WEBS-21G0

Fan-less Embedded System



User's Manual

Version 1.1

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How to Use This Manual

The manual describes how to configure WEBS-2190 system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Fan-less Embedded System.

Chapter 1: System Overview. Present what may have in the box and give an overview of the product specifications and basic system architecture for this fan-less embedded system.

Chapter 2: System Installation. Show the definitions and locations of all the interfaces and describe a proper installation guide so that can easily configure the system.

Chapter 3: BIOS Setup Information. Specify the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 4: Important Instructions. Indicate some instructions which must be carefully followed when the fan-less embedded system is used.

Chapter 5: Frequent Asked Questions. Provide the answers for the most frequently asked questions.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Revision History

Revision	Date	Details of Change(s)	
V1.1	2021/3/09	Initial Release	

Chapter 1 System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market, announced WEBS-21G0, a fan-less intelligent embedded system featuring 15W SKUs of the 8th generation Intel[®] Core[®] processor product family (codename Whiskey Lake). Its rugged, compact design and high performance make the WEBS-21G0, a perfect solution for applications in kiosk, digital signage, in-vehicle mobile video surveillance, medical, defense and the harsh environments of factory automation.

The new rugged WEBS-21G0 is equipped with the Portwell NANO-6051, a NANO-ITX embedded board based on the 8th generation Intel[®] Core[®] processor product family. Processors available in this product family combine low power consumption with high processing power and improved performance compared to previous generation processor. The compact WEBS-21G0 embedded system also features DDR4 SO-DIMM up to 32GB supporting 2400 MT/s; two Mini DisplayPort (DP) on the rear I/O with resolution up to 4096 x 2160; one smart COM port for RS-232/422/485 selected by BIOS; one audio combo jack to support Line-out and Mic-in; and M.2 2280 key M storage. In addition, the compact 150mm x 150mm x 63mm box, WEBS-21G0, integrates a M.2 2230 key E socket interface to support WIFI, Bluetooth, making it an ideal solution as an IoT gateway.

The rugged, fan-less design makes the WEBS-21G0 durable in harsh environment applications, such as factory automation and industrial automation. The rugged and compact WEBS-21G0 supports a temperature range from 0°C to 50°C for harsh environment operations, while at the same time, its fan-less design ensures silent operation, reliability and low maintenance rate and costs. In addition, it has already passed a vibration test of 3Grms/ 10~500Hz and a shock test of 50G, assuring its solidity and reliability. In addition, the system accepts 12V input voltage.

With its superior processing power, high capability and support for 4K resolution (4096 x 2160), Portwell's WEBS-21G0 is indeed an ideal solution for high computing power and/or high 3D video/image applications.

1.2 Check List

The WEBS-21G0 package should cover the following basic items:

- ✓ One WEBS-21G0 Fan-less Embedded System
- ✓ One 65W AC/DC Power Adapter DC-plug with screw (Optional)
- ✓ Other Accessories

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

System			
M/B	NANO-6051		
System Chipset	Intel [®] Whiskey Lake - U SoC		
CPU	Intel [®] Core [®] i5-8365UE (15W) in FCBGA1528 package		
	1.6 GHz up to 4.1 GHz /4C/8T. 6MB Cache.		
	Intel [®] Core [®] i3-8145UE (15W) in FCBGA1528 package		
	2.2 GHz up to 3.9GHz /2C/4T. 4MB Cache		
BIOS	AMI uEFI BIOS (SPI ROM)		
System Memory	One 260-pin DDR4 non-ECC SO-DIMM supports up to		
	32GB		
Storage	1x M.2 key M 2280		
Watchdog Timer	Programmable by embedded controller		
H/W Status Monitor	-Temperature (CPU & System)		
	-Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)		
Expansion	1x M.2 key E 2230 for wireless module		
External I/O			
Series Ports	1x RS-232/422/485 COM Port (selected by BIOS)		
Display	2x mini DP		
USB	3x USB 3.0 (Optional kit: additional 2x USB 3.0)		
Audio	Audio Combo Jack Lin-out/Mic-in		
LAN	2x Gigabit Ethernet (Intel [®] I219LM + I210AT)		
Other	1x Antenna hole for WIFI/Bluetooth module		
Power Supply Unit			
Power Supply	DC 12V		
Environment			
Operating	0°C to 50°C		
Temperature			
Storage Temperature	-20°C to 85°C		
Relative Humidity	95% @ 40℃, non-condensing		
Operating Vibration	3Grms/10~500Hz, IEC 60068-2-6		
Operating Shock	50G, 11 msec, IEC 60068-2-27		
Mechanical			
Dimension (WxDxH)	150x 150 x 63 mm; 5.9" x 5.9" x 2.5"		
Weight	2kg		
Mounting	Wall and DIN Rail mounting		

1.4 Mechanical Dimension





Chapter 2 System Installation

This chapter provides you with instructions to set up your system. Definitions and locations of all the interfaces are described so that you can easily configure your system. For more detailed PIN assignment and jumper setting, please refer to user's manual of NANO-6051.

2.1 Storage M.2 Key M 2280 Device Installation

 It's easy to install and maintenance the 1x M.2 2280 by just open the back cover.

 Step 1. Loosen the 4 screws of the back

 Step 2. Take out the back cover



2.2 M.2 Key E 2230 Device Installation

It is easy to install and maintain the 1x M.2 Key E 2230 device by just opening the back cover.



2.3 DIN Rail Mounting Device Installation

It is easy to install and maintain the Din Rail mounting device by just opening the back cover.



