# NP-NANO ITX-J1900
# Single Board Computer
# User Manual



| Release Date | | Revision |
|---|---|---|
| **April 2023** | | **V1.0** |

# Warning!

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

## Safety Precautions

Follow the messages below to prevent your systems from damage:

◆ Avoid your system from static electricity on all occasions.

◆ Prevent electric shock. Don't touch any components of this card when the card is power-on.

Always disconnect power when the system is not in use.

◆ Disconnect power when you change any hardware devices. For instance, when you

connect a jumper or install any cards, a surge of power may damage the electronic

components or the whole system.

# Table of Contents

# Chapter 1                  System

## 1. Specifications

| NP-NANO-ITX-J1900 | |
| --- | --- |
| **Specifications** | |
| **Size** | 120mm*120mm |
| **CPU** | Intel Celeron J1900 2.0GHz quad core processor |
| **GPU** | Intel CPU Integrated Graphics |
| **Memory** | 4GB - 2SO-DIMM , DDR3L 1.35V 1333/1600MHz Memory   Maximum Support 8G |
| **Display Connector** | 2 HDMI or HDMI+VGA, Support HDMI VGA display synchronously and asynchronously |

| On board LAN | 1 or 2 or 4 optional Realtek RT8111E,1000M Ethernet controllers Support PXE Guidance, and Remote Wakening |
|---|---|
| Storage | 1* 7pin SATA3.0 HDD connector, transmission speed 6Gbps |
| | 1* mSATA3.0 slot |
| Expand Socket | 1* Mini-PCIe slot, support WIFI/4G module |
| USB | 6*USB2.0 1*USB3.0 |
| Power Supply | DC 12V |
| Front I/O Interface | 4* USB 2.0 |
| | 1* Line out and MIC-In two-in-one jack |
| | 2* DB9 RS232 serial ports（RS232 default, COM1 and COM2 can be changed to RS485 by jumper） |
| | 1* Hard disk LED light |
| | 1* Power-on button |
| Back I/O | 1* HDMI1.4 display port |
| | 1* VGA display port（2-HDMI1.4 or HDMI+VGA optional） |
| | 1* USB 3.0 port, 1* USB 2.0 port |
| | 2* RJ-45 1000M Ethernet controllers（Can change one LAN to USB 2.0） |
| | 1* 12V DC power input |
| Built-in I/O | 1* USB 2.0 1*4Pin（USB2.0 cannot use when you use 4G function） |
| | 2* COM port 2*5Pin（COM 1 to 4 optional） |
| | 1* 4pin ATX power input connector |
| | 1* Hard disk power supply connector |
| | GPIO support 4 ways input output |
| | 1* Front panel switch-on and LED light connector 2*5Pin |
| BIOS | 64Mb Flash ROM |
| Form Factor | MINI-ITX (6 layers PCB) , 120mm*120mm |
| System Monitoring and Management | Wake on LAN System Power Management Temperature management, voltage management Fan speed monitoring |
| Working Humidity | 0% ~ 95% (relative humidity, non-condensing) |
| Operating Temperature | -15°C ~ 60°C |

# 1.3 Brief Description of NP-NANO ITX-J1900

NP-NANO ITX-J1900 features a fan less design with the Intel Quad-Core Celeron J1900 (2.0 GHz) Quad Core CPU.

The NP-NANO ITX-J1900 is designed to provide a cost-effective and versatile solution for a wide variety of industrial and commercial applications. Meet the requirements of your application with optional Windows 10 Operating System.

# Chapter 2                                                    Hardware

## 2.1 Mainboard

| Specifications | |
|---|---|
| **Board Size** | 170mm x 113mm |
| **CPU Support** | Intel® Celeron Processor N2930(1M Cache, 1.8 GHz) |
| **Chipset** | Intel NM10 Express |
| **Memory Support** | Onboard 2GB DDRIII SDRAM |
| **Graphics** | Integrated Intel GMA 3600 (N2600) |
| **Display Mode** | 1 x CRT Port<br>1 x LVDS1 (18/24-bit single LVDS) |
| **Support Resolution** | Up to 1920 x1200 for CRT<br>Up to 1366 x768 for LVDS1 (N2600) |
| **Dual Display** | CRT+LVDS1 |
| **Super I/O** | Winbond W83627UHG-E |
| **BIOS** | AMIBIOS |
| **Storage** | 1 x SATA Connector (7P)<br>1 x SATA Connector (7P+15P)<br>1 x SD Socket (USB to SD) |
| **Ethernet** | 2 x PCIe GbE LAN by Realtek RTL8111E |
| **USB** | 2 x USB 2.0 (type A)stack ports (USB4/USB5)<br>2 x USB 2.0 Pin header via CN3 (USB2/USB3)<br>2 x USB 2.0 Pin header via CN1 (USB0/USB1)<br>1 x USB 2.0 for MPCIE1 (USB7)<br>Mini-PCIe(USB7) |
| **Serial** | 1 x RS-232/RS-422/RS-485, DB9 connector for external (COM1)<br>    pin 9 w/5V/12V/Ring select<br>1 x RS232 port, DB9 connector for external (COM2)<br>    pin 9 w/5V/12V/Ring select<br>1 x RS422/485 header via CN2 (COM3)<br>2 x UART via CN3 (COM5,COM6) |
| **Digital I/O** | 8-bit digital I/O Pin header via CN2 |

