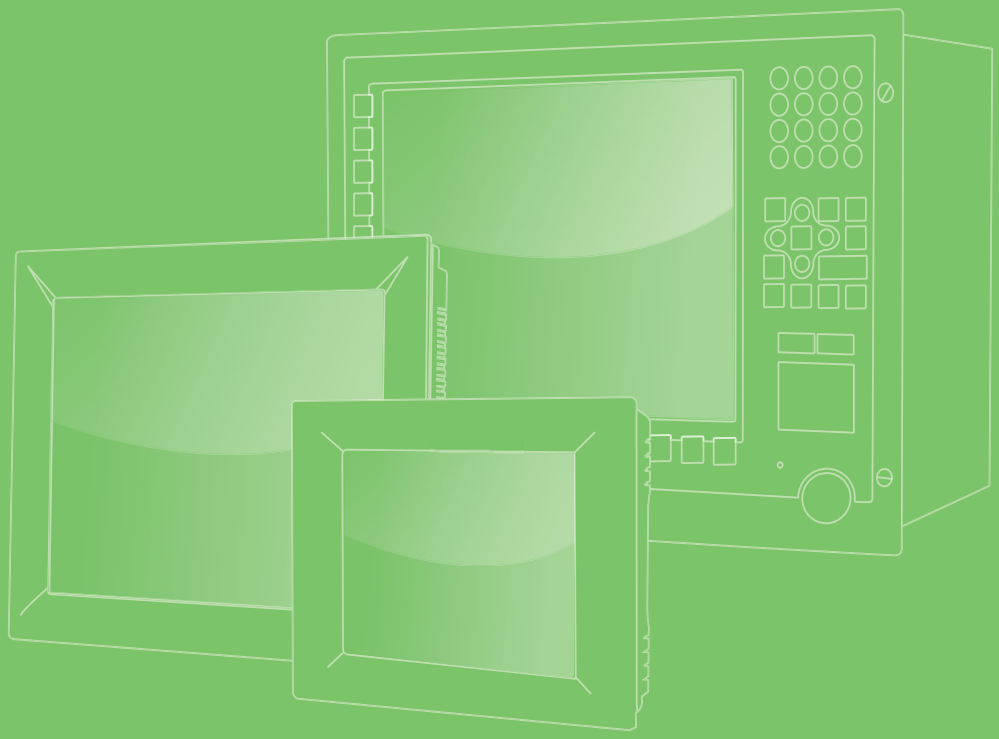

User Manual

PPC-3150SW
PPC-3180SW
PPC-324W-PN4

15.6"/18.5"/23.8" Panel PC with TFT LCD and Intel® Pentium® N4200 Processor

ADVANTECH

Enabling an Intelligent Planet

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Part No. 2001315000 Edition 1

Printed in China October 2024

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from damage resulting from electrostatic discharge (ESD) or electromagnetic interference (EMI) leakage, we strongly recommend using CE-compliant industrial enclosure products.

Technical Support and Assistance

1. Visit the Advantech website at http://support.advantech.com to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Safety Instructions

1. Read these safety instructions carefully.
   Veuillez lire attentivement ce manuel d'instructions de sécurité.
2. Retain this user manual for future reference.
   Veuillez conserver ce manuel d'instructions pour référence ultérieure.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
   Débranchez l'appareil de toutes les prises de courant avant le nettoyage. Nettoyez-le uniquement à l'aide d'un chiffon humide. Ne pas utiliser de detergents liquides ou pulvérisateurs.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
   Pour les appareils enfichables, la prise de courant doit être placée près de l'appareil et facilement accessible.
5. Protect the equipment from humidity.
   Protégez l'appareil contre l'humidité.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
   Placez l'appareil sur une surface fiable pendant l'installation. L'abandon ou la chute de l'appareil pourrait causer des dommages.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
   Les ouvertures du boîtier sont pour la convection d'air. Protégez l'appareil contre la surchauffe. Ne couvrez pas les ouvertures.
8. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet. The power outlet socket should have grounded connection.
   Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'appareil à une prise de courant. La prise de courant doit avoir une bonne connexion mise à la terre.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
   Placez le cordon d'alimentation à l'écart des zones à fort trafic. Ne placez rien sur le cordon d'alimentation.
10. All cautions and warnings on the equipment should be noted.
    Attention à toutes les précautions et avertissements indiqués sur l'appareil.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
    Si l'appareil n'est pas utilisé pendant une longue période, déconnectez-le de la source d'alimentation pour éviter les dommages causés par une surtension transitoire.
12. Never pour liquid into an opening. This may cause fire or electrical shock.
    Ne versez jamais de liquide dans une ouverture. Sinon, cela pourrait provoquer un incendie ou un choc électrique.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
    N'ouvrez jamais l'appareil. Pour des raisons de sécurité, l'appareil ne doit être ouvert que par un technician qualifié.
14. If one of the following occurs, have the equipment checked by service personnel:
    Si l'un des cas suivants se produit, demandez aide à un technicien qualifié:

- The power cord or plug is damaged.
  Le cordon d'alimentation ou la fiche est endommagé.
- Liquid has penetrated the equipment.
  Le liquide a pénétré dans l'appareil.
- The equipment has been exposed to moisture.
  L'appareil a été exposé à l'humidité.
- The equipment is malfunctioning, or does not operate according to the user manual.
  L'appareil est défectueux ou ne fonctionne pas conformément aux instructions.
- The equipment has been dropped and damaged.
  L'appareil a été abandonné et endommagé.
- The equipment shows obvious signs of breakage.
  L'appareil montre des signes évidents de rupture.

15. Do not leave the equipment in an environment with a storage temperature of below -20°C(-4 °F) or above 60 °C (140 °F) as this may cause damage. The equipment should be kept in a controlled environment.
    Ne laissez pas cet appareil dans un environnement dont la température de stockage est inférieure à -20°C(-4 °F) ou supérieure à 60 °C (140 °F), car cela pourrait causer des dommages. L'appareil doit être surveillé dans l'environnement.
16. CAUTION: Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
    ATTENTION: Il y a danger d'explosion s'il y a rem¬placement incorrect de la pile. Remplacer uniquement avec une pile du même type ou d'un type équivalent recommandé par le constructeur.
17. In accordance with the IEC 704-1:1982 specifications, the sound pressure level at the operator's position does not exceed 70 dB (A).
    Conformément aux spécifications de l'IEC 704-1:1982, le niveau de pression acoustique à la position de l'opérateur ne dépasse pas 70 dB (A).
18. The products are intended to be supplied by an UL certified power supply (Adapter: FSP090-DIEBN2 or FSP090-DBBN3) suitable for use at Tma 40 degree C min. and output is rated 19Vdc, 4.74A min., ES1 (or SELV) or the product are intended to be supplied by an UL certified power supply or dc source suitable for use at Tma 50 degree C min. and output is rated 12-24Vdc,5-2.5A(PPC-3150SW/3180SW)/6-3A(PPC-324W-PN4), ES1 (or SELV), if need further assistance, please contact Advantech for further information.
    Le produit doit être alimenté par une alimentation certifiée UL (Adaptateur: FSP090-DIEBN2 or FSP090-DBBN3) approprié pour l'utilisation à une température de 40°C au minimum, et la sortie nominale est 19Vdc, 4.74 A min., ES1 (ou SELV). Ou le produit doit être alimenté par une alimentation certifiée UL ou CC pour l'utilisation à une température de 50°C au minium, et la sortie nominale est 12-24Vdc,5-2.5A(PPC-3150SW/3180SW)/6-3A(PPC-324W-PN4), ES1 (ou SELV). Si vous avez besoin d'aide supplémentaire, veuillez contacter Advantech pour plus d'informations.
19. DISCLAIMER: These instructions are provided in accordance with IEC 704-1 standards. Advantech disclaims all responsibility for the accuracy of any statements contained herein.
    AVERTISSEMENT: Ces instructions sont fournies conformément aux normes IEC 704-1. Advantech decline toute responsabilité quant à la précision de toute déclaration contenue dans le présent document.
20. CAUTION: This product is not intended for use by children and is not suitable for use in locations where children are likely to be present (this product is not a toy).

ATTENTION: Ce produit n'est pas un jouet et devrait être gardé hors de la portée des enfants.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from the PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the equipment is powered on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Power Warning

The power is fit for areas with an altitude of below 5,000 M.

Battery Information

Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

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Chapter 1

General Information

- Introduction
- Specifications
- Dimensions

1.1 Introduction

PPC-3150SW/3180SW/324W-PN4 is a high-value, ultra-slim panel PC equipped with a 15.6"/18.5"/23.8" WXGA TFT LCD and low-power Intel® Pentium® N4200 quad-core (1.1 GHz) processor to provide high-performance computing in a compact fanless system. For high durability and functionality, PPC-3150SW/3180SW/324W-PN4 features an IP65-rated front panel, true-flat multi-touch projected capacitive touchscreen, die cast aluminum alloy enclosure, two serial ports, four USB ports, and two GbE LAN ports, making it suitable for diverse industrial applications.

1.2 Key Features

- 15.6"/18.5"/23.8" true-flat WXGA TFT LCD with projected capacitive touch control
- Fanless design with low power consumption
- 1 x internal 2.5" SATA SSD and 1 x mSATA
- Configurable RS-232/422/485 ports via BIOS
- Automatic data flow control over RS-485
- Wide range DC support (12 ~ 24 VDC)
- Supports dual displays
- IP65-rated front panel

1.3 Front Panel

The PPC-3150SW/3180SW/324W-PN4 front panel is a true-flat color TFT LCD with multi-touch projected capacitive touch control. Additionally, the front panel is IP65 rated for protection from dust and water ingress.

Note! *Figure 1.1 shows the PPC-3150SW-PN4 model. The PPC-3150SW/3180SW/324W-PN4 models all follow the same design.*

Figure 1.1 Front Panel

1.4 Rear Panel

The PPC-3150SW/3180SW/324W-PN4 rear panel features four VESA mount holes (75 x 75 mm) as shown in Figure 1.2.

