

POS Motherboard

I1- CPU

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With kind regards,

Your opinion:

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POS Motherboard

I1- CPU

User Manual

Edition February 2013

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Overview

Introduction

This manual describes the features of a Motherboard based on the INTEL[®] Sandy Bridge processor and Q67 chipset in retail form factor.

This I1 Motherboard is designed for the Wincor Nixdorf POS system BEETLE /M-II plus.

Some Highlights of the I1 Motherboard

- INTEL Sandy Bridge 2nd generation i3, i5, i7 Processor family with integrated Graphic core
- INTEL 6 series chipset, Q67 Cougar Point PCH
- Integrated Intel HD and HD 2000 Graphics supporting HDCP, DirectX 10.1 , Full HD 1080p support depending on used processor
- AMT 7 support (Linux support, Keyboard-Video-Mouse redirection, Firewall tunneling, IPV6 protocol)
- DVI-I and DisplayPort interface
- Gigabit LAN onboard (INTEL Lewisville 82579LM LAN PHY)
- HDD SATA III interface (2 ports) and HDD SATA II interface (2 ports)
- Two DDR3 RAM (DIMM) sockets, up to 16GB (2*8GB) / 1066 and 1333MHz, supported size depends on Operating System; max. size 3GB for 32bit OS
- One riser slot
- SIO supports PWM fan speed control and 6 COM ports. COM1 is unpowered, COM2 is powered and COM3 to COM6 have the option to be powered

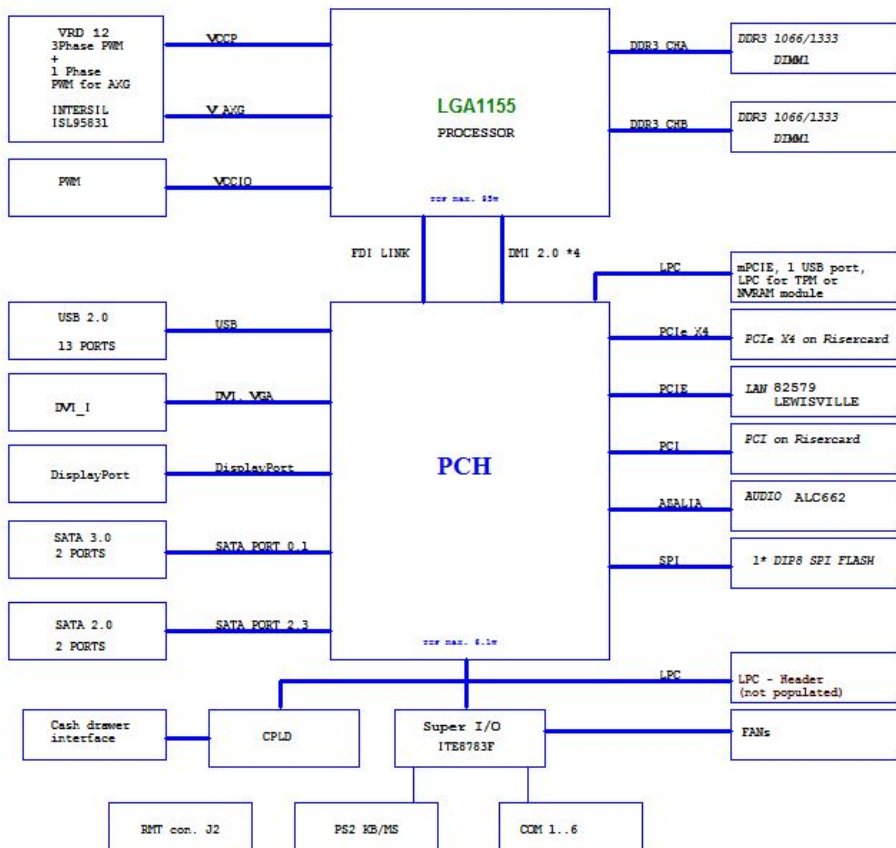
- MiniPCle socket (full size) for NVRAM and TPM module support
- 14 USB ports (3 ports are powered). One of 14 USB ports at miniPCle card slot
- Up to 2 cash drawers can be connected via RJ12 connector at the Power Supply. The 1st connector is always populated, the 2nd connector is optional



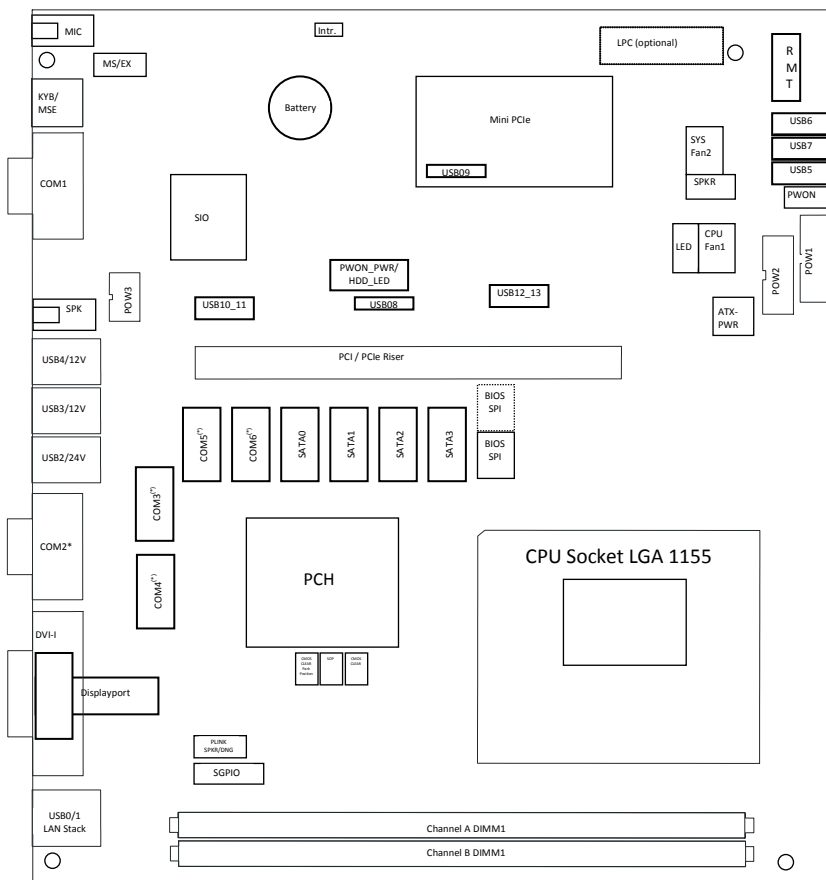
TFT- displays without DDC are not supported

Motherboard Specification

Function Blocks of I1 Motherboard



Motherboard: Mechanical Arrangement



Motherboard PCB Dimension

The Retail proprietary size is 255mm x 210mm (including I/O shield).

External I/O Connector

External I/O connectors are arranged as illustrated below:



Interface	Connector Type
COM1	9pin D-sub male
COM2	9pin D-sub female
Keyboard, Mouse, USB0	6pin Mini Din
LAN, USB0,USB1	RJ45 Ethernet + stacked dual USB series A
DisplayPort and DVI-I	24 + 5pin DVI-I connector, 20pin Display Port connector
AUDIO Speaker Out	3,5 mm female
AUDIO Microphone	3,5 mm female
Power USB 12V USB2,3	2 pcs 4 + 4pin header
Power USB 24V USB4	1 pcs 4 + 4pin header

Internal I/O Connector

Interface	Connector-Type
DDR3 DIMM	2 pcs 240pin connector
Hard disk (SATA III)	2 pcs 7pin Standard SATA headers
Hard disk (SATA II)	2 pcs 7pin Standard SATA headers
12V Power supply	1 pcs ATX 4 pin power connector
3.3V, 5V, 12V supply powered USB supply	1 pcs 2 x 9pin shrouded 1 pcs 2 x 10pin shrouded header 1 pcs 2 x 5pin shrouded header
USB port 5-8	5 pcs 1 x 6pin JST header
USB port 9	On miniPCIe connector
USB port 10-13	2 pcs 2 x 5pin headers, 2.54 mm (two ports on each connector)
SGPIO-BUS (BEETLE /M-II plus BOS)	1 pcs 1 x 6pin
COM* 3-6	4 pcs 2 x 7pin headers
FAN	2 pcs 4pin
RMT	1 pc 1x 7 pin JST header
Dongle detect, ICHSPK for PLINK module	1 pc 2 pin JST header
PCI riser card	1 pcs PCIe x16 connector
LED / Speaker	2 pcs 4pin header, 2.54mm
Chassis intrusion	1 pcs 3pin header

LPC header (optional)	1 pcs 2 x 13pin header 2mm
Int. Mouse / Power Button	2 pcs 4pin header
Mini PCI-Express	1 pcs 52pin Mini-PCIe header
CPU socket	1 pcs 1155pin Intel CPU socket including backplate

Jumper Setting

Jumper	Connector-Type	Setting
CN24	2 pin RM 2.54 header	Open: default, 1-2 CMOS clear
JP2	2 pin RM 2.54 header	Open: default, 1-2 AMT disabled
CN62	2 pin RM 2.54 header	Closed: default, CMOS clear jumper park position

Poly Fuses

Location	Hold / Max Current	Type
5V for USB, Powered COM, DVI Hotplug, PS/2	1.1A / 2.2A	e.g. Bourns MF-MSMF110-2
12V for Powered COM	1.1A / 2.2A	e.g. Bourns MF-R110-AP
12V for Powered USB	1.6A / 3.2A	e.g. Littlefuse 30R160UPR

All Poly fuses have to fulfil the UL requirements (#609501b) for limited power sources (switched off within 5 seconds at 8A).