| | |
|---|---|
| | 4-bit digital Input<br>4-bit digital Output<br>4-bit digital I/O Pin header via CN3<br>2-bit digital Input<br>2-bit digital Output |
| **Battery** | Support CR2477 Li battery by 2-pin header |
| **Audio** | Realtek ALC662 HD audio codec<br>Line-in, Line-out, MIC via 2x6-pin header<br>Audio Line out in phone jack |
| **Keyboard /Mouse** | 1 x PS2 keyboard/mouse 1x6 box pin header via CN3 |
| **Expansion Bus** | 1 x mini-PCI-express slot<br>1 x PCI-express via CN3<br>Option WLAN/BT Module and Antenna |
| **Touch Ctrl** | 1 x Touch control header for TCH1 (COM4) |
| **Power Management** | Wide Range DC 9~36V input<br>1 x 3-pin power input connector |
| **Switches and LED Indicators** | 1 x Power on/off switch via CN1<br>1 x Reset switch via CN1<br>1 x Power LED status via CN1<br>1 x HDD LED status via CN1<br>1 x Buzzer |
| **External I/O port** | 2 x COM Ports (COM1/COM2)<br>2 x USB 2.0 Ports (USB4/USB5)<br>2 x GbE LAN Ports<br>1 x Line out   Audio phone jack |
| **Watchdog Timer** | Software programmable 1 – 255 second by Super I/O |
| **Temperature** | Operating: -20℃ to 70℃<br><br>Storage: -40℃ to 85℃ |
| **Humidity** | 5% - 95%, non-condensing, operating |
| **Power Consumption** | 12V /0.95A (Intel Celeron N2930 processor with 2GB DDR3 DRAM) |
| **EMI/EMS** | Meet CE/FCC class A |

## 2.2 Installations

NP-NANO-ITX-1900 is a 120 x 120 mm industrial motherboard developed on the basis of Intel Bay Trail-D Processors and NM10, which provides abundant peripheral interfaces to meet the needs of different customers. Also, it features dual GbE ports, 2-COM ports and one Mini PCIE configuration, one VGA port, one HDMI port. The product is widely used in various sectors of industrial control.

### 2.2.1 Jumpers Setting and Connectors

Board Top
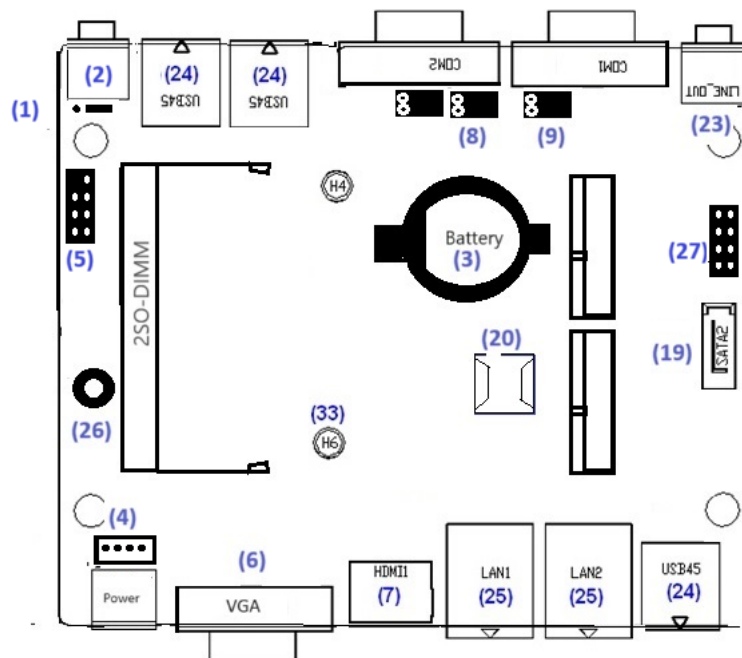


**Figure 2.2: Jumpers and Connectors Location_ Board Top**

# 2.3 Jumpers Setting and Connectors

## 1.   AT-ATX1:

(2.0mm Pitch 1X3 box Pin Header), ATX Power and AT Power jumper setting.

| AT-ATX1 | Mode |
|---------|------|
| Open | AT Power |
| Close | ATX Power |
| Close | **(Default)** |

## 2. Power:

Power Button.