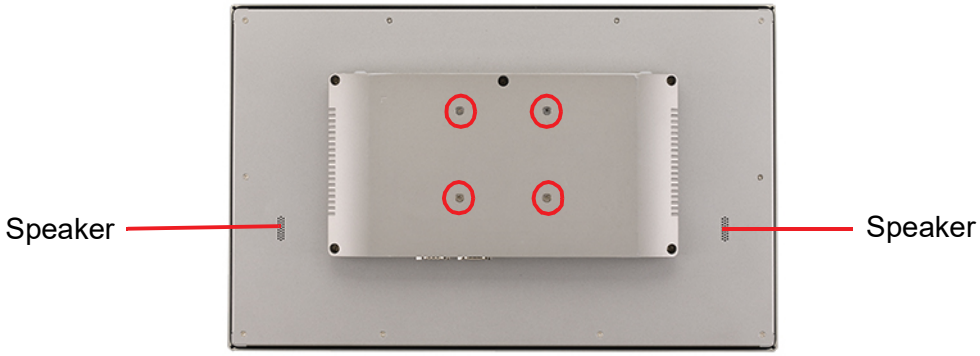


Figure 1.2 Rear Panel

1.5 Dimensions

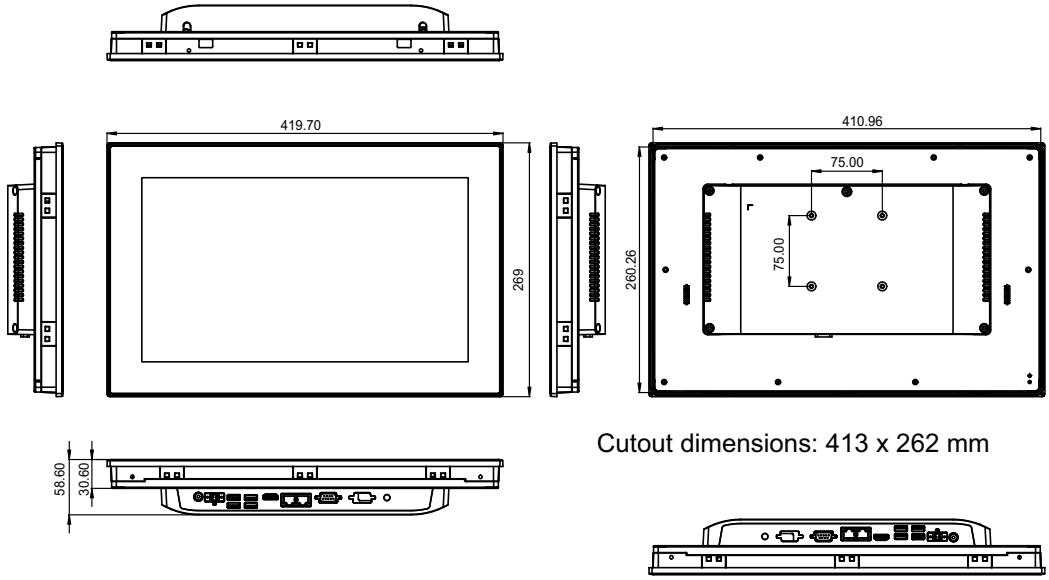


Figure 1.3 PPC-3150SW-PN4 Dimensions

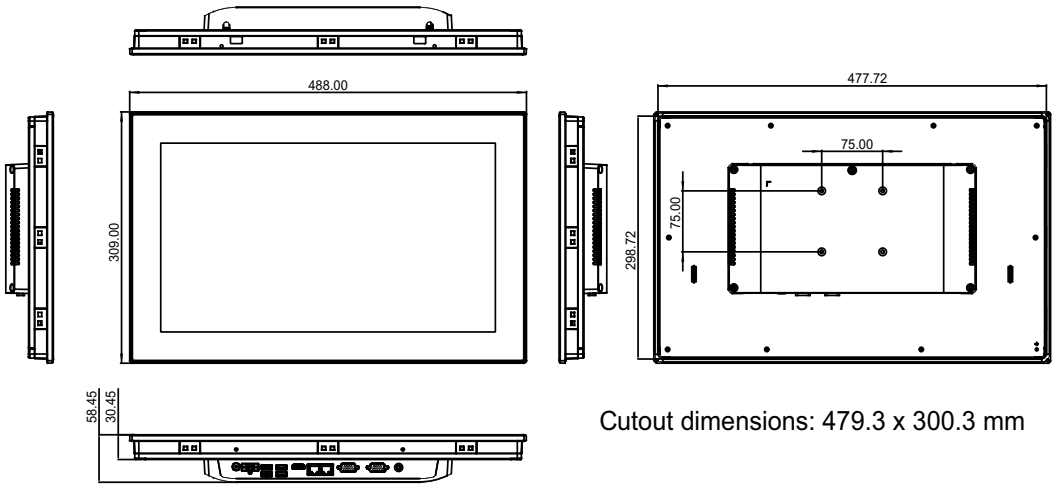


Figure 1.4 PPC-3180SW-PN4 Dimensions

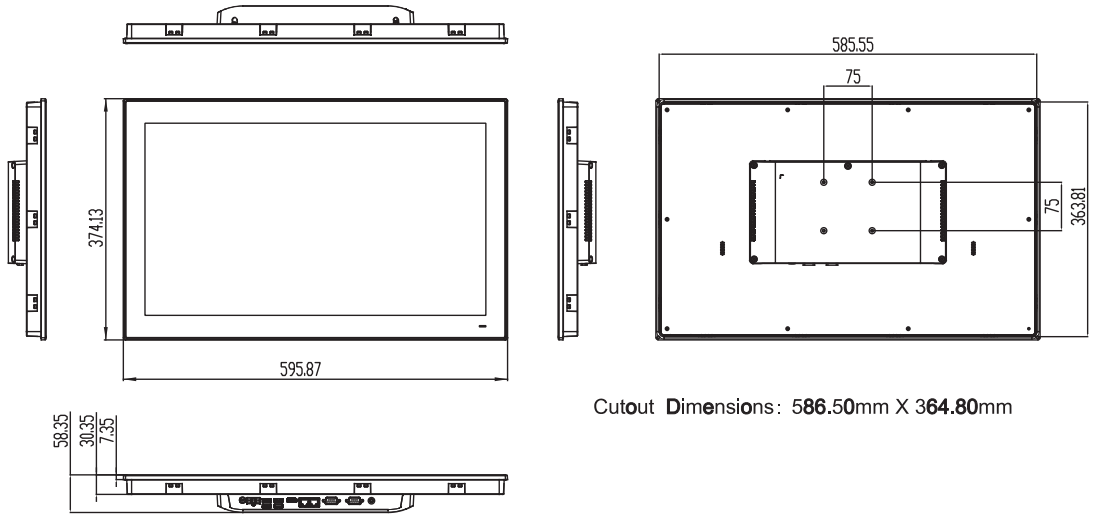


Figure 1.5 PPC-324W-PN4 Dimensions

1.6 Specifications

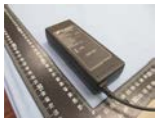
Table 1.1: Specifications

	PPC-3150SW	PPC-3180SW	PPC-324W-PN4
Panel Size	15.6”	18.5”	23.8"
Display Type	TFT LCD	TFT LCD	TFT LCD
Max. Resolution	1366 x 768	1366 x 768	1920 x 1080
Brightness	400	450	350
Color	16.7M	16.7M	16.7M
Pixel Pitch	252 x 252	300(H) x 300(V)	274.5(H) x 274.5(V)
Viewing Angle	170, 165	170, 160	178, 178
Contrast	500	1000	1000
Backlight Lifetime	50,000 (min.)	50,000 (min.)	30,000 (min.)
Touchscreen Type	Multi-touch projected capacitive (P-CAP)		
Light Transmission	90±2%	90±2%	≥85%
Controller	USB interface		
CPU	Intel® Pentium® N4200 quad core		
Memory	1 x SODIMM DDR3L 1866 MHz (max. 8 GB)		
Storage	1 x 2.5" SATA bay 1 x mSATA bay		
Network (LAN)	2 x 10/100/1000/2500 Mbps Ethernet (Intel I225LM)		
I/O	2 x Serial ports (1 x RS-232 and 1 x RS-232/422/485) 2 x USB 2.0, 2 x USB 3.0 1 x Line Out 1 x HDMI		
Expansion	1 x Mini PCIe		
Speaker	2 x 1 W		
Operating System	Microsoft® Windows 10 IOT LTSC(64-bit), Linux		
Power Supply	12 ~ 24 VDC		
Power Consumption	33 W	35 W	70W

Operating Temperature	0 ~ 50°C (32 ~ 122°F)		
Storage Temperature	-20 ~ 60°C (-4 ~ 140°F)		
Relative Humidity	10 ~ 95% @ 40°C (non-condensing)		
Shock	Operating 10G peak acceleration (11 ms duration), following IEC 60068-2-27		
Vibration	Operating random vibration test, 5 ~ 500 Hz, 2 Grms with SSD, following IEC 60068-2-64		
Certification	Safety: CE, UL, CCC, BSMI EMC: CE, FCC Class B, BSMI		
Dimensions	419.7 x 269 x 58.6 mm (16.52 x 10.59 x 2.3 in)	488 x 309 x 58.45 mm (19.21 x 12.16 x 2.3 in)	595.9 x 374.1 x 58.4 mm (23.5" x 14.7" x 2.3")
Weight	4.7 kg (10.36 lb)	5.4 kg (11.90 lb)	8.4 kg (18.5 lb)

1.7 Ordering Information

Table 1.2: Ordering Information

Part Number	Description	Image
PPC-3150SW-PN4 PPC-3180SW-PN4 PPC-324W-PN4	Intel® Pentium® APL N4200 Fanless 15.6"/18.5"/23.8" panel PC	
96PSA-A90W19OT-3	Power adapter 100 ~ 240 V_{DC}, 90 W, 19V	
PPC-WLAN-C1E	Wi-Fi module with antenna	
PPC-ARM-A03	VESA arm mount (standard)	
PPC-174T-WL-MTE	Wall mount kit	
PPC-Stand-A1E	Stand kit	

Chapter 2

System Installation and Setup

- Quick System Tour
- Memory Card Installation
- SSD Installation
- mSATA Installation
- Wireless LAN Card Installation
- System Mounting

2.1 Quick System Tour

Before setting up the panel PC, take a moment to identify the locations of the device controls, drives, connectors, and ports (as shown in Figure 2.3). When placed upright, the PPC-3150SW/3180SW/324W-PN4 front panel should appear as shown in Figure 2.1.

Figure 2.1 Front View

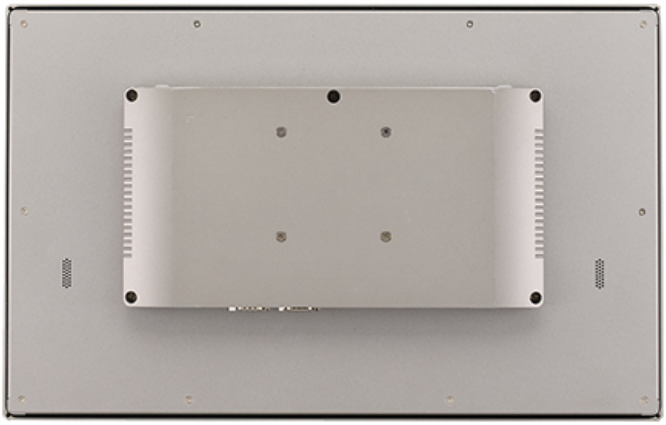
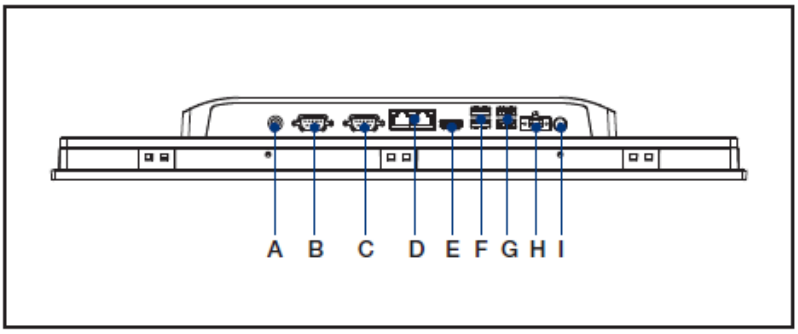


Figure 2.2 Rear View



A. Line out
B. COM1: RS-232
C. COM2: RS-232/422/485
D. 2 x LAN
E. HDMI
F. 2 x USB 3.0
G. 2 x USB 2.0
H. DC-In
I. Power Button

Figure 2.3 I/O Ports

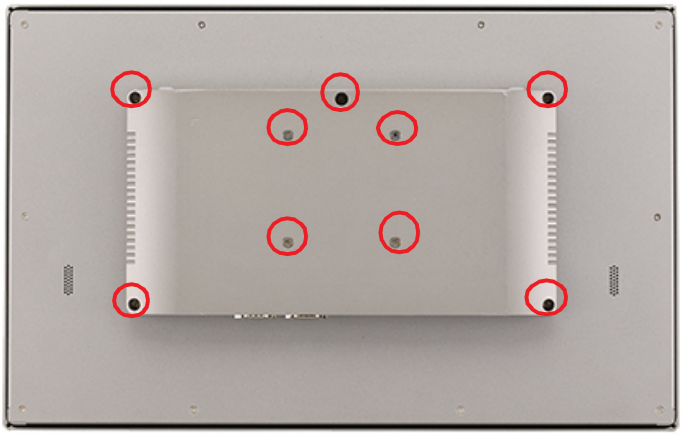
2.2 Installation Procedures

The system installation procedures should be conducted in the following order:

