

PPC-MB-610 Mini-ITX Motherboard with Intel® Core™ i7/ i5/i3/Pentium®/Celeron® LGA 1151 CPU, DP/VGA, 5 COM, 6 USB, Dual LAN, PCIe x 16, and M.2 M Key & E key Startup Manual

Packing List

Before card installation, please ensure that the following items have been included in your shipment:

1. 1 x PPC-MB-610 mini-ITX motherboard
2. 1 x COM cables (1 to 4 port DB9)
3. 1 x SATA cable
4. 1 x PPC-MB-610 startup manual
5. 1 x Warranty card
6. 1 x Thermal grease
7. 14 x COM port screws
8. 2 x M.2 packet screws

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

Note 1: For detailed PPC-MB-610 specifications, refer to the latest product information provided on the Advantech website (PPC-61X1C model).

Note 2: Acrobat Reader is required to view PDF files. The Acrobat Reader software can be downloaded from www.adobe.com/Products/acrobat/readstep2.html (Acrobat is a trademark of Adobe).

For more information about this or other Advantech products, visit our website at

<http://www.advantech.com>

For technical support and service, visit our support website at

<http://support.advantech.com>

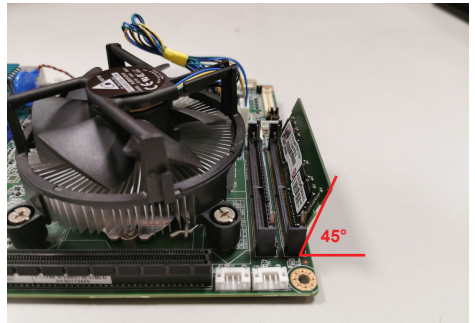
This manual is for PPC-MB-610, Rev. A1.

Part No. 2043776000
Printed in China

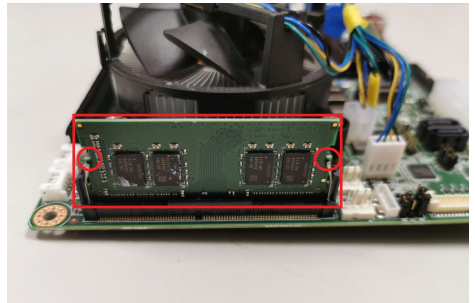
Edition 1
July 2020

Installation Guide

1. Insert the memory module into the memory slot at a 45 degree angle, as shown below. Ensure that the gold fingers of the module are fully inserted into the slot.



2. Once inserted, gently press the memory module into the slot until the tabs snap into place, securing the module in position.



Specifications

Selected M/B	PPC-MB-610								
CPU	CPU	i7-8700/i7-8700T	i5-8500/i5-8500T	i3-8100/i3-8100T	Pentium G5400/ G5400T	Celeron G4900/ G4900T	i7-9700TE	i5-9500E/ i5-9500TE	i3-9100E/ i3-9100TE
	Core NO.	6/6	6/6	4/4	2/2	2/2	8	6/6	4/4
	Max Speed	3.2GHz(up to 4.6GHz) / 2.4 GHz(up to 4.0GHz)	3.0GHz(up to 4.1GHz) / 2.1 GHz(up to 3.5GHz)	3.6/3.1 GHz	3.7 / 3.1 GHz	3.1 / 2.9 GHz	1.8 GHz(up to 3.8GHz)	3.0GHz(up to 4.2GHz)/ 2.2 GHz(up to 3.6GHz)	3.1GHz(up to 3.7GHz)/ 2.2 GHz(up to 3.2GHz)
	L3 Cache	12 / 12 MB	9 / 9 MB	6 / 6 MB	4 / 4 MB	2 / 2 MB	12 MB	9/9 MB	6/6 MB
	TDP	65 / 35 W	65 / 35 W	65 / 35 W	54 / 35 W	54 / 35 W	35 W	65/35 W	65/35 W
Chipset	Q370								
Memory	2 x 260-pin SODIMM DDR4 , 2666 MHz , up to 32 GB (non-ECC)								
Network (LAN)	2 x 10/100/1000 Mbps Ethernet and 1 x intel® L219LM (support AMT 12.0 only for i7 & i5) , 1 x Intel i211								
Rear I/O	1 x RS232/422/485 , 1 x RS232 , 1x DP1.2 , 1 x VGA , 6 x USB3.1 , 1 x Line-out , 1 x Mic-in								
Internal Connector	3 x RS232 , 1 x GPIO (8 channels) , 2 x speaker , 1 x LED , 2 x USB 2.0 , 1 x LVDS , 1 x touch control , 2 x SATA 3.0 (support RAID 0,1) , 1 x LPC (to support TPM2.0) ,								
Watchdog Timer	255 timer intervals , configurable using software								
Expansion	"1 x M.2 slot(2280 M key) for storage; 1 x M.2 slot (2230 E key) for wireless 1 x PCIe16 slot for riser card"								
Dimensions (W x H)	170 mm x 170 mm (6.69" x 6.69")								
OS Support	Microsoft® Windows 10 (64 bit) , Linux								