## 3.   BAT1 :

(1.25mm Pitch 1X2 box Pin Header) 3.0V Li battery is embedded to provide power for CMOS.

| Pin# | Signal Name |
|------|-------------|
| Pin1 | VBAT |
| PIN2 | Ground |

## 4.   DC-IN2:

(5.08mm Pitch 1x4 Pin Connector), DC12V System power input connector。

| Pin# | Power Input |
|------|-------------|
| Pin1 | DC+12V |
| Pin2 | Ground |
| Pin3 | FG |
| Pin4 | N/A |

## 5.   FPanel1:

(5.08mm Pitch 2x8 Pin Connector)
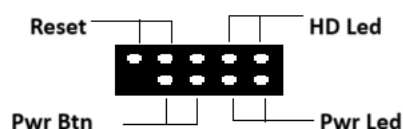
# 6.  VGA1:

Video Graphic Array Port

| Pin # | 15-Pin D | 15-Pin D |
|---|---|---|
| --- | name | Description |
| 1 | RED Video | Red Video |
| 2 | GREEN Video | Green Video |
| 3 | BLUE Video | Blue Video |
| 4 | ID2 | Monitor ID, Bit #2 |
| 5 | GND | Ground |
| 6 | RGND | Red Ground |
| 7 | GGND | Green Ground |
| 8 | BGND | Blue Ground |
| 9 | Key | No pin installed |
| 10 | SGND | Sync Ground |
| 11 | ID0 | Monitor ID Bit #0 |
| 12 | ID1 | Monitor ID Bit #1 |
| 13 | HSYNC | Horizontal Sync |
| 14 | VSYNC | Vertical Sync |
| 15 | ID3 | Monitor ID Bit #3 |

VGA Connector Pin out

# 7.  HDMI:
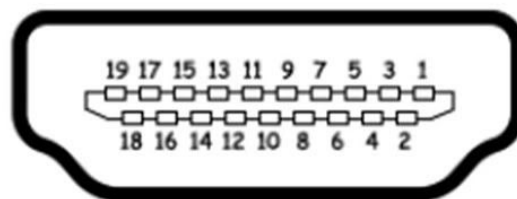
| Pin# | Signal | Pin# | Signal |
|---|---|---|---|
| 1 | TMDS data 2+ | 11 | TMDS clock shield |
| 2 | TMDS data 2 shield | 12 | TMDS clock- |
| 3 | TMDS data 2- | 13 | CEC |
| 4 | TMDS data 1+ | 14 | No connected |
| 5 | TMDS data 1 shield | 15 | DDC clock |
| 6 | TMDS data 1- | 16 | DDC data |
| 7 | TMDS data 0+ | 17 | Ground |
| 8 | TMDS data 0 shield | 18 | +5V power |
| 9 | TMDS data 0- | 19 | Hot plug detect |
| 10 | TMDS clock+ | | |

## 8.  JRS-485 SW2:

COM2 jumper setting, it provides selectable RS232 or RS422 or RS485 serial signal output.

| Function | Pin# |
|---|---|
| **RS232 (Default)** | **ON: Pin1, Pin2, Pin3, Pin4** |
| RS422 (option) | OFF: Pin1, Pin2 |
| RS485 (option) | OFF: Pin1, Pin2 |

## 9.  JRS-485 SW1:

COM1 setting, it provides selectable RS232 or RS422 or RS485 serial signal output.

| Function | RS_422 Pin# |
|---|---|
| **RS232 (Default)** | **OFF:    Pin1, Pin2, Pin3, Pin4** |
| RS422 (option) | ON:    Pin1, Pin2, Pin3, Pin4 |
| RS485 (option) | ON:    Pin1, Pin2, Pin3, Pin4 |

## 11.  COM1:

**(Type DB9),** Rear serial port, standard DB9 Male serial port is provided to make a direct connection to serial devices.
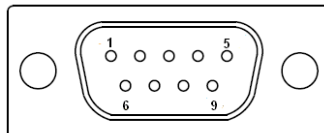


| RS232 (Default): | |
|---|---|
| Pin# | Signal Name |
| 1 | DCD#    (Data Carrier Detect) |
| 2 | RXD (Received Data) |
| 3 | TXD (Transmit Data) |

| 4 | DTR (Data Terminal Ready) |
|---|---|
| 5 | Ground |
| 6 | DSR (Data Set Ready) |
| 7 | RTS (Request To Send) |
| 8 | CTS (Clear To Send) |
| 9 | RI (Ring Indicator) |
| | |

| RS485 (option): | |
|---|---|
| Pin# | Signal Name |
| 1 | 485- |
| 2 | 485+ |
| 3 | NC |
| 4 | NC |
| 5 | Ground |
| 6 | NC |
| 7 | NC |
| 8 | NC |
| 9 | NC |
| | |

## 19   SATA1:

(SATA 7Pin+15Pin), SATA Connectors, one SATA connectors are provided, with transfer speed up to 3.0Gb/s.

