI 1.4b display output
- Audio jacks for line-out and mic-in
- 1 x RJ45 for GbE LAN, 1 x RJ50 for RS-232 serial port, 4 x USB 3.0 ports
- 1 x M.2 E2230 for Wi-Fi or Bluetooth options

1.3 Packing List

Your product package should include the items listed below. If any of the items below is missing, contact the distributor or the dealer from whom you have purchased the product. Drivers and this user manual are downloadable from our website.

• IOPS-602 OPS Digital Signage Player

1.4 Optional Accessories

IBASE provides optional accessories as listed below. Please contact us or your dealer if you would like to order any item.

- IOPS-DK1-SYS docking kit with two screws
- Power adapter & power cord



1.5 Specifications

Product IOPS-602				
System				
Mainboard OPS602				
Operating System• Windows 10 (64-bit) • Linux Ubuntu				
CPU	PU Intel [®] 7 th Gen. Core™ U-series processor BGA1356			
Chipset	Integrated			
Memory	2 x DDR4-2133 SO-DIMM, Dual channel, Max. 32 GB			
Graphics	Integrated graphics			
Network Intel [®] I219LM LAN PHY for Intel [®] i7/i5 processor Controller Intel [®] I219V LAN PHY for Intel [®] i3 processor				
Super I/O	Fintek F81846AD			
Storage	1 x M.2 M2280 slot for SATA SSD			
Power Requirement12V ~ 19V DC-in (Intel® OPS standard)				
WatchdogWatchdog Timer 256 segments, 0, 1, 2255 sec/min				
Chassis SGCC, black & gray				
Mounting	OPS standard bracket			
Dimensions (W x H x D) 200 x 30 x 119 mm (7.87" x 1.18" x 4.69")				
Net Weight 0.9 kg (1.98 lb)				
Compliance	CE, FCC class B			
	I/O Ports			
HDMI	1 x HDMI 1.4b			
LAN	1 x GbE RJ45 LAN port			
Serial	1 x RJ50 for COM1 RS-232 port			
USB	4 x USB 3.0			
Audio Jack	1 x Line-Out1 x Mic-In			
Power Jack	1 x DC-in power jack			
Expansion	1 x M.2 E2230 for WiFi or BT options			
	Environment			
 Operating: 0 ~ 45 °C (32 ~ 113 °F) Storage: -20 ~ 80 °C (-4 ~ 176 °F) 				

Relative Humidity	5 ~ 90% at 45°C (non-condensing)
Vibration	SSD: 5 grms / 5~500Hz / random operation

All specifications are subject to change without prior notice.

1.6 Overview



No.	Name	No.	Name
1	Screw Holes (for the optional docking kit)		Audio Jacks (From left to right: Line-Out, Mic-In)
2	HDMI Port		Antenna Holes
3	GbE LAN Port	8	Power Button
4	USB 3.0	9	LED Indicators (From left to right: for power, for HDD)
5	RJ50 COM RS-232 Port		



1.7 Dimensions

Unit: mm







Chapter 2 Hardware Configuration

This section contains general information about:

- Installations
- Jumper and connectors



2.1 Installations

Before installing any card or module into the device, remove the screws shown in the picture below to pull out the cover.



2.1.1 Memory Module Installation

To install or replace the memory modules, locate the memory slot on the board and perform the following steps:



- 1. Align the key of the memory module with that on the memory slot and insert the module slantwise.
- 2. Gently push the module in an upright position until the clips of the slot close to hold the module in place when the module touches the bottom of the slot.

To remove a module, use your fingers to press the clips outwards until the module pops up. Grab the module gently and pull it out of the slot.

2.1.2 M.2 Cards Installation

1. Align the bus connector of the M.2 card with that of the M.2 slot, and insert the card slantwise.



2. Push the M.2 card downwards as shown in the picture below , and fix it with a screw.



2.1.3 WiFi / 3G / 4G Antenna Installation

Insert the WiFi / 3G / 4G antenna extension cable through the antenna hole of the front I/O cover and fasten the antenna as shown below. Then apply adhesive around the hex nut behind the front I/O cover to prevent the extension cable from falling off if the cable becomes loose.