2.4 Getting Started



2.5 I/O Interfaces

2.5.1 Front View (Standard)



2.5.2 Front View (Optional Kit: Additional 2x USB 3.0)







DC in: (12V)

Using the provided DC source to connect to the system

Power Button:

Press the power button to turn ON/OFF the system

HDD LED:

Shows real-time read and write activity of your HDD/SSD as a small blinking indicator

Mini DP:

Mini DP (Display Port) display output

LAN:

Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports by using Intel I219LM + I210AT Ethernet Controller

USB 3.0:

Three USB 3.0 (Universal Serial Bus) port

RS-232/422/485:

*Note: RS-232/422/485 configuration is determined by BIOS setting. Check BIOS setting for details.

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD#/485D-/422T-	2	RXD#/485D+/422T+
3	TXD#/422R+	4	DTR#/422R-
5	Ground	6	DSR#
7	RTS#	8	CTS#
9	RI#	10	N/C

Audio:

Combo connector for Line-Out and Min-In

Antenna Hole:

Antenna holes for M.2 wireless card

Chapter 3 BIOS Setup Information

WEBS-21G0 system adopts NANO-6051 mother board. The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

3.1 Entering Setup

The following section describes the BIOS setup program. The BIOS setup program can be used to view and change the BIOS settings for the module. Only experienced users should change the default BIOS settings.

BIOS Setup

Power on the computer and the system will start POST (Power on Self Test) process. When the message below appears on the screen, press <Delete> or <ESC> key will enter BIOS setup screen.

Press <ESC > or <Delete> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Press <F1> to Run General Help or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help Screen.

General Help ————————————————————————————————————				
t∔+⊢	: Move			
Enter	: Select			
+/-	: Value			
ESC	: Exit			
F1	: General Help			
F2	: Previous Values			
F3	: Optimized Defaults			
F4	: Save & Exit Setup			
F12	: Capture Screen			
<k></k>	: Scroll help area upwards			
<m></m>	: Scroll help area downwards			
OK				

3.2 Main

Use this menu for basic system configurations, such as time, date etc.

Aptio Setu	up Utility – Copyright (C) 2020 American Megatrends, Inc. Save & Evit
Hain configuration occurry boot	
	·
Project Name	NANO-6051
BIOS Version & Build Date	0.1.0 (01/07/2020 14:02:02)
EC Version & Build Date	R00.E09 (12/18/2019)
Access Level	Administrator
Processor Information	
Name	Whiskey ake ULT
Tune	Intel(R) Core(IM) i3-8145UE CPU @ 2.20GHz
Speed	2400 MHz
ID	0x806EC
Stepping	VO
Package	BGA1528
Number of Processors	2Core(s) / 4Thread(s)
Microcode Revision	C6
GT Info	GT2 (0x3EA0)
TCEV VRIOS Vancion	N/A
IGEN COP Version	9 0 1095
Memoru RC Version	0.7.1.110
Total Memoru	8192 MB
Memory Frequency	2400 MHz
Channel 1 Slot 0	Populated & Enabled
Size	8192 MB (DDR4)

PCH Information		
Name	CNL PCH-LP	
PCH SKU	(U) Premium SKU	
Stepping	DO	
ChinsetInit Base Revision	7	
ChinsetInit OEM Revision	68	
Package	Not Implemented Yet	
TXT Capability of Platform/PCH	Unsupported	
Production Type	Production	
, i cadotizon i gpo		
Dual Output Fast Read support	Not supported	
Read ID/Status Clock Freq	48 MHz	
Write and Erase Clock Freq	48 MHz	
Fast Read Clock Freq	48 MHz	
Fast Read support	Supported	
Read Clock Freq	30 MHz	
Number of Components	1 Component	
SPI Component O Density	16 MB	
ME FW Version	12.0.45.1509	
ME Firmware SKU	Corporate SKU	
System Date	[Mon 02/10/2020]	
System Time	[14:23:02]	T

Feature	Description	Options
System Date	The date format is <day>, <month> <date> <year>. Use [+]</year></date></month></day>	
System Date	or $[-]$ to configure system Date.	
Svotom Time	The time format is <hour> <minute> <second>. Use [+] or</second></minute></hour>	
System Time	[-] to configure system Time.	

3.3

3.3 Configuration Use this menu to set up the items of special enhanced features

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main <mark>Configuration</mark> Security Boot Save & Exit				
 CPU Configuration Chipset Configuration Graphics Configuration Poure Control Configuration PCI/PCIE Configuration LAN Configuration SATA Configuration USB Configuration Super ID Configuration H/W Monitor Serial Port Console Redirection 	CPU Configuration Parameters ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit			
CPU Configuration				
CPU Configuration Parameters				
Aptio Setup Utility – Copyright (C) 2020 American Mega	atrends, Inc.			
CPU Configuration	Number of cores to enable in each			

CPU Configuration		Number of cores to enable in each
Type ID Speed L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache L4 Cache VMX SMX/TXT Active Processor Cores Hyper-Threading Boot performance mode Intel (VMX) Virtualization Technology Intel(R) SpeedStep(tm) Intel(R) SpeedStep(tm) Intel(R) SpeedStep(tm) Intel(R) SpeedStep(tm) C states C-State Auto Demotion C-State Un-demotion Package C-State Un-demotion CState Pre-Wake ID MHAIT Redirection Package C State Limit	<pre>Intel(R) Core(TM) i3-8145UE CPU @ 2 0x806EC 2400 MHz 32 KB x 2 256 KB x 2 256 KB x 2 4 MB N/A Supported Not Supported [All] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [C1 and C3] [C1 and C3] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Auto]</pre>	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>
Version 2.3	20.1275. Conuright (C) 2020 American Megatr	ends. Inc.