Maximum Power Consumption

The maximum current is specified as follows, this does not include external connected peripherals (test condition: I7 – 2600, TAT 100% load for all cores and GPU).

Max. Power Consumption

Voltage	I max	P
3.3V	0.56A	1.85 W
5V	0.2A	1 W
5VSB	0.2A	1 W
12V	11.4A	136 W
-12V	0.11A	1.32 W

Typical Power Consumption

I1 motherboard's typical power consumption is listed below.

Test condition: Motherboard rev.: B, no peripherals, keyboard, mouse, USB devices, COM port not connected, Ethernet link and memory configuration as mentioned below, Windows 7- 64Bit idle.

Voltage	Condition	I	P
3.3V		0.76A	2.5 W
5V		0.23A	1.15 W
5VSB (S0)	S0 No Ethernet link	0.18A	0.9 W
	S0 100MBit	0.18A	0.9 W
	S0 1GB	0.20A	1.02 W
	S3 (no WOL)	0.15A	0.75 W
	S3 (WOL 10 Mbit)	0.19A	0.96 W
	S5 (no WOL)	0.11A	0.55 W
	S5 (WOL 10 Mbit)	0.13A	0.65 W
12V	2GB 1* ELIXIR/1333	1A RMS max 0.61 RMS mean	12 W 7.34 W
	4GB 2* ELIXIR/1333	1.2A RMS max 0.60 RMS mean	14.4 W 7.22 W
	Intel Max Power	10.75A RMS max 10.05A RMS mean	129 W 120.6 W
-12V		0.105A	1.26 W

Maximum Current Rating for External Peripherals

Interface	Voltage	I max
Powered COM, total current (COM 2*-6*)	5V	1A
Powered COM single port	5V	0.3A
Powered COM single port	12V	0.6A
Powered COM, total current (for COM 2*, 3*, 4*)	12V	0.9A
Powered COM, total current (for COM 5*, 6*)	12V	0.9A
USB, single port	5V	0.5A
USB, all ports, total current	5V	3.5A
Keyboard	5V	0.5A
DVI, VGA	5V	0.1A
Display Port	3,3V	0.1A
Powered USB, single port PUSB1	12V	3A
Powered USB, single port PUSB2	12V	1,5A
Powered USB, single port PUSB3	24V	3A
PCI or PCIe Card	all	10W

Supported Power Modes (Sx)

The I1 Motherboard supports power states S0, S3, S4 and S5. Wake up events from sleep states are supported by USB ports on LAN / USB double-stack connector 12V poweredUSB ports, internal USB HUB COM1 ring indicator, internal CMOS clock, PS2 Keyboard or mouse and Ethernet.

The Power management supports **ACPI 2.0**.

Thermal Management

The I1 Motherboard supports 2 FAN connectors with 4pin fan type. The 3rd FAN, located in the power supply, is connected through the power supply connector.

CPU Support

Processor	AMT	Clock Speed	Foot print	Internal Graphic frequency (Turbo) /MHz	Max TDP
2 nd Gen. Sandy Bridge I3-2120	Standard manageability	3.3GHz	LGA1155	HD 2000 / 850 (1.100)	65W
2 nd Gen. Sandy Bridge I5-2400	AMT 7	3.1GHz	LGA1155	HD 2000 / 850 (1.100)	95W
2 nd Gen. Sandy Bridge I7-2600	AMT 7	3.4GHz	LGA1155	HD 2000 / 850 (1.350)	95W
Pentium G850	Standard manageability	2.9GHz	LGA1155	HD / 850 (1.100)	65W
Celeron G540	Standard manageability	2.5GHz	LGA1155	HD / 850 (1.000)	65W

Memory Support

The motherboard has 2 DIMM sockets supporting double channel, unbuffered, no ECC DDR3 SDRAM.

- Supported Memory size is up to 8GB per channel.
- Supports total memory size of 1 GB, 2 GB, 4 GB, 8 GB and 16 GB max

The motherboard supports the following memory features:

- 1066 and 1333MHz, unbuffered DDR3 SDRAM DIMM
- Non-ECC
- 1.5V voltage rating
- BIOS automatically detects memory type, size, and speed

Graphics Subsystem

Graphics support through the internal graphics accelerator of the Sandy Bridge processor providing dual independent displays.

Main features are:

- INTEL HD and HD2000 on embedded processors.
- DirectX* 10.1

The PCH Analogue VGA Port uses an integrated 340.4 MHz RAMDAC that can directly drive a standard progressive scan analogue monitor up to a resolution of 2048 x 1536 pixels with 32-bit colour at 75 Hz.

HD3000 is not available on embedded processors.

Video clock frequency is 850 MHz to 1350 MHz (with Turbo boost) depending on processor (for details please see chapter “CPU support”).

Max. DISPLAY Resolution:

Analogue Display

VGA: 2048 x 1536 pixels with 32-bit colour at 75 Hz.

Digital Display

DisplayPort: 2560 x 1600 at 60 Hz

DVI-I: 1920 x 1200 at 60 Hz using DVI (with reduced blanking).

VIDEO out: DVI and VGA on DVI-I connector

DisplayPort interface

PLink on separate PLINK-DP-MODULE connected via DisplayPort cable.

Signal	Voltage level
R,G,B	0.7VP-P @75OHM
HSYNC, VSYNC	2.5V
DDC Channel	Externally buffered to 5.0V

System Clock Generator

The PCH offers **Full Integrated Clock Mode (FICM)**. This feature leads to reduced power consumption because an external clock synthesizer is not necessary.

Gigabit LAN Interface

A Gigabit LAN interface is provided by the PCI-e based Ethernet Controller INTEL 82579LM which supports AMT 7.

Super I/O controller

Super I/O controller IT8783 from ITE provides the following functions:

- Six 16C550 UARTs
- PS/2 keyboard/ mouse controller
- Three automatic fan speed controllers
- Three tachometer inputs
- Hardware monitor

SATA Interface

The I1 Motherboard has two integrated SATAIII (6GB/s) and two SATAII (3GB/s) host controllers that support independent DMA operation.

SATA Port Cougar Point PCH	Usage on Motherboard	SATA Controller
Port #0 SATA III	On-board connector SATA0	1
Port #1 SATA III	On-board connector SATA1	1
Port #2 SATA II	On-board connector SATA2	1
Port #3 SATA II	On-board connector SATA3	1
Port #4 SATA II	Routed on Test points	2
Port #5 SATA II	Routed on Test points	2

CPU, System and Power Supply Fans

I1 motherboard supports automatic fan speed control by pulse width modulation (PWM). The 3rd fan, located in the power supply, is connected through the power supply connector.

System	FAN Connector	Used as
BEETLE /M-II plus	C_FAN1	CPU fan
	C_FAN2	System fan
	CN33 pin 16	Power supply FAN RPM

Audio

An INTEL HD Audio Link is provided by the Q67 Cougar point PCH together with a Realtek HD Audio Codec (ALC262).

Supported interfaces are:

- Line-out
- Mic-in

The onboard stereo audio amplifier delivers typically 2W per channel of continuous average power to an 8 Ohm load with 10% THD.

USB Interface

The Cougar point PCH contains two EHCI compliant host controllers that support USB 2.0 high speed signalling with data transfer rate of up to 480Mb/s. The Cougar point PCH also contains seven UHCI controllers that support USB full speed and low speed signalling.

EHCI	Connection on Motherboard
Controller #: 1 Port #:0	2 ports stacked connector, series A in I/O shield (together with LAN) U_LANM1A connector pin 1,2,3,4
Controller #: 1 Port #:1	U_LANM1A connector pin 5,6,7,8
Controller #: 1 Port #:2	USB 3 –1 port 12V power USB connector, series A in I/O shield (right) USB1 connector pin 1,2,3,4
Controller #: 1 Port #:3	USB 4 –1 port 12V power USB connector, series A in I/O shield (mid) USB2 connector pin 1,2,3,4
Controller #: 1 Port #:4	USB 5-1 port 24V power USB connector, series A in I/O shield (mid) USB2 connector pin 1,2,3,4
Controller #: 1 Port #:5	USB 5 (yellow) JST 6 pin connector CN28 connector pin 1,2,3,4
Controller #: 1 Port #:6	USB 6 (red) JST 6 pin connector CN29 connector pin 1,2,3,4
Controller #: 1 Port #:7	USB 7 (green) JST 6 pin connector CN30 connector pin 1,2,3,4
Controller #: 2 Port #:8	USB 8 (green) JST 6 pin connector CN75 connector pin 1,2,3,4
Controller #: 2 Port #:9	USB 9 Mini PCIe full size connector MINI_PCIE1 pin 36,38
Controller #: 2 Port #:10	USB 10 2*5 pin header RM2.54 FPU3 connector pin 1,3,5,7
Controller #: 2 Port #:11	USB 11 2*5 pin header RM2.54 FPU3 connector pin 2,4,6,8
Controller #: 2 Port #:12	USB 12 2*5 pin header RM2.54 FPU4 connector pin 1,3,5,7
Controller #: 2 Port #:13	USB 13 2*5 pin header RM2.54 FPU4 connector pin 2,4,6,8

Serial Interfaces COM1-6

The I1 Motherboard provides six serial ports. COM1 is a standard serial interface. All RS-232 signals are available on the DSUB-9 pin male connector including the modem signals RI and DCD.