Jumpers and Connectors

The PPC-MB-610 motherboard features a number of jumpers that allow users to configure the system according to specific applications. The functions of each jumper and connector are listed in the table below.

Connector and Headers

Connectors and Headers List	
Label	Function
CN2	Mic-In/Line-Out connector
LAN2_USB1	RJ45+USB 3.1 stack connector
LAN1_USB1	RJ45+USB 3.1 stack connector
VGA1	VGA display connector
DP1	DisplayPort connector
COM12	COM 1/2 connector
USB3	USB 3.1 x2 connector
ATX12v1	ATX 12V power supply connector
CN21	ATX Power Supply Connector
CN5	Power button connector
CN6	COM 3/4/5 and GPIO connector
BAT1	Battery connector
SPI1	SPI BIOS flash socket
CN16	Touch connector
CN17	LVDS panel connector
CN20	LVDS backlight inverter power connector
Sysfan1 ~ 2	System fan power connector
CPUFAN1	CPU fan power connector
SATA1 ~ 2	SATA signal connector
CN4	Power LED connector
CN9/CN12	2 x USB 2.0 pin header
PCIEX16_1	PCIe x 16 slot connector
AMP1	Audio amplifier output connector
DIMMA1/ DIMMB1	DDR4 SODIMM socket
CPU1	CPU socket
M.2_2	M.2 E-Key
NGFF1	M.2 M Key

Jumpers and Connectors (Cont.)

COM12: COM 2 Connector

Pin	Definition (RS232)	Definition (RS422)	Definition (RS485)
1	DCD	TX-	TX RX-
2	RXD	TX+	TX RX+
3	TXD	RX+	
4	DTR	RX-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		

CN6:COM 3/4/5 and GPIO connector

1	COM3_DCD#	2	COM3_DSR#
3	COM3_RXD	4	COM3_RTS#
5	COM3_TXD	6	COM3_CTS#
7	COM3_DTR#	8	COM3_RI#
9	GND	10	GND
11	COM4_DCD#	12	COM4_DSR#
13	COM4_RXD	14	COM4_RTS#
15	COM4_TXD	16	COM4_CTS#
17	COM4_DTR#	18	COM4_RI#
19	GND	20	GND
21	COM5_DCD#	22	COM5_DSR#
23	COM5_RXD	24	COM5_RTS#
25	COM5_TXD	26	COM5_CTS#
27	COM5_DTR#	28	COM5_RI#
29	GND	30	GND
31	GND	32	SIO_GPIO6
33	SIO_GPIO4	34	SIO_GPIO2
35	SIO_GPIO0	36	SIO_GPIO7
37	SIO_GPIO5	38	SIO_GPIO3
39	SIO_GPIO1	40	+V5_DUAL

Jumpers and Connectors (Cont.)

CN16: Touch Connector

Pin	Definition
1	Y+
2	X+
3	SENSE
4	Y-
5	X-

Sysfan 1 ~ 2: System Fan Power Connector

Pin	Definition
1	GND
2	POWER
3	SPEED
4	PWM

CPUFAN1: CPU Fan Power Connector

Pin	Definition
1	GND
2	POWER
3	SPEED
4	PWM

CN4: Power LED Connector

Pin	Definition
1	+V5_DUAL
2	+V5
3	GND
4	GND

AMP1: Audio Amplifier Output Connector

Pin	Definition
1	SPK L-
2	SPK L+
3	SPK R+
4	SPK R-

Jumpers and Connectors (Cont.)