Feature	Description	Options
Active Processor Cores	Number of cores to enable in each processor package.	★All, 1
Hyper-Threading	Enable or Disable Hyper-Threading Technology	★ Enabled ,Disabled
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	★ Max Non-Turbo Performance, Max Battery, Turbo Performance
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vander pool Technology.	★ Enabled ,Disabled
Intel® Speed Step™	Allows more than two frequency ranges to be supported.	★ Enabled ,Disabled
Intel® Speed Shift Technology	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states	★ Enabled ,Disabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled)	★ Disabled, Enabled
C states	Enable/disable CPU Power Management. Allows CPU to go to C states It's not 100% utilized	★ Enabled ,Disabled
C-State Auto Demotion	Configure C-State Auto Demotion	★ C1 and C3, Disable, C1 ,C3
C-State Un-demotion	Configure C-State Un-demotion	★ C1 and C3, Disable, C1 ,C3
Package C State Demotion	Package C-State Demotion	★ Disabled, Enabled
Package C State Un-demotion	Package C-State Un-demotion	★ Disabled, Enabled
CState Pre-Wake	Disable – Sets bit 30 of POWER_CTL MSR(0x1FC) to 1 to disable the Cstate Pre-Wake	★ Enabled ,Disabled
IO MWAIT Redirection	When set, will map IO_read instructions sent to IO registers PMG_IO_BASE_ADDRBASE+offset to MWAIT(offset)	★ Disabled, Enabled
Package C State Limit	Maximum Package C State Limit Setting. Cpu Default: Leaves to Factory default value. Auto: Initializes to deepest available Package C States Limit	★ Auto ,C0/C1,C2,C3, C6,C7, C7S,C8,C9,C10,Cp u Default,

<u>Chipset Configuration</u> Configuration Chipset feature

	Configuration	Aptio Setup	Utility – Copyright	(C) 2020 American Megatr	rends, Inc.		
	Chipset Configuration	1		V	/T–d capabili	ty	
	VT-d Above 4GB MMIO BIOS a	assignment	[Enabled] [Disabled]				
	HD Audio Port 80h Redirection		[Enabled] [LPC Bus]				
Þ	AMT Configuration						
				-		reen	
				1 E	N∔: Select It Enter: Select	em	
				- F	⊦/–: Change O 51: General H 52: Previous	pt. elp Values	
				, F F	3: Optimized 4: Save & Ex	Defaults	
	Feature	Description		F	12: Capture	Screen	
	VT-d	VT-d Capability			★ Disabled	Enabled,	
	Above 4GB	Enable/Disable	above 4GB Mer	moryMappedIO BIO	S 🔸	Disabled	
	MMIO BIOS assignment	This is enabled a 2048MB	utomatically when	Aperture Size is set to	• Enabled	Dioubiou,	
	HD Audio	Control Detectior	of the HD-Audio	device	★ Disabled	Enabled,	
	Port 80h Redirection	Control where the	e Port 80h cycles	are sent	★ LPC Bus	Bus, PCIE	

Configuration	Aptio Setup Utility – Copyright (C) 2020	American Megatrends, Inc.	
AMT BIOS Features ME Unconfig on RTC Clear	[Enabled] [Disabled]	When disabled AMT BIOS longer supported and u able to access MEBx Se Note: This option does not d Manageability Features	Features are no ser is no longer tup. isable in FW.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit	
	Version 2.20.1275. Copyright (C) 2020 A	merican Megatrends, Inc.	
Feature D	escription		Options
AMT BIOS sup Features Se Features	nen disable AMT BIOS F oported and user is no long tup. Note: This option does r atures in FW	eatures are no longer er able to access MEBx not disable Manageability [Enabled
ME Unconfig on _{Wh} RTC Clear	nen Disable ME will not be un	configured on RTC Clear	Disable

AMT Configuration

<u>Graphics Configuration</u> Configuration Graphics Settings

Configuration	Aptio Setup Utility – Copyright (C) 2020 American Mega	trends, Inc.
Graphics Configuration Primary Display Internal Graphics DVMT Pre-Allocated DVMT Total Gfx Mem	[Auto] [Auto] [32M] [256M]		Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
	Vercion 2, 20, 175, Conucidat (C)	2020. Omenican Medato	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>
Feature	Description	Options	enus, Inc.
Primary Display	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.	★Auto, IGFX,	PEG, PCI
Internal Graphics	Keep IGFX enable based on the setup options.	★Auto, Disabl	e, Enable
DVMT Pre-Allocated	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.	★32M,0M,64N 28M,32M,/F7,3	/I, 4M, 8M,12M,16M,20M,24M, 6M,40M,44M,48M,52M,56M,60M
DVMT Total Gfx Mem	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device	★256M, 128M	, MAX

<u>Power Control Configuration</u> System Power Control Configuration Parameters

Aptio Setup Configuration	Utility – Copyright (C) 2020 Americ	an Megatrends, Inc.
Configuration Power Control Configuration Enable Hibernation ACPI Sleep State Restore AC Power Loss Wake System from S5 via RTC	[Enabled] [S3 (Suspend to RAM)] [Power On] [Disabled]	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
Version 2.	20.1275. Copyright (C) 2020 American	Megatrends, Inc.
Enable Hibernation	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some operating systems.	Enabled , Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.	S3 (Suspend to RAM), Suspend Disable
Restore AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state)	✦Power On ,Power Off ,Last State
Wake System from S5 via R	Enable or disable System wake on alarm event. When enabled, TC System will wake on the hr::min::sec Specified/programmed by the Tools from OS	★Disabled, Enabled

PCI/PCIE Configuration PCI Express Root Port Settings.