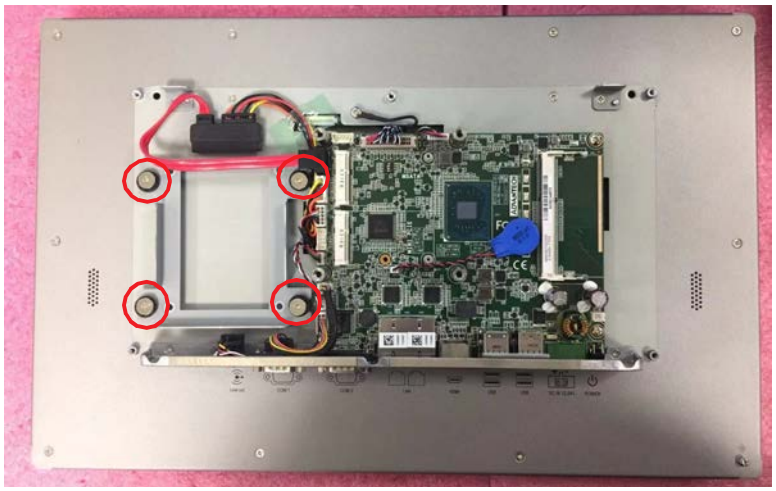
1. Install a SATA SSD or mSATA storage
2. Install a memory card
3. Install a wireless LAN module
4. Mount the panel PC

2.2.1 SSD Installation

1. Loosen and remove the 9 retention screws on the rear cover. Remove the rear cover.

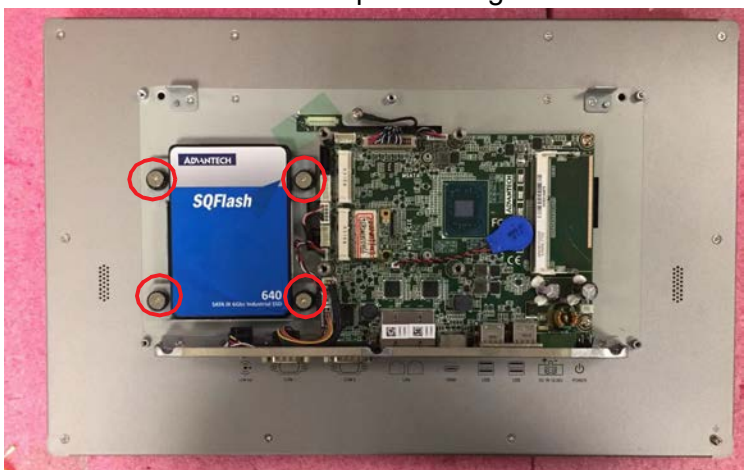


2. Loosen and remove the 4 retention screws on the SSD bracket. Remove the SSD bracket.



3. Install a SATA SSD and affix in place using 4 retention screws

4. Close the SSD cover and affix in place using 4 retention screws



5. Connect the SATA cable to the motherboard.

2.2.2 mSATA Installation

1. Insert an mSATA card into the mSATA socket. Secure the mSATA module using 2 retention screws provided in the accessory box.

2.2.3 Memory Card Installation

1. Insert the memory card into the slot highlighted by the red box in the image below. Then install the memory and CPU thermal pads provided in the accessory box.

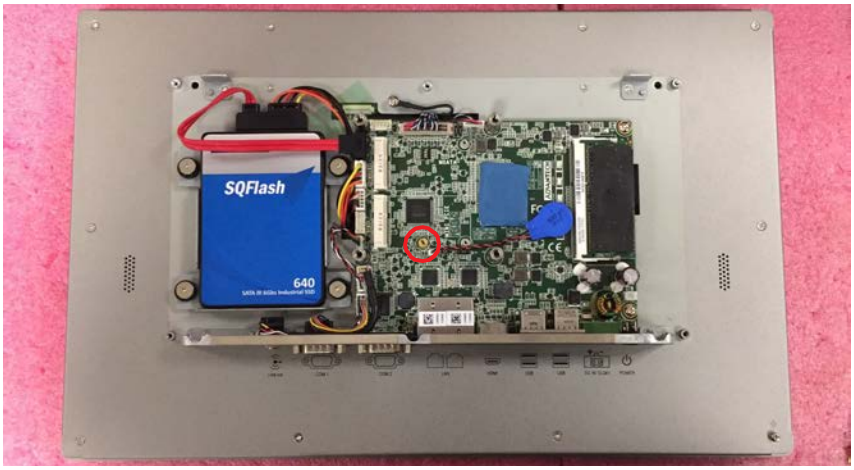
2.2.4 Wireless LAN Module Installation

2.2.4.1 Full-Size Mini PCIe Card Installation

Insert the full-size mini PCIe card into the socket. Secure the card in place using one of the retention screws provided in the accessory box.

2.2.4.2 Half-Size Mini PCIe Card Installation

1. Retrieve the hexagonal screw provided in the accessory box. Align the screw with the notch on the printed circuit board and secure in place.



2. Insert the half-size mini PCIe card into the socket at an angle. Secure the card in place using a screw from the accessory box.

3. Connect the antenna cables and affix them to the brackets. Take note of the cable routing.

4. Remove the two rubber plugs on the rear cover.

5. Install the external antenna.

2.3 System Mounting

Warning! More than one person should participate in mounting the panel PC to prevent accidental damage to the panel or personal injury.

Le comité constate qu'el-nasr mounting, plus d'une personne installation to prevent the cadre accidental damage to personal injury.

The PPC-3150SW/3180SW/324W-PN4 panel PC supports various mounting options.

- Panel mounting
- VESA mounting
- Cabinet mounting

2.3.1 Panel Mounting

To mount the flat bezel panel PC into a panel, follow the steps below.

1. Prepare a panel cutout that corresponds to the device size.
   PPC-3150SW: 413 x 262 mm / 16.25 x 10.31 in
   PPC-3180SW: 479.30 x 300.30mm / 18.87 x 11.82 in
   PPC-324W-PN4: 586.5 x 364.8 mm / 23.09 x 14.36 in

2. Insert the panel PC into the cutout. Retrieve the hook brackets and M6 x 21L screws from the accessory box.
   (10pcs for PPC-3150SW; 12pcs for PPC-3180SW; 14pcs for PPC-324W-PN4)

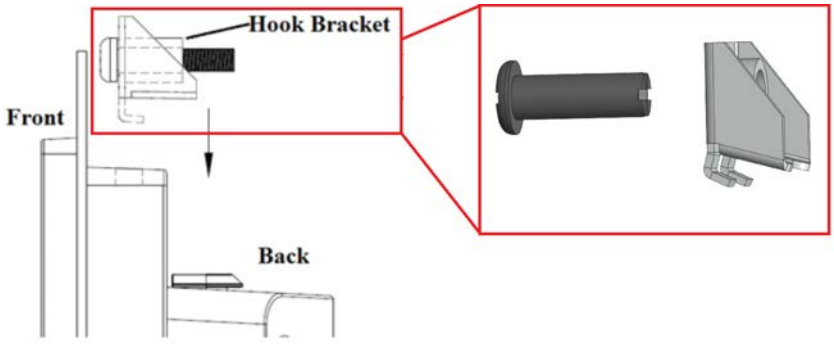


Figure 2.4 Hook Brackets for Panel Mounting

3. Insert the hook brackets into the mount holes in a downwards direction (as shown in Figure 2.9). Then hang the panel PC.

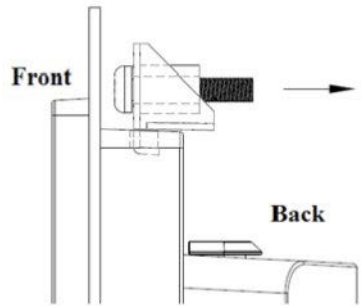


Figure 2.5 Hook Bracket Location

4. Tighten the screws in the hook brackets to secure the panel PC in place.

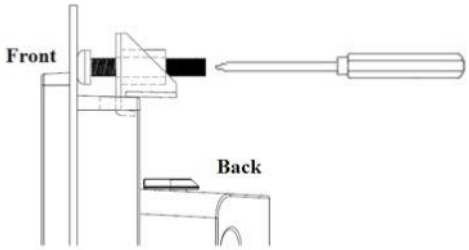


Figure 2.6 Fastening Hook Bracket Screws

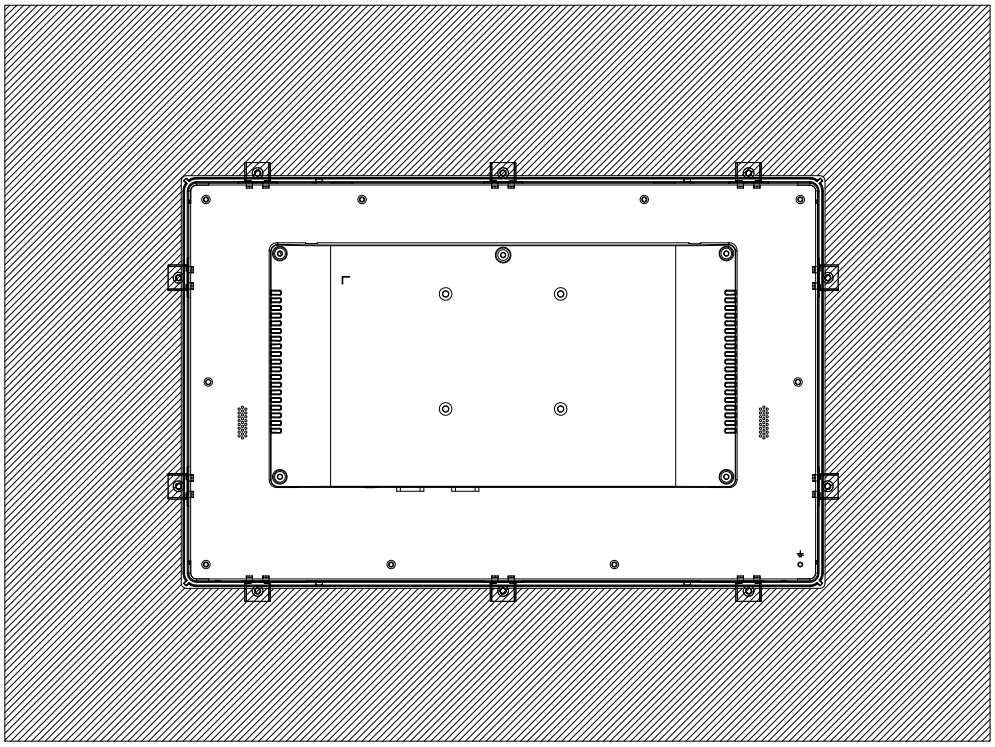
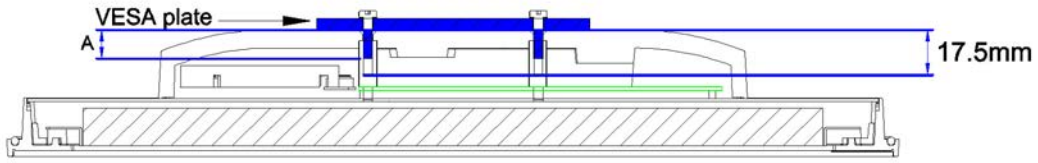


Figure 2.7 Panel Mount Rear View

2.3.2 VESA Mounting

If you install the Stand Kit/Wall mount Kit/Arm mount Kit of different specifications, choose the appropriate screw length according to the different plate thickness at the VESA. The suggestions are as follows:



Note! *Recommended screw thread depth "A" should be more than 9.5mm.*

Chapter 3

Jumper Setting

- Motherboard Layout
- Jumpers and Connectors
- External COM Ports and Pin Definitions

3.1 Motherboard Layout

The PPC-3150SW/3180SW/324W-PN4 motherboard features internal peripheral connectors that can be accessed when the motherboard is outside of the chassis. Figure 3.1 shows the locations of the internal peripheral connectors on the motherboard.

