

IF70 Mini-ITX SBC

Mini-ITX SBC with Intel® 9th Generation Core i3/i5/i7 processor, HDMI, Display Port, LVDS, Dual Giga Ethernet, USB 3.2 Gen.1 and NGFF Interface V110



User Manual

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Please read these instructions carefully before using this product, and save this manual for future use.

Contents

PREFACE	
ABOUT THIS USER MANUAL	7
CHAPTER 1: GENERAL INFORMATION	
1.1 INTRODUCTION	9
1.2 Features	9
1.3 MOTHERBOARD SPECIFICATIONS	10
1.4 FUNCTIONAL DESCRIPTION	
1.5 Physical Description	
CHAPTER 2: HARDWARE INSTALLATION	
2.1 Motherboard Components	
2.1.1 Component Side	
2.1.2 Solder Side	
2.2 Memory Module (SO-DIMM) Installation	17
2.3 I/O EQUIPMENT INSTALLATION	
2.3.1 Power Input 12V DC in	
2.3.2 Serial COM Port	
2.3.3 HDMI (Optional)	
2.3.4 Display Port	
2.3.5 Ethernet Interface	
2.3.6 USB Port	
2.3.7 Audio	
2.4 JUMPER SETTINGS	19
2.4.1 JP1: Panel Power Select	
2.4.2 JP2: Backlight Power Select	
2.4.3 JP3: Backlight Dimming Select	
2.4.4 JP4: Backlight Dimming Control Select	
2.4.5 CLR_CMOS: Clear CMOS Jumper	
2.4.6 CLR_RTC: Clear RTC Jumper	
2.5 Mainboard Connectors	
2.5.1 Connector List	
2.5.2 Connector Description	
CHAPTER 3: INSYDE H20 BIOS SETUP	
3.1 How and When to Use BIOS Setup	
3.2 BIOS Functions	
3.2.1 Main Menu	
3.2.2 Advanced	
3.2.3 Security	
3.2.4 Power	59

3.2.5 Boot	60
3.2.6 Exit	61
3.3 Using Recovery Wizard to Restore Computer	62
3.4 How to Enable Watchdog	63
CHAPTER 4: DRIVER INSTALLATION	65
4.1 Chipset Driver	66
4.2 GRAPHIC DRIVER	69
4.3 Management Engine (ME)	
4.4 Audio Driver	
4.5 Ethernet Driver	
4.6 Watchdog Driver Installation	80
4.7 DIGITAL IO DRIVER INSTALLATION	
CHAPTER 5: TECHNICAL SUPPORT	87
5.1 Drivers	
5.2 Software Development Kit (SDK)	

Preface

Copyright Notice

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Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. (Standard is one year, extended warranty will need to discuss with our sales representatives. If the customer discovers a defect, we will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W19Axxxxxx means October of year 2019.

Packing List

Before using this Motherboard, please make sure that all the items listed below are present in your package:

- IF70 Mini-ITX SBC
- User Manual & Driver CD

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Customer Service

We provide a service guide as below for any problem by the following steps: First, contact your distributor, sales representative, or our customer service center for technical support if you need additional assistance.

You need to prepare the following information before you call:

- Product serial number
- Peripheral attachments
- Software (OS, version, application software, etc.)
- Detailed problem description
- The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

Advisory Conventions

Four types of advisories are used throughout the user manual to provide helpful information or to alert you to the potential for hardware damage or personal injury. These are Notes, Important, Cautions, and Warnings. The following is an example of each type of advisory.



Note:

A note is used to emphasize helpful information



Important:

An important note indicates information that is important for you to know.



Caution A Caution alert indicates potential damage to hardware and explains how to avoid the potential problem.

Attention Une alerte Attention indique des dommages potentiels au matériel et explique comment éviter le problème potentiel.



Warning! An Electrical Shock Warning indicates the potential harm from electrical hazards and how to avoid the potential problem.

Avertissement! Un avertissement de choc électrique indique les dommages potentiels dus aux risques électriques et comment éviter le problème potentiel.

Safety Precautions



Caution Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Attention Mettez-vous toujours à la terre pour éliminer toute charge statique avant de toucher la carte CPU. Les appareils électroniques modernes sont très sensibles aux charges électrostatiques. Par mesure de sécurité, utilisez à tout moment un bracelet antistatique. Placez tous les composants électroniques dans une surface antistatique ou dans un sac antistatique lorsqu'ils ne sont pas dans le châssis.

Safety and Warranty

- 1. Please read these safety instructions carefully.
- 2. Please keep this user manual for later reference.
- 3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
- 4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
- 5. Keep this equipment away from humidity.
- 6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
- 7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- 8. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- 9. All cautions and warnings on the equipment should be noted.
- 10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
- 11. If any of the following situations arises, get the equipment checked by service personnel:
 - A. The power cord or plug is damaged.
 - B. Liquid has penetrated into the equipment.
 - C. The equipment has been exposed to moisture.
 - D. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - E. The equipment has been dropped and damaged.
 - F. The equipment has obvious signs of breakage.

About This User Manual

This User Manual provides information about using the IF70 Mini-ITX SBC. The documentation set for the IF70 Mini-ITX SBC provides information for specific user needs, and includes:

• **IF70 Mini-ITX SBC User Manual** – contains detailed description on how to use the motherboard, its components and features.



Note: Some pictures in this guide are samples and can differ from actual product.

Document Revision History

Version	Date	Note
1.0	10-May -2020	Initial document release
1.1	19-Oct -2020	Revise board version to V110

Chapter 1: General Information

This chapter includes the IF70 Mini-ITX SBC background information.

- Introduction 1.1
- 1.2 Features
- 1.3 Motherboard Specifications
- 1.4 Functional Description1.5 Physical Description

1.1 Introduction

Thank you for choosing the IF70 Motherboard. The IF70 Motherboard is powered by Intel® Q370 chipset, 17x17 mm, and Socket G3 Intel® 9th Generation Core i7/i5/i3 Processor. The Intel®9th Generation Core[™] processor based on 64-bit, multi-core processors built on 22-nanometer process technology. The processors are designed for a two-chip platform consisting of a processor and Platform Controller Hub (PCH) to be used with the mobile chipset. High performance platform delivers the performance and high scalability cutting-edge embedded computing application.

In peripheral connectivity, IF70 Motherboard features two NGFF Sockets two Serial ATA III (6Gb/s) connectors, four serial ports (four pin headers), 4 super-speed USB 3.2 connectors and four hi-speed USB 2.0 connectors(four pin headers). Additionally, IF70 SBC features build-in a 12V DC in power adapter.

Abundant I/O connectors and expandability makes IF70 Motherboard to be the right fit in the majority of industrial computer applications such as machine vision and control, gaming, POS, KIOSK systems, industrial automation, and others. Powerful processor in Mini ITX form-factor meets the demanding performance requirements of modern industrial applications.

1.2 Features

IF70 Mini-ITX SBC features:

- IF70 Motherboard features:
- Mini ITX Form Factor (170 x 170 mm)
- Intel® 9th Generation Core™ i7/i5/i3 (Coffee Lake Refresh S)
- Intel®Q370 Chipset
- Integrated UHD Graphics 630 supports DirectX 12 and OpenGL 4.4
- 2 x DDR4 SO-DIMM, max. 64GB
- Integrated Dual Gigabit Ethernet
- 1 x PCI-E(x16)(Optional)
- 2x SATAIII, 4 x USB3.2 Gen.1 , 4 x USB 2.0

1.3 Motherboard Specifications

	Model Name		
	IF70 Mini-ITX SBC		
	CPU	Intel® Core [™] i7-9700TE Processor, 1.8GHz~3.8GHz Intel® Core [™] i5-9500TE Processor,2.2GHz~3/6GHz Intel® Core [™] i3-9100TE Processor,2.2GHz~3.2GHz	
	Chipset	Intel® Q370	
	System Memory	2x SO-DIMM socket ® DDR4-2666 Non ECC RAM.Max. 64GB	
	Storage	2 x SATA3 2.5" HDD/SSD, (Max. 512GB/1TB)	
System	BIOS	Insyde System BIOS	
Specifications	Graphic	Intel® UHD Graphics 630	
	Super IO Chipset	Fintek F81867	
	Audio	Realtek HD Audio Codec	
	LAN	2 x Giga LAN (Intel® I211-AT Gigabit-LAN Controller + I219-LM Gigabit-LAN PHY)	
	USB	4 ports USB 3.2 Gen.1(5Gbps)	
	OS	Windows® 10 IoT Enterprise	
	Display Interface	Supports DirectX 12 and OpenGL 4.4	
		Analog monitor resolution up to 1920 x 1200 @60Hz	
Display Specifications		HDMI supports HDMI 1.4, max. resolution 4096 x 2160@30Hz	
		Display Port: supports DP 1.2, max. resolution 4096 x 2304@60Hz	
		eDp: supports 1 lane eDP display, max. resolution 4096 x 2304@60Hz	
I/O Ports Specification	External I/O	4 x USB 3.2 Gen.1 2 x RJ-45 for Giga LAN with LED 1 x DP 1.2 1 x HDMI 1.4(Optional) 1 x Audio Jack (Mic-in, Line-out) 1 x (+12V) Power Input 4P Mini DIN Jack 1 x Clear CMOS Button 1 x Reset Button	
	Internal I/O	 2 x RS232 Serial Console to 2x5 Pin Header (COM1/COM2) 2 x LVTTL Serial COM Console to 2x5 Pin Header 	

		(0010)0014)	
		(COM3/COM4)	
		SPK R / SPK L	
		2 x USB 2.0 Pin Wafer	
		1 x CPU FAN Connector	
		1 x SYS FAN Connector (Optional in Backplane BD)	
		1 x LPC DB	
		2 x SATA III Connectors (SATA0/SATA1)	
		2 x 5V power connector	
		1 x 12V power connector	
		1 x SATA Power Connector	
		1 x Panel Backlight Connector	
		1 x LVDS Wafer Connector	
		1 x eDP Wafer Connector	
		1 x VR Control Connector	
		1 x Panel Button connector	
		1 x M.2 NGFF KEY E for WWAN/WALN PCIe Card	
	Expansiona Slat	1 x M.2 2242 Key B SATA3/2280 Key M NVMe SSD,	
Expansions Slot		(Max. 4TB)	
		1 x PCle (x16) slot(Optional)	
Indicators	LAN (2 x RJ45)	10/100 Mbps (Green LED)	
Security	ТРМ	TPM 2.0	
Mechanical	Dimonsions	$170(101) \times 170(1)$ mm	
Specifications	DIMENSIONS		
	Operating Temp.	-20°C ~ 60°C	
Environment	Storage Temp.	-40°C ~ 70°C	
Considerations	Operating	10% = 05% non-condensing	
	Humidity		
Dewer	Power Supply	+12V Power Input	
Managamant	Power		
wanagement	Consumption		
Dooking List	Standard	IF70-110 Mini-ITX SBC	
Packing List		IF70 Mini-ITX SBC Manual & Driver CD	

1.4 Functional Description

Function block (V110)



1.5 Physical Description

Board Dimensions (V110)





Chapter 2: Hardware Installation

This chapter provides information on how to use jumpers and connectors on the IF70 Mini-ITX SBC. Be cautious while working with these modules. Carefully read the content of this chapter in order to avoid any damages.

