Matrix MXE-1200 Series

MXE-1212-232/1212-422/1212-485

User's Manual

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1 Introduction

1.1 Overview



The MXE-1200 series is the ADLINK's latest Matrix product based on the Intel Atom N270 1.6 GHz processor and provides 12 serial ports for device communication and control. This distinctive feature delivers a great benefit to access multiple devices using a compact and rugged controller without any additional serial communication cards.

Leveraging the design concept of the Matrix MXE-1000 series, the MXE-1200 series maintains all theremarkable features such as rugged -20 to 70°C (with extended temperature option) fanless operation, 5 Grms vibration resistance and 6-36 VDC wide range power input. The design of serial ports is also flexible to fit the requirements of diversified applications. Two of the 12 COM ports can be configured to RS-232, RS-422 or RS-485 via BIOS settings and two RS-232 COM ports. The remaining eight COM ports are either RS-232 (MXE-1212) or RS-422/485 (MXE-1212/485). Moreover, the MXE-1200 series is equipped with a mini-PCIe socket, USIM socket and pre-installed SMA-to-IPEX antenna cable for further expansion through wireless communication capability.

Combing reliability, compactness and the unique feature of 12 COM ports, the MXE-1200 series is the perfect fit for communicating with external devices and introduces great benefits to applications such as a toll gate controller (RS-232), automatic fare collection system (RS-232) and smart grid (RS-422/485).

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1.2 Features

- Intel® Atom™ N270 1.6 GHz processor + 945GSE chipset
- Rugged, -20 °C to 70 °C (with extended temperature option) fanless operation
- Provides 12 COM ports
- Two software-programmable RS-232/422/485 ports, two RS-232 ports
- 8x RS-232 ports (MXE-1212) or 8x RS-422/485 ports (MXE-1212/485)
- Built-in 6 VDC to 36 VDC wide-range DC power input
- One 1000/100/10 Mbps Ethernet port
- One internal PCIe Mini Card socket with USIM socket with antenna cable pre-installed
- One external CF socket

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1.3 Specifications

Product Name	MXE-1212/232	MXE-1212/422	MXE-1212/485
55,5M Level Board Name	ABX-1200/232	ABX-1200/422	ABX-1200/485
51 Level Board Name	ABX-1200	ABX-1200	ABX-1200
System Core			
Processor	Intel® Atom N270 1.6GHz CPU		
Chipset	Intel® 945GSE Graphic Memory Control Hub Intel® I/O Controller Hub 7 Mobile(ICH7-M)		
Video	VGA ▶ Analog CRT, supports QXGA (2048 x 1536) resolution LVDS display via DVI-D connector ▶ 18-bit LVDS output via DVI-D connector for LCD panel		
Memory	1 GB DDR2 667 MHz SODIMM module (up to 2 GB)		
I/O Interface			
Serial Port	▶ -2xSoftware-programmable RS-232/422/485 (COM1 & COM2) by DB9 connectors ▶ -2x RS-232 (COM3 & COM4) by DB9 connectors ▶ -8x RS-232 (COM5-COM12) by DB62 connector	▶ 2xSoftware-programmable RS-232/422/485 (COM1 & COM2) by DB9 connectors ▶ -2x RS-232 (COM3 & COM4) by DB9 connectors ▶ -8x RS-422 (COM5-COM12) by DB62 connector	▶ -2xSoftware-programmable RS-232/422/485 (COM1 & COM2) by DB9 connectors ▶ -2x RS-232 (COM3 & COM4) by DB9 connectors ▶ -8x RS-485 (COM5-COM12) by DB62 connector
Ethernet	1x GbE port (Realtek 8111C)		
USB	4x USB 2.0 ports		
Mini-PCIe	1x Internal PCIe Mini Card Socket		
USIM	1x USIM socket for 3G communication (used for a 3G mini-PCIe module)		
Antenna	1x SMA Antenna connector with SMA-to-IPEX cable pre-installed		
Audio	1x Mic-in and 1x Speaker-out		
KB/MS	1x PS/2 keyboard and 1x PS/2 mouse		
Power Supply			
DC Input	Built-in 6-36 VDC wide-range DC input 3P pluggable connector with latch (V-, GND, V+)		
AC Input	Optional 40 W external AC-DC adapter for AC input		
Storage Device			
SATA HDD	On-board SATA port for 2.5" HDD/SSD installation		
CompactFlash	1x type II CompactFlash socket, supporting PIO and DMA modes		
Mechanical			
Dimensions	210(W)x170(D)x54(H) mm		
Weight	1.9 kg		