Fasten the hex nut and the washer. Then
 Apply adhesive around here. install the antenna.

Info: The diameter of the nut is around 6.35 mm (0.25"-36UNC).



2.2 Pin Assignment for COM RS-232 Port

Pin	Signal Name	Pin	Signal Name
1	DSR (Data set ready)	6	DCD (Data carrier detect)
2	Ground	7	DTR (Data terminal ready)
3	Ground	8	CTS (Clear to send)
4	TX (Transmit)	9	RTS (Request to send)
5	RX (Receive)	10	RI (Ring indicator)

2.3 Setting the Jumpers

Configure your device by using jumpers to enable the features that you need based on your applications. Contact your supplier if you have doubts about the best configuration for your use.

2.3.1 How to Set Jumpers

Jumpers are short-length conductors consisting of several metal pins with a base mounted on the circuit board. Jumper caps are placed (or removed) on the pins to enable or disable functions or features. If a jumper has 3 pins, you can connect Pin 1 with Pin 2 or Pin 2 with Pin 3 by shorting the jumper.



A 3-pin jumper



A jumper cap

Refer to the illustration below to set jumpers.

Pin closed	Oblique view	Illustration
Open		$\Box \bigcirc \bigcirc$ 1 2 3
1-2		1 2 3
2-3		□ • • 1 2 3

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.4 Jumper & Connector Locations on Motherboard

Motherboard: OPS602



OPS602 - top view



OPS602 – bottom view

2.5 Jumper & Connectors Quick Reference

Jumper:

Function	Connector Name	Page
Clearing CMOS Data	JP3	14
Clearing ME Register	JP4	14
Factory Use Only	JP1, JP5	

Connectors:

Function	Connector Name	Page
CPU Fan Power Connector	CPU_FAN1	15
Battery Connector	J4	15
Power Button	SW1	
OPS Connector	CN1	
HDMI Port	CN2	
GbE LAN Port	CN3	
Dual USB 3.0 Port	CN4, CN5	
COM RS-232 Port ^[1]	CN6	
Audio Jack	CN7, CN8	
DDR4 SO-DIMM Slot	J3, J6	
M.2 E2230 Slot	J2	
M.2 M2280 Slot	J7	
LED Indicator	LED1 (for power),	
Factory Use Only	JP2, J1, J5	

[1]: Refer to 2.2 Pin Assignment for COM RS-232 Port.

2.5.1 Clearing CMOS Data (JP3)



Function	Pin closed	Illustration
Normal (default)	1-2	1 🗖 • O
Clear CMOS	2-3	1 🗆 • •

2.5.2 Clearing ME Register (JP4)



Function	Pin closed	Illustration
Normal (default)	1-2	1 🗖 • O
Clear CMOS	2-3	1 🗆 • •

2.5.3 CPU Fan Power Connector (CPU_FAN1)



Pin	Signal Name	Pin	Signal Name
1	Ground	3	Rotation detection
2	+12V		

2.5.4 Battery Connector (J4)



Pin	Signal Name	Pin	Signal Name
1	Power	2	Ground

Chapter 3 Driver Installation

The information provided in this chapter includes:

- Intel[®] Chipset Software Installation Utility
- Intel[®] HD Graphics Drivers
- HD Audio Drivers
- LAN Network Drivers
- Intel[®] Management Engine Components Drivers



3.1 Introduction

This section describes the installation procedures for software drivers. The software drivers are available on IBASE website <u>www.ibase.com.tw</u>. Register as a member on our website to download all the necessary drivers.

Note: After installing your Windows operating system, you must install the Intel[®] Chipset Software Installation Utility first before proceeding with the drivers installation.

3.2 Intel[®] Chipset Software Installation Utility

The Intel[®] Chipset drivers should be installed first before the software drivers to install INF files for Plug & Play function for the chipset components. Follow the instructions below to complete the installation.

- 1. Run the **Setup.exe** file.
- 2. When the *Welcome* screen to the Intel[®] Chipset Device Software appears, click **Next** to continue.