## 20   SIM1/SD:

(SD/SIM card socket), Micro Secure Digital Memory Card socket.

## 23.   LINE  OUT:

(Diameter 3.5mm Jack), HD Audio port, an onboard Realtek ALC662 codec is used to provide high quality audio I/O ports. Line Out can be connected to a headphone or amplifier.


Line out

## 24. USB45:

**USB4/USB5：** (Double stack USB type A), Rear USB connector, it provides up to 4

USB2.0 ports, High-speed USB 2.0 allows data transfers up to480 Mb/s ,support USB full-speed and low-speed signaling.

USB4

USB5
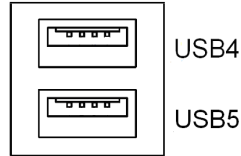
**Each USB Type A Receptacle (2 Ports) Current limited value is 1.5A.**
**If the external USB device current exceeds 1.5A, please separate connectors into different Receptacle.**

## 25. LAN1/LAN2:

**LAN1/LAN2:** (RJ45 Connector), Rear LAN port, Two standard 10/100/1000M RJ-45 Ethernet ports are provided. Used Realtek RTL8111E chipset, LINK LED (green) and ACTIVE LED (yellow) respectively located at the left-hand and right-hand side of the Ethernet port indicate the activity and transmission state of LAN.

LAN1          LAN2
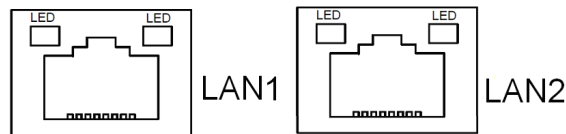
## 26. BUZ1:

Onboard buzzer.

## 27 GPIO1:

(2.0mm Pitch 2X4 box Pin Header), General Purpose I/O **in BIOS settings.**

# Chapter 3                                BIOS Setup

## 3.1   Operations after POST Screen

After CMOS discharge or BIOS flashing operation,.Press [Delete] key to enter CMOS Setup.
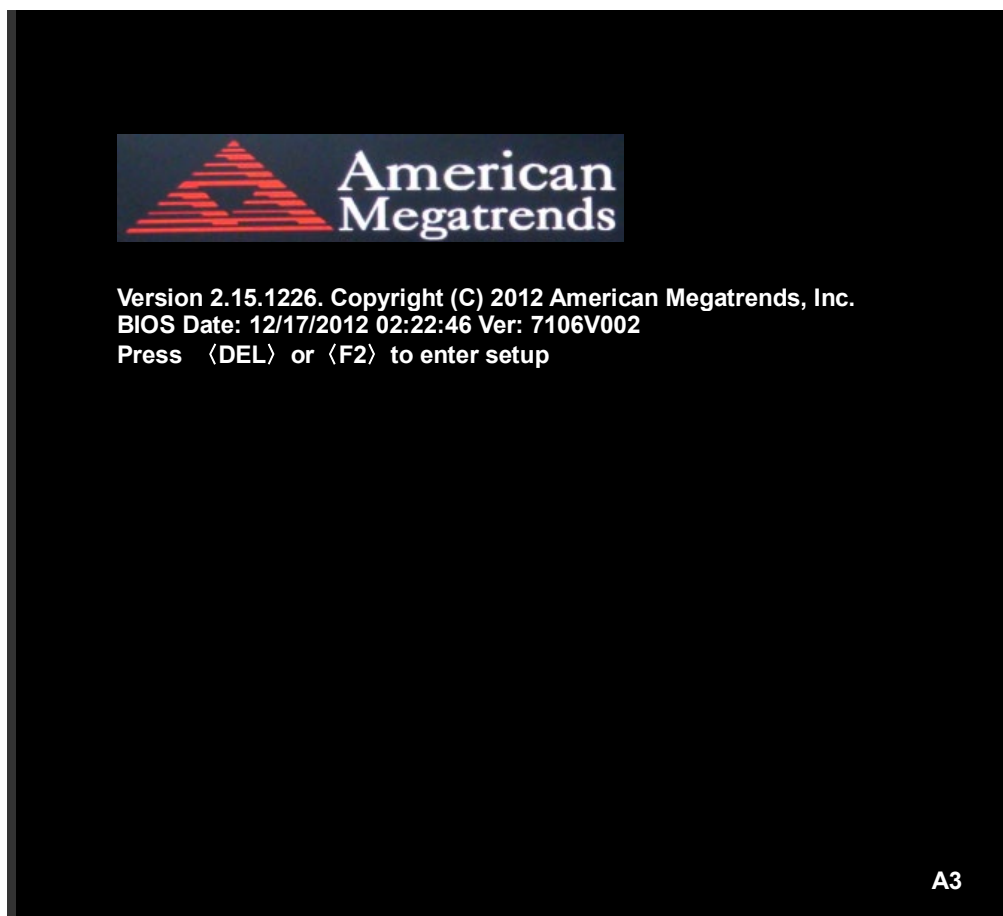