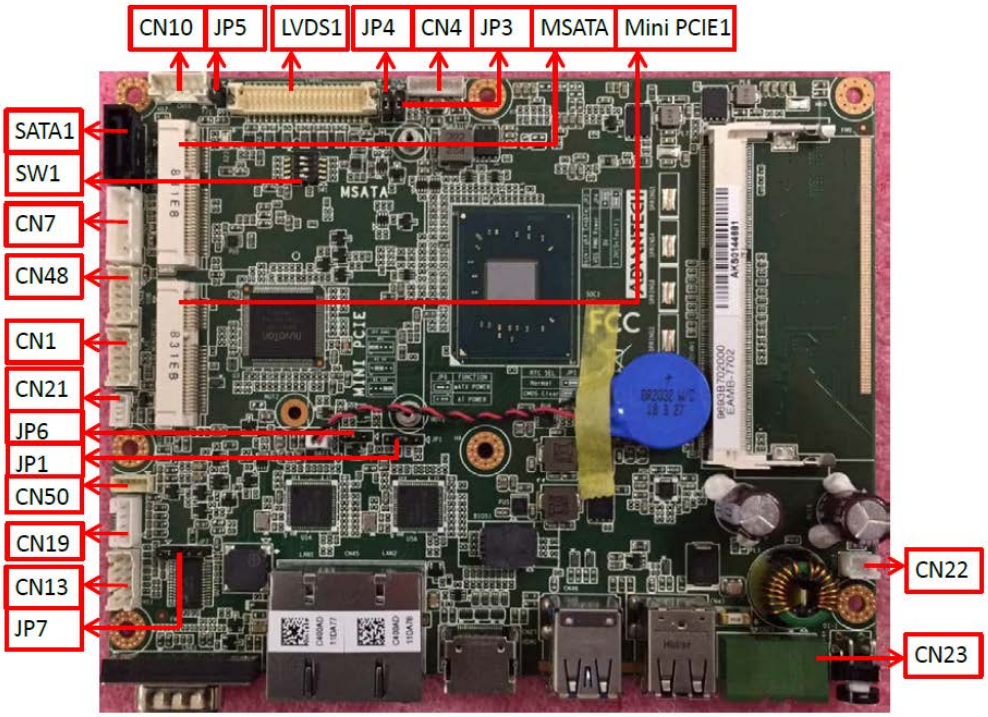


Figure 3.1 Motherboard Layout Diagram

Table 3.1: Connectors

Connectors	Functions
CN1	LPC conn
CN4	LCD backlight
CN7	SATA power
CN10	Resistive touch
CN13	COM1
CN19	Speaker
CN21	Front LED
CN22	Power button
CN23	Power input
CN48	Internal USB
CN50	Line out
SW1	Panel resolution
JP1	RTC reset
JP3	Backlight power selection
JP4	Backlight PWM power selection
JP5	Touch power selection
JP6	ATX/AT selection
JP7	COM1 ring and power selection
MSATA	Mini SATA conn
Mini PCIE1	Mini PCIE conn
CN22	Power button connection

3.2 Jumpers and Connectors

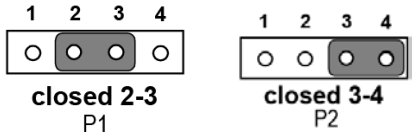


Table 3.2: JP1

JP1	Icon	RTC Reset
(2~3)	P1	Normal (default)
(3~4)	P2	CMOS clear

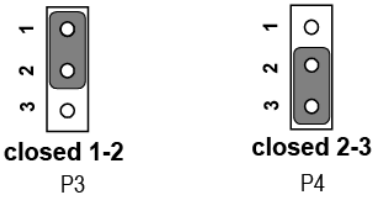


Table 3.3: JP3

JP3	Icon	Backlight Power Selection
(1~2)	P3	5V
(2~3)	P4	3.3V (default)

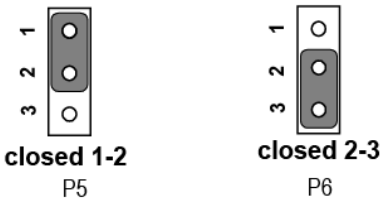


Table 3.4: JP4

JP4	Icon	Backlight PWM Power Selection
(1~2)	P5	5V
(2~3)	P6	3.3V (default)

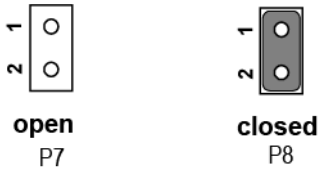
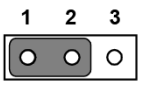
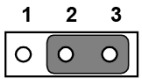


Table 3.5: JP5

JP5	Icon	Touch Power Selection
(1~2) Closed	P8	3.3VSB
(1~2) Open	P7	Resistive touch disabled (default)



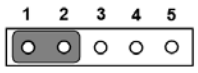
closed 1-2
P9



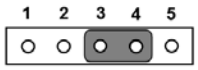
closed 2-3
P10

Table 3.6: JP6

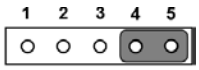
JP6	Icon	ATX/AT Selection
(1~2)	P9	AT power
(2~3)	P10	ATX power (default)



closed 1-2
P11



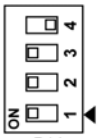
closed 3-4
P12



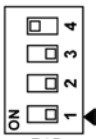
closed 4-5
P13

Table 3.7: JP7

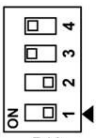
JP7	Icon	COM1 Ring and Power Selection
(1~2)	P11	COM1 RI (default)
(3~4)	P12	COM1 5V
(4~5)	P13	COM1 12V



P14



P15



P16

Table 3.8: SW1

SW1	Icon	Panel Resolution
1,2,3 ON; 4 OFF	P14	1366 x 768 (24 bit) for PPC-3180SW
1,2,3 OFF; 4 ON	P15	1366 x 768 (24 bit) for PPC-3150SW
1, 2 OFF; 3,4 ON	P16	1920x1080(48bit) for PPC-324W-PN4

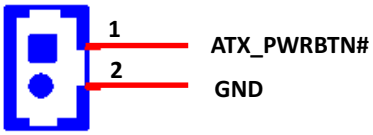


Table 3.9: Power Button Connection

CN11	Function
Power button	Can be used as an external extension line switch

3.3 External COM Port Pin Definition

3.3.1 COM1: RS-232; COM2: RS-232/422/485

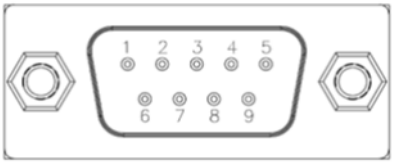


Table 3.10: COM1: RS-232; COM2: RS-232/422/485

PIN	COM1	COM2		
	RS232	RS232	RS422	RS485
1	DCD	DCD	TX-	DATA-
2	RXD	RXD	TX+	DATA+
3	TXD	TXD	RX+	NC
4	DTR	DTR	RX-	NC
5	GND	GND	GND	GND
6	DSR	DSR	NC	NC
7	RTS	RTS	NC	NC
8	CTS	CTS	NC	NC
9	Ring or 5V/12V output	Ring	NC	NC

Chapter 4

Software Setup

- Driver Installation
- BIOS Setup Program

4.1 Driver Installation

Before installing software on the panel PC, install the corresponding drivers to ensure full functionality.

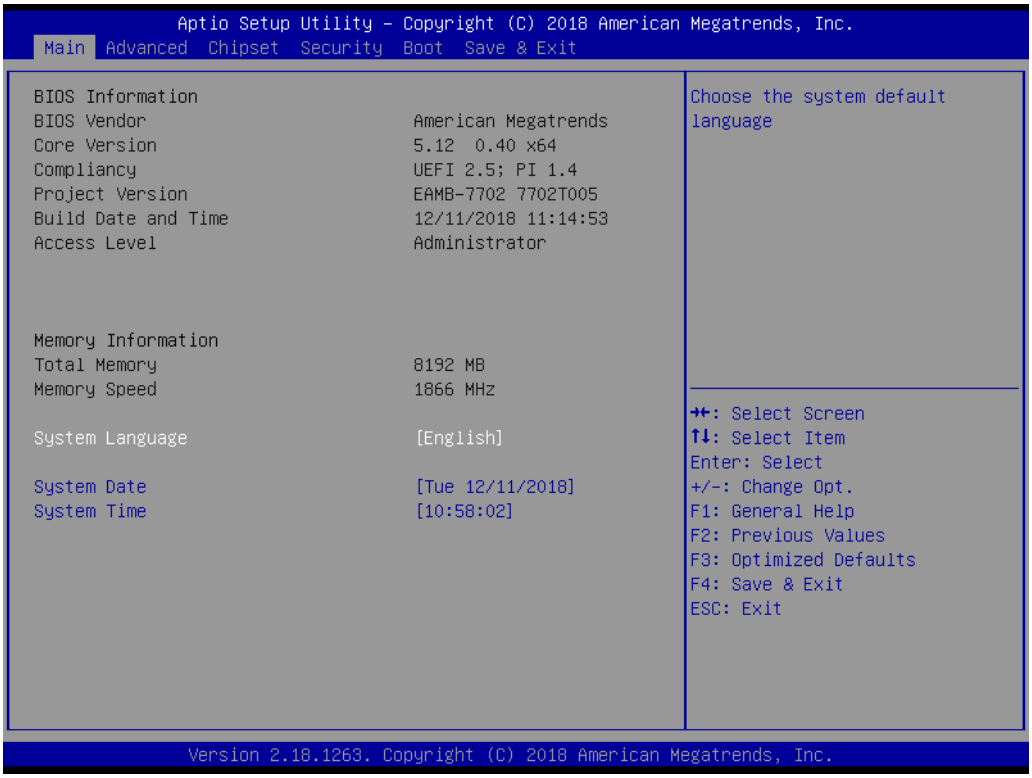
All drivers can be downloaded from the Advantech website at http://www.advantech.com.

4.2 BIOS Setup Program

4.2.1 Entering the BIOS Utility

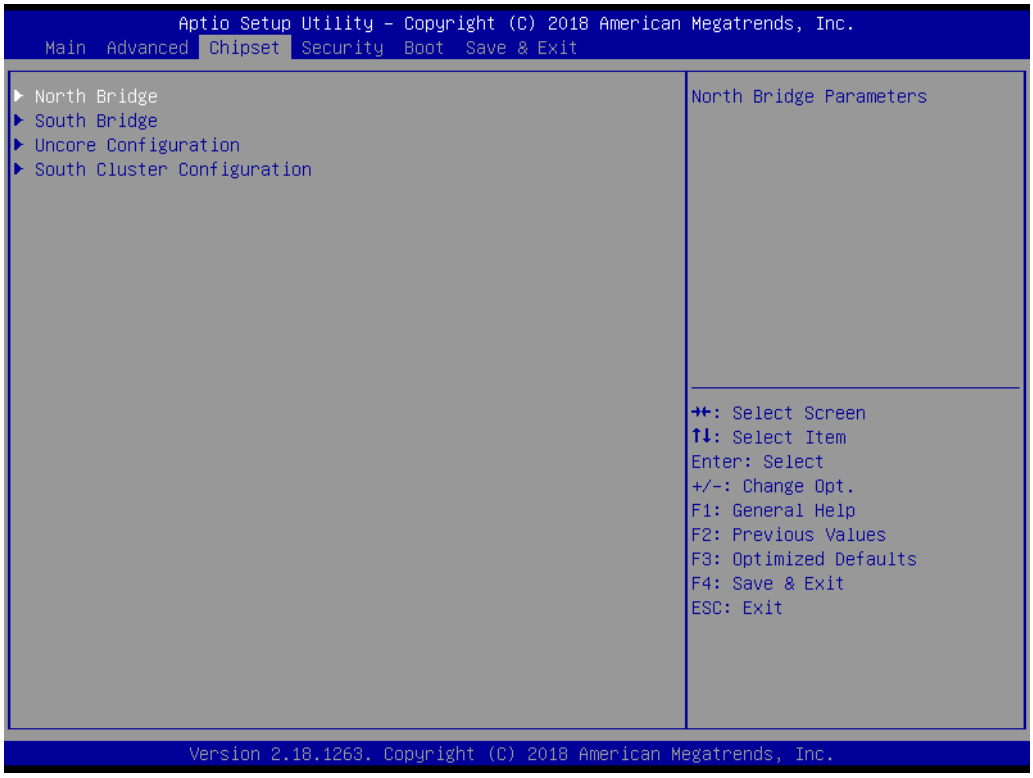
During system bootup, press the <Del> button to enter the BIOS setup utility.