3. Accept the license agreement and proceed with the installation process.

Intel(R) Chipset Device Software License Agreement	(intel)
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribut User)	tion & Single
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load this software and any associated materials (col "Software") until you have carefully read the following terms and o loading or using the Software, you agree to the terms of this Agre not wish to so agree, do not install or use the Software.	lectively, the conditions. By ement. If you do
Please Also Note: * If you are an Original Equipment Manufacturer (OEM), Independ Vendor (IHV), or Independent Software Vendor (ISV), this complete AGREEMENT applies; * If you are an End-User, then only Exhibit A, the INTEL SOFTWARE AGREEMENT applications of the Software Softw	ent Hardware e LICENSE E LICENSE
	~
Back Accept	Cancel

4. On the Readme File Information screen, click Install.



5. Installation is now complete. Restart the system for changes to take effect.

3.3 Intel[®] Graphics Driver Installation

- 1. Run the **Setup.exe** file.
- 2. When the Welcome screen appears, click Next to continue.



3. Click **Yes** to agree with the license agreement and continue the installation.



- 4. On the *Readme File Information* and *Setup Progress* screen, click **Next** until the installation starts.
- 5. Installation is now complete. Restart the system for changes to take effect.



3.4 HD Audio Driver Installation

1. Run the **Setup.exe** file for the installation wizard to start.



2. On the *Welcome* screen of the InstallShield Wizard, click **Next** to start installing the audio driver on your system.

Realtek High Definition Audio Driv	ver Setup (4.27) R2.79	×
	Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, dick Next.	
InstallShield	< Back Canc	el

3. Installation is now complete. Restart the system for changes to take effect.

3

3.5 LAN Driver Installation

- 1. Run the **Setup.exe** file.
- 2. On the Welcome screen of the InstallShield Wizard, click Next to continue.



- 3. Accept the license agreement and click Next.
- 4. On the Setup Options screen, tick the checkbox to select the desired driver(s) and click **Next**.

Intel(R) Network Connections Install Wize	ard		×
Select the program features you want i	nstalled		(intel)
Select the program readines you wantin	natalieu.		
Install:			
Drivers Intel(R) PROSet for Windows* Dev Advanced Network Services Windows* PowerShell Module Intel(R) Network Connections SNM	ice Manager P Agent		
Feature Description			
	< Back	Next >	Cancel

- 5. Click Install.
- 6. Installation is now complete. Restart the system for changes to take effect.



3.6 Intel[®] Management Engine Components Drivers Installation

- 1. Run the **Setup.exe** file.
- 2. When the Welcome screen appears, click Next.



3. Accept the license agreement and click Next.



- 4. Assign a desired destination folder and click **Next** for installation.
- 5. Installation is now complete. Restart the system for changes to take effect.

Chapter 4 BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

- Main Settings
- Advanced Settings
- Chipset Settings
- Security Settings
- Boot Settings
- Save & Exit



4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system supports Intel® processors. The BIOS provides critical low-level support for standard devices such as disk drives, serial ports and parallel ports. It also provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

4.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Press the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still need to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

Press to Enter Setup

In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS Setup utility, the *Main Menu* screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: It is strongly recommended that you avoid making any changes to the chipset defaults.

These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could make the system unstable and crash in some cases.



4.3 Main Settings

Aptio Setup Main Advanced Chipset	Utility – Copyright (C) 2018 American Security Boot Save & Exit	n Megatrends, Inc.
Memory RC Version Total Memory Memory Frequency	1.0.3.1 8192 MB 2133 MHz	Set the Date. Use Tab to switch between Date elements.
System Date System Time	[Tue 04/17/2018] [16:06:54]	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.1	18.1263. Copyright (C) 2018 American M	Megatrends, Inc.

BIOS Setting	Description
System Date	Sets the date.
	Use the <tab> key to switch between the data elements.</tab>
System Time	Set the time.
	Use the <tab> key to switch between the data elements.</tab>

4.4 Advanced Settings

This section allows you to configure, improve your system and allows you to set up some system features according to your preference.

Aptio Setup Utility – Copyright (C) 2018 American Main <mark>Advanced</mark> Chipset Security Boot Save & Exit	Megatrends, Inc.
 CPU Configuration Power & Performance PCH-FW Configuration ACPI Settings F81846 Super IO Configuration Hardware Monitor CSM Configuration USB Configuration 	CPU Configuration Parameters
	<pre>++: Select Screen t4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. Copyright (C) 2018 American Me	egatrends, Inc.