Configuration	Aptio Setup Utility – Copyright (C) 2020 American Mega	trends, Inc.
PCI/PCIE Configuration		PCI Express Root Port Settings.
 PCI Express Root Port 8 PCI Express Root Port 9 PCI Express Root Port 14 		
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>

PCI Express Root Port8, Port9, Port14

Aptio Set Configuration	up Utility – Copyright (C) 2020 American Mega	itrends, Inc.
PCI Express Root Port 8 ASPM 8 PCIe Speed	[Enabled] [Auto] [Auto]	Control the PCI Express Root Port.
Eastura	Description	14: Select Item
reature	Description	Options
PCI Express Root Port 8/9/14	Control the PCI Express Root Port.	★Enabled , Disabled
ASPM 8/9/14	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO-BIOS auto configure DISABLE – Disables ASPM	★Auto ,Disabled, L0s, L1, L0sL1,
PCIe Speed	Configure PCIe Speed	★Auto, Gen1, Gen2, Gen3

LAN Configuration Configuration on Board I AN device

Aptio Set Configuration	up Utility – Copyright (C) 2020 Americ:	an Megatrends, Ir	с.
LAN Configuration		Enable/Di	sable onboard NIC.
Intel Ethernet Controller WGI219LM LAN MAC Address PCH LAN Controller Wake on LAN Enable	88-88-88-88-87-88 [Enabled] [Enabled]		
Intel Ethernet Controller WGI210AT LAN MAC Address Intel LAN I210 Controller Wake on LAN Enable	00-90-FB-6C-C2-E7 [Enabled] [Enabled]		
Launch UEFI PXE ROM Ipv4 PXE Support Ipv4 HTTP Support Ipv6 PXE Support Ipv6 HTTP Support IPSEC Certificate PXE boot wait time Media detect count	[Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] 0 1	++: Select f1: Select Enter: Se +/-: Char F1: Gener F2: Previ F3: Optim	t Screen t Item Hect ge Opt. al Help ous Values hized Defaults
		ESC: Exit	
Version	2.20.1275. Copyright (C) 2020 American	Megatrends, Inc.	
Version Feature	2.20.1275. Copyright (C) 2020 American Description	Megatrends, Inc.	Options
Version Feature PCH LAN Controller	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIC	Megatrends, Inc.	Options ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NI(Enable/Disable integrated L/ the system.	Megatrends, Inc. C AN to wake	Options ★Enabled , Disabled ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIC Enable/Disable integrated L/ the system. Enable or Disable Intel I210 Controller#1.	Megatrends, Inc. C AN to wake LAN	Options ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller Wake on LAN	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIC Enable/Disable integrated L/ the system. Enable or Disable Intel I210 Controller#1. Enable /Disable integrated L	Megatrends, Inc. C AN to wake LAN AN to wake	Options ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller Wake on LAN Launch UEFI PXE Rom	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIG Enable/Disable integrated L/ the system. Enable or Disable Intel I210 Controller#1. Enable /Disable integrated L the system. Enable /Disable Intel I210 Controller#1. Enable /Disable Integrated L the system. Enable /Disable Integrated L the system. Enable/Disable UEFI Netword	Megatrends, Inc. C AN to wake LAN AN to wake rk Stack	Options ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller Wake on LAN Launch UEFI PXE Rom Launch UEFI PXE om[Enable]	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIC Enable/Disable integrated L/ the system. Enable or Disable Intel I210 Controller#1. Enable /Disable integrated L the system. Enable /Disable integrated L the system. Enable /Disable integrated L the system. Enable /Disable UEFI Netword	Megatrends, Inc. C AN to wake LAN AN to wake rk Stack	Options ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled ★Enabled , Disabled ★Disabled, Enabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller Wake on LAN Launch UEFI PXE Rom Launch UEFI PXE om[Enable] Ipv4 PXE Support	2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIC Enable/Disable integrated L/ the system. Enable /Disable integrated L the system. Enable /Disable UEFI Netword Enable /Disable IPv4 PXE S disable, IPv4 PXE boot supp available.	Megatrends, Inc. C AN to wake LAN AN to wake rk Stack Support .If ort will not be	Options ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller Wake on LAN Launch UEFI PXE Rom Launch UEFI PXE Rom Launch UEFI PXE om[Enable] Ipv4 PXE Support Ipv4 HTTP Support	 2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIC Enable/Disable integrated L/ the system. Enable or Disable Intel I210 Controller#1. Enable /Disable integrated L the system. Enable /Disable integrated L the system. Enable /Disable Integrated L Enable /Disable IPv4 PXE S disable, IPv4 PXE boot supp available. Enable /Disable Ipv4 HTTP S disable, IPv4 HTTP boot sup be available. 	Megatrends, Inc. C AN to wake LAN AN to wake rk Stack Support .If ort will not be Support. If oport will not	Options ★Enabled , Disabled
Version Feature PCH LAN Controller Wake on LAN Intel I210 LAN Controller Wake on LAN Launch UEFI PXE Rom Launch UEFI PXE Rom Launch UEFI PXE om[Enable] Ipv4 PXE Support Ipv6 PXE Support	 2.20.1275. Copyright (C) 2020 American Description Enable /Disable onboard NIG Enable/Disable integrated L/ the system. Enable or Disable Intel I210 Controller#1. Enable /Disable integrated L the system. Enable /Disable integrated L the system. Enable /Disable UEFI Netword Enable /Disable IPv4 PXE S disable, IPv4 PXE boot supp available. Enable /Disable Ipv4 HTTP 3 disable, IPv4 HTTP boot sup be available. Enable /Disable Ipv6 PXE S disable, IPv6 PXE boot supp available. 	Megatrends, Inc. C AN to wake LAN AN to wake rk Stack Support .If ort will not be Support .If oport will not upport .If	Options ★Enabled , Disabled ★Enabled , Disabled

	disable, IPv6 HTTP boot support will not	
	be available.	
IDSEC Cortificato	Support to Enable/Disable IPSEC	★Enabled , Disabled
	certificate for Ikev	
	Wait time in seconds to press ESC key to	
PXE boot wait time	abort the PXE boot. Use either +/- or	★0
	numeric keys to set value.	
	Number of times the presence of media	
Media detect count	will be checked. Use either +/- or numeric	★1
	keys to set value.	