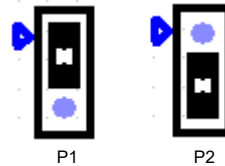
Jumper Settings

Jumpers List

Jumper	Function
JP1	ATX/AT select
JCMOS1	RTC select
JP2	Touch power select
JP3	LCD power select
JP4	Enable power select
JP5	LVDS PWM power select
JP6	COM Pin 9 power select (COM 1 and 2)
JP7	LVDS resolution select

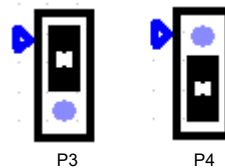
ATX/AT Select (JP1)

(1-2) P1	AT
(2-3) P2	ATX (default)



RTC Select (Jcmos1)

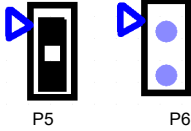
(1-2) P3	Normal (default)
(2-3) P4	Clear CMOS



Jumpers and Connectors (Cont.)

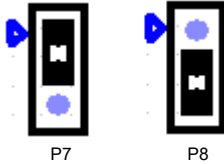
Touch Power Select (JP2)

(1-2) P5	connect resistive touch screen(default)
NC P6	not connect resistive touch screen



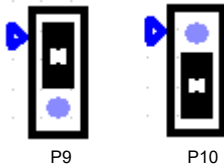
LCD Power Select (JP3)

(1-2) P7	+V5
(2-3) P8	+V3.3 (default)



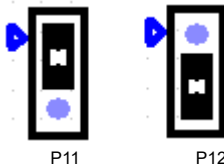
Enable Power Select (JP4)

(1-2) P9	+V5
(2-3) P10	+V3.3 (default)



LVDS PWM Power Select (JP5)

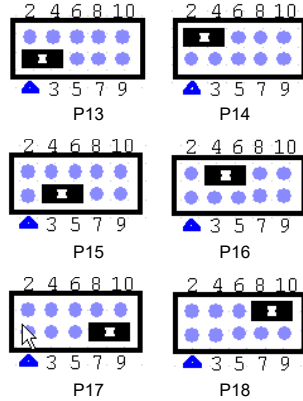
(1-2) P11	+V5
(2-3) P12	+V3.3 (default)



Jumpers and Connectors (Cont.)

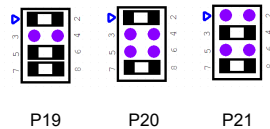
COM Ring Select (JP6)

(1-3)/(2-4) P13/P14	COM 2/1 ring (default)
(3-5)/(4-6) P15/P16	COM 2/1 5V
(7-9)/(8-10) P17/P18	COM 2/1 12V

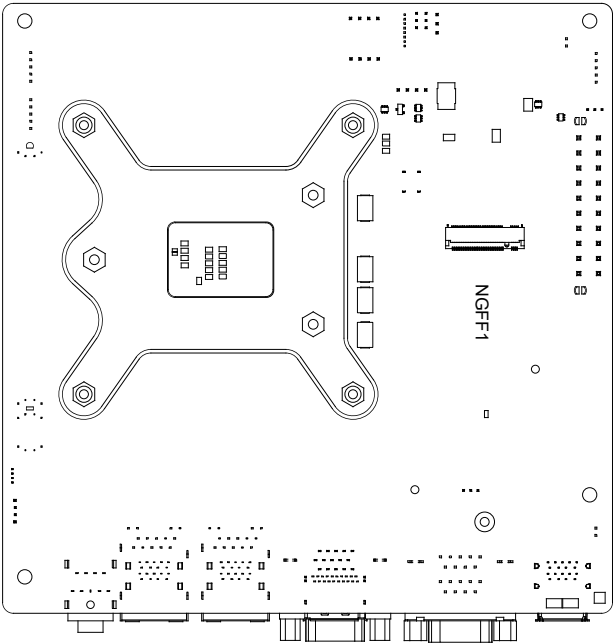
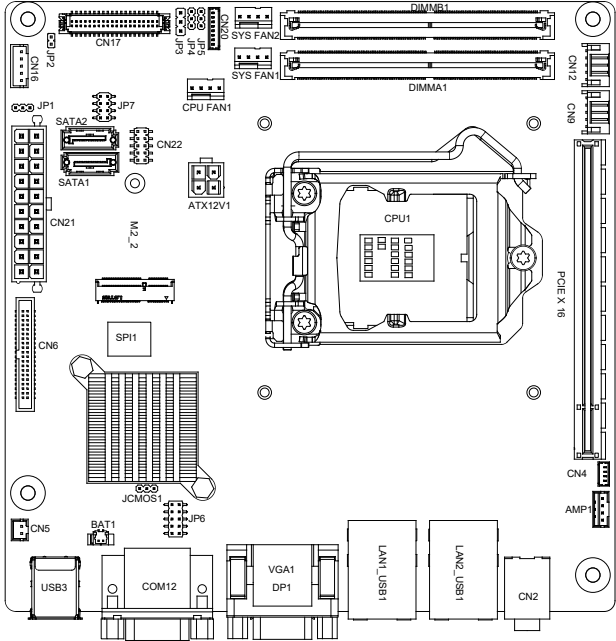