4.4.1 CPU Configuration

Aptio Advanced	Setup Utility – Copyright	(C) 2018 American	Megatrends, Inc.
CPU Configuration			
Type ID Speed	Intel(R) 17-7600U 0×806E9 2900 MHz	Core(TM) CPU @ 2.80GHz	
			<pre>++: Select Screen ++: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>
			F4: Save & Exit ESC: Exit
Versi	on 2.18.1263. Copyright (C) 2018 American M	egatrends, Inc.



4.4.2 Power & Performance

Aptio Setup Utility – Copyright (C) 2018 An Advanced	merican Megatrends, Inc.
Power & Performance ▶ CPU – Power Hanagement Control	CPU – Power Management Control Options
	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263, Copyright (C) 2018 Amer	rican Megatrends, Inc.

BIOS Setting	Description
CPU - Power Management Control	Shows CPU power management control options.

CFU - Power Management Control Allows more than two frequency ranges to be supported. Intel(R) SpeedStep(tm) [Enabled] Turbo Mode [Enabled] ++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	Aptio Setup Utility - Advanced	- Copyright (C)	2018 American	Megatrends, Inc.
++: Select Screen 14: Select Item Enter: Select +/- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	CPU – Power Management Control Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Turbo Mode	[Enabled] [Enabled] [Enabled]		Allows more than two frequency ranges to be supported.
				++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

BIOS Setting	Description
Intel(R) SpeedStep(tm)	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Enables / Disables Intel [®] Speed Shift Technology support. Enabling this function will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Enables / Disables processor Turbo Mode (EMTTM should be enabled too). AUTO means enabled, unless max. turbo ratio is bigger than 16 – SKL A0 W/A.



4.4.3 PCH-FW Configuration

Aptio Setup Utility – Advanced	Copyright (C) 2018 American	Megatrends, Inc.
ME Firmware Version ME Firmware Mode ME Firmware SKU ME File System Integrity Value ME Firmware Status 1 ME Firmware Status 2 NFC Support	11.6.27.3264 Normal Mode Corporate SKU 2 0x90000055 0x60008106 Disabled	<pre>++: Select Screen tl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. C	opyright (C) 2018 American M	egatrends, Inc.

4.4.4 ACPI Setting

Aptio Setup Utility - Advanced	– Copyright (C) 2018 Americar	Megatrends, Inc.
ACPI Settings		Enables or Disables System ability to Hibernate (OS/S4 Sleen State) This ontion may
Enable Hibernation ACPI Sleep State	[Enabled] [S3 (Suspend to RAM)]	be not effective with some OS.
		++: Select Screen f4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. 0	Copyright (C) 2018American M	legatrends, Inc.

BIOS Setting	Description
Enable Hibernation	Enables / Disables the system ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Selects an ACPI sleep state (Suspend Disabled or S3) where the system will enter when the Suspend button is pressed.

4.4.5 F81846 Super IO Configuration

	Aptio Setup Utility — Advanced	Copyright (C) 2018 American	Megatrends, Inc.
F81846	Super IO Configuration		Set Parameters of Serial Port
Super	IO Chip	F81846	1 (conn)
▶ Serial ▶ Serial	Port 1 Configuration Port 2 Configuration		
Power	Failure	[Always off]	
			<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

BIOS Setting	Description
Serial Port Configuration	Sets parameters of Serial Ports (COMA). Enables / Disables the serial port and select
	an optimal setting for the Super to device.
Power Failure	Set parameters of Serial Port 1 (COMA).