- 2.1 **Motherboard Components**
- 2.2 Memory Module Installation
- I/O Equipment Installation 2.3
- 2.4
- Jumper Settings Motherboard Connectors 2.5

2.1 Motherboard Components

2.1.1 Component Side



IF70 Mini-ITX SBC Top Layer (CPU Side, Top View)

Note: HDMI is an optional connector



Note: HDMI is an optional connector

2.1.2 Solder Side



IF70 Mini-ITX SBC Bottom Layer (IO Side, Top View)

2.2 Memory Module (SO-DIMM) Installation

The IF70 Mini-ITX SBC has two 260-pin SODIMM slot. The socket supports DDR4.

When installing the memory unit, please follow the steps below:

- 1. Firmly insert the SO-DIMM at an angle of about 30-degree into the slot. Align the SO-DIMM with the slot until it is fully inserted. The notch on the SO-DIMM should match the break on the slot.
- 2. Press downwards on SO-DIMM until the retaining clips at both ends fully snap closed and the SO-DIMM is properly seated.





Caution The SO-DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the SO-DIMM if the SO-DIMM is forced into the slot at the incorrect orientation.

Attention Le SO-DIMM ne tient que dans une seule orientation correcte. Cela causera des dommages permanents à la carte de développement et au SO-DIMM si le SO-DIMM est forcé dans le logement avec une orientation incorrecte.

2.3 I/O Equipment Installation

2.3.1 Power Input 12V DC in

The IF70 Mini-ITX SBC allows plugging 12V DC-IN jack on the board without another power module converter under power consumption by Intel® 9th Generation Core i7/i5/i3 Processor and Q370 chipset.

2.3.2 Serial COM Port

Four COM Port Pin Headers build in the IF70 Mini-ITX SBC. Optional COM ports support RS-422/485.

*When an optional touch-screen is ordered with PPC, serial com port can connect to a serial or an optional touch-screen.

2.3.3 HDMI (Optional)

The IF70 Mini-ITX SBC has one HDMI port that can be connected to an external LCD monitor. Use HDMI cable to connect to an external LCD monitor, and connect the power cable to the outlet. The HDMI connector is a standard 19-pin HDMI connector.

2.3.4 Display Port

The Motherboard has one Display Port that can be connected to an external LCD monitor. Use Display Port cable to connect to an external LCD monitor, and connect the power cable to the power outlet. The Display Port connector is a standard 20-pin DP connector.

2.3.5 Ethernet Interface

The IF70 Mini-ITX SBC is equipped with Intel® I211-AT Gigabit-LAN Controller + I219-LM Gigabit-LAN PHY which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol compatible. It is supported by major network operating systems. The Ethernet ports provide two standard RJ-45 jacks.

2.3.6 USB Port

Eight USB devices (four with pin headers) may be connected to the system though an adapter cable. Various adapters may come with USB ports. USB usually connect the external system to the system. The USB ports support hot plug-in connection. Whatever, you should install the device driver before you use the device.

2.3.7 Audio

The Audio 7.1 channel capabilities are provided by a Realtek chipset supporting digital audio outputs. The audio interface includes two jacks: line-out and mic-in.

2.4 Jumper Settings

This section explains how to set jumpers for correct configuration of the motherboard.



Note: A pair of needle nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

The jumper setting diagram is shown below. When the jumper cap is placed on both pins, the jumper is SHORT. The illustration below shows a 3-pin jumper; pins 1 and 2 are short. If you remove the jumper cap, the jumper is OPEN.





Caution To avoid damaging the module, always turn off the power supply before setting jumpers or clearing CMOS.

Attention Pour éviter d'endommager le module, coupez toujours l'alimentation avant de régler les cavaliers ou d'effacer le CMOS.

Jumpers		
Label	Function	Note
JP1	Panel Power Select	2x3 header, pitch 2.0mm
JP2	Backlight Power Select	1x3 header, pitch 2.0mm
JP3	Backlight Dimming Select	1x3 header, pitch 2.0mm
JP4	Backlight Dimming Control Select	1x3 header, pitch 2.0mm
CLR_CMOS	Clear CMOS	1*3p P:2.0mm DIP 180o
CLR_RTC	Clear RTC	1*3p P:2.0mm DIP 1800

2.4.1 JP1: Panel Power Select



Pin №	Name
1-2	+3.3V
3-4 (Default)	+5V
5-6	+12V

2.4.2 JP2: Backlight Power Select



Pin №	Name
1-2	+5V
2-3 (Default)	+12V

2.4.3 JP3: Backlight Dimming Select



Pin №	Name
1-2 (Default)	PWM Mode
2-3	DC Mode

2.4.4 JP4: Backlight Dimming Control Select



Pin №	Name
1-2	Chipset
2-3(Default)	VR Control

2.4.5 CLR CMOS: Clear CMOS Jumper

Remember to set jumper back to Normal before turning on the power supply.



Caution TURN OFF the power supply before setting Clear CMOS. **Attention** COUPEZ l'alimentation avant de régler Clear CMOS.

Clear CMOS Norm



Normal		
1	0	
2	\bigcirc	
3		

Pin №	Function
1-2 (Default)	Normal
2-3	Clear CMOS

2.4.6 CLR RTC: Clear RTC Jumper

Normal		Clear RTC
1		1 🔾
2	•	2
3	0	3

Pin №	Function
1-2 (Default)	Normal
2-3	Clear RTC

2.5 Mainboard Connectors

2.5.1 Connector List

Connectors			
Label	Function	Note	
CN1	Power 4P Terminal Block Connector	Din 4p dip Quick Lock	
CN2	Power 6P Wafer	Wafer 6p dip	
CN3/ HDMI1 (Optional)	HDMI Port Connector	HDMI1.4a	
CN4/ DP	Display Port Connector	Display Port 1.2	
CN5	Audio Jack	PJD-035-17A	
CN6	SHB Express PCIEx16	16x164p180°2EG08217-D2D	
CN25	NGFF M.2 KEY M Connector	NGFF M.2 KEY M Connector	
CN8	NGFF M.2 KEY E Connector	NXSE0-S6705-TP50	
CNO	Digital Input / Digital	Header/2*5p P: 2.0mm SMD	
	Output	180°, black color	
CN11	eDP Connector	DF13 2*15p P:1.25mm SMD 180°	
CN12	LVDS Connector	2*20p P:1.25mm SMD 180° White color	
CN13 Backlight Connector		7p P:2.0mm DIP 180°	
CN14	Backlight Brightness Control	3p P:2.0mm DIP 180°	
CN15, CN16,CN17	Power Output Wafer	CN15 / CN16: 2p P:2.0mm DIP 180°, red color CN17 - 2p P:2.0mm DIP 180°, yellow color	
CN18	RTC Wafer	Hirose:DF13-2P-1	
CN20, CN21	USB2.0 Wafer	2*4p P:2.0mm DIP 180°	
COM1,COM2, COM3, COM4	Internal COM Port	2*5p P:2.0mm SMD 180°	
LAN1, LAN2	Gigabit Ethernet	RJ45+LED	
PANEL 1	Front Panel Pin Header	2*5p P:2.0mm SMD 180°	
SATA1, SATA2,	SATA Connector	WATM-07ABN4A2B8UW	
SW1	Clear COM, Reset	Button	
FAN1, FAN2	Fan Connector	3P 2.54mm DIP 180°	

Connectors				
Label	Function	Note		
14		ASAA82X-EASB0-7H 9.2mm		
J1	DDR4 30-DIMM	1.2V SMT		
10	AS0AB26-H2SB-7H	AS0AB26-H2SB-7H 5.2mm		
JZ	5.2mm 1.2V SMT	1.2V SMT		
USB1, USB2	USB 3.2 Gen.1	USB Type A		

Signal Name

12VDC

12VDC

2.5.2 Connector Description

2.5.2.1 CN1: Power 4P Terminal Block Connector

The DC power input for the IF70 Mini-ITX SBC allows a voltage input of 12V DC.

Pin №

1

CN1

2.5.2.2 CN2: Power 6P Wafer

[1	
	2	
	3	
	4	
	5	
	6	
_		

Pin №	Signal Name
1	+12V
2	+12V
3	+12V
4	DC_GND
5	DC_GND
6	DC_GND

Pin №

2

4

Signal Name

GND

GND

CN2

2.5.2.3 CN3: HDMI Port Connector (Optional)

Use HDMI connector to connect the IF70 Mini-ITX SBC to an external monitor.

19	1
18	2

HDMI

Pin №	Signal Name	Pin №	Signal Name
1	TMDS_DATA2+	2	GND
3	TMDS_DATA2-	4	TMDS_DATA1+
5	GND	6	TMDS_DATA1-
7	TMDS_DATA0+	8	GND
9	TMDS_DATA0-	10	TMDS_CLOCK+
11	GND	12	TMDS_CLOCK-
13	CEC	14	NC
15	DDC_CLOCK	16	DDC_DATA
17	GND	18	5V
19	Hot Plug Detect		

2.5.2.4 CN4: Display Port Connector

IF70 Mini-ITX SBC provides one Display Port 1.2 connector.

		_
	19 1	
IL I		
	<u> </u>	
		┛

CN4

Pin №	Signal Name	Pin №	Signal Name
1	Lane 0+	2	GND
3	Lane 0-	4	Lane 1+
5	GND	6	Lane 1-
7	Lane 2+	8	GND
9	Lane 2-	10	Lane 3+
11	GND	12	Lane 3-
13	AUX_EN_N	14	GND
15	AUX+	16	GND
17	AUX-	18	Hot Plug
19	GND	20	+3.3V

2.5.2.5 CN5: Audio Jack

IF70 Mini-ITX SBC has two stereo audio ports with phone jack connectors, one is Line-out, and the other one is Mic-in.