LVDS Resolution Select (JP7)

(1-2)/(5-6)/(7-8) P19	1024*768 (24 bit) (for PPC-6151C chassis)
(1-2)/(7-8)P20	1280*1024 (24 bit) (for PPC-6171C chassis)
(3-4)/(7-8) P21	1280*1024 (24 bit) (for PPC-6191C chassis)



Board Layout: Jumper and Connector Locations



BIOS Setup Program

1.1 Entering the BIOS Setup Utility

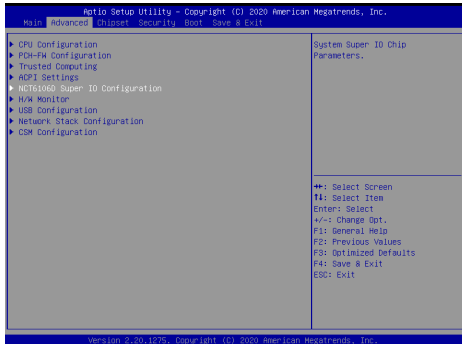
When the power is turned on, press the button to enter the BIOS setup screen.

After a setting is configured, press <F4> to save and exit; otherwise, the configuration will not be saved in the BIOS.

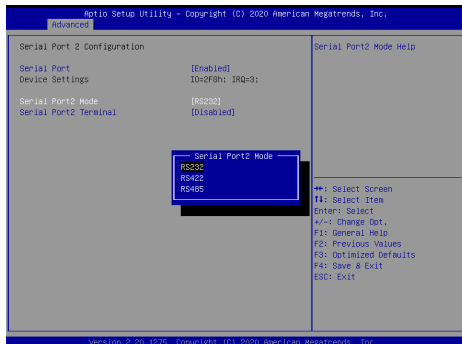


1.2 COM 2 Mode Selection (RS232/422/RS485)

1. Access the "NCT6106D Super IO Configuration" item from the "Advanced" tab.

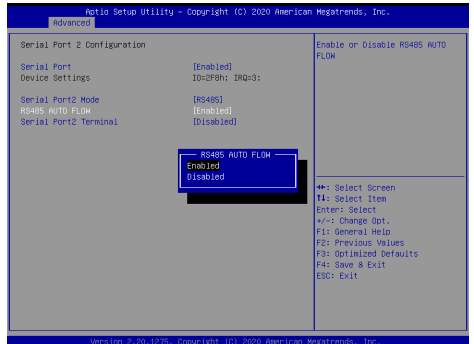


2. Select "Serial Port 2 Configuration". The COM 2 mode can be configured via the "Serial Port2 COM 2" item.



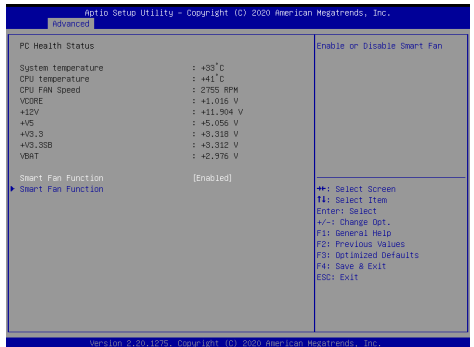
BIOS Setup Program (Cont.)