SATA Configuration SATA Device Options Settings

Aptio : Configuration	Setup Utility – Copyright (C) 2020 American M	legatrends, Inc.
SATA Configuration		Enable/Disable SATA Device.
SATA Controller(s) SATA Mode Selection SATA Controller Speed	[Enabled] [AHCI] [Default]	
Serial ATA Port 1 Software Preserve Port 1 Hot Plug Configured as eSATA SATA Device Type	Empty Unknown [Enabled] [Disabled] Hot Plug supported [Hard Disk Drive]	<pre>**: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit</pre>
Versi	on 2.20.1275. Copyright (C) 2020 American Meg	atrends, Inc.
Feature	Description	Options
SATA Controller(s)	Enable/Disable SATA Device.	★Enabled , Disabled
SATA Mode Selection	Determines how SATA controller(s) operate.	★AHCI
SATA Controller Speed	Indicates the maximum speed the SATA controller can support	★Default,Gen1,Gen2,Gen3
Serial ATA Port 1		
Port 1	Enable or Disable SATA Port	★Enabled ,Disabled
Hot Plug	Designates this port as Hot Pluggable	★Disabled, Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive	★Hard Disk Drive, Solid State Driv

USB Configuration USB Configuration Parameters

Configuration	Aptio Setup Utility – Copyright (C) 2020 Ameri	can Megatrends, Inc.	
USB Configuration USB Controllers: 1 XHCI USB Devices: 1 Drive, 1 Keyboa	ind	Enable/Disable Connector (phys disabled, any U connector will or OS.	this USB Physical sical port). Once JSB devices plug into the not be detected by BIOS
USB SS Physical Connect USB HS Physical Connect	Image: Second		
USB HS Physical Connect USB HS Physical Connect XHCI Hand-off USB Mass Storage Driver	cor #9 [Enabled] [Enabled] [Enabled] * Support [Enabled]	 File Select Iter File Select Iter Enter: Select +/-: Change Opt F1: General He: F2: Previous Vi F3: Optimized I F4: Save & Extit F1: Cranture St 	n L. Lp alues Defaults t treen
UFD 3.0 Silicon-Power16	GGPMAP [Auto] Version 2.20.1275. Copyright (C) 2020 America	ESC: Exit	
Feature	Description		Options
USB SS/HS USB Mass Storage Dr Connector #0~5,#9	Enable/Disable_this_LISE_Physical (disable, any USB devices plug into the be detected by BIOS or OS	Connector. Once connector will not	★ Enabled Disabled
Legacy USB Support	Enables Legacy USB support. AUTC legacy support if no USB devices DISABLE option will keep USB devices EFI application) option disables are connected. available only for	★ Enabled Disabled, Auto
XHCI Hand-off	This is a workaround for OSes witho support. The XHCI ownership change s by XHCI driver	ut XHCI hand-off should be claimed	★ Enabled Disabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Dri	iver Support	★ Enabled Disabled

TPM Configuration Trusted Computing Setting

		otiiity – copyright (c)		inchus, inc.	
TPM20 Device Found Firmware Version: Vendor:		7.61 IFX		Enables or Disa security device Security Device INT1A interface	bles BIOS support for . O.S. will not show . TCG EFI protocol and will not be available.
Security Device Supp Active PCR banks Available PCR banks		[Enable] SHA-1,SHA256 SHA-1,SHA256			
SHA-1 PCR Bank SHA256 PCR Bank		[Enabled] [Enabled]			
Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarch TFM2.0 UEFI Spec Ver Physical Presence Sp TFM 20 InterfaceType Device Select	y sion ec Version	[None] [Enabled] [Enabled] [TC6_2] [1.3] [TIS] [Aut0]		<pre>++: Select Scree t4: Select Item Enter: Select +/-: Change Opt F1: General Help F2: Previous Va F3: Optimized Di F4: Save & Exit F12: Capture Sci ESC: Exit</pre>	en Lues efaults reen
	Version 2.2	20.1275. Copyright (C) 20	920 American Megatre	nds, Inc.	
Feature	Description	n		· ·	Options
Security Device Support	Enables or E O.S. will not and INT1A Ir	Disables BIOS su show Security D nterface will not be	pport for secu evice. TCG E e available.	rity device. FI protocol	★ Enabled Disabled
SHA-1 PCR Bank	Enables or D)isables SHA-1 P(`R Bank		A Enchlad
			Dank		Disabled
SHA256 PCR Bank	Enables or D)isables SHA256 I	PCR Bank		 ★ Enabled ★ Enabled Disabled
SHA256 PCR Bank Pending operation	Enables or D Schedule an Your Compu change State	Disables SHA256 F Operation for th uter will reboot d of Security Device	PCR Bank e Security De uring restart	vice. Note: in order to	 ★ Enabled Disabled ★ Enabled Disabled ★ None, TPM Clear
SHA256PCRBankPending operationPlatform Hierarchy	Enables or D Schedule an Your Compu change State Enables or D	Disables SHA256 I Operation for th uter will reboot d of Security Device Disables Platform I	PCR Bank e Security De uring restart ce Hierarchy	vice. Note: in order to	 ★ Enabled ▶ Enabled ▶ Enabled ▶ None, TPM Clear ▶ Enabled ▶ Enabled
SHA256 BankPCRPending operationPlatform HierarchyStorage Hierarchy	Enables or D Schedule an Your Compu change State Enables or D Enables or D	Disables SHA256 I Operation for th uter will reboot d of Security Devic Disables Platform I Disables Storage I	PCR Bank e Security De uring restart ce Hierarchy	vice. Note: in order to	 ★ Enabled Disabled ★ Enabled Disabled ★ None, TPM Clear ★ Enabled Disabled ★ Enabled Disabled
SHA256 BankPCRBankPending operationPlatform HierarchyStorage HierarchyEndorsement Hierarchy	Enables or D Schedule an Your Compu change State Enables or D Enables or D Enables or D	Disables SHA256 I Operation for th uter will reboot d of Security Devic Disables Platform I Disables Storage I Disables Endorsem	PCR Bank e Security De uring restart ce Hierarchy lierarchy ment Hierarchy	vice. Note: in order to	 ★ Enabled Disabled
SHA256 BankPCRBankPending operationPlatform HierarchyStorage HierarchyEndorsement HierarchyTPM2.0 Spec Version	Enables or D Schedule an Your Compu change State Enables or D Enables or D Enables or D Select the TC TCG_1_2: th TCG_2: Sup for Win10 or	Disables SHA256 I To Operation for the uter will reboot de of Security Device Disables Platform I Disables Storage I Disables Endorsem CG2 Spec Version I CG2 Spec Version Port new TCG2 p later	PCR Bank e Security De uring restart ce Hierarchy lierarchy nent Hierarchy Support de for Win8/W protocol and e	in order to	 ★ Enabled ▶ Enabled ▶ Enabled ▶ None, TPM Clear ▶ Enabled