Color	Signal Name
1	Line-out
2	Mic-in

2.5.2.6 CN6: SHB Express PCIEx16

CN6

	Side B	Net	Description	Side A	Net	Description
1	Side B	SMB_SHB_CLK	PCIE 12V power	Side A	SMB_SHB_DATA	External pull down
2	Side B	GND	PCIE 12V power	Side A	GND	PCIE 12V power
3	Side B	SHB_TDI	PCIE 12V power	Side A	SHB_TCK	PCIE 12V power
4	Side B	SHB_TDO	GND	Side A	SHB_TMS	GND
5	Side B	SHB_TRST#	SMBUD CLK	Side A	SHB_WAKE_N	
6	Side B	SYSFANIN	SMBUS DATA	Side A	SHB_PCI_WAKE_N_R	
7	Side B	NC	GND	Side A	SHB_PSON_N	
8	Side B	NC	PCIE 3.3V power	Side A	SHB_PERST_N	
9	Side B	SHB_CFG0_R	NC	Side A	SHB_CFG1_R	PCIE 3.3V power
10	Side B	SHB_CFG2_R	PCIE 3.3V aux	Side A	SHB_CFG3_R	PCIE 3.3V power
11	Side B	SHB_RSVD1	Wake signal	Side A	GND	Platform Reset
12	Side B	GND	NC	Side A	SHB_RSVD3	GND
13	Side B	PCIE9_SHB_TX_DP	GND	Side A	GND	PCIE CLK+
14	Side B	PCIE9_SHB_TX_DN	PCIE Group A TX0+	Side A	GND	PCIE CLK-
15	Side B	GND	PCIE Group A TX0-	Side A	PCIE9_SHB_RX_DP	GND
16	Side B	GND	GND	Side A	PCIE9_SHB_RX_DN	PCIE Group A RX0+
17	Side B	PCIE10_SHB_TX_DP	PCIEX16 PRSNT	Side A	GND	PCIE Group A RX0-
18	Side B	PCIE10_SHB_TX_DN	GND	Side A	GND	GND
19	Side B	GND	PCIE Group A TX1+	Side A	PCIE10_SHB_RX_DP	NC
20	Side B	GND	PCIE Group A TX1-	Side A	PCIE10_SHB_RX_DN	GND
21	Side B	PCIE11_SHB_TX_DP	GND	Side A	GND	PCIE Group A RX1+
22	Side B	PCIE11_SHB_TX_DN	GND	Side A	GND	PCIE Group A RX1-
23	Side B	GND	PCIE Group A TX2+	Side A	PCIE11_SHB_RX_DP	GND
24	Side B	GND	PCIE Group A TX2-	Side A	PCIE11_SHB_RX_DN	GND
25	Side B	PCIE12_SHB_TX_DP	GND	Side A	GND	PCIE Group A RX2+
26	Side B	PCIE12_SHB_TX_DN	GND	Side A	GND	PCIE Group A RX2-
27	Side B	GND	PCIE Group A TX3+	Side A	PCIE12_SHB_RX_DP	GND
28	Side B	GND	PCIE Group A TX3-	Side A	PCIE12_SHB_RX_DN	GND
29	Side B	CLK_PCIE_SHB_B0_P	GND	Side A	GND	PCIE Group A RX3+
30	Side B	CLK_PCIE_SHB_B0_N	NC	Side A	GND	PCIE Group A RX3-
31	Side B	GND	PCIEX16 PRSNT	Side A	CLK_PCIE_SHB_B1_P	GND
32	Side B	NC	GND	Side A	CLK_PCIE_SHB_B1_N	NC
33	Side B	CLK_PCIE_SHB_B2_P	PCIE Group A TX4+	Side A	GND	NC
34	Side B	CLK_PCIE_SHB_B2_N	PCIE Group A TX4-	Side A	GND	GND
35	Side B	GND	GND	Side A	CLK_PCIE_SHB_B3_P	PCIE Group A RX4+
36	Side B	NC	GND	Side A	CLK_PCIE_SHB_B3_N	PCIE Group A RX4-
37	Side B	CLK_PCIE_SHB_A0_P	PCIE Group A TX5+	Side A	GND	GND
38	Side B	CLK_PCIE_SHB_A0_N	PCIE Group A TX5-	Side A	GND	GND
39	Side B	GND	GND	Side A	CLK_PCIE_SHB_A1_P	PCIE Group A RX5+
40	Side B		GND	Side A	CLK_PCIE_SHB_A1_N	PCIE Group A RX5-
41	HSOP_6	SHB_PCIE_A6_TXP	PCIE Group A TX6+	Side A	GND	GND
41	Side B		PCIE Group A 1X6-	Side A	GND	GND
42	Side B	CLK_PCIE_SHB_A2_N	GND	Side A	GND	PCIE Group A RX6+
43	Side B			Side A		
44	Side B			Side A		
45	Side B	EXP_A_IX_15_0P		Side A		
40	Side B			Side A		
4/	Side B	GND	CND	Side A	EXP_A_KX_15_UP	
40	Side B			Side A		
50	Side B			Side A	GND	GND
50	Side R		- CIE GIOUP A TAO-	Side A	5110	5110

51	Side B	GND	GND	Side A	EXP_A_RX_14_DP	PCIE Group A RX8+
52	Side B	GND	GND	Side A	EXP_A_RX_14_DN	PCIE Group A RX8-
53	Side B	EXP_A_TX_13_DP	PCIE Group A TX9+	Side A	GND	GND
54	Side B	EXP_A_TX_13_DN	PCIE Group A TX9-	Side A	GND	GND
55	Side B	GND	GND	Side A	EXP_A_RX_13_DP	PCIE Group A RX9+
56	Side B	GND	GND	Side A	EXP_A_RX_13_DN	PCIE Group A RX9-
57	Side B	EXP_A_TX_12_DP	PCIE Group A	Side A	GND	GND
58	Side B	EXP_A_TX_12_DN	PCIE Group A	Side A	GND	GND
59	Side B	GND	GND	Side A	EXP_A_RX_12_DP	PCIE Group A RX10+
60	Side B	GND	GND	Side A	EXP_A_RX_12_DN	PCIE Group A RX10-
61	Side B	EXP_A_TX_11_DP	PCIE Group A	Side A	GND	GND
62	Side B	EXP_A_TX_11_DN	PCIE Group A	Side A	GND	GND
63	Side B	GND	GND	Side A	EXP_A_RX_11_DP	PCIE Group A RX11+
64	Side B	GND	GND	Side A	EXP_A_RX_11_DN	PCIE Group A RX11-
65	Side B	EXP_A_TX_10_DP	PCIE Group A	Side A	GND	GND
66	Side B	EXP_A_TX_10_DN	PCIE Group A	Side A	GND	GND
67	Side B	GND	GND	Side A	EXP_A_RX_10_DP	PCIE Group A RX12+
68	Side B	GND	GND	Side A	EXP_A_RX_10_DN	PCIE Group A RX12-
69	Side B	EXP_A_TX_9_DP	PCIE Group A	Side A	GND	GND
70	Side B	EXP_A_TX_9_DN	PCIE Group A	Side A	GND	GND
71	Side B	GND	GND	Side A	EXP_A_RX_9_DP	PCIE Group A RX13+
72	Side B	GND	GND	Side A	EXP_A_RX_9_DN	PCIE Group A RX13-
73	Side B	EXP_A_TX_8_DP	PCIE Group A	Side A	GND	GND
74	Side B	EXP_A_TX_8_DN	PCIE Group A	Side A	GND	GND
75	Side B	GND	GND	Side A	EXP_A_RX_8_DP	PCIE Group A RX14+
76	Side B	GND	GND	Side A	EXP_A_RX_8_DN	PCIE Group A RX14-
77	Side B	NC	PCIE Group A	Side A	GND	GND
78	Side B	+V3.3S_SHB	PCIE Group A	Side A	+V3.3S_SHB	GND
79	Side B	+V3.3S_SHB	GND	Side A	+V3.3S_SHB	PCIE Group A RX15+
80	Side B	+V3.3S_SHB	PCIEX16 PRSNT	Side A	+V3.3S_SHB	PCIE Group A RX15-
81	Side B	+V3.3S_SHB	NC	Side A	+V3.3S_SHB	GND
82	SB	+V3.3A_SHB		SA	+V3.3A_SHB	

2.5.2.7 CN8: NGFF M.2 KEY B Connector

The IF70 Mini-ITX SBC NGFF M.2 connecter supports 2 M.2 card applications:

• PCIe I/F + USB

2.5.2.8 CN9: Digital Input / Digital Output

1	2
3	4
5	6
7	8
9	10

Pin №	Signal Name	Pin №	Signal Name
1	GND	2	DIO_5V
3	DOUT3	4	DOUT1
5	DOUT2	6	DOUT0
7	DINT3	8	DINT1
9	DINT2	10	DINT0

CN9

2.5.2.9 CN11:EDP Connector



CN11

Pin №	Signal Name	Pin №	Signal Name
1	EMB_AUXN	2	SMB_DATA_MAIN
3	EMB_AUXP	4	SMB_DATA_CLK
5	GND	6	GND
7	DP_TXN3_C	8	+VCC_EDP_BKLT
9	DP_TXP3_C	10	+VCC_EDP_BKLT
11	GND	12	+VCC_EDP_BKLT
13	DP_TXN2_C	14	GND
15	DP_TXP2_C	16	GND
17	GND	18	GND
19	DP_TXN1_C	20	GND
21	DP_TXP1_C	22	LCDVDD
23	GND-	24	LCDVDD
25	DP_TXN0_C	26	LCDVDD
27	DP_TXP0_C	28	LCDVDD
29	GND	30	+VCC_EDP_BKLT

2.5.2.10 CN12:LVDS Connector



CN12					
Pin №	Signal Name	Pin №	Signal Name		
1	LCDVDD	2	LVDS0_TX0_N		
3	LCDVDD	4	LVDS0_TX0_P		
5	LCDVDD	6	LVDS0_TX1_N		
7	GND	8	LVDS0_TX1_P		
9	GND	10	LVDS0_TX2_N		
11	GND	12	LVDS0_TX2_P		
13	GND	14	LVDS0_CLK_N		
15	GND	16	LVDS0_CLK_P		
17	GND	18	LVDS0_TX3_N		
19	GND	20	LVDS0_TX3_P		
21	GND	22	LVDS1_TX0_N		
23	GND	24	LVDS1_TX0_P		
25	GND	26	LVDS1_TX1_N		
27	GND	28	LVDS1_TX1_P		
29	GND	30	LVDS1_TX2_N		
31	GND	32	LVDS1_TX2_P		
33	GND	34	LVDS1_CLK_N		
35	GND	36	LVDS1_CLK_P		
37	GND	38	LVDS1_TX3_N		
39	GND	40	LVDS1_TX3_P		

2.5.2.11 CN13: Backlight Connector



Pin №	Signal Name		
1	+BKLPWR_R		
2	+BKLPWR_R		
3	+BKLPWR_R		
4	GND		
5	BRIGHT		
6	GND		
7	BLON_5V		

2.5.2.12 CN14: Backlight Brightness Control



Pin №	Signal Name		
1	+V5S		
2	VRD_ADC		
3	GND		

2.5.2.13 CN15/ CN16/ CN17: Power output wafer



2.5.2.14 CN18: Power output wafer



Pin №	Signal Name		
1	GND		
2	BACKUP_VBAT		

2.5.2.15 CN20 & CN21: USB2.0 Wafer

56	5	6
12	1	2

```
CN20
```

CN21

Pin №	Signal Name	Pin №	Signal Name
1	USB_VCC	2	USB_VCC9
3	USB_DN	4	USB_DN
5	USB_DP	6	USB_DP
7	GND	8	GND

Pin №	Signal Name	Pin №	Signal Name
1	USB_VCC8	2	USB_VCC
3	USB_DN	4	USB_DN
5	USB_DP	6	USB_DP
7	GND	8	GND

2.2.2.16 LAN1, LAN2: LAN Conector

IF70 Mini-ITX SBC has two Ethernet connectors located on the front. Ethernet ports provide a standard RJ45 10/100/1000 Mbps jack connector with LED indicators on the front side to show its Active/ Link status and Speed status.