3. Select the "RS485" option. Autoflow and termination resistors can be enabled or disabled.



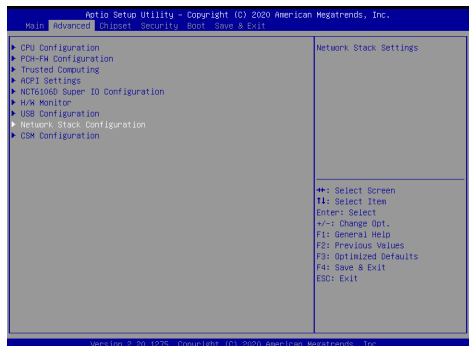
1.3 H/W Monitor and Smart Fan Mode Configuration

1. Access the "H/W Monitor" item from the "Advanced" tab to check the voltage temperature and fan speed.



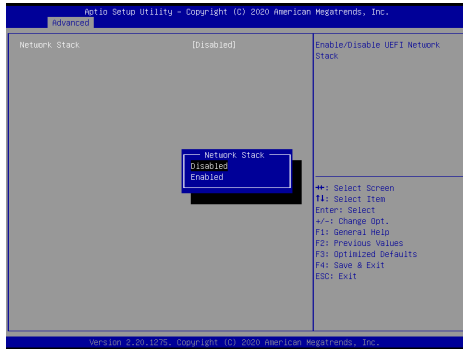
1.4 LAN PXE Mode Selection

1. Access the "Network Stack Configuration" item from the "Advanced" tab.



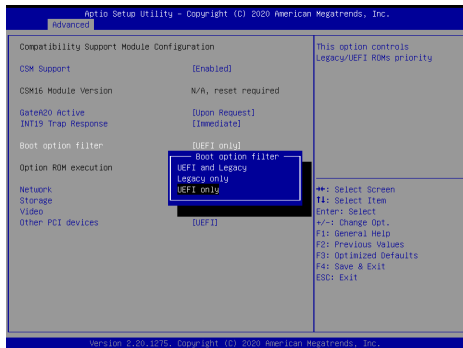
BIOS Setup Program (Cont.)

2. Select the “Enabled” option for the “Network Stack” item.

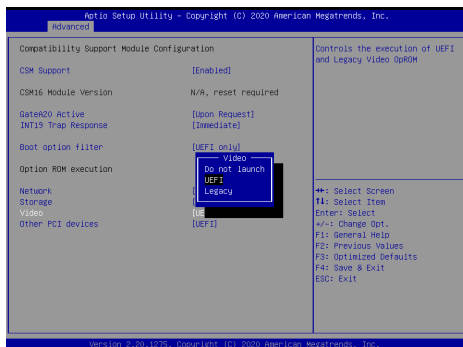


1.5 Boot Option Filter

1. Access the “CSM Configuration” item from the “Advanced” tab. Users can select “UEFI only” or “Legacy only” for “Boot Option Filter” configuration.



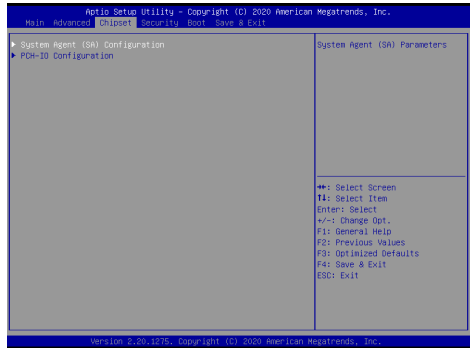
2. Configure the Video and Storage item settings to match the Boot Option Filter configuration.



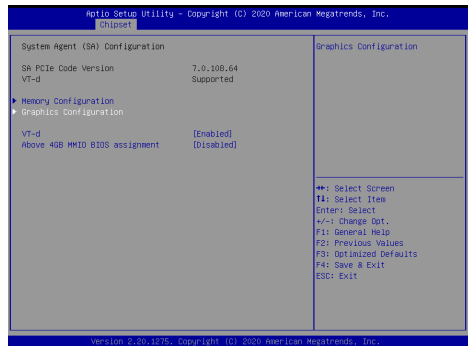
BIOS Setup Program (Cont.)