Table 1-1: MXE-1200 Series Specifications

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Mounting	VESA 100 mounting kit for Wall-mount
Environmental	
Operating Temperature	w/o FAN, w/o Card and w/o HDD: -10°C to 60°C
Storage Temperature	-40°C to 85°C
Humidity	~95% @ 40°C (non-condensing)
Vibration	Operating, 5 Grms, 5-500 Hz, 3 axes (w/ CF or SSD)
	Operating, 0.5 Grms, 5-500 Hz, 3 axes (w/ HDD)
EMC	CE, FCC
Shock	Operating, 100 Grms, half sine 11ms duration (w/ CF or SSD)

Table 1-1: MXE-1200 Series Specifications

1.4 Unpacking Checklist

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from your dealer before returning any product to ADLINK.

Check if the following items are included in the package.

MXE-1212/232

- MXE-1212/232 controller
- VESA-100 wall-mount bracket (located under the MXE-1212)
- Screw pack for wall-mounting and HDD fixing
- User's manual
- ADLINK All-in-One DVD

MXE-1212/422

- MXE-1212/422 controller
- VESA-100 wall-mount bracket (located under the MXE-1212)
- Screw pack for wall-mounting and HDD fixing
- User's manual
- ADLINK All-in-One DVD

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MXE-1212/485

- MXE-1212/485 controller
- VESA 100 wall-mount bracket (located under the MXE-1212)
- Screw pack for wall-mounting and HDD fixing
- User's manual
- ADLINK All-in-One DVD

Note: OEM version packaging may vary depending on customer requests. The assigned controller and/or peripheral modules may be pre-installed and shipped with the chassis. Inquire with your dealer for additional information on these options.

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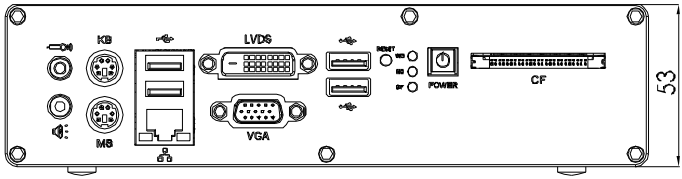
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2 System Description

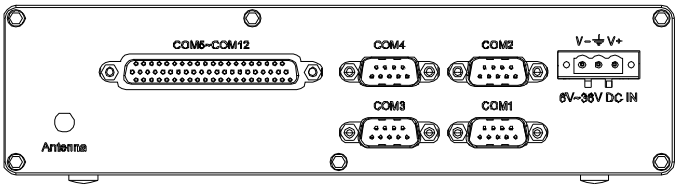
This section describes the appearance and connectors of the MXE-1200 controllers, including chassis dimension, front panel connectors, rear panel connectors, and internal IO connectors.