After optimizing and exiting CMOS Setup, the POST screen displayed for the first time is as follows and includes basic information on BIOS, CPU, memory, and storage devices.

## 3.2   BIOS SETUP UTILITY

Press [Delete] key to enter BIOS Setup utility during POST, and then a main menu containing system summary information will appear.

## 3.3   Main Settings

```
      Aptio Setup Utility - Copyright (C) 2022 American
 Main

BIOS Information
BIOS Vendor                          American Megatrends
Core Version                         5.010
Compliancy                           UEFI 2.4; PI 1.3
Motherboard Identifier               NUC19D 2C
Service ID                           F1
Build Date and Time                  07/20/2022 21:15:37
Access Level                         Administrator


OS Selection                         [Linux/Windows7]


System Language                      [English]


System Date                          [Fri 09/06/2024]
System Time                          [01:29:37]










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```

**System Time:**

Set the system time, the time format is:

Hour :        0 to 23

Minute :     0 to 59

Second :    0 to 59

**System Date:**

Set the system date, the date format is:

**Day**:        Note that the 'Day' automatically changes when you set the date.

**Month**:   01 to 12

**Date:**      01 to 31

**Year:**      1998 to 2099

# 3.4   Advanced Settings
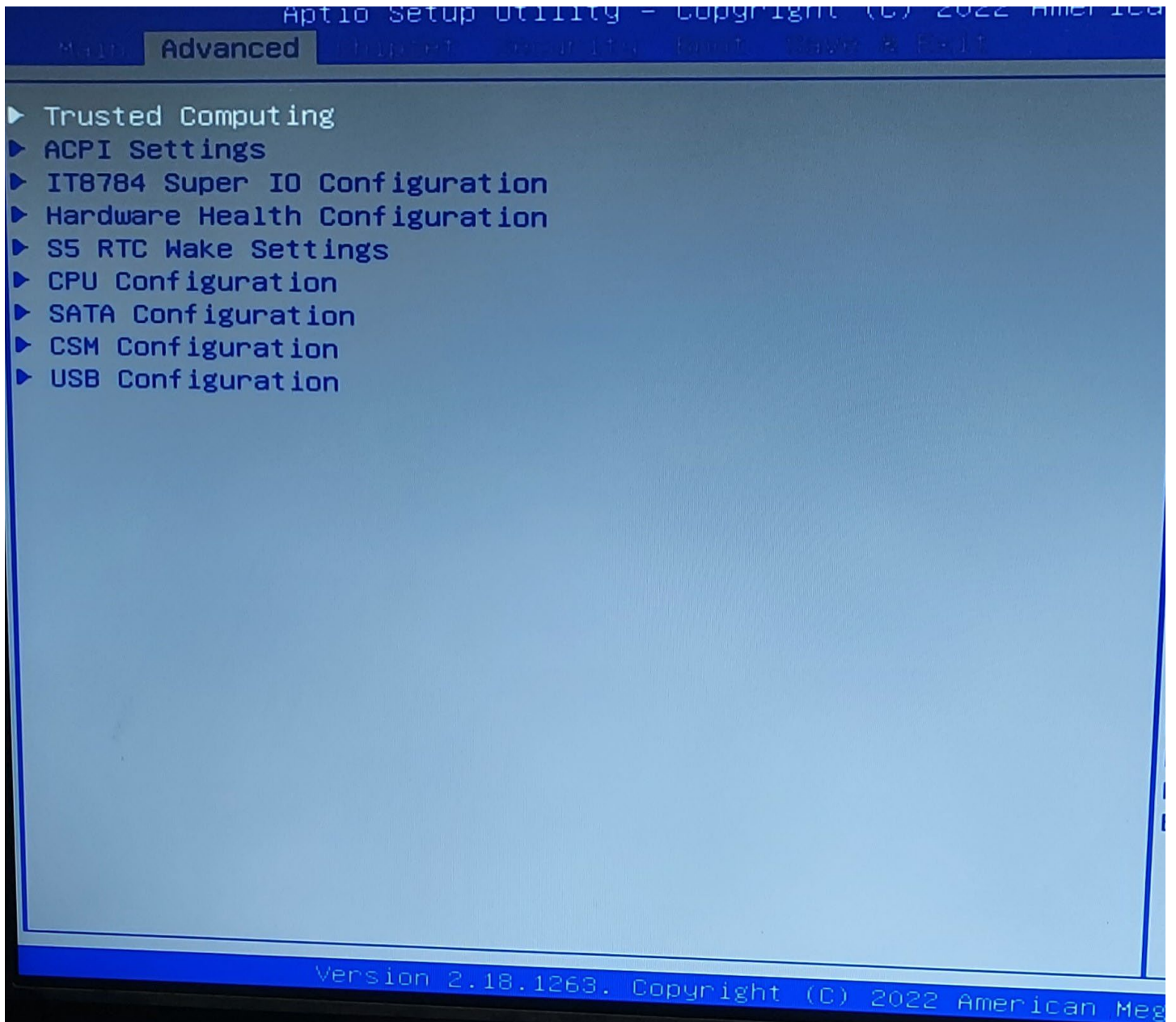


### 3.4.1  ACPI Settings

**Enable ACPI Auto Conf:**

> **[Disabled]**
> [Enabled]

**Enable Hibernation:**

> **[Enabled]**
> [Disabled]

**ACPI Sleep State:**

**[Both S1 and S3 available for OS to choose from ]**
[Suspend Disabled]
[S1 only(CPU Stop Clock) ]
[S3 only (Suspend to RAM) ]

**Lock Legacy Resources:**

**[Disabled]**
[Enabled]

**S3 Video Repost:**

**[Disabled]**
[Enabled]

### 3.4.2 CPU Configuration

| | |
|---|---|
| Processor Type | Intel(R) Celeron N2930 |
| EMT64 | Not Supported |
| Processor Speed | 1600 MHz |
| System Bus Speed | 400MHz |
| Ratio Status | 16 |
| Actual Ratio | 16 |
| System Bus Speed | 400 MHz |
| Processor Stepping | 30661 |
| Microcode Revision | 269 |
| L1 Cache RAM | 2x56 k |
| L2 Cache RAM | 2x512 k |
| Processor Core | Dual |
| Hyper-Threading | Supported |

Hyper-Threading:

**[Enabled]**
[Disabled]

Execute Disable Bit:

**[Enabled]**
[Disabled]