COM2* is a powered COM.

The following cable assemblies (used also on G41 motherboard) for powered COM and standard RS232 functionality are available:

Cable for COM 5*-6* mounted in housing (female, powered):

1750209149 9DSUB-FEMALE_COM_Kabel_195mm

Cable for COM 5-6 mounted in housing (male, non-powered standard):

1750209150 9DSUB-MALE_COM_Kabel_195mm

Cable for COM 3*-4* mounted in I/O shield(female, powered):

5789000416 COM7 VARIABLE STVB-FEMALE

Cable for COM 3-4 mounted in I/O shield (male, non-powered):

6161800416 COM7 VARIABLE STVB-MALE

With the standard cable assembly all RS232 signals are available including the modem signals RI and DCD.

With the powered COM cable assembly, the I/O assignments of the powered serial ports (COM3* to COM6*) deviate from the standard, as it is equipped with system voltage of + 5V and + 12V instead of the signals RI and DCD.

These serial ports are routed to 2 x 7pin headers (2.0 mm shrouded) and via cables to DSUB-9 pin male (standard) or female (powered) connectors. All serial ports comply with RS-232 signal voltage level.

PS/2 Keyboard Mouse Interface

The keyboard controller is part of the Super I/O chip. The PS/2 keyboard/mouse interface is available on a Mini DIN connector.

Type: 6pin Mini Din (Tyco 5749180-1)



Note: This type is equipped with a locking mechanism. An internal connector provides an additional mouse interface.

Front Panel Interface

The motherboard has a front panel interface, which supports the following features:

- Power ON/OFF button and Reset button
- Status LED, showing Active S0- state (Green), Standby S3 (flashing green, this feature is only available at front panel header FP1) ,S4,S5- state(orange), HDD activity LED (Amber, flashing) also used as BIOS activity LED
- System beeper

Risercard

The I1-RISER-PCIe4x-PCI card (01750231212) supports one PCIe x4 and one PCI card.

MiniPCIe slot

I1 Motherboard supports a mini PCIe slot. This interface contains extra LPC bus signals for direct support of BIOS post code cards (I/O 80h), TPM modules, NVRAM modules, wireless LAN and others. Half size modules can be plugged.

RMT feature

I1 Motherboard supports the optional RMT module (Kit order number: 01750182128) on connector J2. This interface is used to remote power on the motherboard from a connected Wincor Nixdorf Monitor BA82/BA83. Furthermore the PC speaker signal is routed to the monitor using this interface.

Cash Drawer Interface

The I1 Motherboard supports 2 cash drawer interfaces. The connector for cash drawer control and feedback is part of the power supply connector.

The 1st cash drawer is connected via RJ12 connector located at Power Supply. Connection for 2nd cash drawer is optional (an additional interface card is necessary).

Reading of I/O address 310h gets back status of cash drawer and power button. 1 indicates an open cash drawer. 0 indicates a closed or not connected cash drawer.

7	6	5	4	3	2	1	0
CD2	CD1	PB	x	x	x	x	x

Writing 1 to address 310h bit 6 or 7 initiate a 500ms active low signal on the cash drawer output 1 or 2. Writing 1 to both bits at the same time is not supported by hardware. In this case both outputs stay inactive.

Intrusion Detect Interface

I1 Motherboard supports an intrusion detect interface on a 3pin shrouded header.

NVRAM

NVRAM is supported by the NVRAM-MiniPCIe-v2 module (01750244359).

TPM

The I1 Motherboard is prepared for Infineon TPM IC. The TPM-MODULE-miniPCIe-v2 (01750244361) is supported.

SGPIO Bus Connector

BEEBLE BOS functions are supported via SGPIO bus connector.

System Beeper

The I1 Motherboard supports a speaker interface connector.

Connector and Pin Assignment

External Connectors

PS/2 Keyboard-Mouse Connector

Type: Mini-DIN Female

Pin Number	Function
1	KB Data
2	MS Data
3	GND
4	KB+5V
5	KB Clock
6	MS Clock
7, 8, 9	Shield GND

Gigabit LAN Connector

Type: RJ45 connector. (Stacked LAN + USB connector)

Pin number	Function
10	Bi-directional Pair 0+
11	Bi-directional Pair 0-
12	Bi-directional Pair 1+
13	Bi-directional Pair 1-
14	Bi-directional Pair 2+
15	Bi-directional Pair 2-
16	Bi-directional Pair 3+
17	Bi-directional Pair 3-

USB Connectors

Type: Stacked USB Type A connector, Male (Stacked LAN + 2* USB A Connector)

Pin Number	Function
1	Fused +5V
2	USB D-
3	USB D+
4	GND

COM1 Connector

Type: DSUB- 9pin, male, DSUB- 9 Male

Pin number	Function
1	DCD - Data Carrier Detect
2	RXD - Serial Data In
3	TXD - Serial Data Out
4	DTR - Data Terminal Ready
5	GND
6	DSR - Data Set Ready
7	RTS - Request To Send
8	CTS - Clear to Send
9	RI - Ring Indicator

COM2* And Other Powered COM Ports Connector

Type: DSUB-9 pin, female

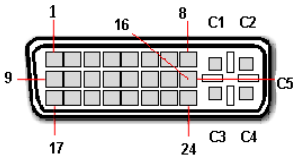
Pin number	Function
1	+12V
2	RXD - Serial Data In
3	TXD - Serial Data Out
4	DTR - Data Terminal Ready
5	GND
6	DSR - Data Set Ready

Pin number	Function
7	RTS - Request To Send
8	CTS - Clear to Send
9	+5V

DVI-I Connector

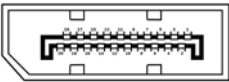
Type: 24+5 pin DVI-I connector

Pin number	Function
C1	Red
C2	Green
C3	Blue
C4	HSYNC
C5	GND
1	TMDS Data 2-
2	TMDS Data 2+
3	TMDS Data 2/4 shield
4, 5, 12, 13, 20, 21	n.c.
6	DDC SCL
7	DDC SDA
8	VSYNC
9	TMDS Data 1-
10	TMDS Data 1+
11	TMDS Data1/3 shield
14	VCC
15	GND
16	HPD
17	TMDS Data 0-
18	TMDS Data 0+
19	TMDS Data0/5 shield
22	TMDS CLK shield
23	TMDS CLK1+
24	TMDS CLK1-



DisplayPort Connector

Type: CompuPack DP202001LS6-A2-RS1 or equivalent



Pin Number	Function
1	LANE0+
2,5,8,11,16	GND
3	LANE0-
4	LANE1+
6	LANE1-
7	LANE2+
9	LANE2-
10	LANE3+
12	LANE3-
13	CONFIG1 (Dongle detect)
14	CONFIG2 (GND)
15	AUXCH+
17	AUXCH-
18	Hotplug detect
19	PWR_RTN (GND)
20	DP_PWR_3V3
21,22,23,24	Case GND

Audio Connector

Type: Audio Jack

Connector	Function
SD3	Line/Speaker out
SD4	Microphone In

Connectors and Headers For Internal Connection

SATA

Type: 7pin SATA connector, LD180F-S16P (Foxconn) or equivalent.



Pin number	Function
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

USB Header

Type: 2 x 5pin headers, 2.54mm pitch.

Pin number	Function
1	+5V
2	+5V
3	D0-
4	D1-
5	D0+
6	D1+
7	GND
8	GND
9	Key
10	GND

+5V 1	2 +5V
P0- 3	4 P1-
P0+ 5	6 P1+
GND 7	8 GND
Key 9	10 GND

Speaker Connector

Type: 1 x 4pin shrouded header, 2.54 mm pitch

Pin number	Function
1	Speaker -
2	GND
3	Reset switch +
4	Speaker + (VCC)

LED Connector

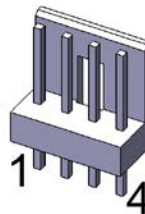
Type: 1 x 4pin shrouded header, 2.54 mm pitch.

Pin Number	Function
1	LED common
2	n.c.
3	HD / BIOS LED
4	Power LED

Fan Connector (with FAN Speed Control)

Type: 4pin connector with Friction Lock, vertical.

Pin Number	Function
1	GND
2	+12V
3	FAN RPM
4	FAN PWM



Intrusion Interface

Type: 3pin shrouded header, B3B-PH-K-S (JST) or equivalent.
This connector is available as an option.

Pin number	Function
1	GND
2	Intrusion input
3	n.c.

Proprietary Power Connector

Type: 2 x 9pin shrouded header, RM2.54

Pin Number	Function
1, 2, 3, 4	GND
5	Coding pin
6, 7, 8, 9, 10	+3.3V
11	KLA2N
12	KLA1N
13	KLE2N
14	KLE1N
15	FANCON_PSU
16	FAN_RPM_PSU
17, 18	+5V

Type: 2 x 5pin shrouded header, RM2.54

Pin Number	Function
1	5VSB
2	GND
3, 4, 5	+24V
6, 7, 8	GND
9, 10	+12V

2 x 10pin shrouded header, RM2.54

Pin Number	Function
1	Power ok
3, 4	+ 12V
5, 6, 15, 16, 17	GND
8	- 12V
9	Power ok
10	Coding pin
11, 13, 14	+ 5V
12	5VSB
18	PSON
20	AKLOW
2, 7, 19	n.c.