4.4.5.1. Serial Port 1 Configuration

Aptio Setup Utility Advanced	– Copyright (C) 2018 Ame	erican Megatrends, Inc.
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
		++: Select Screen f↓: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Version 2 18 1263	Conucidat (C) 2018 Amer	ican Magatrands The

BIOS Setting	Description	
Serial Port	Sets parameters of Serial Ports (COMA).	
Change Settings	Selects an optimal settings for Super IO device. Options:	
	Auto	
	• IO = 3F8h; IRQ = 4	
	• IO = 3F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12	
	• IO = 2F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12	
	• IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12	
	• IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12	



4.4.5.2. Serial Port 2 Configuration

Aptio Setup Utility - Advanced	- Copyright (C) 201	8 American Megatrends, Inc.
Serial Port 2 Configuration		Enable or Disable Serial Port
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=3;	
Change Cattings	[Outo]	
change sectings	(HU(U)	
		14: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help E2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version 2.18.1263. (Copyright (C) 2018	American Megatrends, Inc.

BIOS Setting	Description	
Serial Port	Sets parameters of Serial Ports (COMA).	
Change Settings	Selects an optimal settings for Super I/O device.	
	Options: • Auto • IO = 2F8h: IRQ = 3	
	 IO = 3F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 IO = 2F8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 	
	 IO = 3E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 IO = 2E8h; IRQ = 3, 4, 5, 6, 7, 9, 10, 11, 12 	



4.4.6 Hardware Monitor

Aptio Setup Advanced	Utility – Copyright (C) 2	018 American	Megatrends, Inc.
Pc Health Status CPU Fan smart fan control CPU temperature System temperature CPU Fan Speed VCORE +5V Memory Voltage VCC3V CPU Shutdown Temperature	[Disabled] : +31 C : +29 C : 3614 RPM : +0.864 V : +5.003 V : +1.192 V : +3.312 V [Disabled]		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2 1	8 1263 Conuright (C) 201	8 American Me	watrends Inc

BIOS Setting	Description
CPU Fan Smart Fan	Selects the smart fan mode.
Control	Options: Disabled, 50°C, 60°C, 70°C, 80°C
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.
CPUShutdown Temperature	This field enables or disables the Shutdown Temperature
	Options: Disabled, 70°C, 75°C, 80°C, 85°C, 90°C, 95°C



4.4.7 CSM Configuration

Aptio Se Advanced	etup Utility – Copyright (C) 2018 American Megatrends;	Inc.
Option ROM execution Network	[Do not lau	Controls th and Legacy	ne execution of UEFI FXE OpROM
		++: Select †1: Select Enter: Sele +/-: Change F1: Genera. F2: Previou F3: Optimiz F4: Save & ESC: Exit	Screen Item ect e Opt. L Help Is Values red Defaults Exit
Version	2 18 1263 Convergent (C)	2018 American Megatrends	Inc

BIOS Setting	Description
Network	Controls the execution of UEFI and Legacy PXE OpROM.
	Options: Do not launch, Legacy

4.4.8 USB Configuration

Aptio Setup Utility – Advanced	Copyright (C) 2018 American	Megatrends, Inc.
USB Configuration		Enables Legacy USB support.
USB Module Version	16	support if no USB devices are
USB Controllers: 1 XHCI		keep USB devices available only for EFI applications.
USB Devices: 1 Keyboard		
Legacy USB Support XHCI Hand-off USB Mass Storage Driver Support	(Enabled) (Enabled) (Enabled)	
Port 60/64 Emulation	[Disabled]	↔: Select Screen
USB hardware delays and time-outs: USB transfer time-out	[20 sec]	T∔: Select Item Enter: Select
Device reset time-out Device power-up delay	[20 sec] [Auto]	+/−: Change Opt. E1: General Help
control point. ap actual		F2: Previous Values
		F4: Save & Exit
		ESU: EXIT
Version 2.18.1263. Co	pyright (C) 2018American M	egatrends, Inc.

BIOS Setting	Description
Legacy USB SUpport	 Enable: Enables Ledacy USB Support. Auto: Disables legacy support if no USB devices are connected. Disable: Keeps USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI / EHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
Port 60/64 Emulation	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
USB Transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	Seconds of delaying execution of start unit command to USB mass storage device.
Device power-up delay	The maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses default value for a Root port it is 100ms. But for a Hub port, the delay is taken from Hub descriptor.



4.5 Chipset Settings

Aptio Setur Main Advanced Chipset	Utility – Copyright (C) 2018 Security Boot Save & Exit	American Megatrends, Inc.
▶ PCH-IO Configuration		PCH Parameters ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.	18.1263. Copyright (C) 2018 Am	erican Megatrends, Inc.