**Limit CPUID Maximum:**

**[Disabled]**
[Enabled]

### 3.4.3 Thermal Configuration

CPU Thermal Configuration
DTS SMM

**[Disabled]**
[Enabled]


Platform Thermal Configuration
Critical Trip Point   [POR]
Active Trip Point Lo [55 C]
Active Trip Point Hi [71C]
Passive Trip Point [95]
Passive TC1 Value       1
Passive TC2 Value       5
Passive TSP Value      10


### 3.4.4  IDE Configuration
SATA Port0               Not Present
SATA Port1               Not Present


**SATA Controller(S):**

**[Enabled]**
[Disabled]
**Configure SATA as:**

**[IDE]**
[AHCI]
**Misc Configuration for hard disk**


### 3.4.5  USB Configuration
USB Configuration
USB Devices:

1 Drive   , 1 keyboard

Legacy USB Support:

[Enabled]
[Disabled]
EHCI Hand-off:

[Disabled]
[Enabled]


USB hardware delays a
USB transfer time-out:

[20 sec]

[10 sec]
                                [5 sec]
                                [1 sec]
Device reset time-out:

                                [20 sec]
                                [10 sec]
                                [30 sec]
                                [40 sec]
Device power-up delay

                                [Auto]
                                [Manual]

Mass Storage Devices :

Multiple card Reader 1

                                [Auto]
                                [Floppy]
                                [Forced FDD]
                                [Hard Disk]
                                [CD-ROM]

### 3.4.6 TI8784 Super IO Configuration

```
                  Aptio Setup Utility - Copyright (C) 2022 American
          Advanced

     IT8784 Super IO Configuration

     Super IO Chip                         IT8784
   ▶ Serial Port 1 Configuration
   ▶ Serial Port 2 Configuration

     Misc. Configuration
     Restore AC Power Loss                 [Power On]
     Watch dog Controller                  [Disabled]

     GPIO Modules Settings
     GPIO Pin3 Output Level                [Low]
     GPIO Pin5 Output Level                [Low]
     GPIO Pin7 Output Level                [Low]
     GPIO Pin9 Output Level                [Low]




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```

**TI8784** Super IO chipset **TI8784**

Serial Port 1 Configuration

Select IRQ address or Auto


Power Failure

[Keep last state]

[Always off]

[Always on]

GPIO Module Settings

Set the output levels for the pins on the main board.