2 x 2pin Standard ATX 12V connector

Pin Number	Function
1, 2	GND
3, 4	+ 12V

Mini PCIe (full size)

Full- size modules are supported.

PCI Riser

The riser slot shall support riser cards with one PCIE X4 and one PCI slot and is prepared to support cards with two PCI slots.

Pin Number	Function	Pin Number	Function
B1	PCI_RESET#	A1	GND
B2	GND	A2	RSEVD6
B3	PREQ-1	A3	GND
B4	PIRQ-D	A4	IDSEL0
B5	+5V	A5	GND
B6	GND	A6	IDSEL1
B7	PGNT-1	A7	GND
B8	GND	A8	RSEVD3
B9	LOCK#	A9	GND
B10	GND	A10	PCICLK0
B11	PIRQ-A	A11	GND
B12	ADDRESS30	A12	GND
B13	ADDRESS28	A13	PCICLK1
B14	+5V	A14	GND
B15	ADDRESS26	A15	PREQ-2
B16	+5V	A16	GND
B17	ADDRESS24	A17	WOL#
B18	ADDRESS23	A18	PIRQ-C
B19	PRSNT2	A19	GND
B20	ADDRESS22	A20	PGNT-2
B21	+5V	A21	GND
B22	ADDRESS19	A22	PIRQ-B
B23	+5V	A23	GND
B24	ADDRESS17	A24	ADDRESS31
B25	GND	A25	+3V3
B26	C-BE2	A26	ADDRESS29
B27	GND	A27	+3V3

Pin Number	Function	Pin Number	Function
B28	TRDY#	A28	ADDRESS27
B29	GND	A29	+3V3
B30	PERR#	A30	ADDRESS25
B31	GND	A31	+3V3
B32	DEVSEL#	A32	C-BE3
B33	+5V	A33	ADDRESS21
B34	PAR	A34	ADDRESS20
B35	GND	A35	FRAME#
B36	ADDRESS15	A36	WAKE#
B37	GND	A37	IRDY#
B38	ADDRESS13	A38	PLTRST#
B39	+5V	A39	STOP#
B40	ADDRESS11	A40	SMB_data
B41	GND	A41	SERR#
B42	ADDRESS09	A42	SMB_clock
B43	GND	A43	+3V3
B44	C-BE0	A44	GND
B45	+5V	A45	ADDRESS18
B46	ADDRESS06	A46	C-BE1
B47	+5V	A47	ADDRESS16
B48	ADDRESS04	A48	+3V3
B49	+3V3SB	A49	ADDRESS14
B50	+12V	A50	ADDRESS12
B51	ADDRESS02	A51	ADDRESS10
B52	+5V	A52	+3V3
B53	ADDRESS00	A53	ADDRESS08
B54	PRSNT1	A54	+3V3

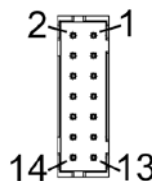
Pin Number	Function	Pin Number	Function
B55	+5VSB	A55	ADDRESS07
B56	+5VSB	A56	+3V3
B57	-12V	A57	ADDRESS05
B58	-12V	A58	+3V3
B59	GND	A59	ADDRESS03
B60	PETN4	A60	+3V3
B61	PETP4	A61	ADDRESS01
B62	GND	A62	+3V3
B63	GND	A63	+12V
B64	PERP4	A64	+12V
B65	PERN4	A65	+12V
B66	GND	A66	+12V
B67	GND	A67	GND
B68	PCIECLK2N	A68	PETP3
B69	PCIECLK2P	A69	PETN3
B70	GND	A70	GND
B71	GND	A71	GND
B72	PCIECLK1N	A72	PERP3
B73	PCIECLK1P	A73	PERN3
B74	GND	A74	GND
B75	GND	A75	GND
B76	PETN1	A76	PERP2
B77	PETP1	A77	PERN2
B78	GND	A78	GND
B79	GND	A79	GND
B80	PERP1	A80	PETN2

Pin Number	Function	Pin Number	Function
B81	PERN1	A81	PETP2
B82	GND	A82	GND

COM3*-6* Connectors

Connector type: 2x7 pin header JST B14B-PHDSS or similar

Pin Number	Function
1	+5V
2	GND
3	DCD - Data Carrier Detect
4	GND
5	CTS - Clear to Send
6	DTR - Data Terminal Ready
7	RTS - Request To Send
8	TXD – Serial Data Out
9	DSR - Data Set Ready
10	RXD - Serial Data In
11	RI - Ring Indicator
12	GND
13	+12V
14	GND



USB connector for HUB

Type: CN75, 6 pin shrouded header, B6B-PH-K-M (JST, green) or equivalent.

Pin Number	Function
1	5V_DUAL_USB
2	USBP8N
3	USBP8P
4	GND
5	GND
6	USB_OC4_R_N

USB connector for USV

Type: CN28, 6 pin shrouded header, B6B-PH-K-Y (JST, yellow) or equivalent.

Pin Number	Function
1	VCC
2	USBP5N
3	USBP5P
4	GND
5	GND
6	OC5 (USB_OC3_R_N)

USB connector

Type: CN29, 6 pin shrouded header, B6B-PH-K-R (JST, red) or equivalent.

Pin Number	Function
1	VCC
2	USBP6N
3	USBP6P
4	GND
5	GND
6	OC5 (USB_OC3_R_N)

USB connector

Type: CN30, 6 pin shrouded header, B6B-PH-K-M (JST, green) or equivalent.

Pin Number	Function
1	VCC
2	USBP7N
3	USBP7P
4	GND
5	GND
6	OC5 (USB_OC3_R_N)

Internal mouse/keyboard connector

Type: 4 pin shrouded header, B4B-PH-K-S (JST) or equivalent.

Pin Number	Function
1	GND
2	MS_CLK
3	MS_DATA
4	KBMSVCC

Internal SGPIO connector

Type: 6 pin shrouded header, B6B-PH-K-S (JST) or equivalent.

Pin Number	Function
1	VCC
2	GP22
3	GP38
4	GNDGP39
5	PLTRST_N
6	GND

Front panel connector

Type: FP1, 2x6 pin header, 2.54mm pitch.

Pin Number	Function
1	PWBTIN_N
2	FP_RST_N
3	GND
4	GND
5	PLED+
6	SPK
7	PLED-
8	Coding pin
9	HDD_LED+
10	GND
11	HDD_LED-
12	SPK-PW

Internal RMT connector

Type: J2, 7 pin shrouded header, B7B-PH-K-S (JST) or equivalent.

Pin Number	Function
1	GND
2	PWBTNIN_N
3	n.c.
4	n.c.
5	n.c.
6	ICHSPK
7	5VSB

Technical Data

Microprocessor	INTEL Sandy Bridge 2 nd generation i3, i5, i7 Processor family
Supported Systems	BEETLE /M-II plus
Architecture	PC-AT compatible and POS - specific functional units
Chipset	Q67 Cougar point PCH, supporting SATA (II and III) controller, USB UHCI and EHCI controller, Interrupt controller, DMA controller, LPC interface, RTC, SMBUS host interface PCI, PCIe x1 and x4, Intel High Definition Audio interface, SPI, Intel Anti-Theft Technology: INTEL VT/TXT support, INTEL RST, vPro and RAID support, Intel Turbo Boost Technology
Super I/O	IT8783 , supporting 6 UARTS, PS/2 Keyboard and Mouse interface, automatic fan speed controller, Hardware monitor, chassis intrusion detection, power button disable function
Ethernet PHY	PCI-e based INTEL 82579LM Lewisville (10/100/1000MBit), PXE
Wake On Feature	Wake On LAN/WLAN, Wake On Time, Wake On USB1 and USB2 (USB/ LAN stack), Wake On Keyboard, Wake On Modem (standard via RI COM1), Wake On RMT (only with optional RMT module)
Sound Controller	Audio Codec and amplifier TEA2025B providing 2W per channel @ 8ohm, 10% THD Stereo Speaker Out and Mic-in, connectors in I/O shield, common GND on speaker out

Cash Drawer Output Input	Supporting up to 2 cash drawers, Onboard CPLD, support for up to two cash drawers Open / closed state of two cash drawer ports can be detected
NVRAM, TPM	Optional mini PCIe module supported
Main Memory	Max. 16 GB (2 * 8GB) , size depends on Operating System; max size 3GB for winXP (32 bit OS), non-ECC running at 1066/1333 MHz
BIOS	SPI Flash, 16MB, AMI BIOS with customization for BEETLE Systems, PnP 1.1, ACPI, DMI-support
Keyboard	PS/2 connection onboard in I/O shield, supporting Y-cable for Mouse support 4 pin JST connector for additional internal PS/2 connection (mouse only)
Serial Interfaces	COM1 onboard in I/O shield, DSUB-9 pin male connector, COM2 onboard in I/O shield, DSUB-9 pin female connector powered COM, COM3 to COM6 onboard 2x7 pin headers supporting powered COM
USB	USB2.0, 14 ports. USB port 0, 1: 2 ports stacked connector, series A in I/O shield (together with LAN) USB port 2, 3: 2 ports 12V power USB connector, series A in I/O shield USB port 4: 1 port 24V power USB connector series A in I/O shield USB port 5 (yellow), USB port 6 (red), USB port 7 (white), USB port 8 (green): 4 ports: 1x6pin internal coloured JST PHR connector