Davias Salast	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will \bigstar Auto, TPM 1.2,
Device Select	support both with the default set to TPM 2.0 devices if TPM 2.0 not found, TPM 1.2 devices will be enumerated.

Super IO Configuration System Super IO Chip Parameters.

Configuration	Aptio Setup Utility – Copyright (C) 2	2020 American Megatrends, Inc.
Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
▶ Serial Port 1 Configuration		
Watch Dog Timer Timer Unit Timer value	[Enabled] [Second] 20	++: Select Screen 11: Select Item Enter: Select

Feature	Description	Options		
Watch Dog Timer	Enable/Disable Watch Dog Timer	★ Disabled, Enabled		
Timer Unit	Select Timer count unit of WDT	★Second, Minute		
Timer value	Set WDT Timer value	★20		

Serial Port 1 Configuration Set Parameters of Serial Port 1 (COM A)

Main	Aptio Setup Utility – C	Copyright (C) 2020 American Megatr	ends, Inc.
Serial Port 1 Configuration		E	nable or Disable Serial Port (COM)
Module Serial Port 1 Device Settings RS-232/422/485 Control Optio Change Settings	[Enabled] IO=3F8h; 1 [RS-232] [Auto]	IRQ=4;	←: Select Screen ↓: Select Item nter: Select

Feature	Description Options		
Module Serial Port1	Enable or Disable Serial Port (COM)	★Enabled, Disabled	
RS-232/422/485	Serial Port RS-232/422/485 Control Option	★ RS-232,RS-485	

Control Option		HALF DUPLEX,RS-422
		FULL DUPLAX
		★ Auto, IO=3F8h
		IRQ=4,
		IO=3F8h;
Change Settings	Select an optimal settings for Super IO Device	IRQ=3,4,5,6,7,9,10,1
		1,12 IO=2F8h
		IRQ=3,4,5,6,7,9,10,1
		1,12 IO=3E8h
		IRQ=3,4,5,6,7,9,10,1
		1,12 IO=2E8h
		IRQ=3,4,5,6,7,9,10,1
		1,12

H/W Monitor

Monitor hardware status

Configuration	Aptio Setup Utility – Copyright (C) 2020 An	merican Megatrends, Inc.
CPU temperature VCore +3.3V +5V +12V VDIMM	Aptio Setup Utility - Copyright (C) 2020 Ar : +49 C : +0.744 V : +3.318 V : +5.068 V : +11.939 V : +1.185 V	++: Select Screen ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit F12: Capture Screen ESC: Exit
	Version 2.20.1275. Copyright (C) 2020 Amer	rican Megatrends, Inc.

Serial Port Console Redirection Serial Port Console Redirection

Aptio Setup Configuration	Utility – Copyright (C) 2020 American Mega	trends, Inc.
Serial Port Console Redirection		Console Redirection Enable or Disable.
COMO Console Redirection ▶ Console Redirection Settings		
COM1(Pci Bus0,Dev0,Func0) (Disabled) Console Redirection	Port Is Disabled	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Ont.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		F12: Capture Screen ESC: Exit
Version 2.2	20.1275. Copyright (C) 2020 American Megatr	ends, Inc.