### 3.4.7 Hardware Health

PC Health Status


| | | |
|---|---|---|
| System temperature1 | : | +38 |
| System Speed | : | N/A |
| VCORE | : | +0.968 V |
| +12V | : | +12.302 V |
| +3.3V | : | +3.320 V |
| +1.5V | : | +1.528 V |
| AVCC | : | +5.203 V |
| VCC5V | : | +5.216 V |
| VSB5 | : | +5.203 V |
| VBAT | : | +3.334 V |


# 3.6   Boot Settings

Aptio Setup Utility - Copyright (C) 2022 America

Boot

Boot Configuration
Setup Prompt Timeout                              1
Bootup NumLock State                              [On]

Quiet Boot                                        [Disabled]
Fast Boot                                         [Enabled]
  VGA Support                                     [EFI Driver]
  USB Support                                     [Partial Initial]
  PS2 Devices Support                             [Enabled]
  NetWork Stack Driver Support                    [Disabled]

Boot Option Priorities
Boot Option #1                                    [Windows Boot Manage...]
Boot Option #2                                    [PO: MSH-256       ...]

Hard Drive BBS Priorities

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Setup Prompt Timeout                    [1]

Bootup Numlock State

                                        [On]
                                        [off]

Quiet Boot

                                        [Disabled]
                                        [Enabled]

Fast Boot

                                        [Enabled]
                                        [Disabled]

Skip VGA

                                        [Enabled]

[Disabled]

Skip USB

[Disabled]
[Enabled]

Skip PS2

[Disabled]
[Enabled]

CSM16 Module Version     07.69

Gatea20 Active

[Upon Request]
[Always]

Option ROM Messages

[Force BIOS]
[Keep Current]

Interrupt 19 Capture

[Immediate]
[Postponed]

Boot Option #1
Boot Option #2
……

Sets the system boot order

Hard Drive BBS Priorities    [SATA PM:*** … ]

Boot Option #1
SATA PM:***…
******
Disabled

CSM Parameters
     Launch CSM

[Always]
[Never]

     Boot option filter

[UEFI and Legacy]
[Legacy only]
[UEFI only]
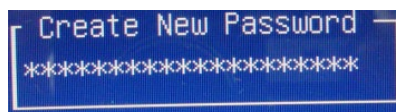
Launch PXE OpROM poli

        [Do not Launch]

        [UEFI only]

        [Legacy only]

Launch Storage OpROM

        [Legacy only]

        [Do not Launch]

        [UEFI only]

Launch Video OpROM po

        [Do not Launch]

        [UEFI only]

        [Legacy only]

Other PCI device ROM

        [UEFI OpROM]
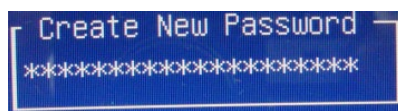
        [Legacy OpROM]

## 3.7   Security Settings

**Aptio Setup Utility – Copyright (C) 2012**

**American Megatrends, Inc.**

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

| Password Description | Set Administrator |
| | Password |
| | |
| If ONLY the Administrator's password is set, | |
| Then this only limits access to Setup and is | |
| Only asked for when entering Setup. | |
| If ONLY the User's password is set, then this | |
| Is a power on password and must be entered to | |
| Is a power on password and must be entered to | |
| Boot or enter Setup. In Setup the User will | |
| Have Administrator rights. | →←: Select Screen |
| The password length must be | ↑↓  : Select Item |
| In the following range: | Enter:   Select |
| Minimum length          3 | +/- : Charge Opt. |
| Maximum length         20 | F1 : General Help |
| | F2: Previous Values |
| Administrator Password | F3:Optimized Defaults |
| User Password | F4:Save and Exit |
| | ESC   Exit |

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### 3.7.1  Administrator Password

Create New Password
*********************

### 3.7.2  User Password

Create New Password
*********************

Type the password with up to 20 characters and then press ≺Enter≻ key. This will clear all previously typed CMOS passwords. You will be requested to confirm the password. Type the password again and press ≺Enter≻ key. You may press ≺Esc≻ key to abandon password entry operation.