BIOS Setting	Description
PCH-IO Configuration	Shows PCH parameters

4.5.1 PCH-IO Configuration

Aptio Setup Utility – Chipset	Copyright (C) 2018 American	Megatrends, Inc.
PCH-IO Configuration		SATA Device Options Settings
 SATA And RST Configuration PCH LAN Controller Wake on LAN Enable 	[Enabled] [Enabled]	<pre>++: Select Screen 14: Select Item Enter: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: OptImized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. Co	ppyright (C) 2018 American M	egatrends, Inc.

BIOS Setting	Description
SATA and RST Configuration	Shows SATA device options settings.
PCH LAN Controller	Enables / Disables onboard NIC.
Wake on LAN Enable	Enables / Disables integrated LAN to wake to system.

4.5.1.1. SATA and RST Configuration

Aptio Setup Utility - Chipset	Copyright (C) 2018 American	Megatrends, Inc.
SATA And RST Configuration SATA Controller(s) SATA Mode Selection Serial ATA Port 0 Software Preserve Port 0 Hot Plug Serial ATA Port 1 Software Preserve Port 1 Hot Plug Serial ATA Port 2 Software Preserve Port 2 Hot Plug	[Enabled] [AHCI] Empty Unknown [Enabled] [Disabled] TS128XBTMM16-I (128.0GB) SUPPORTED [Enabled] [Disabled] Empty Unknown [Enabled] [Disabled]	<pre>Enable/Disable SATA Device. ++: Select Screen t4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.18.1263. C	opyright (C) 2018 American M	legatrends, Inc.

BIOS Setting	Description
SATA Controller(s)	Enables / Disables SATA devices.
SATA Mode Selection	Determines how the SATA controller(s) operate. Options: AHCI Mode, Intel RST Premium
Serial ATA Ports	Enables / Disables Serial Ports.
Hot Plug	Designates this port as Hot Pluggable.

4.6 Security Settings

Aptio Setup U Main Advanced Chipset S	tility – Copyright (C) 2018 American ecurity Boot Save & Exit	Megatrends, Inc.
Password Description		Set Administrator Password
If ONLY the Administrator's then this only limits acces only asked for when enterin If ONLY the User's password is a power on password and boot or enter Setup. In Set have Administrator rights. The password length must be in the following range: Minimum length	password is set, s to Setup and is g Setup. is set, then this must be entered to up the User will 3	
Maximum length	20	++: Select Screen
Administrator Password		↑↓: Select Item
User Password		Enter: Select +∕−: Change Opt. F1: General Help
HDD Security Configuration: P1:TS128XBTMM16–I		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18	.1263. Copyright (C) 2018 American M	legatrends. Inc.

BIOS Setting	Description
Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.

4.7 Boot Settings

Aptio Setup Utility – Main Advanced Chipset Security	Copyright (C) 2018 American Boot Save & Exit	Megatrends, Inc.
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot Fast Boot	1 [Off] [Disabled] [Disabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Boot mode select	[LEGACY]	
FIXED BOOT ORDER Priorities Boot Option #1	[Hard Disk:	
Boot Option #2	[CD/DVD]	
Boot Option #3 Boot Option #4	[USB Hard Disk] [USB CD/DVD]	++: Select Screen
Boot Option #5	[USB Key]	↑↓: Select Item
Boot Option #6 Boot Option #7	[USB Floppy] [USB Lan]	Enter: Select +/-: Change Ont
Boot Option #8	[Network]	F1: General Help
▶ Hard Disk Drive BBS Priorities		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. Co	pyright (C) 2018 American M	egatrends, Inc.

BIOS Setting	Description
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
Fast Boot	Enables / Disables boot with initialization of a minimal set of devices required to launch the active boot option. There no effect for BBS boot options.
Boot Mode Select	Selects a Boot mode.
Boot Option Priorities	Sets the system boot order priorities for hard disk, CD/DVD, USB, Network.