1.6 Graphics Configuration

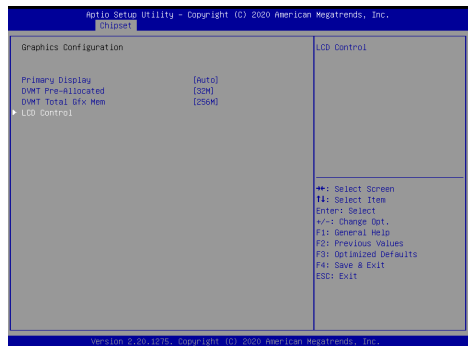
1. Access the “System Agent (SA) Configuration” item from the “Chipset” tab.



2. Click on the “Graphics Configuration” item.

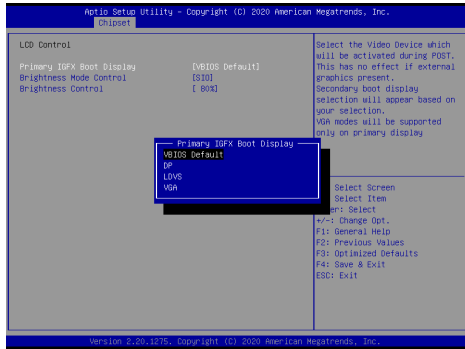


3. Select the “LCD Control” item.

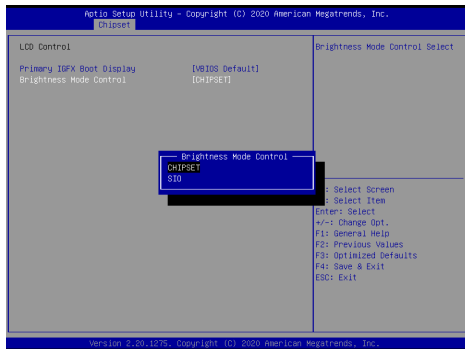


BIOS Setup Program (Cont.)

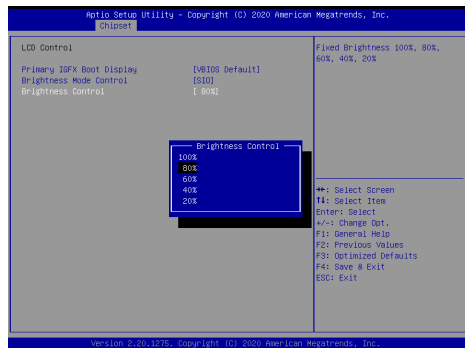
- The Primary IGFX Boot Display item can be configured as "VBIOS Default", "DP", "LVDS", or "VGA".



- The Brightness Mode Control item configuration is set to "Chipset" by default. This means users can adjust the system brightness via the OS brightness dimmer.



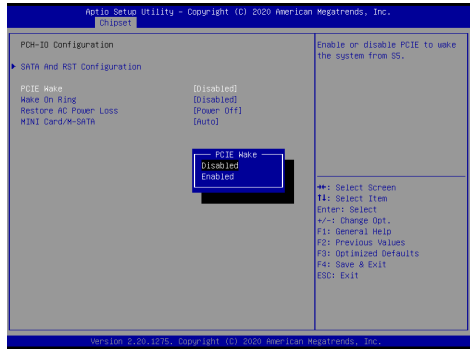
- Access the "Brightness Manual Control" item to select from six brightness level options.



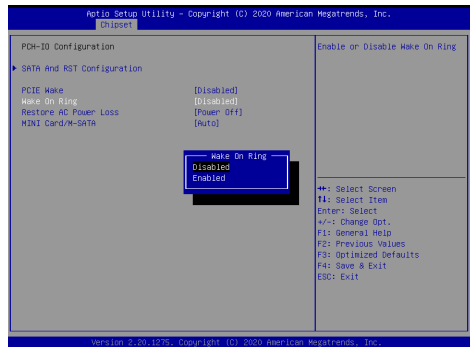
BIOS Setup Program (Cont.)

1.7 Wake-On-LAN and Ring

- In the "Chipset" tab click the "PCH-IO Configuration" item to access "PCIE Wake" configuration. Select the "Enabled" option to allow wake-on-LAN function.



- In the "Chipset" tab click the "PCH-IO Configuration" item to access "Wake on Ring" configuration. Select the "Enabled" option to allow wake-on-ring function.



1.8 AT and ATX Settings

In the "Chipset" tab click the "PCH-IO Configuration" item to access the "Restore AC Power Loss" item. Set the item configuration to "Power On", "Power Off", or "Last State".