	USB port 9- 1 port: Connected to mini PCIe card slot USB ports 10, 11, 12, and 13: Four ports on two internal 2x5 pin headers.
Status LED	Two front panel LEDs: one Power LED (yellow/green), flashing in S3 and one shared orange LED for HDD and BIOS activity.
Onboard LEDs	3 LEDs: PWROK (green), PROCHOT (yellow) and WLAN activity (yellow).
HDD	2 x SATA II interface (3.0 Gbit/s), 2 x SATA III interface (6.0 Gbit/s).
Riser Card	PCI Bus (32 Bit interface, 33MHz) PCI Express 1.0a, PCIe x4
Video out	Dual independent display INTEL HD2000 internal graphic available on embedded processors.
Battery	for RTC and Super-I/O, Type: CR2032, 220mAh.
Fuses	Poly switches for +5V of powered COM, PS/2 and DVI Power, all USB, +12V and 24V of powered USB, +12V powered COM.
Board Dimension	255mm x 210mm

Changing the Battery

The BEETLE POS systems are equipped with a lithium battery on the motherboard (see also page 4) to ensure data retention, the time and the setup parameters. The battery should be changed approximately every five years.



When inserting the new battery, make sure the polarity is correct. This is marked in the socket. Incorrect replacement of the battery may lead to the danger of explosion.

The battery is located in a socket on the Motherboard. To gain access to the battery, proceed as described in the according chapters of your BEETLE **User Manual**.

See:

http://www.wincor-nixdorf.com/internet/site_EN//EN/Support/Downloads/POSLotterySystems/Manuals/manuals_node.html



The lithium battery must be replaced only by identical batteries or types recommended by Wincor Nixdorf International.

You can return the used batteries to your Wincor Nixdorf International sales outlet. Batteries containing harmful substances are marked accordingly.

The chemical denotations are as follows: **CD** = Cadmium; **Pb** = Lead, **Li** = Lithium.



This symbol on a battery tells you that batteries containing harmful substances must not be disposed of as household waste. Follow the country specific laws and regulations. Within the European Union you are legally bound to return these batteries to the service organization where you purchased the new battery.



The setup parameters must be reset each time the battery has been changed.

Addendum A: Sleep States

S0	Normal operation (“On”)
S3	Suspend to RAM / “Stand By”
S4	Suspend to Disk / “Hibernation”
S5	Soft Off

UEFI BIOS Setup

The main board I1.0-Q67-STD comes with an AMI UEFI BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the main boards components. This section explains the information contained in the Setup program and tells you how to modify the settings according to your system configuration.

Even if you are not prompted to use the Setup program, you might want to change the configuration of your system in the future. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the system can recognize these changes and record them in the NVRAM. All setup data is stored in a non-volatile memory (NVRAM). When you remove the battery, all parameters will be lost.

Standard UEFI BIOS Version

The UEFI BIOS ROM of the system holds the Setup utility. When you turn on the system, it will provide you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <F2> to call the Set-up utility. If you missed to press this key, POST will continue with its test routines, thus preventing you from calling Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + . You can also restart by turning the system off and then on again. But do so only if the first method failed.

If you like to change the boot order only once, you can press the <F10> key during the POST is running. At the end you will see a Pop-Up window with all the devices the system has found. With the keys <UP> and <DOWN> you select the boot device.

The Setup program has been designed to make operations as easy as possible. It is a menu-driven program, so that you can scroll through the various sub-menus and make your selections among the predetermined choices.

When you start Setup, the main program screen will appear. Read more about the Setup entries on the following pages.

As the UEFI BIOS software is constantly being updated, the following UEFI BIOS screens and descriptions are for reference purposes only and may not reflect your UEFI BIOS screens exactly.

BIOS Menu Bar

The top of the screen has a menu bar with the following sections:

Info	Use this menu for information only
Main	Use this menu to make changes to the basic system configuration.
Advanced	Use this menu to enable and make changes to the advanced features.
Boot	Use this menu to configure the default system device used to locate and load the Operating System.
Security	Use this menu to enable a supervisor or user password and Intrusion Detection.
Save & Exit	Use this menu to exit the current menu or specify how to exit the Setup program.



To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

Legend Screen

The right frame displays the key legend. The keys in the legend frame allow you to navigate through the various setup menus.

The following table lists the keys found in the legend with their corresponding alternates and functions.

Navigation Key(s)	Description of Functions
← or → (keypad arrows)	Select the menu item to the left or right.
↑ or ↓ (keypad arrows)	Moves the highlight up or down between fields.
+ (plus key) - (minus key)	Change field contents.
<Tab>	Jumps from one field to the next.
<F1>	Opens a general Help Screen with extended informations.
<F4>	Saves changes and exits Setup.
<Esc>	Opens a windows to select between exit and return to Setup

General Help

In addition to the Item Specific Help window, the UEFI BIOS setup program provides a General Help screen. This screen can be called from any menu by pressing <F1>. The General Help screen lists the legend keys with their corresponding alternates and functions.

Scroll Bar

When a scroll bar appears to the right of a help window it indicates that there is more information displayed that will not fit into the window. Use <PgUp> and <PgDn> or the up and down keys to scroll through the entire help document.

Press <Home> to display the first page, press <End> to reach the last page. To exit the help window, press the <Enter> or <Esc> key.

Sub-Menu



Note that a right pointer symbol “➤” appears left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter.

To call a sub-menu move the highlight to the field and press <Enter>. The sub-menu will then appear immediately. Use the legend keys to enter values and move from field to field within a sub-menu just as you would do within a menu. Use the <Esc> key to return to the main menu.

Take your time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F3>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located at the right side of each menu. This window displays the help text for the currently highlighted field.

Info Screen

When the Setup program is accessed, the following info screen appears:

Wincor Nixdorf Info Page

Product Name:	I1.0-Q67-STD
Bios Version	xx/yy 09/28/2012
Ethernet MAC-Address	AC-DC-FA-DE-BE-EF
d716af80-6f0a-1018-8789-fbd248a1242f	
System:	

###-----	
Mainboard:	

###-----	
Power Supply:	

###-----	

This screen is for information only. Nothing can be changed herein. All information is intended to facilitate the support of your system.

Product Name

This text is fixed for your mainboard with standard UEFI BIOS. This board is also called "I1.0-Q67-STD".

BIOS Version

The UEFI BIOS version is displayed in the WN release format xx/yy

The UEFI BIOS Date is displayed the date of release in international format.

Ethernet MAC Address

The Ethernet MAC-Address of the onboard LAN Controller is displayed at this line if this device is [Enabled].

UUID Info

A UUID is an identifier standard used in software construction, standardized by the Open Software Foundation. The intent of UUIDs is to enable distributed systems to uniquely identify information without significant central coordination.

System, Main board, Power Supply

The default placeholders may be replaced by specific data from factory, describing configuration, serial number etc. for each device.

Main Menu

BIOS Information	
Memory Information	
Total Memory	2048 MB (DDR3 1067)
System Date	[FR 09/29/2012]
System Time	[23:23:23]
Access Level	Administrator

System Date [XX/XX/XXXX]

Sets your system to the date that you specify (usually the current date).
The format is month, day, year. Valid values for month, day and year are:
Month: (1 to 12), Day (1 to 31), Year: (up to 2079).

System Time [XX: XX: XX]

Sets your system to the time that you specify (usually the current time).
The format is hour, minute, second. Valid values for hour, minute, and second are: Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59).
Press <Enter> to terminate every entry value and reach the next position.

On the upper right frame find the keys listed to modify the values.

Advanced Menu

GbE Controller	Enabled
Legacy OpROM Support	
Launch PXE OpROM	[Disabled]
Launch Storage OpROM	[Enabled]
➤ Trusted Computing ➤ Hardware Configuration ➤ CPU Configuration ➤ North Bridge ➤ SATA Configuration ➤ Intel TXT(LT) Configuration ➤ USB Config. ➤ ME Subsystem ➤ Super IO Configuration ➤ H/W Monitor ➤ AMT Configuration ➤ Serial Port Console Redirection	

GbE Controller

The Gigabit Ethernet Controller is always enabled to support the AMT functionality.

Configuration Options: [Enabled]

Legacy OpROM Support

Launch PXE OpROM [Enabled]

Handle the boot option ROM for legacy network devices.

Configuration Options: [Disabled] [Enabled]

Launch Storage OpROM [Enabled]

Handle the boot option ROM for legacy mass storage devices.

Configuration Options: [Disabled] [Enabled]

Sub Menu ➤ Trusted Computing

TPM Configuration	
TPM Support	[Disabled]
TPM State	[Disabled]
Pending TPM Operation	[None]
Current TPM Status Information	
TPM Enabled Status	[Disabled]
TPM Active Status	[Deactivated]
TPM Owner Status	[UnOwned]

TPM Support [Disable]

This option enable or disable the Trusted Platform Module.
After change this option the system will reboot automated.
If the security device is disable the OS will not show this device in device list.