10/100 Mbps- Green 1G Mbps – Orange

Pin №	Signal Name	Pin №	Signal Name
1	TX1+	2	TX1-
3	TX2+	4	TX2-
5	TX3+	6	TX3-
7	TX4+	8	TX4-

2.5.2.17 Panel1: Front Panel Pin Header

	2	1		
	4	3		
	6	5		
	8	7		
	10	9		
PANEL1				

Pin №	Signal Name	Pin №	Signal Name
1	PW_LED+	2	HD_LED+
3	GND	4	HD_LED-
5	PW_BT	6	GND
7	BRI+	8	RST-BT
9	BRI-	10	5VSB

2.5.2.18 SATA1/ SATA2: SATA connector



SATA1/ SATA2

Pin №	Signal Name	Pin №	Signal Name
1	GND	2	SATA_TXP
3	SATA_TXN	4	GND
5	SATA_RXN	6	SATA_RXP
7	GND		

2.5.2.19 COM1/COM2/COM3/COM4: Internal RS232 COM

The serial port which is Winbond I/O support is RS232 only.



COM1

Pin №	Signal	Pin №	Signal
	Name		Name
1	FK_NDCD1	2	FK_NDSR1
3	FK_NSIN1	4	FK_NRTS1
5	FK_NSOUT1	6	FK_NCTS1
7	FK_NDTR1	8	FK_NRI3
9	GND	10	COM1_5V



Pin №	Signal Name	Pin №	Signal
			Name
1	FK_NDCD2	2	FK_NDSR2
3	FK_NSIN2	4	FK_NRTS2
5	FK_NSOUT2	6	FK_NCTS2
7	FK_NDTR2	8	FK_NRI2
9	GND	10	COM2_5V



COM3

Pin №

2

4

6

8

10

Signal Name

FK_NDSR3

FK_NRTS3 FK_NCTS3

USB

COM3 5V

Signal Name

FK_NDCD3

FK_NSIN3

FK_NSOUT3

FK_NDTR3

GND

Pin №

1

3

5

7

9

9	Δ	A	A	A	£	1
ſ					ີ່	
ł		Ø	國			
10	Ţ	T	T	T	T	2

COM4

Pin №	Signal	Pin №	Signal Name
	Name		
1	FK_NDCD4	2	FK_NDSR4
3	FK_NSIN4	4	FK_NRTS4
5	FK_NSOUT4	6	FK_NCTS4
7	FK_NDTR4	8	FK_NRI4
9	GND	10	COM4_5V

2.5.2.20 SATA_PWR1: SATA POWER Connector



SATA_PWR1

Pin №	Signal Name	Pin №	Signal Name
1	+V12S	2	+V12S
3	GND	4	GND
5	GND	6	GND
7	+V5S	8	+V5S

2.5.2.21 FAN1/ FAN2: FAN Connector



FAN1



FAN2

Pin 1 GND

Pin 2 +12V

Pin 3 SENSE

2.5.2.22 J1: DDR4 SO-DIMM



2.5.2.23 J2: DDR4 SO-DIMM



2.5.2.24 USB1, USB2 (USB 3.2 Gen.1) Connector

USB1.	USB2

Pin №	Signal Name	Pin №	Signal Name
1	+5V	2	USB_D-
3	USB_D+	4	GND
5	STDA_SSRX-	6	STDA_SSRX+
7	GND_DRAIN	8	STDA_SSTX-
9	STDA_SSTX+		

Chapter 3: Insyde H20 BIOS Setup

This chapter describes the different settings available in the INSYDE BIOS that comes with the board. This chapter offers information on the Award BIOS installation utility.

- 3.1 How and When to Use BIOS Setup
- **3.2 BIOS Functions**
- 3.3 Using Recovery Wizard to Restore Computer
- 3.4 How to Enable Watchdog

3.1 How and When to Use BIOS Setup

To enter the BIOS setup, you need to connect an external USB keyboard, external monitor and press Del key when the prompt appears on the screen during start up. The prompt screen shows only few seconds so need press Del key quickly.



Important: Updated BIOS version may be published after the manual released. Check the latest version of BIOS on the website.

You may need to run BIOS setup utility for reasons listed below:

- 1. Error message on screen indicates to check BIOS setup
- 2. Restoring the factory default settings.
- 3. Modifying the specific hardware specifications
- 4. Necessity to optimize specifications

BIOS Navigation Keys

The following keys are enabled during POST:

Key	Function
Del	Enters the BIOS setup menu.
F7	Display the boot menu. Lists all bootable devices that are connected to the system. With cursor ↑and cursor ↓and by pressing <enter>, select the device used for the boot.</enter>
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the POST.

The following Keys can be used after entering the BIOS Setup.

Key	Function
F1	Help
F5/ F6	Change Values
F9	Setup Defaults
F10	Save & Exit
Esc	Exit
Enter	Select SubMenu
↑ / ↓	Select Item
$\leftarrow I \rightarrow$	Select Item

For items marked ► press **<Enter>** for more options.



Note: You can press the F1, F2, F3, F4, –/+, and Esc keys by connecting a USB keyboard to your computer.

3.2 BIOS Functions

3.2.1 Main Menu

The Main menu displays the basic information about yoursystem including BIOS version, processor RC version, system language, time, and date. When you enter BIOS setup, the first menu that appears on the screen is the main menu. It contains the system information including BIOS version, processor RC version, system language, time, and date.

	InsydeH20	Setup Utility		Rev. 5.0
Main Advanced Security Power Boo	ot Exit			
InsydeH20 Version Processor Type System Bus Speed System Hemory Speed Cache RAH Total Hemory Channel A Unknown 0 Channel B SODIHH 0 Platform Configuration CPUID: CPU Speed: CPU Stepping: Number 0f Processors: Hicrocode Rev: GT Info: SMX/TXT: PCH Rev / SKU GOP Ver: Intel HE Version / SKU LAN PHY Revision Language System Time System Date	IF70. V104 Intel(R) Core(TH) 100 HHz 2133 HHz 2048 KB 4096 HB (Not Installed] 4096 HB 0x906ED (CoffeeLak 1800 HHz 906ED (R0 Stepping 8 Core(s) / 8 Thre 000000CA 6T2 (0x3E98) Supported 10 (B0 Stepping) / 9.0.1098 12.0.40.1433 / COR A6 (B2 Stepping) <english> [11:01:50] [08/10/2020]</english>	i7-9700TE CPU 0 1.80GHz e DT)) ad(s) CNL PCH-H Q370 PORATE	Select the current default by the InsydeH20.	language used
F1Help1/4 SeEsc Exit+/+ Se	elect Item elect Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit	

BIOS Setting	Description	Setting Option	Effect
Language	Displays the system	Adjustment of	Set the language in
	language. [English]	the	other language. The
	is set up by default.	language	language in this
			device is English.
System Time	This is current time	Date and time	Set the time in the
	setting. The time is	changes.	format:
	maintained by the		[hh/mm/ss]
	battery when the		
	device is turned off.		
System Date	This is current date	Date and time	Set the date in the
	setting.	changes.	format
			[mm/dd/yyyy];

3.2.2 Advanced

Select the Advanced Tab from the setup menu to enter the advanced BIOS setup screen. You can select any of the items on the left frame of the screen to go to the sub menu for the item, such as CPU Configuration. You can use the <Arrow> keys enter all advanced BIOS setup options. The advanced BIOS setup menu is shown below. The submenus described on the following pages.



Caution Handle advanced BIOS settings page with caution. Any changes can affect the operation of your computer.

Attention Gérez la page des paramètres avancés du BIOS avec prudence. Tout changement peut affecter le fonctionnement de votre ordinateur.

Main Advanced Securi	InsydeH20 tv Power Boot Exit	Setup Util	ity		Rev. 5.0
Hain Advanced Securi CPU Configuration PPower & Performance Psystem Agent (SA) Conf PPCH-10 Configuration PPCH-FW Configuration >S10 F81866A	ty Power Boot Exit	K		About Super10 Si	etting
F1 Help Fac Fait	1/4 Select item	F5/F6 Cha Enter Sel	nge Values ect ► SubMenu	F9 Sett	up Defaults and Exit
IOS Setting	Description		Setting	Option	Effect
PU	Configures Trusted		Enter		Opens submen
onfiguration	Computing parameter	S			
ower &	Configures Power &		Enter		Opens submen
erformance	Performance paramet	ers			
ystem Agent	Configures System Ag	gent	Enter		Opens submen
onfiguration	Configuration parame	ters			

Configuration	Configuration parameters		
PCH-OI	Configures PCH-OI	Enter	Opens submenu
Configuration	parameters		
PCH-FM	Configures PCH-FM	Enter	Opens submenu
Configuration	parameters		
SIO F81866A	SIO F81866A parameters	Enter	Opens submenu

3.2.2.1 CPU Configuration

	InsydeH2	0 Setup Utility	Rev. 5.0
Advanced			
CPU Configuration			When enabled, a VMM can utilize the
Type ID	Intel(R) Core(TM) 0x906ED	i7-9700te cpu @ 1.80gHz	provided by Vanderpool Technology.
Speed	1800 MHz		
VHX	Supported		
SMX7TXT	Supported		
Intel (VMX) Virtualization Technology PECI	<enab led=""> <enab led=""></enab></enab>		
Active Processor Cores	<a11></a11>		
AES .	<enabled></enabled>		
		6	
		ĸ	
F1 Help 1/4 Selec	t Item	F5/F6 Change Values	F9 Setup Defaults
ESC EXIT +/+ Selec	t Item	💿 Enter Selfect 🕨 SubMenu	I FIU Save and Exit