To clear the password, just press ≺Enter≻ key when password input window pops up. A confirmation message will be shown on the screen as to whether the password will be disabled. You will have direct access to BIOS setup without typing any password after system reboot once the    password is disabled.
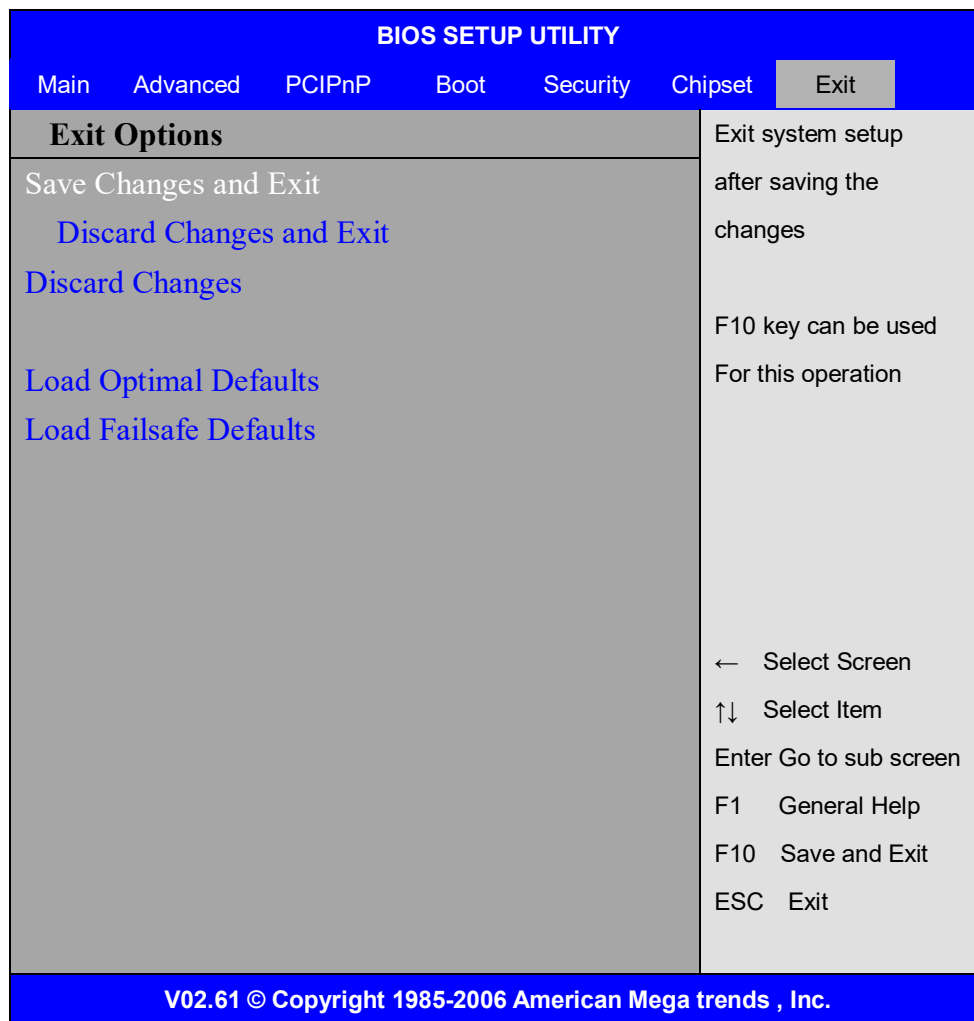
Once the password feature is used, you will be requested to type the password each time you enter BIOS setup. This will prevent unauthorized persons from changing your system configurations.

Also, the feature is capable of requesting users to enter the password prior to system boot to control unauthorized access to your computer. Users may enable the feature in Security Option

of Advanced BIOS Features. If Security Option is set to System, you will be requested to enter the password before system boot and when entering BIOS setup; if Security Option is set to Setup, you will be requested for password for entering BIOS setup.

# 3.8   Save and Exist Settings

# 3.9   Exit Options

| BIOS SETUP UTILITY | | | | | | |
|---|---|---|---|---|---|---|
| Main | Advanced | PCIPnP | Boot | Security | Chipset | Exit |

| Exit Options | Exit system setup |
|---|---|
| Save Changes and Exit | after saving the |
| Discard Changes and Exit | changes |
| Discard Changes | |
| | F10 key can be used |
| Load Optimal Defaults | For this operation |
| Load Failsafe Defaults | |
| | ←   Select Screen |
| | ↑↓   Select Item |
| | Enter Go to sub screen |
| | F1   General Help |
| | F10   Save and Exit |
| | ESC   Exit |

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**Save Changes and Exit:**

Save configuration changes and exit setup?

(F10 key can be used for this operation)

[OK]

[Cancel]

**Discard Changes and Exit:**

Discard Changes and Exit setup?

(ESC key can be used for this operation)

[OK]

[Cancel]

**Discard Changes:**

Discard changes?

(F7 key can be used for this operation)

[OK]

[Cancel]

**Load Optimized Defaults:**

Load Optimized Defaults?

(F9 key can be used for this operation)

[OK]

[Cancel]

**Load Fail-Safe Defaults:**

Load Fail-Safe Defaults?

(F9 key can be used for this operation)

[OK]

[Cancel]