TPM State [Disabled]

This option change the actual state of the security module.
Select the TPM operation after the next automated reboot of the system.

Pending TPM Operation [None]

[None]: The TPM state will be untouched.
[Enable Take Ownership]: This option will enable to take the ownership.
[Disable Take Ownership]: This option will disable to take the ownership.
[TPM Clear]: WARNING! Clearing erases information stored on the TPM.
You will lose all created keys and access to data encrypted by these keys.
After clearing the TPM, it will get the status “deactivated” and not owned.

Sub Menu ➤ Hardware Configuration

Wake On LAN	[Enabled]
Wake On Ring	[Disabled]
Wake On Time	[Disabled]
Display Output to COM3	[Disabled]
Speaker Volume	[High]
Restore AC Power Loss	[Power Off]
Onboard COM5/COM6	[Auto Disabled]
BootOrder Menu	[Enabled]

Wake On LAN [Disabled]

This allows enabling or disabling power up the BEETLE when the LAN controller receives a call while the BEETLE is in Soft-Off or Hibernate mode. Configuration options: [Disabled] [Enabled].

Wake On Ring [Disabled]

This allows enabling or disabling power up the BEETLE when the modem receives a call while the BEETLE is in Soft-Off or Hibernate mode.



NOTE: The BEETLE cannot receive or transmit data until the system and applications are fully running, thus connection cannot be made on the first try. Turning an external modem off and then back on while the BEETLE is off causes an initialization string that will cause the system to power on.

Configuration options: [Disabled] [Enabled].

Wake On Time

[Disabled]

This allows enabling or disabling power up the BEETLE on specific time while the BEETLE is in Soft-Off or Hibernate mode. If this option is enabled a wake time is programmable within next two lines. The first line is setting the hour in international format(0-23). The second line is setting the minutes(0-59). Configuration options: [Disabled] [Enabled].



NOTE: Wake time is also adjustable from OS and can override this option. Configuration options: [Disabled] [Enabled].

Wake-on Modes

Please note that you have to shut down the system in power saving modes by OS before you can use Wake-on modes. Switching off the system by main power switch or front button-override will not initialize system wakeup functions. See following table, for wakeup events and power states:

	Standby (S3)	Hibernate (S4)	Soft off (S5)
Front Button	Yes	Yes	Yes
LAN (Note1)	Yes	Yes	Yes
Modem (Note2)	Yes	Yes	Yes
Time (Note3)	Yes	Yes	Yes

Note 1: "Yes" is valid only, if the option <Wake on LAN> is [Enabled].

Note 2: "Yes" is valid only, if the option <Wake on Ring> is [Enabled].

Note 3: "Yes" is valid only if the option <Wake on Time> is [Enabled].

- Display Output to COM3** [Disabled]
- This enables or disables the display output control to a device connected to COM3. Configuration options: [Disabled] [Enabled].
- Speaker Volume** [High]
- This entry is the volume control of the installed speaker.
Configuration options: [Low] [Middle] [High].
- Restore AC Power Loss** [Power Off]
- Select whether you want your system to be rebooted after power has been interrupted. [Power off] leaves your system off and [Last State] reboots your system if it was active before power loss. With the key [Power On] selected, the system will start up any time power is available.
Configuration options: [Power off] [Last State] [Power On].
In mode [Power On] the front button is disabled. This means that there is no way to force down the system pressing the front button for more than four seconds, avoiding accidental shutdown.
Configuration options: [Power On] [Power Off] [Last State].
- Onboard COM5/COM6** [Auto disabled]
- This option handle the states of the onboard serial ports 5 and 6 if a Wincor Nixdorf COM card is mounted. The option [Always enabled] keep always the COM Ports 5/6 available and all COM Ports on the WN Card are also available.
The option [Auto disabled] disable COM Ports5/6 if a WN COM card is mounted.
Configuration options: [Always enabled] [Auto disabled].
- Boot order Menu** [Disabled]
- This option enables or disables the popup menu to change the boot order by pressing F10 during POST.
- [Enabled] Popup menu is available during POST
[Disabled] Popup menu is not available during POST

Sub Menu ➤ CPU Configuration

CPU Configuration

➤ Socket 0 CPU Information

CPU Speed	2400 MHz
64-bit	Supported
Active Processor Cores	[All]
Limit CPUID Maximum	[Disabled]
Execute Disable Bit	[Enabled]
Hardware Prefetcher	[Enabled]
Adjacent Cache Line Prefetch	[Enabled]
Intel Virtualization Technology	[Disabled]
Power Technology	[Energy Efficient]
Factory long duration power limit	65 Watts
Long duration power limit	0
Factory long duration maintained	1000 ms
Long duration maintained	0
Recommended short duration power 1	1.25 * Long Duration
Short duration power limit	0

Socket 0 CPU Information

This option will show a separated information screen with all detailed information about the installed CPU.

Limit CPUID Maximum [Disabled]

When CPUID instruction is executed, newer CPU may return a value greater than 3 which cause a certain problem with specific operating systems. Enabling " Limit CPUID Maximum" will limit the returned value to 3 (and less) to get rid of the problem. The problem does not occur with Windows series operating systems.

Configuration options: [Disabled] [Enabled]

Execute Disable Bit [Enabled]

Execute Disable Bit (EDB) is an Intel® Hardware-based security feature that can help reduce system exposure to viruses and malicious code. EDB allows the processor to classify areas in memory where application code can or cannot execute.

Configuration options: [Disabled] [Enabled]

Hardware Prefetcher [Enabled]

The processor has a hardware prefetcher that automatically analyzes its requirements and prefetches data and instructions from the memory into the Level 2 cache. This reduces the latency associated with memory reads.

Configuration options: [Disabled] [Enabled]

Adjacent Cache Line Prefetch [Enabled]

The processor has a hardware adjacent cache line prefetch mechanism that automatically fetches an extra 64-byte cache line whenever the processor requests for a 64-byte cache line. This reduces cache latency by making the next cache line immediately available if the processor requires it as well.

Configuration options: [Disabled] [Enabled]

Intel Virtualization Technology [Disabled]

Virtualization enhanced by Intel® Virtualization Technology will allow a system to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple "virtual" systems.

Configuration options: [Disabled] [Enabled]

Power Technology

[Energy Efficient]

This option handles the power management features. The option [Energy Efficient] will optimized the power consumption of the CPU. Setting the option to [Custom] allows the adjustment of several power management features.

Configuration options: [Disabled] [Energy Efficient] [Custom]

Long duration power limit

Long duration power limit - this is the processor power consumption limit (in Watts) during a long duration time window.

Configuration options: 0 – 255 (Watts)

Long duration maintained

Long duration maintained - this is the time in milliseconds where the Long Duration Power Limit is maintained.

Configuration options: 0 – 32000 (ms)

Short duration power limit

During Turbo Mode, the system may exceed the processor's default power setting and exceed the Short Duration Power limit.

By increasing this value, the processor can provide better performance for a short duration.

Configuration options: 0 – 255 (Watts)

Sub Menu ➤ North Bridge

North Bridge	
VT-d	[Disabled]
Initiate Graphic Adapter	[PCI/IGD]
Internal Graphics Port Order	[DVI-I > Display Port]
IGD Memory	[64M]

VT-d [Disabled]

Intel Virtual Technology (VT) is supported by several processors. If an installed processor doesn't support the VT feature this option is not available.

Initiate Graphic Adapter [PCI/IGD]

This option selects the graphics controller to use as primary boot device.
Configuration options: [IGD] [PCI/IGD] [PCI/PEG/IGD] [PEG/IGD]

IGD Memory [64M]

This option set the size of shared memory for IGD.
Configuration options: [32M][64M][96M]...[480M][512M]

Sub Menu ➤ **SATA Configuration**

SATA Configuration	
SATA Mode	[IDE Mode]
Serial-ATA Controller 0	[Compatible]
Serial-ATA Controller 1	[Disabled]
SATA Port 0	Not Present
SATA Port 1	Not Present
SATA Port 2	Not Present
SATA Port 3	Not Present

SATA Mode [IDE Mode]

This option selects the SATA controller mode.

Configuration options: [Disabled] [IDE Mode] [AHCI Mode] [RAID Mode]

Serial-ATA Controller 0 [Compatible]

This option enables or disables the SATA Controller 0. Adjust the compatible option to support legacy devices.

Configuration options: [Disabled] [Enhanced] [Compatible]

Serial-ATA Controller 1 [Disabled]

This option enables or disables the SATA Controller 1.

Configuration options: [Disabled] [Enhanced]

Sub Menu ➤ TXT(LT) Configuration

Intel Trusted Execution Technology Configuration

Intel TXT support only can be enabled/disabled if SMX is enabled. VT and VT-d support must also be enabled prior to TXT.