2.1 Mechanical Drawing

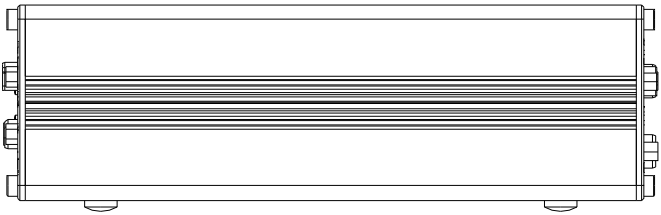
2.1.1 Front View



2.1.2 Rear View

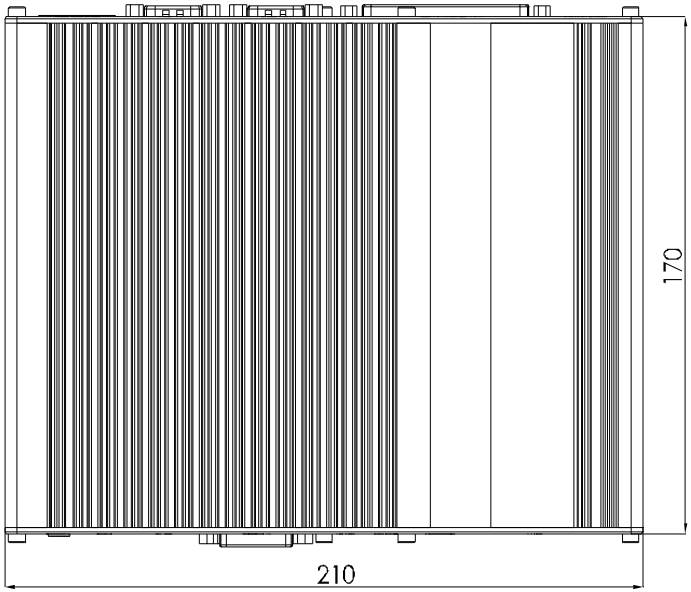


2.1.3 Side View

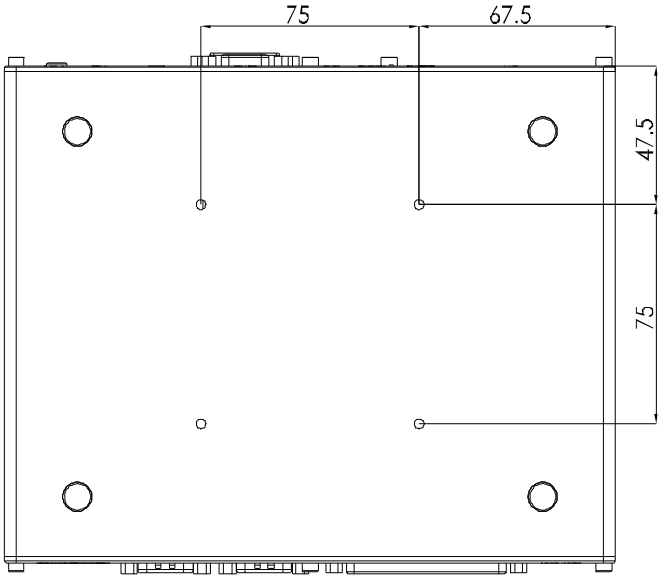


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2.1.4 Top View



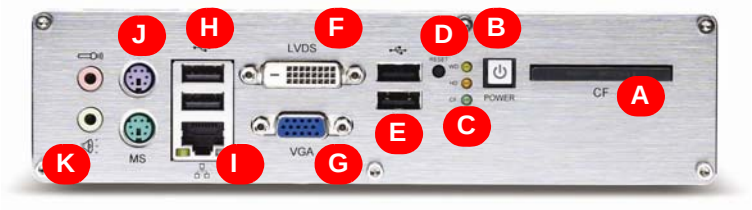
2.1.5 Bottom View



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2.2 Front Panel I/O Connectors

Each of the MXE-1200 series controllers have the same I/O connector configuration on the front panel. This section describes the functions of these I/O connectors.



A. CompactFlash Socket
B. Power Button
C. LED Indicators
D. Reset Button
E. Two USB 2.0 Connectors (Type A)
F. LVDS Connector
G. VGA Connector
H. Two USB 2.0 Connectors (Type A)
I. Gigabit Ethernet (RTL8111C)
J. Keyboard & Mouse PS2 connectors
K. Audio Jacks

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2.2.1 CompactFlash Socket

The Matrix MXE-1200 series is equipped with a Type I Compact-Flash socket which is located on the front panel. The CF interface is transferred from SATA by an ASIC, and can be an alternative storage device for system installation. The MXE-1200 controller can be booted via a CF card with an OS installed. Due to the nature of the SATA interface, the CF card can't be hot-plugin and must be installed before the system is powered on. The illustration of installing a CF card is described in section 3.3.

2.2.2 Power Button

The power button is a non-latched push button with a blue LED indicator. System is turned on when button is pressed, and the power LED is also lighted up. To shut down the system, you can issue shutdown command in operating system or just press the power button. If the system halts, you can also press the button for 5 seconds to compulsorily turn off the system.