BIOS Setting	Description	Setting Option	Effect
Intel (VMM)	Enable or disable	Enable/Disable	When enabled, a
Virtualization	Intel Virtualization		VMM can utilized
Technology	Technology.		the additional
			hardware
			capabilities
			provided by
			Vanderpool
			Technology.
Active Processor	Number of core to	All / 1 / 2/ 3	Select number of
Cores	enable in each		core to enable in
	processor package		each processor
			package
AES	Enable or disable	Enable/Disable	Enable or disable
	AES (Advanced		AES
	Encyption		
	Standard)		
3.2.2.2 Power & Performance

	In	sydeH20 Setup Utility	Rev. 5.0
Advanced			
Power & Performance			CPU - Power Management Control Options
►CPU - Power Management Control			
		R	
	Salaat Itam		
Esc Exit +/+	Select Item	Enter Select ► SubMenu	F10 Save and Exit

BIOS Setting	Description	Setting Option	Effect
CPU – Power	Configure CPU -	Enter	Enters sub-menu
Management	Power		
Control	Management		
	Control		
	parameters		



BIOS Setting	Description	Setting Option	Effect
Boot	Configure Boot	-Max non-turbo	Select the performance state
Performance	Performance Mode	performance	that the BIOS will set starting
Mode	parameters	-Max battery	from reset vector
		-Turbo	
		Performance	
Intel	Configure Intel	Enabled/ Disabled	Allows more than two
SpeedStep (ta)	SpeedStep (ta)		frequency ranges to be
	parameters		supported
Intel Speed	Configure Intel	Enabled/ Disabled	Enable/ Disable Intel Speed
Shift	Speed Shift		Shift Technology support.
Technology	Technology		Enabling will expose the CPP
	parameters		v2 interface to allow for
			hardware controlled P-states
-Turbo Mode	Enable or disable	Enabled/ Disabled	Enable/ Disable processor
	Turbo Mode		Turbo Mode (requires
			EMTTM enabled too). Auto
			means enabled, unless max
			turbo ratio is bigger than 16 –
			SKL AO W/A

3.2.2.2.1 How to Enable/Disable Turbo Mode

	InsydeH20 Setup Utility	Rev. 5.0
Advanced		
CPU - Power Management Control Boot performance mode Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Turbo Mode	<nax non-turbo="" performance=""> <enabled> <enabled> <disabled></disabled></enabled></enabled></nax>	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).
	Turbo Hode Disabiled	
F1Help1/↓ SelectEsc Exit+/+ Select	t Item F5/F6 Change Value t Item Enter Select⊧Sub	es F9 Setup Defaults oMenu F10 Save and Exit

	InsydeH20 S	etup Utility	Rev. 5.
Advanced			
Power & Performance			CPU - Power Management Control Options
▶CPU - Power Management Control			
		ß	
FT Help 1/↓ Se Esc. Exit +/→ Se	elect item elect item	F57F6 Change Values Enter Select ► SuhMenu	F9 Setup Defaults F10 Save and Exit



3.2.2.3 System Agent (SA) Configuration

Advanced	InsydeH20	Setup Utility	Rev. 5. (
System Agent (SA) Configuration			Graphics Configuration
SA PCle Code Version VT-d	7. 0. 110. 64 Supported		
▶Graphics Configuration ▶PEG Port Configuration			
VT-d	<enabled></enabled>		
		R	
F1 Help tr	/J Select Item	F5/F6 Change Values	F9 Setup Defaults

BIOS Setting	Description	Setting Option	Effect
Graphics	Configure	Enter	Opens sub-menu
Configuration	Graphics		
	Configuration		
	parameters		
PEG Port	Configure PEG	Enter	Opens sub-menu
Configuration	Port		
	Configuration		
	parameters		
Vt-d	Intel®	Enabled	Vt-d capability
	Virtualization	Disabled	
	Technology for		
	Directed I/O		

3.2.2.3.1 Graphics Configuration

	Insy	deH20 Setup Utility	Rev. 5.0
Advanced			
Graphics Configuration			Graphics turbo IMON current values supported (14-31)
Graphics Turbo IMON Current	[31]		
Primary Display Aperture Size DVHT Pre-Allocated DVHT Total Gfx Hem	<auto> <256HB> <32H> <256H></auto>	×	
F1 Help	1/4 Select Item	F5/F6 Change Values	F9 Setup Defaults
ESC EXIT	TH SELECT ITEM	enter select 🕨 Subhenu	FIU Save and Exit

BIOS Setting	Description	Setting Option	Effect
Graphics Turbo IMON Current	Graphics Turbo IMON Current	14-31	Select Graphics Turbo IMON Current values supported
	values supported		
Primary Display	Select Primary	Auto	Select which of IGFX/PEG/
	Display	IGFX	PCI Graphics device should be
		PEG	primary display or select SG for
		PCI	Switchable Gfx
Aperture Size	Select the	128MB	Select the aperture size
	aperture size	256MB	Note: Above 4MB MMIO BIOS
		512MB	assignment is automatically
		1024MB	enabled when selecting 2048MB
		2048 MB	aperture. To use this feature
			please disable CSM port
DVMT	Select DVMT	0M~60M	Select DVMT 5.0 Pre-Allocated
Pre-Allocated	Pre-Allocated		(Fixed) Graphic Memory size
			used by Internal Graphic Device
DVMT Total Gfx	Select DVMT	256M	Select DVMT 5.0 Total Graphic
Mem	Total Gfx Mem	128M	Memory size used by the
		MAX	Internal Graphic Device

3.2.2.3.2 PEG Port Configuration

	Insyde	H2O Setup Utility	Rev. 5.0
Advanced			
PEG Port Configuration			Enable or Disable the Root Port
PEG Port Configuration PEG 0:1:0 Enable Root Port Max Link Speed PEGO Slot Power Limit Value PEGO Slot Power Limit Value PEGO Physical Slot Number PEG 0:1:1 Enable Root Port Max Link Speed PEG1 Slot Power Limit Value PEG 0:1:2 Enable Root Port Max Link Speed PEG2 Slot Power Limit Value PEG2 Slot Power Limit Scale PEG2 Slot Power Limit Scale PEG3 Physical Slot Number Program PCle ASPH after OpROM Program Static Phasel Eq • Gen3 Root Port Preset value :	Not Present <auto> <auto> <auto> <auto> <1.0x> [1] Not Present <auto> <auto> <auto> <auto> <auto> <1.0x> [2] Not Present <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto> <auto< th=""><th></th><th>Enable or Disable the Root Port</th></auto<></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto></auto>		Enable or Disable the Root Port
 Gen3 Endpoint Hint value for Gen3 RxCTLE Control Gen3 Adaptive Software Equaliz 	r each Lane zation		
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

	Insyde	eH20 Setup Utility	Rev. 5.0
Advanced			
Always Attempt SW EQ Number of Presets to test Allow PERST# GP10 Usage SW EQ Enable VOC Jitter Dwell Time Jitter Error Target VOC Dwell Time VOC Error Target Generate BDAT PEG Margin Data PCIe Rx CEM Test Mode PCIe Spread Spectrum Clocking	<d i="" led="" sab=""> <auto> <enab led=""> <auto> [3000] [2] [10000] [2] <d i="" led="" sab=""> <d i="" led="" sab=""> <enab led=""></enab></d></d></auto></enab></auto></d>		Allows disableing Spread Spectrum Clocking for compliance testing
		R	
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select⊦ SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Description	Setting Option	Effect
Enable Root	Configure Root	Enabled	Enable or disable Root Port
Port	Port parameters	Disabled Auto	
Max Link Speed	Select Max Link	Auto	Configure PEG 0:1:0 Max
	Speed	Gen1	Speed
		Gen2	
		Gen3	
PEG0 Slot	PEG0 Slot	75	PEG0 Slot Power Limit Value
Power Limit	Power Limit		
Value	Value		
PEG0 Slot	Select PEG0	1.0x	Select the scale used for Slot
Power Limit	Slot Power Limit	0.1x	Power Limit Value
Scale	Scale	0.01x	
		0.001x	
Program PCle	Program PCle	Disabled	PCIe ASPM will be
ASPM after	ASPM after		programmed before OpROM
OpROM	OpROM	Enabled	PCIe ASPM will be
			programmed after OpROM
Program Static	Program Static	Disabled	Program Phase1 Presents/
Phase1 Eq	Phase1 Eq	Enabled	CTLEp
Always Attemp	Always Attemp	Disabled	Always Attemp SW EQ, even
SW EQ	SW EQ	Enabled	it has been done once
Number of	Select number	7,3,5,8	Choose between 7,3,5,8 and
Presents to test	of Presents to	0-9	0-9. Auto = current default
	test	Auto	(7,3,5,8 for SKL). Do not
			change the default unless
			debugging.
Allow PERST #	Allow PERST #	Disabled	Enable/ Disable GPIO-based
GPIO Usage	GPIO Usage	Enabled	resets to PEG endpoint(s)
			during margin search. if
			needed
SW EQ Enable	Select Jitter.	-Jitter Only Test Mode	Select Jitter & VOC test mode
VOC	VOC test mode	-Jitter & VOC Test	(default) or Jitter only test
		Mode	mode. Auto will current
		-Auto	default (Enabled)

BIOS Setting	Description	Setting Option	Effect
Generate BDAT	Generate BDAT	-Disabled	Enable to generate BDAT
PEG Margin	PEG Margin	-Generate Port Gitter	PCIe margin tables
Data	Data	Data	
PCIe Rx CEM	PCIe Rx CEM	Disabled	Enable/ Disable PEG Rx
Test Mode	Test Mode	Enabled	CEM Loopback Mode
	settings		
PCIe Spread	PCle Spread	Enabled Disabled	Allow disabling Spread
Spectrum	Spectrum		Spectrum Clocking for
Clocking	Clocking		compliance testing
Gen3 Root Port	Gen3 Root Port	Lane 0-Lane 15	Value for Lane 0- Lane 15
Present value	Present value		
for each Lane	for each Lane		
Gen3 Root Port	Gen3 Root Port	Lane 0-Lane 15	Value for Lane 0- Lane 15
Endpoint value	Endpoint value		
for each Lane	for each Lane		
Gen3 Endpoint	Gen3 Endpoint	Lane 0-Lane 15	Value for Lane 0- Lane 15
Hint value for	Hint value for		
each Lane	each Lane		
Gen3 RxCTLE	Gen3 RxCTLE	Bundle0-Bundle7	Gen3 RxCTLE settings for
Control	Control		Bundle0 (Lane0, Lane1)
		RxCTLE Overrride	When enabled, it overrides
			PEG's RxCTLE adaptive
			behavior