Feature	Description	Options
Console Redirection	on Console Redirection Enable or Disable	★Disabled, Enabled
Console Redirection	n Settings	
Configuration	Aptio Setup Utility – Copyright (C) 2020 American M	legatrends, inc.
COMO Console Redirection Sett: Terminal Type Bits per second Data Bits Parity Stop Bits Flow Control VT-UTF8 Combo Key Support Recorder Mode Resolution 100x31 Putty KeyPad	Ings [ANSI] [115200] [8] [None] [1] [None] [Enabled] [Disabled] [Disabled] [VT100]	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Conturn	Version 2.20.1275. Copyright (C) 2020 American Meg	Attends, Inc.
Feature	Description	Options
Terminal Type	VT100: ASCII char set. VT100+: Ex VT100 to support color, function keys VT-UTF8: Uses UTF8 encoding to Unicode chars onto 1 or more bytes.	ttends s, etc. map VT-UTF8
Bits per second	Select Serial port transmission speed speed must be matched on other side. Lo noisy lines may require lower speeds.	. The ong or 38400, 57600 38400, 57600
Data bits	Data bits	★8,7
Parity	A parity bit can be sent with the data be detect some transmission errors. Even: bit is 0 if the num of 1's in the data bits is Odd: parity bit is 0 if num of 1's in the dat is odd. Mark: parity bit is always 1. Se parity bit is always 0. Mark and Space do not allow for error detection. They co used as an additional data bit.	bits to parity even. ta bits Space Parity an be
Stop Bits	Stop bits indicate the end of a serial packet. (A start bit indicates the begin The standard setting is 1 stop Communication with slow devices may re	l data ining). bit. equire

	more than 1 stop bit.	
Flow Control	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signal.	★None, Hardware RTS/CTS
VT-UTFB Combo	Enable VT-UTF8 Combination Key Support	✦Enabled Disabled
Key Support	for ANSI/VT100 terminals	
Recorder Mode	With this mode enabled only text will be sent. This is to capture Terminal data.	★Disabled, Enabled
Resolution 100x31	Enables or disables extended terminal resolution	★Disabled, Enabled
Putty KeyPad	Select FunctionKey and KeyPad on Putty	★ VT100, LINUX,XTERMR6, SCO,ESCN,VT400

3.4 Security

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main Configuration <mark>Security</mark> Boot Save & Exit				
Password Description		[Setup] check password when enter setup screen.		
If ONLY the Administrator's passwo then this only limits access to Se	ord is set, etup and is	[Power on] check password on every time system power on.		
only asked for when entering Setur).			
is a power on password and must be	e entered to			
boot or enter Setup. In Setup the	User will			
The password length must be				
in the following range: Minimum length	0			
Maximum length	20			
Password Check Mode				
Administrator Password				
User Password		++: Select Screen		
		↑↓: Select Item		
		Enter: Select +/-: Change Opt.		
		F1: General Help		
		F2: Previous Values F3: Optimized Defaults		
		F4: Save & Exit		
		ESC: Exit		

Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	★Setup, Power on
Administrator Password	Set Administrator Password	

3.5 Boot

Aptio Setup U Main Configuration Security <mark>Boot</mark> Sav	tility – Copyright (C) 2020 American Megatrends, Inc. e & Exit		
Boot Configuration Setup Prompt Timeout Bootup NumLock State CSM Support Full Screen LOGO Post Report Summary Screen Boot mode select FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #3 Boot Option #5 Boot Option #6 Boot Option #7 • UEFI Application Boot Priorities • UEFI USB Drive BBS Priorities	1 Number of s activation indefinite [Disabled] [Disabled] [Disabled] [UEFI] [Hard Disk] [NYME] [UEFI] [UEFI] [IMPR] [UEFI] [UEFI] AP:UEFI: Built-in EFI Shell] [CD/DVD] [SD] [USB Device:UEFI: UFD 3.0 Silicon] [Network] ++: Select 74: Select 1: Select F2: Previou F3: Optimiz F4: Save & F12: Captur F2: Captur ESC: Exit	econds to wait for setup key. 65535(0xFFFF) means waiting. Screen Item tet : Opt. . Help is Values ted Defaults Exit re Screen	
Version 2.20	.1275. Copyright (C) 2020 American Megatrends, Inc.		
Feature	Description	Options	
Setup Prompt Timeout	Number of seconds to wait for activation key. 65535(0xFFFF) r indefinite waiting.	setup neans ★1	
Bootup NumLock State	Select the keyboard NumLock state	★On, Off	
CSM Support	Enable/Disable CSM support. Note: want to disable CSM support, you s set the video UEFI.	if you should ★ Disabled, Enabled	
CSM Support[Enable]			
Network	Controls the execution of UEFI and L Network 0pROM	egacy ★ UEFI, Do not launch, Legacy	
Storage	Controls the execution of UEFI and L Storage 0pROM	egacy ★ UEFI, Do not launch, Legacy	
Video	Controls the execution of UEFI and L Video 0pROM	egacy ★ UEFI, Do not launch, Legacy	
Full Screen LOGO	Enables or disables Quiet Boot optic Full screen Logo.	n and ★ Disabled, Enabled	
Post Report	Post Report Support Enabled/Disabled		
Summary Screen	Summary Screen Support ★ Disable Enabled/Disabled		
Boot mode select	Select boot mode LEGACY/UEFI	★UEFI ,Legacy	
Boot Option #1~7	Sets the system boot order	★ Hard Disk, NVME, UEFI AP,	

						CD/DVD,SD,USB Device, Network, Disabled
UEEI Application Boot Priorities	Specifies	the	Boot	Device	Priority	
	sequence	from a	vailable	e UEFI Ap	plication	

3.6 Save & Exit

Aptio Setup Utility – Copyright (C) 2020 American Megatrends, Inc. Main Configuration Security Boot <mark>Save & Exit</mark>		
Save Options Save Changes and Reset Discard Changes and Reset	Reset the system after saving the changes.	
Default Options Restore Defaults Boot Override UEFI: Built-in EFI Shell UEFI: UFD 3.0 Silicon-Power16GPMAP, Partition 1 Launch EFI Shell from filesystem device		
	++: Select Screen fl: Select Item	
Feature	Enter: Select Option	ns
Save Changes and Reset	Reset the system after saving the changes.	
Discard Changes and Reset	Reset system setup without saving any changes.	
Restore Defaults	Restore/Load Default values for all the setup options.	
UEFI: Built-in EFI Shell		
Launch EFI Shell from filesystem device	Attempts to Launch EFI Shell application (Shell.efi) from one of the available filesystem devices.	