After making changes, press <F4> to save and exit the BIOS setup program; otherwise the settings will not be saved.

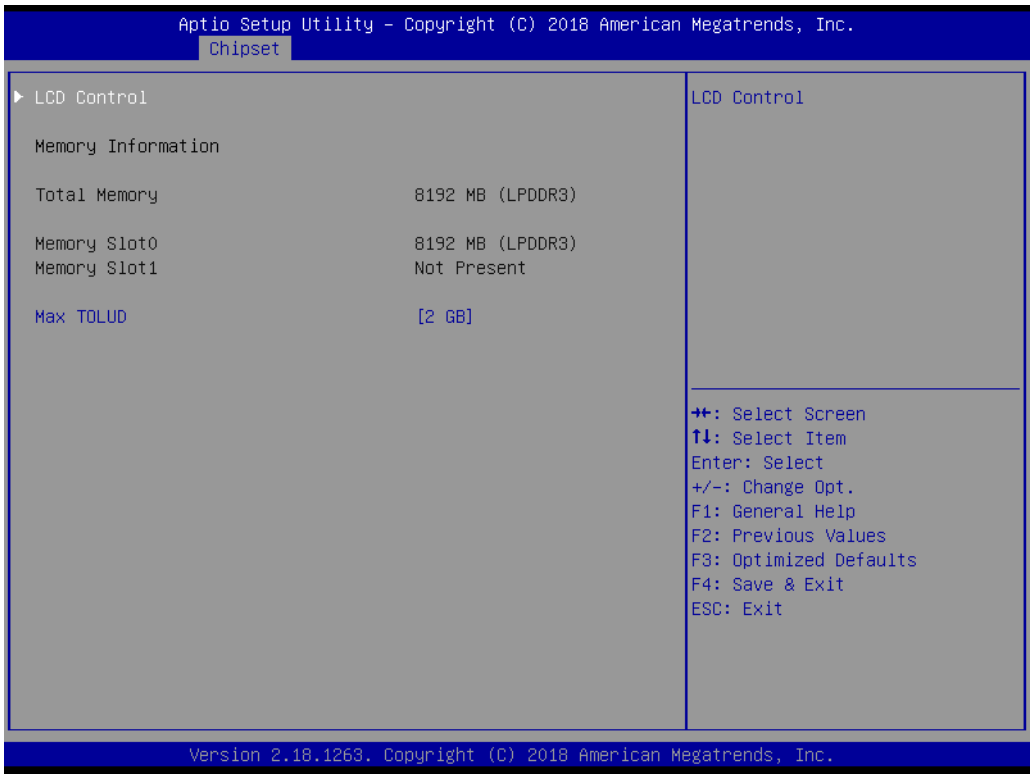


4.2.2 LCD Brightness Settings

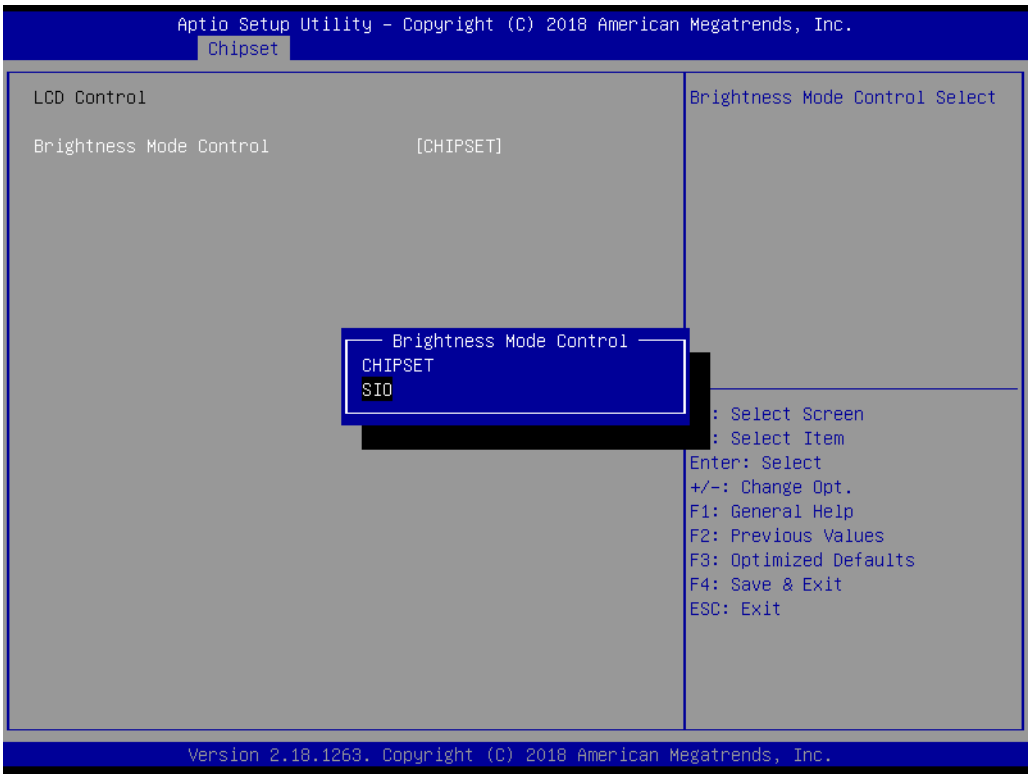
1. Select the “North Bridge” item in the “Chipset” tab.



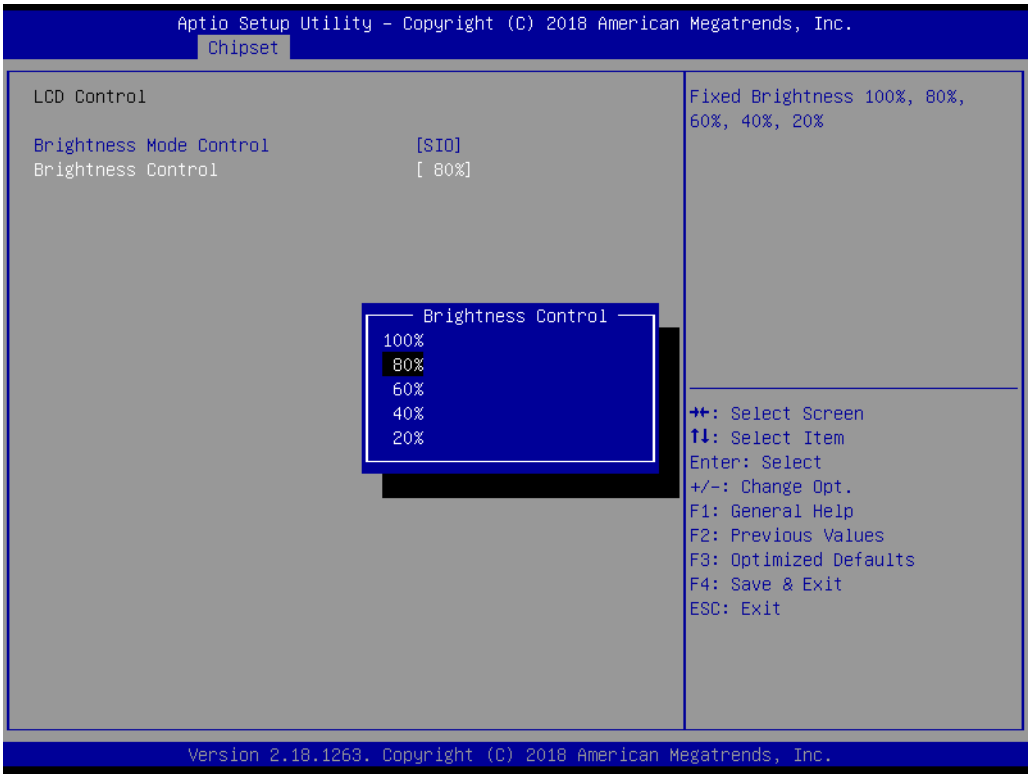
2. Then select “LCD Control”.