3.2.2.3.3 VT-d

	Ins	sydeH20 Setup Utility	Rev. 5.0
Advanced			
System Agent (SA) Configuration	n		VT-d capability
SA PCIe Code Version VT-d	7. 0. 110. 64 Suppor ted		
▶Graphics Configuration ▶PEG Port Configuration			
VT−d	<enab led=""></enab>		
		VT-d DisadNed Enabled	
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Description		Setting Option	Effect
Vt-d	Intel®		Enabled	Vt-d capability
	Virtualization		Disabled	
	Technology f	for		
	Directed I/O			

3.2.2.4 PCH-IO Configuration

	Insyde	20 Setup Utility	Rev. 5.0
Advanced			
PCH-10 Configuration			PCI Express Configuration settings
 SATA And RST Configuration USB Configuration 			
PCH LAN Controller State After G3	<enabled> <\$5 \$tate></enabled>		
		R	
		~	
F1 Help	1/1 Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	+/+ Select Item	Enter SeTect ► SubMenu	FTO Save and Exit

BIOS Setting	Description	Setting Option	Effect
PCI Express	Configure PCI	Enter	Opens sub-menu
Configuration	Express settings		
SATA And RST	Configure SATA	Enter	Opens sub-menu
Configuratuion And RST settings			
USB	Configure USB	Enter	Opens sub-menu
Configuration	settings		
State After G3			

Advanced	Insyd	leH2O Setup Utility	Rev. 5.0
		p	CL Express Clock Gating Enable/Disable
PCL Express Clock Gating	<enabled></enabled>	f	for each root port.
PCI Express Root Port 5 ▶PCI Express Root Port 7 ▶PCI Express Root Port 8 ▶PCI Express Root Port 17	Reserved for e	thernet	
		K	
F1 Help Esc Exit	†/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

4.2.2.4.1 PCI Express Configuration

BIOS Setting	Description	Setting Option	Effect
PCI Express	PCI Express Clock	Enabled	PCI Express Clock
Clock Gating	Gating settings	Disabled	Gating Enable/
			Disable for each
			root port
PCI Port	PCI Port assigned to	Value	Choose value
assigned to LAN	LAN settings		
PCI Express	Control the PCI	Enter	Opens sub-menu
Root Port 4	Express Root Port 4		
PCI Express	Control the PCI	Enter	Opens sub-menu
Root Port 7	Express Root Port 7		

	Insyde	H20 Setup Utility	Rev. 5.0
Advanced			
Advanced PCI Express Root Port 7	<enab led=""></enab>	H2O Setup Utility	Rev. 5.0
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubHenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Description	Setting Option	Effect
PCI Express	Control the PCI	Enter	Opens sub-menu
Root Port 7	Express Root Port		
	7		
Topology	Topology settings	Unknown	Identify the SATA
		x1	Topology if it is Default
		x4	or ISATA or Flex or
		SATA Express	DirectConnect or M2
		M2	
ASPM	ASPM settings	Auto	Automatically enable
		L0sL1	ASPM based on
		L1	reported capabilities
		L0s	and known issues
		Disabled	
L1 Substates	PCIE Expresas	Disabled	PCIE Expresas L1
	L1 Substates	L1.1	Substates settings
	settings	L1.2	
		L1.1 & L1.2	
Gen3 Eq	Gen3 Eq Phase3	Hardware	PCle Gen3
Phase3 Method	Method settings	Static Coefic	Equalization Phase 3
		Software Search	Method

BIOS Setting	Description	Setting Option	Effect
ACS	Access Control	Disabled	Enable/ Disable
	Services	Enabled	Access Control
	Extended		Services Extended
	Capability settings		Capability
PCIe Speed	Configure PCIe	Auto	Configure PCIe Speed
	Speed	Gen1	
		Gen2	
		Gen3	
PCH PCIE4 LTR	PCH PCI Latency	Disabled	PCH PCI Latency
	Reporting Enable/	Enabled	Reporting Enable/
	Disable		Disable
PCIE4 LTR Lock	PCIE4 LTR Lock	Disabled	PCIE4 LTR
	settings	Enabled	Configuration Lock
PCIE4 CLKREQ	PCIE4 CLKREQ	Default	PCIE4 CLKREQ
Mapping	Mapping Override	No CLKREQ	Mapping Override for
Override		Custom Number	default platforma
			mapping

3.2.2.4.1 SATA and RST Configuration

Advanced	Insy	deH20 Setup Utility	Rev	. 5.0
Advanced				
SATA And RST Configuration			Enable/Disable SATA Device.	
SATA Controller(s) SATA Mode Selection	<enabled> <ahcl></ahcl></enabled>			
Serial ATA Port 2 Software Preserve Port 2 Serial ATA Port 3 Software Preserve Port 3 Serial ATA Port 4 Software Preserve Port 4	Emp ty Unknown <enab led=""> Emp ty Unknown <enab led=""> Emp ty Unknown <enab led=""></enab></enab></enab>			
		×		
F1 Help Esc Exit	↑/↓ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit	

	InsydeH20	Setup Utility	Rev. 5.0
Advanced			
Spin Up Device	<d i="" led="" sab=""></d>		If enabled for any of ports Staggerred
SATA Device Type	<hard disk="" drive=""></hard>		Spin Up will be performed and only the
Topology	<unknown></unknown>		drives which have this option enabled
SATA Port 2 DevSlp	<disabled></disabled>		will spin up at boot. Otherwise all
DITO Configuration	<d i="" led="" sab=""></d>		drives spin up at boot.
DITO Value	[0]		
DM Value	[15]		
Serial ATA Port 3	Empty		
Software Preserve	Unknown		
Port 3	<enabled></enabled>		
Hot Plug	<d i="" led="" sab=""></d>		
Configured as eSATA	Hot Plug supported		
Spin Up Device	<d i="" led="" sab=""></d>		
SATA Device Type	<pre><hard disk="" drive=""></hard></pre>		
Topo logy	<unknown></unknown>		
SATA Port 3 DevSlp	<d i="" led="" sab=""></d>		
DITO Configuration	<disabled></disabled>		
DITO Value	[625]	R	
DM Value	[15]		
Serial ATA Port 4	Empty		
Software Preserve	Unknown		
Port 4	<enabled></enabled>		
Hot Plug	<disabled></disabled>		
Configured as eSATA	Hot Plug supported		
Spin Up Device	<disabled></disabled>		
SATA Device Type	<solid drive="" state=""></solid>		
Topology	<unknown></unknown>		
SATA Port 4 DevSlp	<disabled></disabled>		
DITO Configuration	<disabled></disabled>		
DITO Value	[625]		
DM Value	[15]		
	t/l Soloct Itam	ENJER Chapter Values	EQ Satup Dafaulte
Esc Evit	elect Item	Enter Select > SubMonu	F10 Save and Evit
ESC LATE			TIV Saye and EXIL

3.2.2.4.2 USB Configuration

	Insyde	H2O Setup Utility	Rev. 5.0
USB Configuration			Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.
USB Port Disable Override	<disable></disable>		
		A	
F1 Help	t/↓ Select Item	F5/F6 Change Values	F9 Setup Defaults

BIOS Setting	Description	Setting Option	Effect
USB Port Disable	USB Port Disable	Disable	Selectively Enable/
Override	Override	Select Per-Pin	Disable the
	configuration		corresponding USB
			port from reporting
			a Device
			Connection to the
			controller

3.2.2.4.3 State After G3

Advanced	Ins	ydeH20 Setup Utility	Rev. 5.0
PCH-10 Configuration PCI Express Configuration SATA And RST Configuration USB Configuration			Specify what state to go to when power is re-applied after a power failure (G3 state).
PCH LAN Controller State After 63	< <u>Enabled></u> <s5 state=""></s5>	State After 63 S0 State S5 State	
F1 Help Esc Exit	1/↓ Select Item +/+ Select Item	F5/F6 Change Values Enter Select ▶ SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Description	Setting Option	Effect
State After G3	State After G3	S0 State	Specify what state
	configuration	S5 State	to go to when
			power is
			re-applied after a
			power failure (G3
			state)

3.2.2.5 PCH-FW Configuration

		InsydeH20 Setup Utility	Rev. 5.0
Advanced			
ME Firmware Version ME Firmware Mode ME Firmware SKU ME Firmware Status 1 ME Firmware Status 2	12, 0 Norm Corp 0x90 0x86	0,40,1433 mal Hode porate SKU 0000255 610810E	When Disabled ME will be put into ME Temporarily Disabled Mode.
HE State Manageability Features State AMT BIOS Features ▶AMT Configuration	<ena <ena <dis< td=""><td>ah led> ab led> sab led></td><td></td></dis<></ena </ena 	ah led> ab led> sab led>	
		K	
F1 Help Esc Exit	↑/↓ Select Item +/→ Select Item	m F5/F6 Change Values m Enter Select ▶ SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Description	Setting	Effect
ME State	ME State configuration	Disabled Enabled	When Disabled ME will be put into ME Temporarily Disabled Mode
Manageability Features State	Manageability Features State configuration	Disabled Enabled	Enable/ Disable Intel Manageability Features Note: this option disabled/ enables Manageability Features support in FW. To disable support platform must be in an unprovisioned state first.
AMT BIOS Features	AMT BIOS Features	Disabled Enabled	Enable/ Disable Intel Active Management Technology BIOS Extension. Note: iAMT H/W Is always enabled. This option just controls the BIOS Extension execution.
AMT Configuration	AMT Configuration	Enter	Opens sub-menu
ME Unconfig on RTC Clear State	ME Unconfig on RTC Clear State	Disabled Enabled	Disabling this option will cause ME not to unconfigure on RST clear
Comms Hub Support	Comms Hub Support	Disabled Enabled	Enable/Disable support for Comms Hub
JHI Support	JHI Support	Disabled Enabled	Enable/Disable Intel DAL Host Interface Service (JHI)
Core BIOS Done Message	Core BIOS Done Message	Disabled Enabled	Enable /Disable Core BIOS Done message sent to ME
Firmware Update Configuration	Firmware Update Configuration	Enter	Opens sub-menu
PTT Configuration		Enter	Opens sub-menu
ME Debug Configuration			

3.2.2.6 SIO F81866A

	Insy	deH20 Setup Utility	Rev. 5.0
Advanced			
Serial Port A Serial Port B Serial Port C Serial Port D WDT PHardware Monitor PGP10 Group 0 Configuration PGP10 Group 5 Configuration PGP10 Group 7 Configuration	<auto> <auto> <auto> <auto> <auto> <d i="" le="" sab=""></d></auto></auto></auto></auto></auto>		Configure Serial port using options : [Disable] No Configuration [Enable] User Configuration [Auto] EFI/OS chooses configuration
		K	
F1 Help	1/4 Select Item	F5/F6 Change Values	F9 Setup Defaults
ESC EXIT	Select Item	enter select 🕨 Subhenu	FIU Save and Exit