Troubleshooting

This section provides a few useful tips to quickly get NANO-6051 running with success. This section will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, NANO-6051 supports ATX 12V 4 Pin or DC 12V Power adaptor only. Therefore, there is no other setting that needs to be setup. However, there is ATX 4 Pin Connector – J9& DC JACK – J1 on the NANO-6051 board.





ATX 4 Pin Connector – J9 BIOS Setting

DC JACK – J1

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. DDR4 So-DIMM Memory, keyboard, mouse, Mini DP connector, power cable of the device, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with NANO-6051, it is recommended, when going with the boot-up sequence, to hit "Delete" or "ESC" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "Restore Defaults", press "Enter" and select "Yes" to load default optimal BIOS setup. This will force your BIOS setting back to the initial factory configurations. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting at any time when system appears to be unstable in boot up sequence.

Chapter 4 Important Instructions

This chapter includes instructions which must be carefully followed when the fan-less embedded system is used.

4.1 Note on the Warranty

Due to their limited service life, parts which, by their nature, are especially subject to wear are not included in the guarantee beyond the legal stipulations.

4.2 Exclusion of Accident Liability Obligation

Portwell, Inc. shall be exempt from the statutory accident liability obligation if users fail to abide by the safety instructions.

4.3 Liability Limitations / Exemption from the Warranty Obligation

In the event of damage to the system unit caused by failure to abide by the hints in this manual and on the unit (especially the safety instructions), Portwell, Inc. shall not be required to respect the warranty even during the warranty period and shall be free from the statutory accident liability obligation.

4.4 Declaration of Conformity

<u>EMC</u>

CE/FCC Class A

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.

2. This equipment must accept any interference that may cause undesired operation.

Applicable Standards:

EN 55022: 2006 + A1: 2007, Class A EN 61000-3-2: 2006 EN 61000-3-3: 1995 + A1: 2001 + A2: 2005 EN 55024: 1998 + A1: 2001 + A2: 2003 IEC 61000-4-2: 2008 IEC 61000-4-3: 2006 + A1: 2007 IEC 61000-4-3: 2004 IEC 61000-4-5: 2005 IEC 61000-4-6: 2007 IEC 61000-4-8: 1993 + A1: 2000 IEC 61000-4-11: 2004 FCC 47 CFR Part 15 Subpart

Chapter 5 Frequent asked question

Information & Support

Question: I forgot my password of system BIOS, what am I supposed to do?

Answer: You can switch off your power supply then find the JP6 on the NANO-6051 board to set it from 1-2 short to 2-3 short and wait 5 seconds to clean your password then set it back to 1-2 short to switch on your power supply.

JP6 : Clear CMOS Setup

	Jumper Setting Describe
*1-2	Normal
2-3	Clean CMOS

Question: How to update the BIOS file of NANO-6051? **Answer:**

1. Please visit web site of Portwell download center as below hyperlink

http://www.portwell.com.tw/support/download_center.php

Registering an account in advance is a must. (The E-Mail box should be an existing Company email address that you check regularly.)

http://www.portwell.com.tw/member/newmember.php

2. Type in your User name and password and log in the download center.

3. Select "Search download" and type the keyword "NANO-6051.

4. Find the "BIOS "page and download the ROM file and flash utility.

5. Unzip file to bootable USB flash drive which can boot to dos mode. Then execute the "update.bat" or "update.efi". It will start to update BIOS.

NOTE: Once you use "update.efi" to update BIOS, it must be get into the SHELL MODE to update BIOS.

6. When you see the "FPT Operation Passed" message, which means the BIOS update processes finished. Please cut the AC power off and wait for 10 seconds before powering on.

7. When you see the "Programming success" message, which means the BIOS update processes finished. Please cut the AC power off and **wait for 10 seconds** before powering on.

Portwell Software Service

- 1. If you have customized requirements of BIOS, you can contact person of our company or branch.
- 2. If you have requirements of WDT
 GPIO APP, you can contact our headquarter or branch, and we can render you assistance on developing.

Portwell Worldwide:	
Portwell, Inc.	E-mail: info@portwell.com.tw
Shanghai Portwell	E-mail: info@portwell.com.cn
Portwell Japan, Inc	E-mail: <u>info@portwell.co.jp</u>
American Portwell Technology	E-mail: info@portwell.com
European Portwell Technology	E-mail: <u>info@portwell.eu</u>
Portwell UK Ltd.	E-mail: info@portwell.co.uk
Portwell Deutschland GmbH	E-mail: <u>info@portwell.eu</u>
Portwell India Technology	E-mail: info@portwell.in
Portwell Korea, Inc.	E-mail: info@portwell.co.kr
Portwell Latin America	E-mail: vendas@portwell.com.br

Industry Specifications

The list below provides links to industry specifications that apply to Portwell modules.

 Low
 Pin
 Count
 Interface
 Specification,
 Revision
 1.0
 (LPC)

 http://www.intel.com/design/chipsets/industry/lpc.htm
 1.0
 (LPC)

 Universal Serial Bus (USB)
 Specification, Revision 2.0
 http://www.usb.org/home

 PCI
 Specification, Revision 2.3
 https://www.pcisig.com/specifications

 Serial ATA
 Specification, Revision 3.0
 https://www.serialata.org/

 PCI
 Express
 Base
 Specification, Revision 2.0
 https://www.pcisig.com/specifications