3. Select “Brightness Mode Control”.

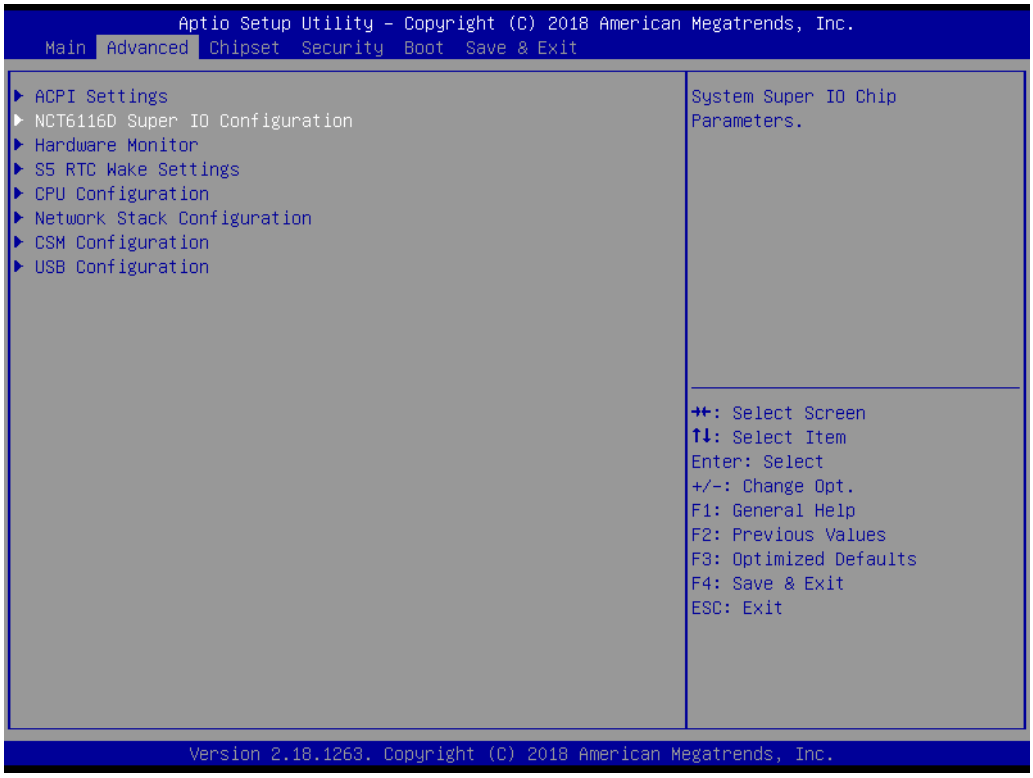


4. There are six brightness levels available. Select the level most suitable for your application needs.

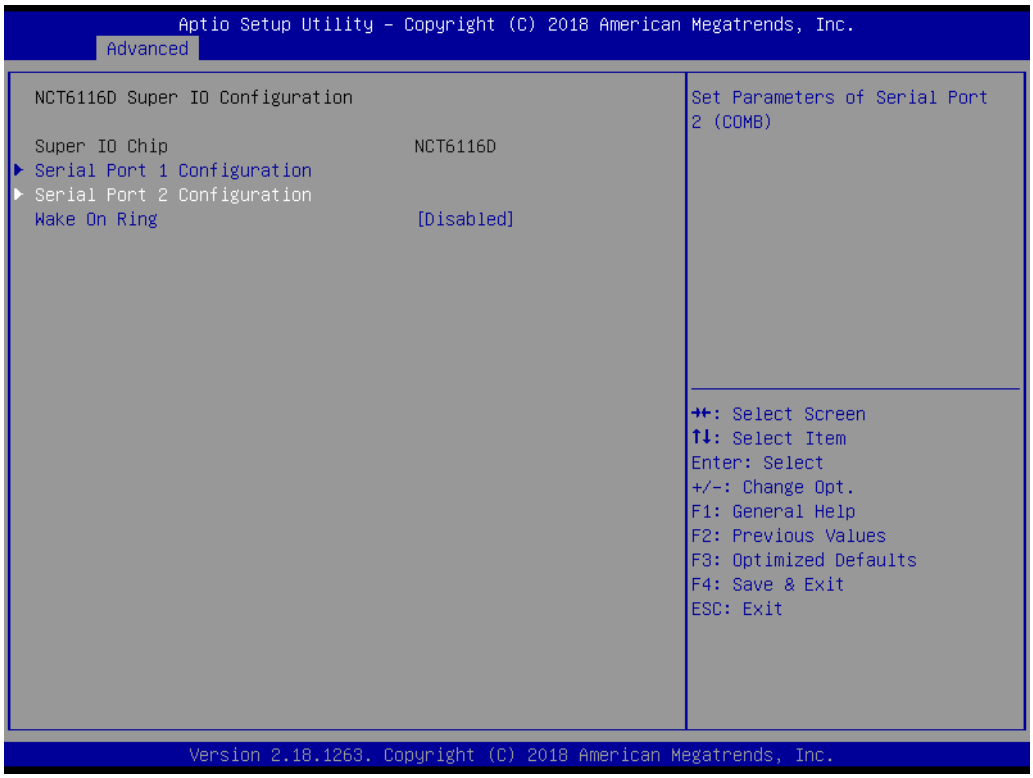


4.2.3 COM2 Mode Selection (RS-232/422/485)

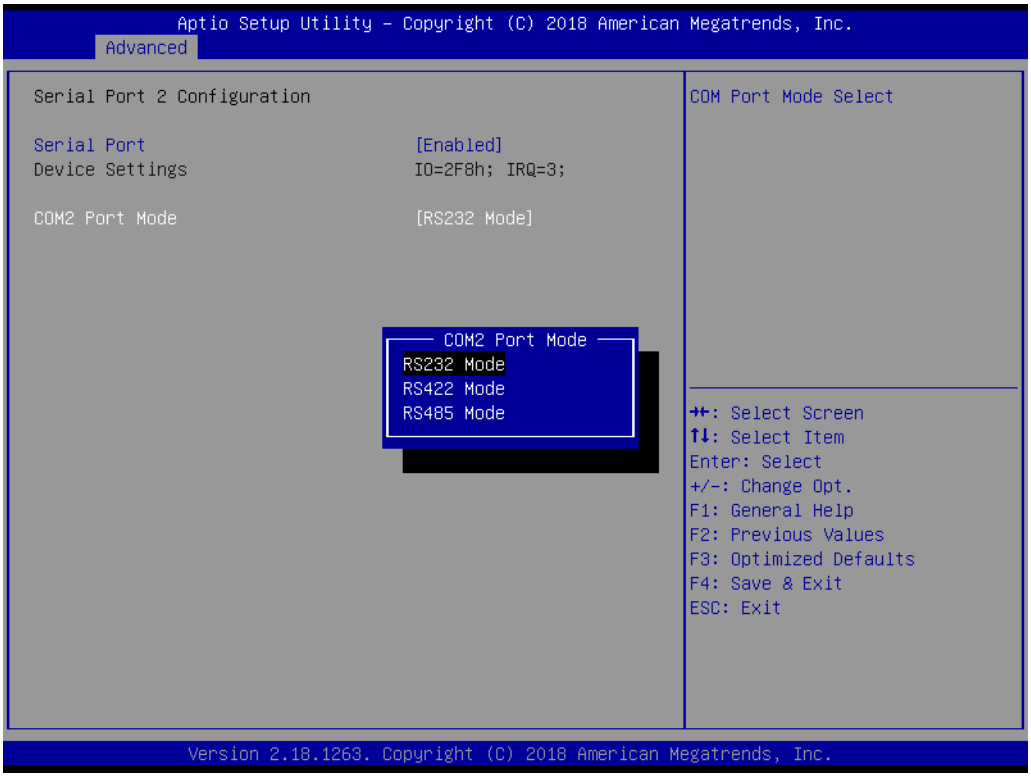
1. Select the “NCT6116D Super IO Configuration” option in the “Advanced” tab.



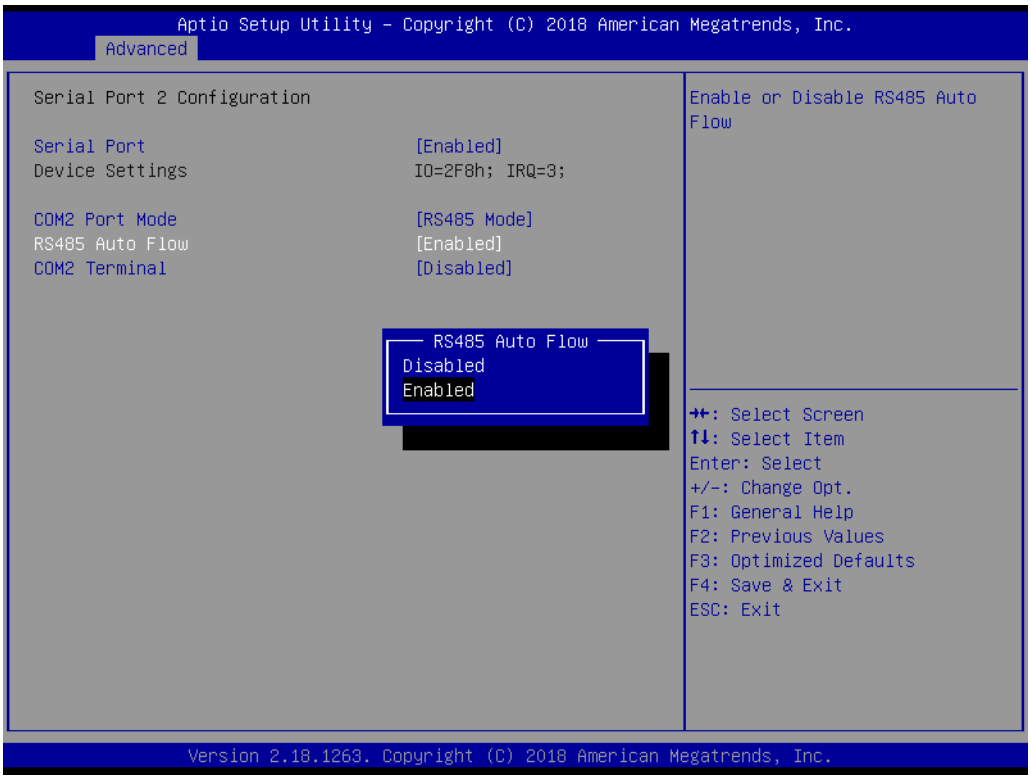
2. Select “Serial Port 2 Configuration”.



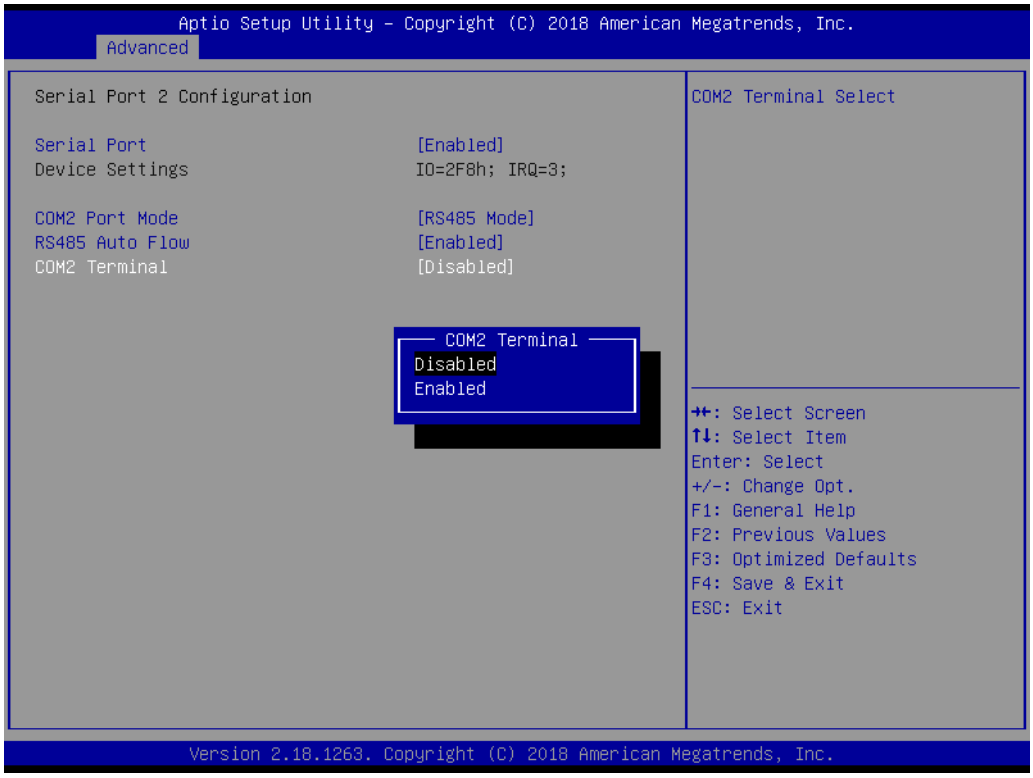
3. Navigate to the “Serial Port 2 Mode” item and double click to set the COM2 operation mode as [RS-422] or [RS-485].



4. When COM2 Mode is set as RS-485, the “RS-485 Auto Flow” item can be configured as [enabled] or [disabled]



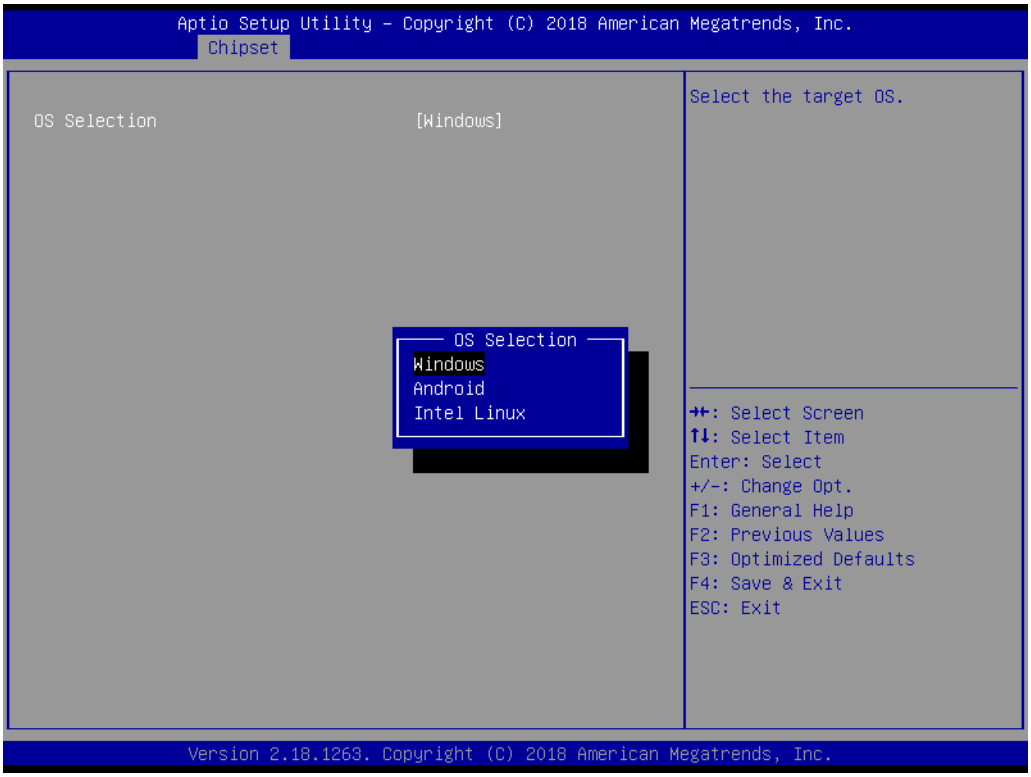
5. When COM3 Mode is set as RS-485, the “Serial Port3 Terminal” can be configured as [enabled] or [disabled]