4.8 Save & Exit Settings

Aptio Setup Utility – Copyright (C) 2018 American Main Advanced Chipset Security Boot <mark>Save & Exit</mark>	Megatrends, Inc.
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes Default Options Restore Defaults	Exit system setup after saving the changes.
Save as User Defaults Restore User Defaults Boot Override P1: TS128XBTMM16-I Launch EFI Shell from filesystem device	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
Save Changes	Saves changes done so far to any of the setup options.
Discard Changes	Discards changes done so far to any of the setup options.
Restore Defaults	Restores / Loads defaults values for all the setup options.
Save as User Defaults	Saves the changes done so far as user defaults.
Restore User Defaults	Restores the user defaults to all the setup options.

Appendix

This section provides the mapping addresses of peripheral devices and the sample code of watchdog timer configuration.

- I/O Port Address Map
- Interrupt Request Lines (IRQ)
- Watchdog Timer Configuration



A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x0000063-0x0000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x0000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x0000070-0x00000070	System CMOS/real time clock
0x0000080-0x0000080	Motherboard resources
0x0000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x00001800-0x000018FE	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002E8-0x000002EE	Communications Port (COM2)
	* COM2 comes from the optional docking kit.
0x0000F0A0-0x0000F0A7	Intel(R) Active Management Technology - SOL (COM3)
0x00000000-0x00000CF7	PCI Express Root Complex

Address	Device Description
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x0000F000-0x0000F03F	Intel(R) HD Graphics 620
0x000003B0-0x000003BB	Intel(R) HD Graphics 620
0x000003C0-0x000003DF	Intel(R) HD Graphics 620
0x0000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x0000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x0000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x0000038-0x00000039	Programmable interrupt controller
0x000003C-0x000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x00001854-0x00001857	Motherboard resources
0x0000F040-0x0000F05F	Mobile 6th/7th Generation Intel(R) Processor Family I/O SMBUS - 9D23
0x0000FF00-0x0000FFFE	Motherboard resources
0x0000060-0x0000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard
0x0000F090-0x0000F097	Standard SATA AHCI Controller
0x0000F080-0x0000F083	Standard SATA AHCI Controller
0x0000F060-0x0000F07F	Standard SATA AHCI Controller

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function	
IRQ 0	System timer	
IRQ 1	Standard PS/2 Keyboard	
IRQ 3	Communications Port (COM2) * COM2 comes from the optional docking kit.	
IRQ 4	Communications Port (COM1)	
IRQ 5	Communications Port (COM3)	
IRQ 8	System CMOS/real time clock	
IRQ 11	PCI Device	
IRQ 11	Intel(R) 100 Series/C230 Series Chipset Family SMBus - A123	
IRQ 11	Intel(R) 100 Series/C230 Series Chipset Family Thermal subsystem - A131	
IRQ 12	Microsoft PS/2 Mouse	
IRQ 13	Numeric data processor	
IRQ 14	Motherboard resources	
IRQ 16	High Definition Audio Controller	
IRQ 17	Qualcomm Atheros AR946x Wireless Network Adapter	
IRQ 54 ~ IRQ 204	Microsoft ACPI-Compliant System	
IRQ 256 ~ IRQ 511	Microsoft ACPI-Compliant System	
IRQ 4294967289	Intel(R) Management Engine Interface	
IRQ 4294967290	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)	
IRQ 4294967291	Intel(R) HD Graphics 530	
IRQ 4294967292	Intel(R) Ethernet Connection (2) I219-V	
IRQ 4294967293	Standard SATA AHCI Controller	
IRQ 4294967294	Intel(R) 100 Series/C230 Series Chipset Family PCI Express Root Port #6 - A115	

C. Watchdog Timer Configuration

The Watchdog Timer (WDT) is used to generate a variety of output signals after a user programmable count. The WDT is suitable for the use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven.

Under normal circumstance, you will need to restart the WDT at regular intervals before the timer counts to zero.