BIOS Setting	Description	Setting	Effect
		Option	
Serial Port A ~	Configure Serial	Disable	No configuration
Serial Port D	port settings	Enable	User configuration
		Auto	EFI/OS chooses
			configuration
WDT	Watchdog Timer	Disable	Enable or disable
	configuration	Enable	Watchdog Timer
Hardware	Hardware Monitor	Enter	Opens sub-section
Monitor			
GPIO Group 0	GPIO Group 0	Enter	Opens sub-section
Configuration	Configuration		
GPIO Group 1	GPIO Group 1	Enter	Opens sub-section
Configuration	Configuration		

3.2.2.6.1 Hardware Monitor

	InsydeH2	0 Setup Utility	Rev. 5.0
Hardware Monitor			
Voltage VCC (V) VCORE (V) V12S (V) V3.3S (V) VASB3 (V) VBAT VASB5 (V)	3.344 V 0.816 V 12.056 V 3.328 V 3.360 V 3.040 V 5.160 V		
Temperature Temperature 0 (°C/°F) Temperature 1 (°C/°F) Temperature 2 (°C/°F)	32.0 C/ 89.6 F 36.0 C/ 96.8 F 43.0 C/ 109.4 F		
Fan Speed FAN1	2803 RPM	Ľ	
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Descriptio	n	Setting Option	Effect		
FAN1 Mode	FAN1	Mode	Manual	Select	FAN1	Mode
	configuratio	on	Linear	configu	ration	
			Stage			

3.2.2.6.2 GPIO Configuration

	Insydel	H2O Setup Utility	Rev. 5.0
Advanced			
General Purpose Group O Input/Output GP1000			User can pull internal resistance push-pull/open-drain
Internal Resistance	<push pull=""></push>		
Input/Output Mode GP1001	<input/>		
Internal Resistance	<push pull=""></push>		
Input/Output Mode GP1002	<input/>		
Internal Resistance	<push pull=""></push>		
Input/Output Mode GP1003	<input/>		
Internal Resistance	<push pull=""></push>		
Input/Output Mode GP1004	<input/>		
Internal Resistance	<push pull=""></push>		
Input/Output Mode	<input/>		
		ß	
F1 Help 1/4 S Esc Exit +/+ S	elect Item elect Item	F5/F6 Change Values Enter Select ▶ SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS S	etting	Description		Setting Option	Effect
Internal		Internal		Push Pull	User can pull internal
Resista	nce	Resistance		Open Drain	resistance push-pull /
		configuration			open-drain
Input/	Output	GPIO	pin	Input	Set GPIO pin is input
Mode		configuration		Output	or output

3.2.3 Security

	InsydeH	20 Setup Utility	Rev. 5.0
Main Advanced Security Power	Boot Exit		
Current TPH Device TPH State TPH Active PCR Hash Algorithm TPH Hardware Supported Hash Algo BloS Supported Hash Algorithm TFE Protocol Version TPH Availability TPH Operation Clear TPH Supervisor Password User Password Set Supervisor Password Set Supervisor Password Set All Hdd Password Set All Haster Hdd Password >Storage Password Setup Page	<pre>cord Exit </pre> <pre>cithm content of the system of</pre>	Enabled, Owned A384 3324 3_256	TrEE Protocol Version: 1.0 or 1.1
F1 Help 1 Esc Evit	/1 Select Item	F5/F6 Change Values	F9 Setup Defaults
LJC LATC	VOTOOL FLOM		

BIOS Setting	Description	Setting Option	Effect
TrEE Protocol	Choose TrEE	1.0	TrEE Protovol
Version	Protocol Version	1.1	Version: 1.0 or 1.1
TPM Availability	TPM Availability	Available	When hidden don't
	configuration	Hidden	exposes TPM to 0
TPM Operation	TPM Operation	[]	Select one of the
	configuration		supported
			operation to
			change TPM2state
Clear TPM	Clear TPM	[]	Select to Clear
	configuration		TPM
Set Supervisor	Set Supervisor	Enter New	Install or Change
Password	Password	password	the password and
			the length of
			password must be
			greater than one
			character

3.2.4 Power

	InsydeH20	Setup Utility	Rev. 5.0
Main Advanced Security Powe	r Boot Exit		
Quick Boot Quiet Boot Network Stack PXE Boot capability ACPI Selection Timeout Automatic Failover PBoot Type Order	<d i="" led="" sab=""> <d i="" led="" sab=""> <d i="" led="" sab=""> <d i="" led="" sab=""> <d i="" led="" sab=""> <acp 0="" i5.=""> [0] <enab led=""></enab></acp></d></d></d></d></d>		Allows InsydeH2O to skip certain tests while booting. This will decrease the time needed to boot the system.
		K	
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

BIOS Setting	Description	Setting Option	Effect
ACPI S3	ACPI S3	Disabled	Enable/ Disable
	configuration	Enabled	ACPI S1/S3 Sleep
			state
Auto Wake on S5	Auto Wake on S5	Disabled	Auto Wake on S5,
	configuration	By Every Day	by Day or Month
		By Every Month	or fixed time of
			every day

<u>3.2.5 Boot</u>

	InsydeH20	Setup Utility	Rev.	5.0
Main Advanced Security	Power Boot Exit			
Boot Type Quick Boot Quiet Boot Network Stack PXE Boot capability Timeout Automatic Failover	 <uef1 boot="" type=""></uef1> <d i="" led="" sab=""></d> 		Select boot type to Dual type, Legacy type or UEFI type	
▶Boot Type Order				
		ß		
F1 Help Esc Exit	1/J Select Item +/+ Select Item	F5/F6 Change Values Enter Select ► SubHenu	F9 Setup Defaults F10 Save and Exit	

BIOS Setting	Description	Setting Option	Effect		
Boot Type	Boot Type	UEFI Boot Type	Select boot type to Dual type,		
	configuration		Legacy type or UEFI type		
Quick Boot	Quick Boot	Enabled	Allows InsydeH20 to skip		
	configuration	Disabled	certain tests while booting.		
			This will decrease the time		
			needed to boot the system		
Quiet Boot	Quiet Boot	Enabled	Disable or enable booting in		
	configuration	Disabled	text Mode.		
Network	Network	Disabled	Network Stack Support:		
Stack	Stack	Enabled	Windows 8 Bitlocker Unlock		
	configuration		UEFI IPv4/ IPv6 PXE		
			Legacy PXE OPROM		
Timeout	Timeout	[Value]	Timeout settings		
Automatic		Enable	If boot to default device fail, it		
Failover			will directly try to boot next		
			device		
		Disable	If boot to default device fail, it		
			will pop warning message		
			then go to firmware UI		
Boot Type	Boot Type	Enter	Opens sub-menu		
Order	Order				

<u>3.2.6 Exit</u>

		InsydeH20 Setup Utility	Rev. 5.0
Main Advanced Security F	Power Boot Exit		
Exit Saving Changes Save Change Without Exit Exit Discarding Changes Load Optimal Defaults Load Custom Defaults Save Custom Defaults Discard Changes			Exit system setup and save your changes.
		K	
F1 Help Esc Exit	1/↓ Select Item +/+ Select Item	F5/F6 Change Values Enter Select ▶ SubHenu	F9 Setup Defaults F10 Save and Exit

3.3 Using Recovery Wizard to Restore Computer



Note: Before starting the recovery process, make sure to backup all user data. The data will be lost after the recovery process.



Important:

Before starting the recovery process, remove any expansion card.

To enable quick one-key recovery procedure:

- 1. Connect the computer to the power source. Make sure the computer stays plugged in to power source during the recovery process.
- 2. Turn on the computer, and when the boot screen shows up, press **F6** to initiate the Recovery Wizard.
- 3. The following screen shows the Recovery Wizard. Click Recovery button to continue.



4. A warning message about data loss will show up. Make sure the data is backed up before recovery, and click **Yes** to continue.



5. Wait the recovery process to complete. During the recovery process, a command prompt will show up to indicate the percent of recovery process complete. Please restart your computer manually.

3.4 How to Enable Watchdog

To enable Watchdog, you need to download Winmate Watchdog utility. Find more information on Watchdog in "Watchdog Guide" that you can download from Winmate Download Center or File Share. Refer to the User Manual for more details.

To enable watchdog in Watchdog AP follow the instructions below:

1. On the right bottom side of the desktop screen, click **triangle button** to show hidden icons.



2. lick ^w icon to open Watchdog utility.

3. In Watchdog utility window set countdown time and periodically feed time, or disable watchdog.



Example:

Every 10 min watchdog will monitor the system, in case any error occurs the system will restart automatically when the countdown time reaches 0.

Every 9 min watchdog timer will be reset to 10 min.

Setting	Description				
Watchdog Countdown Time	The system automaticity restarts when this countdown time reaches zero.				
	Default: 10 min				
Deviadically Food Time	To set a cycle time to automatically reset watchdog				
	Default: 9 min				
Enable / Disable	Enable or disable watchdog. <i>Default: Enable</i>				

Chapter 4: Driver Installation

This chapter contains driver installation guide. Follow the instructions below to complete the installation. You will quickly complete the installation. This chapter provides instructions on how to install drivers on the IF70 Mini-ITX SBC.

- 4.1 Chipset Driver Installation
- 4.2 Graphic Driver Installation
- 4.3 Management Engine (ME) and .NET Framework
- 4.4 Audio Driver Installation
- 4.5 Ethernet Driver Installation
- 4.6 RST Driver Installation
- 4.7 Microsoft .NET Framework Driver Installation
- 4.8 Watchdog Driver Installation

4.1 Chipset Driver

Follow instructions below to install Chipset driver.

1. Open the Driver CD (included in the package) and select **Chipset** driver.

i i i i i i i i i i i i i i i i i i i	Share	View	Application Manage	Tools c	hipset-10.1.17	570.8068								-	- 0	× ^ 7
Pin to Quick Copy access	Paste	K Cut Copy pat Paste sho	h ortcut	Copy to •	Delete Rena	ame New folder	New The Second S	item • access •	Properties	Edit S Alistory	Select	all none selection ect	n			
$\leftrightarrow \rightarrow \cdot \uparrow$	> RE	OVD (D:) → E)river → Chip	set > ch	ipset-10.1.175	70.8068					~ () Se	arch ch	nipset-10).1.17570.80	68 , P
 Quick access Desktop Downloads 	A A	Name The mup The setup The wixLi	Chipset	^		Date modif 2/7/2018 5: 2/7/2018 5: 2/7/2018 5:	ied 18 PM 18 PM 16 PM	Type XML Do Applicat	cument tion cument	Size 1,454 5,280 4	KB KB					
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This PC RDVD (D:) Driver																
Network 3 items 1 item set	elected	5.15 MB														
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2. Installation window will pop up, select Next.