4.2.4 OS Selection

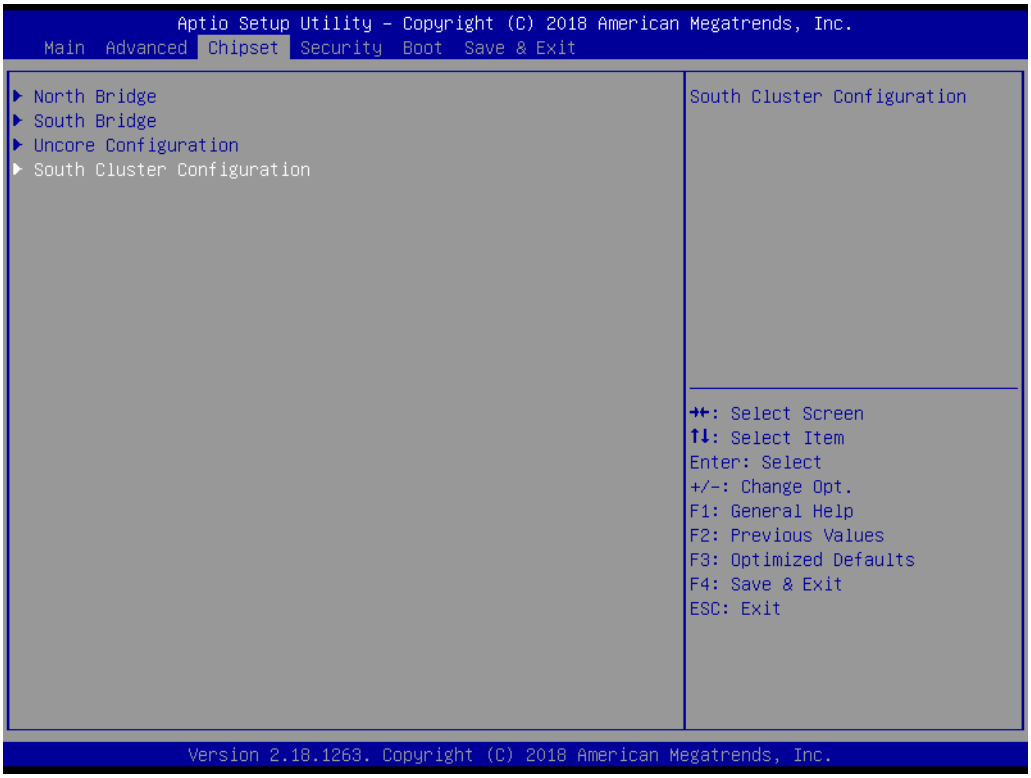
1. Select the “South Bridge” item in the “Chipset” tab.

2. The system supports different OS [Windows/Android/Intel Linux]. Navigate to the “OS Selection” item to set the system OS.

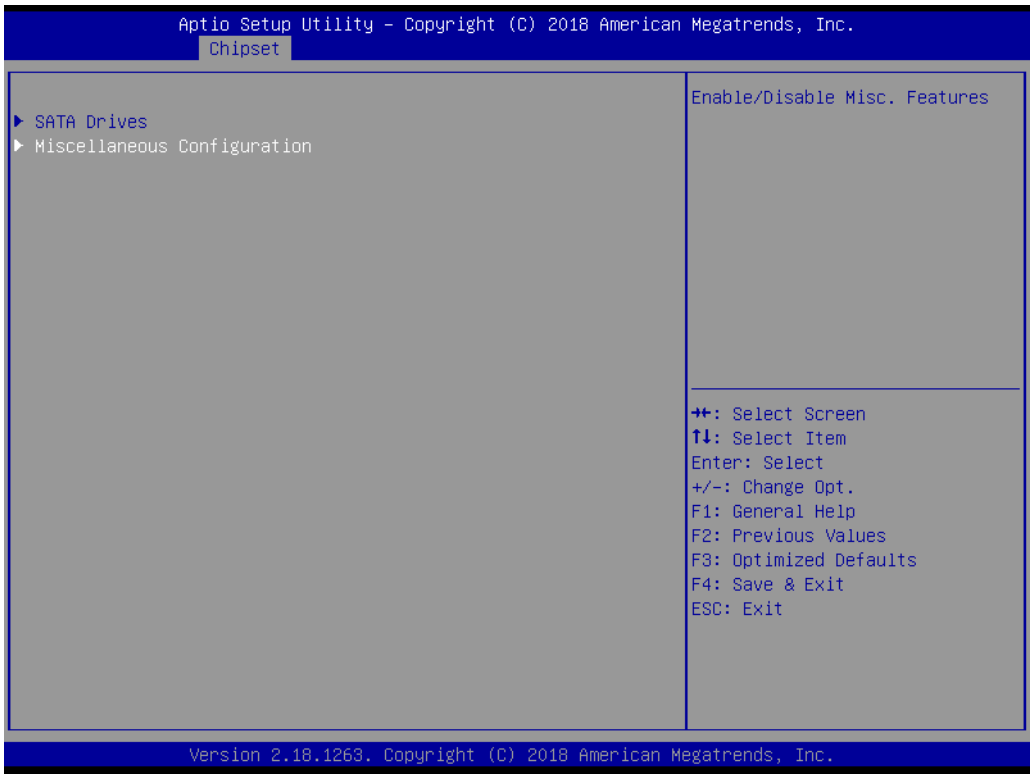


4.2.5 BIOS AT/ATX Setup

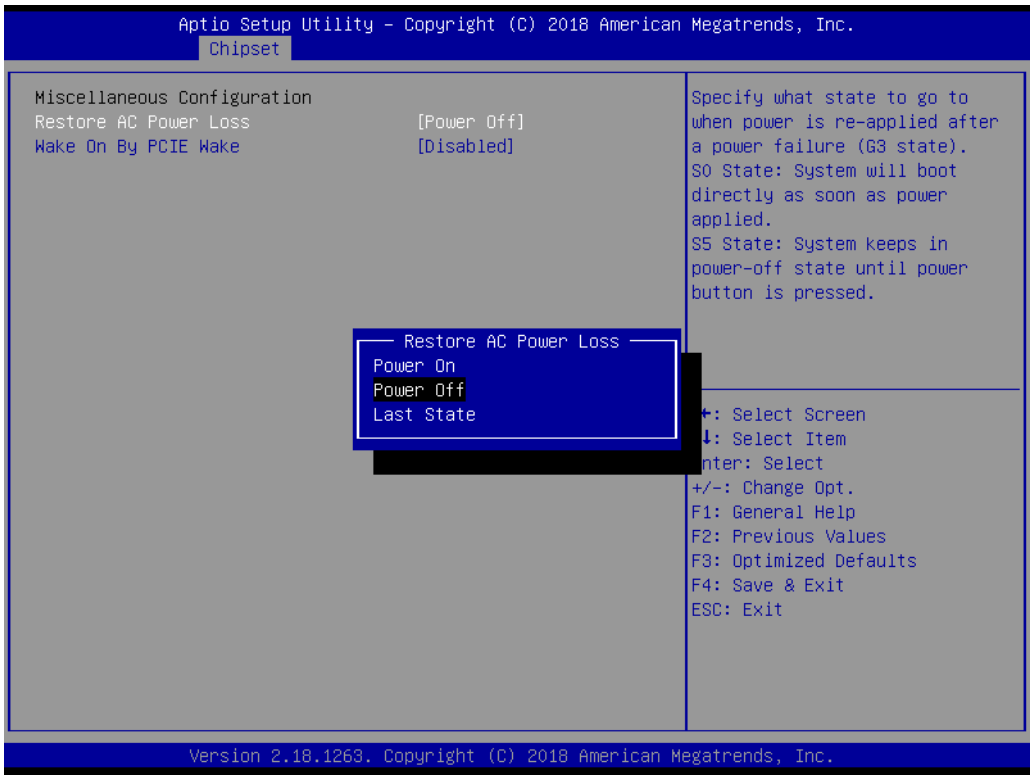
1. Select the “South Cluster Configuration” item in the “Chipset” tab.