Secure Mode Extensions (SMX)

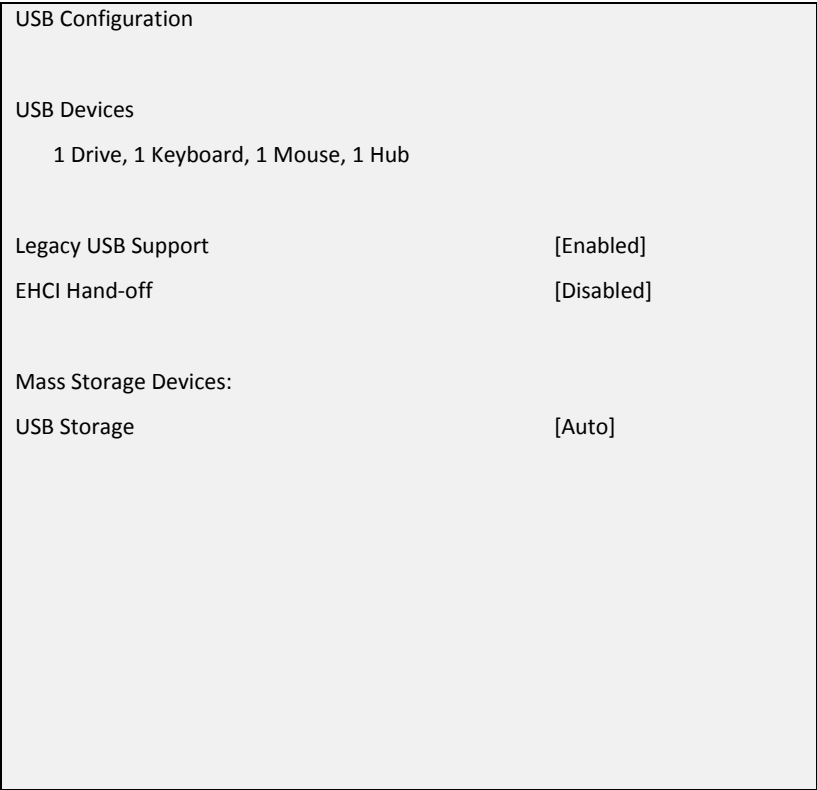
[Disabled]

Intel TXT(LT) Support

[Disabled]

Intel Trusted Execution Technology (TXT) is supported by several processors. If an installed processor does not support the TXT feature this page is not available.

Sub Menu ➤ USB Configuration



Legacy USB Support [Enabled]

Enables the legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable this option keep USB devices available only for EFI applications.

Configuration options: [Disabled] [Enabled] [Auto]

EHCI Hand-off [Disabled]

Enables support for operating systems without an EHCI hand-off feature.

Configuration options: [Disabled] [Enabled]

Mass Storage Devices:

All device are listed in this section are enumerates according to their media format. An USB stick is a special device and can be assigned as follows:
[Auto] [Floppy] [Forced FDD] [Hard Disk] or [CD-ROM]

Sub Menu ➤ ME Subsystem

Intel ME Subsystem Configuration	
ME Version	7.x.xx.xxxx
ME Subsystem	[Enabled]
ME Temporary Disable	[Disabled]
End of POST Message	[Enabled]
Execute MEBx	[Enabled]
MEBx Mode	[Normal]

Intel ME (Management Engine) Subsystem

Intel ME Subsystem is a separated microcontroller embedded in the chip-set driven by a special firmware.

ME Subsystem [Enabled]

This option enables or disables the ME. All other options are hidden if ME is disabled.

Configuration options: [Disabled] [Enabled]

ME Temporary Disable [Disabled]

With the option DISABLED the ME will be disabled until a next booting.
Configuration options: [Disabled] [Enabled]

End of POST Message [Enabled]

This option enables or disables an End Of POST message to a remote server.
Configuration options: [Disabled] [Enabled]

Execute MEBx [Enabled]

The Management Engine BIOS Extension (MEBx) provides platform-level configuration options to configure the behavior of the Management Engine (ME) platform. Options include enabling and disabling individual features and setting power configurations.
Configuration options: [Disabled] [Enabled]

MEBx Mode [Enabled]

The MEBx handles an own setup and can be entered while booting the system by pressing the keys CTRL + P. With the option NORMAL a short message shows the key combination CTRL + P and MEBx can be entered. The option Hidden Ctrl + P will hide this message and Enter MEBx Setup will always enter MEBx while booting the system.
Configuration options: [Normal] [Hidden Ctrl + P] [Enter MEBx Setup]

Sub Menu ➤ Super IO Configuration

Super IO Configuration	
Super IO Chip	IT8783F
Serial Port 1 Config.	[IO=3F8h; IRQ=4]
Serial Port 2 Config.	[IO=2F8h; IRQ=3]
Serial Port 3 Config.	[IO=3E8h; IRQ=10]
Serial Port 4 Config.	[IO=2E8h; IRQ=10]
Serial Port 5 Config.	[IO=2A0h; IRQ=11]
Serial Port 6 Config.	[IO=2E0h; IRQ=11]

The Super IO Configuration is only an information screen which shows all serial ports with their associated properties.

Sub Menu ➤ H/W Monitor

PC Health Status		
PCH Temperature		: +30 °C/+86 °F
Board Temperature		: +30 °C/+86 °F
CPU Temperature		: +45 °C/+113 °F
CPU Fan Speed		: 1630 RPM
System Fan Speed		: N/A
PSU Fan Speed		: 1285 RPM
CPU		: +1.056 V
Gfx		: +0.432 V
P3V3		: +3.406 V
P12V		: +12.096 V
N12V		: -12.031 V
DDR1V5		: +1.556 V
VBAT		: +3.024 V

The H/W Monitor is only an information screen which shows all system temperatures, voltages and fan speeds.

Sub Menu ➤ AMT Configuration

AMT	[Enabled]
Unconfigure AMT/ME	[Disabled]
Watchdog timer	[Disabled]
OS Watchdog timer	0
BIOS Watchdog timer	0

AMT [Enable]

Intel Active Management Technology (AMT) is a special firmware for the maintenance of the system with remote systems. This option enables or disables the AMT. All other options are hidden if AMT is disabled.

Configuration options: [Disabled] [Enabled]

Unconfigure AMT/ME [Enable]

This option performs AMT/ME unconfigure without password operation.
Configuration options: [Disabled] [Enabled]

WatchDog Timer [Disabled]

This option enables or disables the Watchdog timer. If this option is enabled the watchdog timer for OS and BIOS are separately adjustable.

Configuration options: [Disabled] [Enabled]

Sub Menu ➤ Serial Port Console Redirection

COM0 (Disabled)	
Console Redirection	Port Is Disabled
COM1(PCI Bus0,Dev0,Func0) (Disabled)	
Console Redirection	Port Is Disabled
Serial Port for out-of-Band Management/ Windows Emergency Management Services (EMS)	
Console Redirection	[Enabled]
➤ Console Redirection Settings	

Out-of-Band Mgmt Port	[COM0(Disabled)]
Terminal Type	[VT-UTF8]
Bits per second	[115200]
Flow Control	[None]
Data Bits	8
Parity	None
Stop Bits	1

Console Redirection [Enable]

This option enables or disables the Console Redirection. Next option is greyed out if Console Redirection is disabled.
Configuration options: [Disabled] [Enabled]

Console Redirection Settings

If this option is entered a new screen will open.

Out-of-Band Mgmt Port

[COM0 (Disabled)]

Microsoft Windows Emergency Management Service (EMS) allows access for remote management of a Windows Server through a serial port.

Configuration options: [COM0(Disabled)] [COM1(PCI Bus0,Dev0,Func0) (Disabled)]

Terminal Type

[VT-UTF8]

VT-UTF8 is the preferred terminal type for out-of-band management.

Configuration options: [VT100] [VT100+] [VT-UTF8] [ANSI]

Bits per second

[115200]

Select the serial port transmission speed.

Configuration options: [9600] [19200] [57600] [115200]

Flow Control

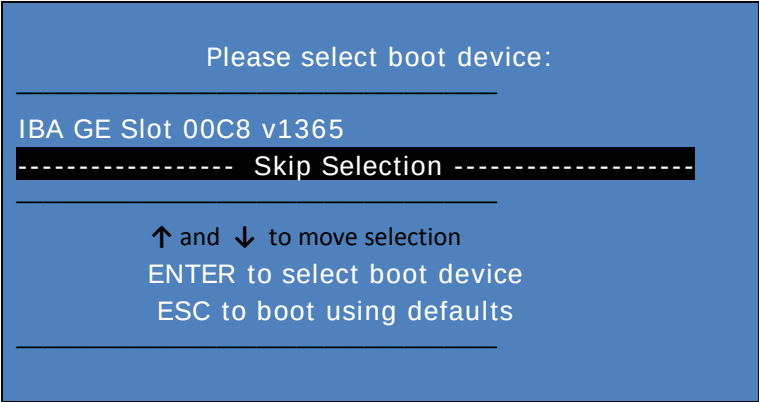
[None]

Flow Control can prevent data loss from buffer overflow.

Configuration options: [None] [Hardware RTS/CTS] [Software Xon/Xoff]

Boot Menu

The Boot Menu enables you to set the order of bootable devices to a regular base. Pressing the function key <F10> while POST is running will change the boot order only once. You will see a Pop-Up window listing all devices the system is able to boot from. Select the boot device with keys <Up> and <Down>. Press <Enter> key to start the selected device booting.



Boot Configuration	
Fast Boot	[Disabled]
Boot Option Priorities	
Boot Option #1	[USB]
Boot Option #2	[Hard Drive]
Boot Option #3	[Network]
Boot Option #4	[UEFI:]

Fast Boot

[Disabled]

Enables or disables booting with initialization of minimal set of devices required to launch activate boot option.