Sample Code:

//-----// // THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY // KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE // IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR // PURPOSE. // //-----#include <dos.h> #include <conio.h> #include <stdio.h> #include <stdlib.h> #include "F81846.H" //----int main (int argc, char *argv[]); void EnableWDT(int); void DisableWDT(void); //----int main (int argc, char *argv[]) { unsigned char bBuf; unsigned char bTime; char **endptr; char SIO: printf("Fintek 81846 watch dog program\n"); SIO = Init_F81846(); if (SIO == 0){ printf("Can not detect Fintek 81846, program abort.\n"); return(1); M = 0if (argc != 2){ printf(" Parameter incorrect!!\n"); return (1); } bTime = strtol (argv[1], endptr, 10); printf("System will reset after %d seconds\n", bTime); if (bTime) EnableWDT(bTime); } else { DisableWDT(); } return 0; { }

```
//-----
void EnableWDT(int interval)
{
unsigned char bBuf;
bBuf = Get F81846 Reg(0x2B); bBuf &= (~0x20);
Set_F81846_Reg(0x2B, bBuf); //Enable WDTO
Set_F81846_LD(0x07); //switch to logic device 7
Set_F81846_Reg(0x30, 0x01); //enable timer
bBuf = Get F81846 Reg(0xF5); bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81846_Reg(0xF5, bBuf); //count mode is second Set_F81846_Reg(0xF6,
interval); //set timer
bBuf = Get_F81846_Reg(0xFA); bBuf |= 0x01;
Set_F81846_Reg(0xFA, bBuf); //enable WDTO output
bBuf = Get_F81846_Reg(0xF5); bBuf |= 0x20;
Set_F81846_Reg(0xF5, bBuf); //start counting
}
//-----
void DisableWDT(void)
{
unsigned char bBuf;
Set F81846 LD(0x07); //switch to logic device 7 bBuf = Get F81846 Reg(0xFA);
bBuf &= \sim 0x01;
Set_F81846_Reg(0xFA, bBuf); //disable WDTO output
bBuf = Get_F81846_Reg(0xF5); bBuf &= ~0x20;
bBuf = 0x40;
Set_F81846_Reg(0xF5, bBuf); //disable WDT
}
//-----
```

```
//-
   -----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include "F81846.H"
#include <dos.h>
//-----
unsigned int F81846 BASE; void Unlock F81846 (void); void Lock F81846 (void);
//-----
unsigned int Init_F81846(void)
{
unsigned int result; unsigned char ucDid;
F81846 BASE = 0x4E;
result = F81846_BASE;
ucDid = Get F81846 Reg(0x20);
if (ucDid == 0x07) //Fintek 81846
{
   goto Init_Finish; }
F81846_BASE = 0x2E;
result = F81846_BASE;
ucDid = Get_F81846_Reg(0x20);
if (ucDid == 0x07) //Fintek 81846
   goto Init_Finish; }
{
F81846\_BASE = 0x00;
result = F81846 BASE;
Init Finish:
return (result);
}
//-----
void Unlock F81846 (void)
{
outportb(F81846 INDEX PORT, F81846 UNLOCK); outportb(F81846 INDEX PORT,
F81846 UNLOCK);
}
//-----
void Lock_F81846 (void)
{
outportb(F81846 INDEX PORT, F81846 LOCK);
}
//-----
void Set_F81846_LD( unsigned char LD)
{
Unlock_F81846();
outportb(F81846_INDEX_PORT, F81846_REG_LD);
```

} //----void Set_F81846_Reg(unsigned char REG, unsigned char DATA) Unlock F81846(); outportb(F81846 INDEX PORT, REG); outportb(F81846 DATA PORT, DATA); Lock_F81846(); } //----unsigned char Get_F81846_Reg(unsigned char REG) { unsigned char Result; Unlock_F81846(); outportb(F81846_INDEX_PORT, REG); Result = inportb(F81846_DATA_PORT); Lock F81846(); return Result; } //-----//-----// // THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY // KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE // IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR // PURPOSE. // //-----#ifndef F81846_H #define F81846_H 1 //-----#defineF81846_INDEX_PORT (F81846_BASE) #defineF81846_DATA_PORT (F81846_BASE+1) //-----#defineF81846 REG LD 0x07 //-----#define F81846 UNLOCK 0x87 #defineF81846_LOCK 0xAA //----unsigned int Init F81846(void); void Set_F81846_LD(unsigned char); void Set F81846 Reg(unsigned char, unsigned char); unsigned char Get_F81846_Reg(unsigned char);

//-----

#endif // F81846_H