2. Select the “Miscellaneous Configuration” item.

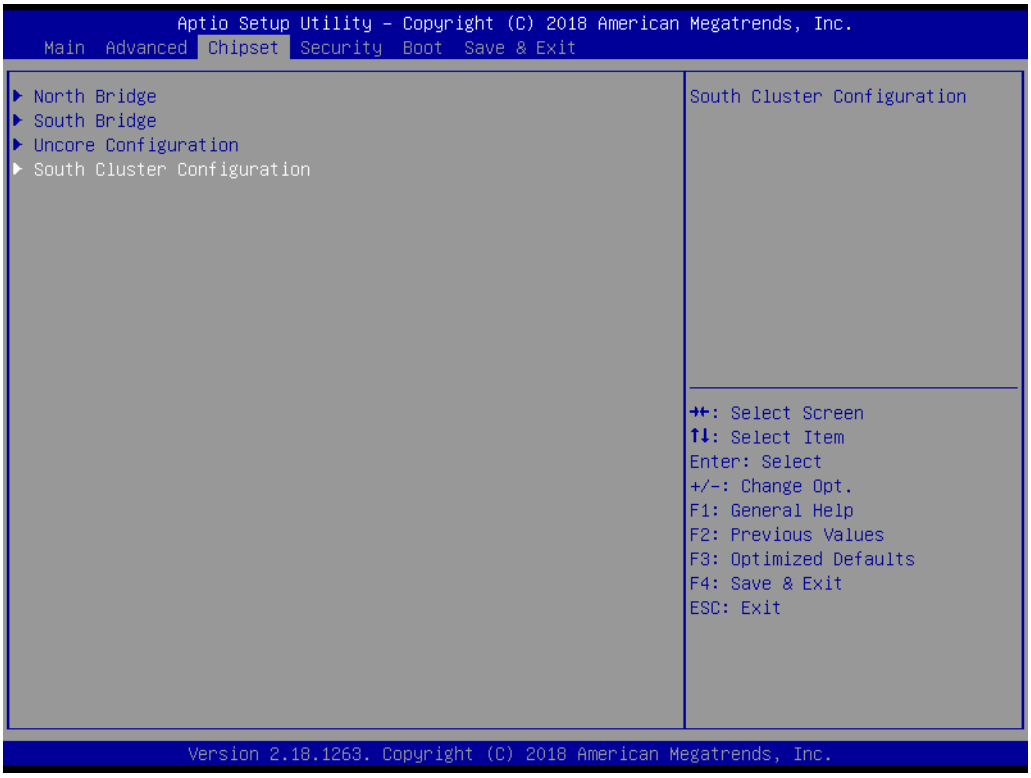


3. Configure the “Restore AC Power Loss” item as “Power On” when in “AT Mode” and as “Power Off” for “ATX Mode”.

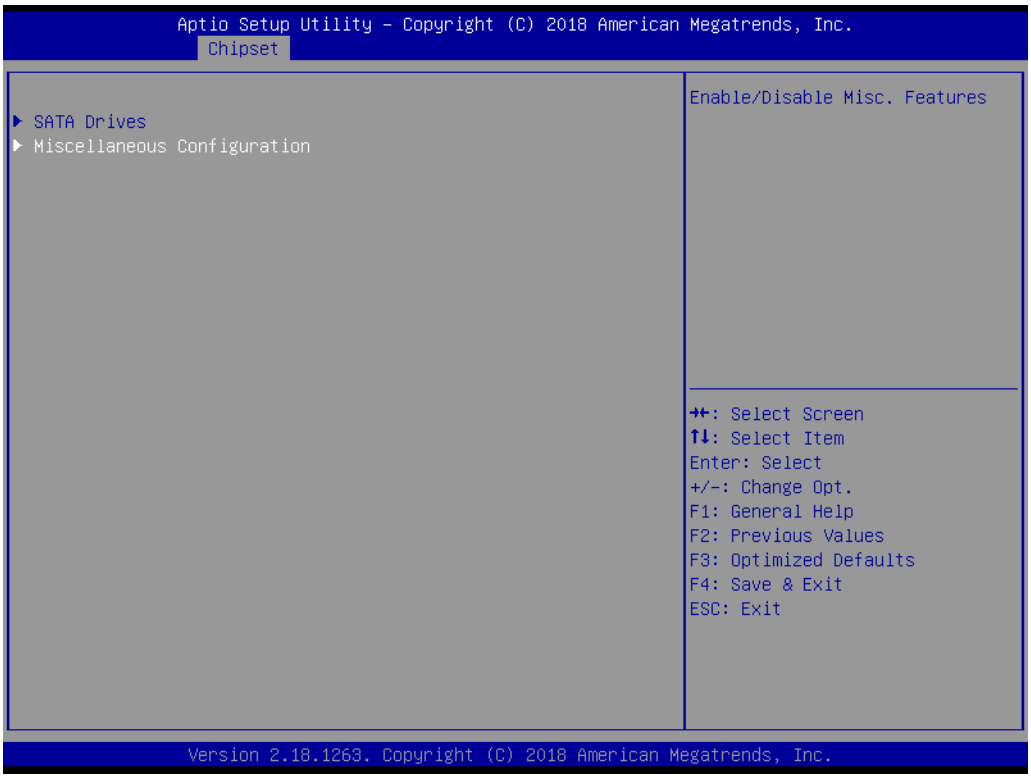


4.2.6 Wake-on-LAN

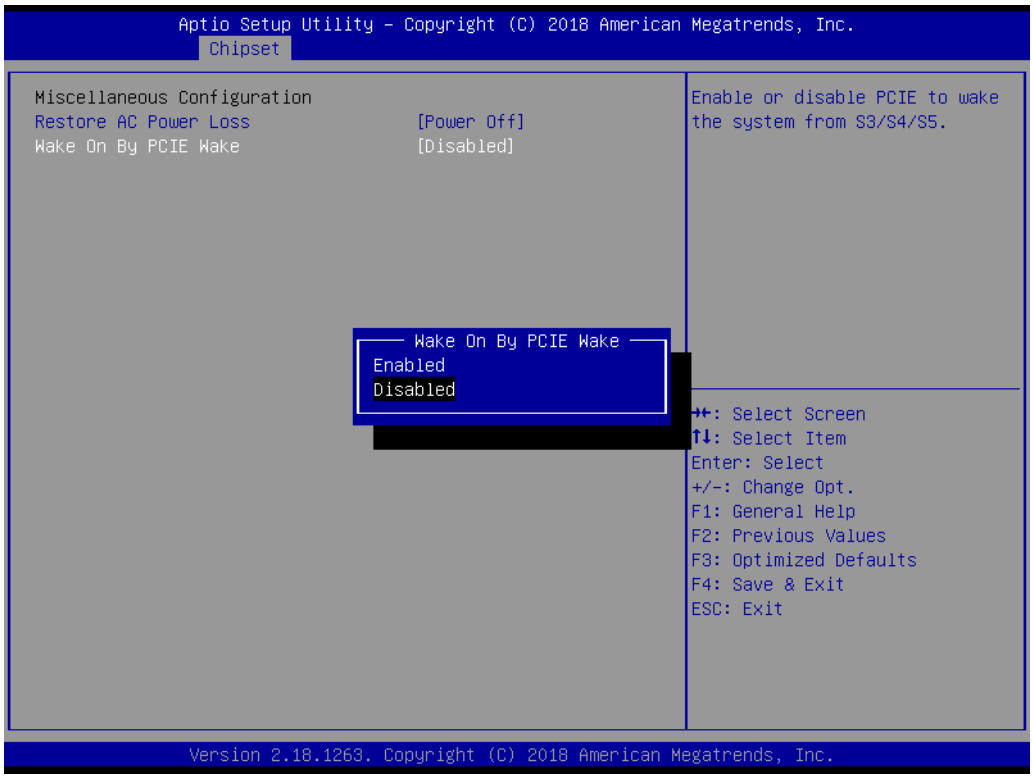
1. Select the “South Cluster Configuration” item in the “Chipset” tab.



2. Select the “Miscellaneous Configuration” item.

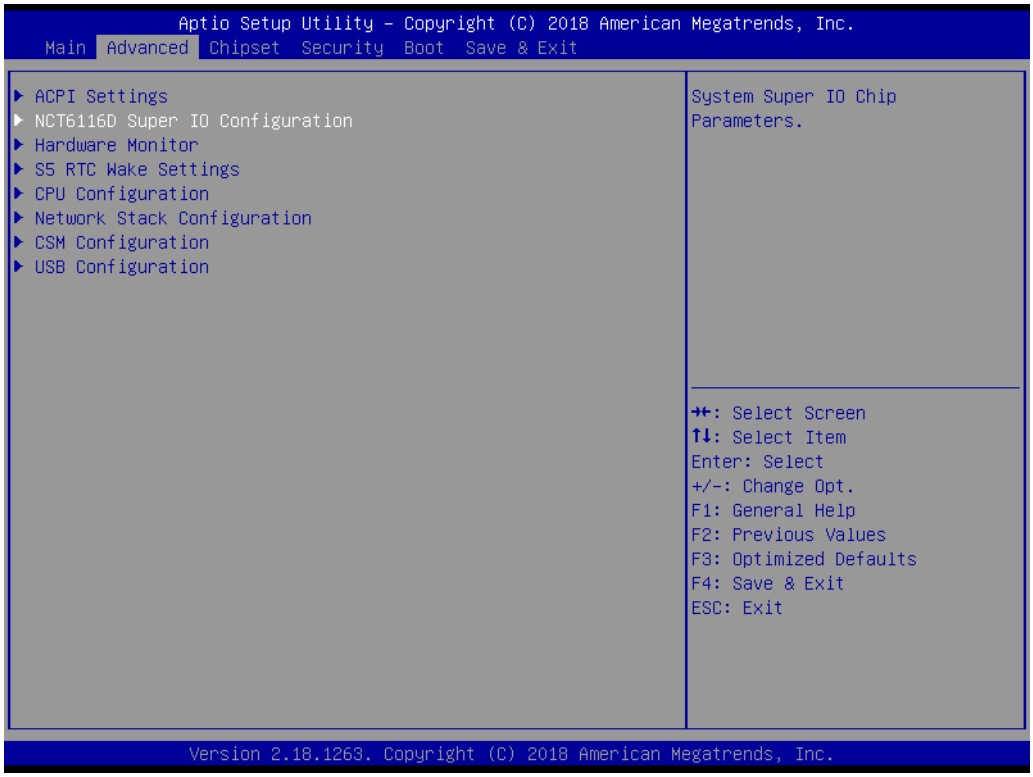


3. Set “Wake-on-PCIE” as “enabled”.

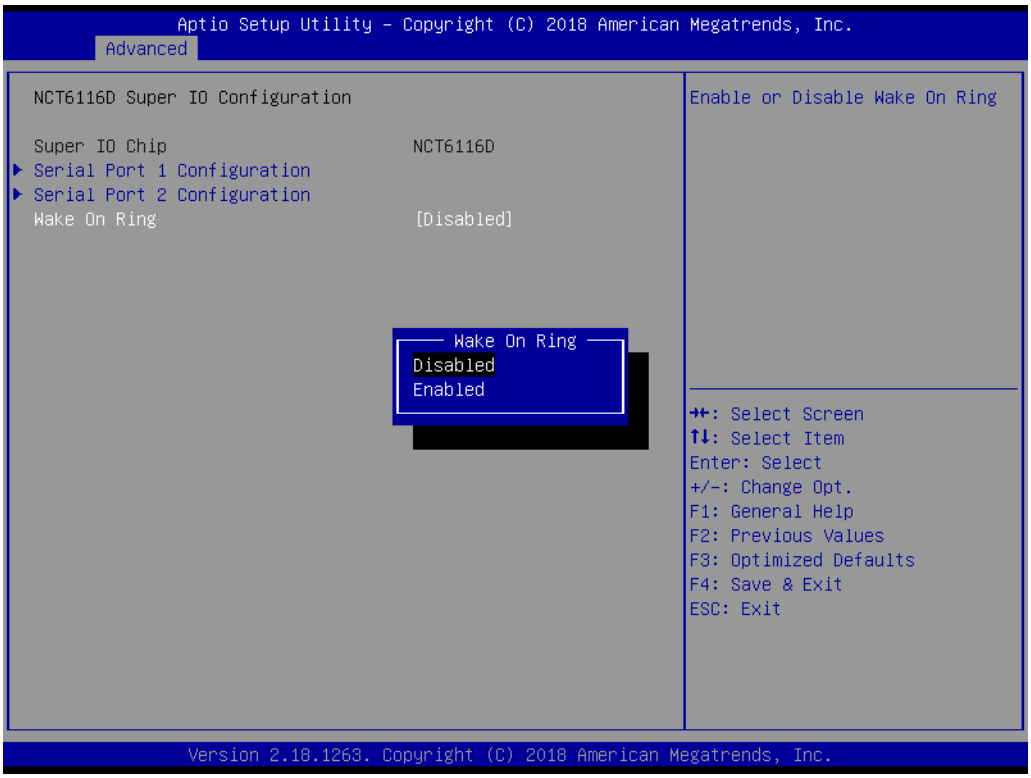


4.2.7 Wake-on-Ring

1. Select the “NCT6106D Super IO Configuration” item in the “Advanced” tab.



2. Set “Wake-on-Ring” to “enabled”.



Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Programming Example

The watchdog timer is provided to ensure that standalone systems can always recover from catastrophic CPU failures and crashes. Such events may have been caused by external EMI or a software bug. If the CPU is malfunctioning, the watchdog timer performs a hardware reset to return the system to a previous state.

The following watchdog timer example code is written in Intel 8086 assembly language for a DOS environment. The number of watchdog timer intervals can be set as 0 ~ 255 via software.

```
-----------------------------------------------
; Enter the Extended Function Mode
;-----------------------------------------------
MOV DX, 2EH; dependency by HW strap to 2Eh
MOV AL, 87H
OUT DX, AL
OUT DX, AL
;-------------------------------------------------------------------------
; Configure logical device 8, configuration register CR30
;-------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, 07H
OUT DX, AL; point to logical device number reg.
MOV DX, 2FH
MOV AL, 08H
OUT DX, AL; select logical device 8
;-------------------------------------------------------------------------
;Set WDT logic device to active
;-------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, 30H
OUT DX, AL; select CR30
MOV DX, 2FH
MOV AL, 01H
OUT DX, AL; set WDT active
;-------------------------------------------------------------------------
;Initial WDT mode
;-------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, F0H
OUT DX, AL
MOV DX, 2FH
MOV AL, 00H; bit 0: 0 = pulse mode, 1 = level mode; bit 3: 0 = second mode, 1 =
minute mode
OUT DX, AL; set second mode, default value
;-------------------------------------------------------------------------
;Set WDT timeout value
```

```
;--------------------------------------------------------------------------
MOV DX, 2EH
MOV AL, F1H
OUT DX, AL
MOV DX, 2FH
MOV AL, 05H
OUT DX, AL; set timeout value as 5s; 00 = timeout disabled
;----------------------------------------------
; Exit the Extended Function Mode
;----------------------------------------------
MOV DX, 2EH
MOV AL, AAH
OUT DX, AL
```

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