Configuration options: [Disabled] [Enabled]

‘#n’ Boot Device

These menu entries are used to specify the boot sequence from the available devices. Every entry (from #1 till #n) specifies a boot device that found during POST.

Security Menu

Password Description

If the Administrator’s password is set,
Then this only limits access to Setup and is
only asked for when entering Setup.
The password must be 3 to 20 characters long.

Administrator Password

Intrusion detection

[Disabled]

Case Status

[Closed]

Administrator Password

This field allows you to set the password. Highlight the field and press <Enter>.Type a password and press <Enter>. You can type 3 to 20 alpha-numeric characters. Symbols and other characters are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. This password allows full access to the UEFI BIOS Setup menu. To clear the password, highlight this field and press <Enter>. The same dialog box as above will appear. Press <Enter> and the password will be set to [Disabled].

Intrusion Detection

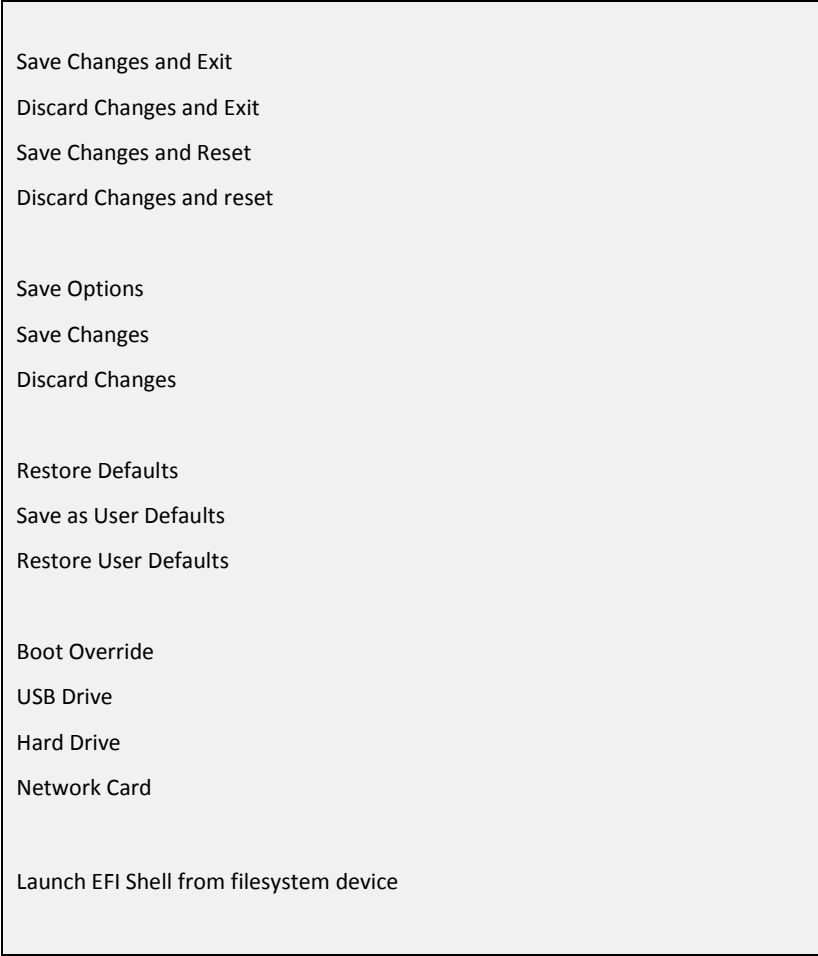
[Disabled]

If the system cover is removed and the Intrusion Detection is [Enabled], the system stops during the next reboot or power up process and a warning message is displayed . After this warning the boot process stops and the user has to enter the UEFI BIOS setup which resets the open case detection automatically. Additionally, a viewing point of the case open switch below the enable/disable entry point is placed. This message will signalize the case open status directly.

Configuration Options:

[Disabled] [Enabled]

Save & Exit Menu



Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and reset

Save Options
Save Changes
Discard Changes

Restore Defaults
Save as User Defaults
Restore User Defaults

Boot Override
USB Drive
Hard Drive
Network Card

Launch EFI Shell from filesystem device

Once all selections from the various menus in the Setup program are made, changes should be saved and Setup can be left. Select Exit from the menu bar to display the following menu.

Save Changes and Exit

Having finished changing setup values, this option from the Exit menu or pressing <F4> ensures that values are saved to the NVRAM. The NVRAM is sustained by an onboard backup battery and stays on even when the BEETLE is turned off. Once this option is selected, a confirmation is requested. Select [Ok] to save changes and exit.

Discard Changes and Exit

This option should only be used if the changes made in Setup should not be saved. If changes were made to fields other than system date, system time, and password, the system will ask for confirmation before exiting.

Save Changes and Reset

Having finished changing setup values, this option from the Exit menu ensures that values are saved to the NVRAM. The NVRAM is sustained by an onboard backup battery and stays on even when the BEETLE is turned off. Once this option is selected, a confirmation is requested. Select [Ok] to save changes and reset the system.

Discard Changes and Reset

This option should only be used if the changes made in Setup should not be saved. If made some changes to fields other than system date, system time, and password, the system will ask for confirmation before exiting and reset the system.

Restore Defaults

This option loads the default values for each of the values on the Setup menu. When this option is selected or if <F3> is pressed, a confirmation is requested. Select [Ok] to load default values. Now select Exit Saving to save the default values or make other changes before saving the values to the non-volatile RAM.

Save as User Defaults

This option saves the default user values for each of the parameters on the Setup menu. When this option is selected a confirmation is requested. Select [Ok] to save the user default values. Now select Exit Saving or make other changes before saving the values to the non-volatile RAM.

Restore User Defaults

This option restores the default user values for each of the parameters on the Setup menu. When this option is selected a confirmation is requested. Select [Ok] to load the user default values. Now select Exit Saving Changes or make other changes before saving the values to the non-volatile RAM.

Boot Override

With this option you choose a boot device that is listed below this menu entry. Every entry specifies a boot device that enumerates during POST.

Launch EFI Shell from Filesystem Device

Attempts to launch EFI shell application from one of the available filesystem devices.

Test Points Codes

At the beginning of each POST routine, the UEFI BIOS outputs the test point error code to I/O port address 80h. Use this code during trouble shooting to establish where the system failed and what routine has been performed.

Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	SEC errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

SEC Phase

Status Code	Description
0x00	Not used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization

SEC Error Codes

0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not loaded

PEI Phase

Status Code	Description
Progress Codes	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-Memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-memory South Bridge initialization (South Bridge module specific)
0x1D - 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other).
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started

0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F-0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started
PEI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error.
0x55	Memory not installed
0x56	Invalid CPU type or Speed
0x57	CPU mismatch
0x58	CPU self-test failed or possible CPU cache error
0x59	CPU micro-code is not found or micro-code update is failed
0x5A	Internal CPU error
0x5B	reset PPI is not available
0x5C-0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4-0xE7	Reserved for future AMI progress codes
S3 Resume Error Codes	
0xE8	S3 Resume Failed
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC-0xEF	Reserved for future AMI error codes

Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found
0xF4	Recovery firmware image is loaded
0xF5-0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

PEI Beep Codes

# of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXE IPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

DXE Phase

Status Code	Description
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)

0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE Initialization (South Bridge module specific)
0x74	South Bridge DXE Initialization (South Bridge module specific)
0x75	South Bridge DXE Initialization (South Bridge module specific)
0x76	South Bridge DXE Initialization (South Bridge module specific)
0x77	South Bridge DXE Initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E – 0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started
0xA5	SCSI Reset
0xA6	SCSI Detect

0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements can not be met

Abbreviations

ACPI	Advanced Configuration and Power Interface
AT	Advanced Technology
ATA	AT Attachment
BIOS	Basic Input and Output System
BOS	Back Office System
CMOS	Complementary Metal Oxide Semiconductor
COMn*	Powered COM Interface (Asterisk denotes Power)
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit
DDC	Display Data Channel
DIMM	Dual Inline Memory Module
DMA	Direct Memory Access
DMI	Desktop Management Interface
DVI	Digital Video Interface
EEPROM	Electrical Erasable Read Only Memory
EFI	Extensible Firmware Interface
EHCI	Enhanced Host Controller Interface
EMS	Expanded Memory System
FICM	Full Integrated Clock Mode
IDE	Integrated Drive Electronics
IGD	Internal Graphic Device
IPL	Initial Program Load (Device)
LAN	Local Area Network
LCD	Liquid Crystal Display
MAC	Media Access Control
ME	Management Engine

NVRAM	Non-volatile Random Access Memory
PCH	Platform Controller Hub
PCI	Peripheral Component Interconnect
PnP	Plug and Play
POS	Point of Sales
POST	Power On Self Test
PWM	Pulse Width Modulation
RAM	Random Accessible Memory
RI	Ring Indicator
ROM	Read Only Memory
RS	Retail Systems
SATA	Serial AT Attachment (new version of hard disk interface)
SMB	System Management Bus
SMM	System Management Mode
SMRAM	System Management RAM
SPI	Serial Peripherals Interface
TDP	Thermal Design Power
TFT	Thin-film transistor
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
UHCI	Universal Host Controller Interface
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
UUID	Universal Unique Identifier
VGA	Video Graphics Array
WOL	Wake On LAN

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