3. Select **Accept** to agree with the terms of license agreement.



4. Check the ReadMe file information, select Install to continue.



5. Wait for the driver to be installed. When installation completed, select **Restart Now** to restart your computer.



View Log Files



4.2 Graphic Driver

Follow instructions below to install Graphic driver.

1. Open the Driver CD (included in the package) and select Graphic driver.



2. Installation window will pop up, select Next.



3. Select Accept to agree with the terms of license agreement.



4. Check the ReadMe file information, select Next to continue.



5. Wait for the driver to be installed.

ntel® Installation Framework	
Intel® Graphics Driver	
Setup Progress	(intel)
Please wait while the following setup operations are performed	l:
Creating Process: C:\Program Files (x86)\Intel\Intel(R) Proces Installing Driver: Intel(R) Display Audio Version: 10.24.00.01 •••	sor Graphics \uninstall \UninstallVulka
<	>
	Next >
	Intel® Installation Framework

6. Select **Next** to continue.

Intel® Installation Framework	
Intel® Graphics Driver	
Setup Progress	(intel)
Please wait while the following setup operations are performed:	
Deleting File: C: \ProgramData \Microsoft\Windows\Start Menu\Prog Deleting File: C: \ProgramData \Microsoft\Windows\Start Menu\Prog Deleting File: C: \Users \Public\Desktop \Intel(R) HD Graphics Contro Deleting File: C: \Users \Public\Desktop \Intel(R) Graphics and Media Deleting File: C: \ProgramData \Microsoft\Windows\Start Menu\Prog Deleting File: C: \ProgramData \Microsoft\Windows\Start Menu\Prog Deleting File: C: \Users \Public\Desktop \Intel(R) Iris(R) Graphics Cor Deleting File: C: \Users \Public\Desktop \Intel(R) Iris(R) Graphics Cor Deleting File: C: \Users \Public\Desktop \Intel\Intel(R) Iris(R) Graphics Deleting File: C: \Users \Public\Desktop \Intel\Intel(R) Iris(R) Graphics Deleting Registry Key: HKLM\SOFTWARE \Intel\GFX \Internal\Audio Deleting Registry Key: HKLM\SOFTWARE \Intel\GFX \Internal\Audio	grams\Intel(R) Graphics and grams\Intel\Intel(R) Graphic I Panel.lnk Control Panel.lnk grams\Intel\Intel(R) Iris(R) (grams\Intel(R) Iris(R) Graph throl Panel.lnk cs Control Panel.lnk Fix Fix
Click Next to continue.	~
	Next > — Intel® Installation Framework
7. After installation is completed, select "Yes, I want to restart this computer now", and click Finish.



4.3 Management Engine (ME)

Follow instructions below to install Management Engine (ME).

1. Open the Driver CD (included in the package) and select ME driver.



2. Select Next to start the installation.

Click Next to continue, or click Cancel to exit the setup program.

Setup		Х
Intel® Management Engine Components Welcome	(intel)	
You are about to install the following product:		
Intel® Management Engine Components 11.7.0.1058		
It is strongly recommended that you exit all programs before continuing		

< Back

Next >

Cancel

Intel Corporation

3. Select **Next** to agree with the terms of license agreement.

Setup	\times
Intel® Management Engine Components License Agreement	
INTEL SOFTWARE LICENSE AGREEMENT(OEM / IHV / ISV Distribution & Single User)	^
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING. Do not use or load software (including drivers) from this site or any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement, which Intel may modify from time to time following reasonable notice to You. If you do not wish to so agree, do not install or use the Software.	l
Please Also Note: • If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV) or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies; • If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT, applies.	
For OEMs, IHVs and ISVs:	
LICENSE. Subject to the terms of this Agreement, Intel grants to You a nonexclusive,	¥
☑ I accept the terms in the License Agreement.	
Intel Corporation <back next=""> Can</back>	icel

4. Wait for the driver to be installed.

Setup	
Intel® Management Engine Components Progress	(intel)
Please wait while the product is being installed.	
Setup Intel® Management Engine Components	×
Completion	

5. When installation completed, select **Finish** complete



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installation.

4.4 Audio Driver

Follow instructions below to install Audio driver.

1. Open the Driver CD (included in the package) and select **Audio** driver.

🔒 🛃 📙 🚽			Appl	ication Tools	Realtek High De	finition Driver 6	4bit V6.0.1	.8036(R281)	-	
File Home	Share	e View		Manage						~ 🕐
Pin to Quick Copy access	D Paste	K Cut Sun Copy pati Paste sho	n rtcut	🖌 Move to	 ✓ Delete ▼ ✓ ■ Rename 	New folder	Propertie	■ Open ▼ Bdit S	Select a	ll Ione election
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📥 Quick access		Name		~		Date modified	d T	ype	Size	
Desktop	*	0008-	64bit_	Win7_Win8_W	/in81_Win10_R281	3/26/2017 7:4	3 PM – A	pplication	212,	455 KB
Downloads	*									
🔮 Documents	*									
Pictures	*									
IntelNic										
🐔 OneDrive										
💻 This PC										
RDVD (D:)										
Driver										
💣 Network										
1 item 1 item se	lected 2	207 MB								

2. Select **Next** to continue.

Realtek High Definition Audio Driver Setup (4.54) R2.81		- 🗆 ×
Realtek High Definition	Audio Driver R2.81	
	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, click Next.	
InstallShield	<gadk next=""> Cancel</gadk>	
🚛 🔎 🗊 🌣 🍯 🔤	へ 覧 切り	8:42 PM 7/2/2018

3. When installation completed, select **Finish** complete installation.

Realtek High Def	ntion Audio Driver Setup (4.54) R2.81 High Definition	Audio Driver R2.81	-		×
	Realtek High Definition Audio D	Driver Setup (4.54) R2.81			
		Uninstall Complete InstallSheid Witzard has finished uninstalling Realtek High Definition Audio Driver. Realtek audio driver has been uninstalled. If you want to re-install the Realtek audio driver, please restart the computer. Realtek setup program will install audio driver automatically after reboot. The Start is a start my computer now. No, I will restart my computer later. InstallSheid Witzard has finished uninstalling Realtek High Definition Audio Driver. To complete the uninstallation, you must restart your computer.			
	InstallSried	< Back Finish Cancel			
			8	43 PM	

4.5 Ethernet Driver

Follow instructions below to install LAN driver.

1. Open the Driver CD (included in the package) and select LAN driver.



2. When compression is complete, select **Next**.

🖟 Intel(R) Network Connections Install Wizard

Welcome to the install wizard for Intel(R) Network Connections



3. Read the license agreement, and then select Next.

🖟 Intel(R) Network Connections Install	Wizard				Х
License Agreement Please read the following license agree	ment carefully.			(inte	P
INTEL SOFTWAR	RE LICENSE A	GREEN	IENT		^
IMPORTANT - READ BEFOR	E COPYING, II	ISTAL	LING OR USI	NG.	
Do not copy, install, or use this softw (collectively, the "Software") provide ("Agreement") until you have carefu By copying, installing, or otherwise u the terms of this Agreement. If you o do not copy, install, or use the Softw	vare and any a ed under this Ily read the fo using the Soft Io not agree to vare.	associ licens llowin ware, j o the t	iated materia e agreement g terms and you agree to erms of this	als t conditions. be bound by Agreement,	
LICENSES:					~
I accept the terms in the license agreem	ient			Print	
○ I do not accept the terms in the license	agreement				
	< Back		Next >	Cancel	

4. System displays the installed packages, select Next.

记 Intel(R) Network Connections Install Wizard	×
Ready to Install the Program	(intol)
The wizard is ready to begin installation.	linter
Click Install to begin the installation.	
If you want to review or change any of your installation settings, dick Back. Cli exit the wizard.	ck Cancel to
< Back Install	Cancel

5. Confirm the installation, select Install to start the installation.



6. When installation is completed, select **Finish** to close the window.



4.6 Watchdog Driver Installation

For more details about Winmate Watchdog, please download Watchdog Guide from Winmate Downloads Center <u>here</u>.

Follow instructions below to install Watchdog driver.

1. Type "cmd" in the run box then the cmd.exe will appear in programs.



- 2. Right click on the cmd.exe and click on "Run as administrator" to start
- 3. Open the Driver CD (included in the package) and select Watchdog driver.



4. When Windows Security dialog appear, select **install** to continue the Installation.



5. Wait for installation to complete. When installation is complete, press any key to close.



- 6. Open the Driver CD (included in the package) and select Watchdog AP.
- 7. Select Next.



8. The installed storage location is displayed, select **Next** to continue.



- 9. Select **Next** to start the installation.
- 10. When installation is completed, select **Finish** to close the window.



4.7 Digital IO Driver Installation

For more details about Winmate Watchdog, please download Digital IO Guide from Winmate Downloads Center:

Follow instructions below to install **Digital IO** river.

- 1. Type "cmd" in the run box then the cmd.exe will appear in programs.
- 2. Right click on the cmd.exe and click on "Run as administrator" to start



- 3. Open the Driver CD (included in the package) and select Digital IO driver.
- 4. When Windows Security dialog appear, select **install** to continue the Installation.
- 5. Wait for installation to complete. When installation is complete, press any key to close.



6. Open the Driver CD (included in the package) and select Digital IO AP.

🖌 📘 🖛		Application Tools	AP				- 0	×
File Home	Share View Paste Copy p Paste Paste	Manage Dath Shortcut	 → X Delete → → Rename 	New folder	Propert	ies Open -	Select all Select none	^ 🕜
Cli ← → ~ ↑	pboard > RDVD (D:) >	O Driver > WMDIO A	rganize PP v1.0.0.3 → AP	New	v ∂	Open Search AP	Select	P
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Network 2 items 1 item se								



Chapter 5: Technical Support

This chapter includes the directory for technical support. Free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. If any problem occurs immediately contact us.

5.1 Drivers

5.2 Software Development Kit (SDK)

5.1 Drivers

The list of drivers available for IF70 Mini-ITX SBC:

ltem	Driver
1	Chipset Driver
2	Graphic Driver
3	ME Driver
4	Audio Driver
5	Ethernet Driver
6	Watchdog Driver/AP
7	Digital IO Driver/AP

To find the Drivers, please refer to the Driver CD that comes in the package or contact us.

5.2 Software Development Kit (SDK)

The list of SDK available for IF70 Mini-ITX SBC:

ltem	File Type	Description
1	SDK	Watchdog SDK
2	SDK	Digital IO SDK

To find the SDK, please refer to the Driver CD that comes in the package or contact us.

Notes

Notes



Winmate Inc. 9F, No.111-6, Shing-De Rd., San-Chung District, New Taipei City 24158, Taiwan, R.O.C www.winmate.com

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