2.2.3 LED Indicators

Besides the LED attached in the power button, there are three LED indicators on the front panel. The following table describes the color and function of the LED indicators.

LED indicator	Color	Description
Watchdog (WD)	Yellow	Indicates the status of watchdog timer. When watchdog timer is started, the LED is flashing. And when timer is expired, the LED is on.
Hard disk drive (HD)	Red	Indicates the operating state of HDD. When the SATA hard drive or CF card is active, the LED indicator is flashing.
CompactFlash card (CF)	Green	Indicates the operating state of CF card. The LED indicator is flashing when CF card is active.

Table 2-1: LED Indicators

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2.2.4 Reset Button

The reset button is used to perform hard reset for MXE-1200 controller.

2.2.5 LVDS Connector

The LVDS connector is a DVI type to connect the MXE-1200 series controller to a LVDS interface monitor. The connector pin definition is listed below:



1	C_LVD_A_DATA2_N	GPIB_DIO8_CN	14	VCC_FPD
2	C_LVD_A_DATA2_P	GPIB_REN_CN	15	DGND
3	DGND		16	C_LDDC_CLK
				GPIB_DIO7_CN
4	C_LVD_EN	GPIB_DIO1_CN	17	C_LVD_A_DATA0_N
				GPIB_DAV_CN
5	D12V_EXT		18	C_LVD_A_DATA0_P
				GPIB_NRFD_CN
6	C_L_BRIGHTNESS	GPIB_EOI_CN	19	DGND
7	C_LBKLT_EN_DELAY	GPIB_DIO4_CN	20	C_LCD_PID1_R
				GPIB_IFC_CN
8	C_LDDC_DATA	GPIB_DIO6_CN	21	C_LCD_PID0_R
				GPIB_SRQ_CN
9	C_LVD_A_DATA1_N	GPIB_ATN_CN	22	DGND
10	C_LVD_A_DATA1_P	GPIB_DIO5_CN	23	C_LVD_A_CLK_P
				GPIB_DIO3_CN
11	DGND		24	C_LVD_A_CLK_N
				GPIB_DIO2_CN
12	C_DBL_CLK	GPIB_NDAC_CN	25	CHGND
13	DGND		26	CHGND

Table 2-2: LVDS Connector

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2.2.6 VGA connector

The VGA connector is used to connect the MXE-1200 series controller to a VGA interface (D-sub 15P) monitor.

2.2.7 USB 2.0 connectors

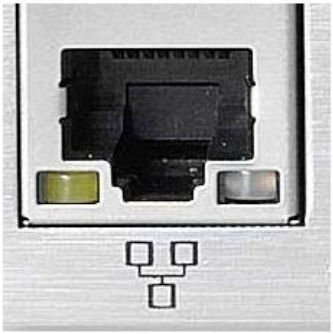
The MXE-1200 series controller provides four USB 2.0 ports in Type A USB connectors on the front panel. All USB ports are compatible with high-speed, full-speed and low-speed USB devices. The MXE-1200 series controller supports multiple boot devices, including USB flash drive, USB external hard drive, USB floppy, USB CD-ROM and etc. The boot priority and boot device can be configured in BIOS. Please refer to Section 4.1 for detail.

2.2.8 Gigabit Ethernet (RTL8111C)

The MXE-1200 series controller has one Gigabit Ethernet port on the front panel by Realtek 8111C controller. The Ethernet controller supports the following features:

- x1 PCI Express® interface with 2.5 GHz signaling
- Advanced error reporting
- Message signaled interrupts
- TCP segmentation offload/large-send support
- 802.3x flow control-compliant
- IEEE 802.1p and 802.1q support
- 10/100/1000 IEEE 802.3-compliant
- Automatic MDI/MDIX crossover at all speeds
- ACPI 2.0 specification
- Wake-On-Link feature
- Fully integrated ASF 2.0 functionality with on-chip µc
- SMBus 2.0 master interface for ASF functionality
- Serial Peripheral Interface (SPI) for ASF firmware

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Active/Link LED

LED Color	Status	Description
Yellow	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and is transmitting/receiving data.

Table 2-3: Active/Link LED

Speed LED

LED Color	Status	Description
Green/Orange	Green	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

Table 2-4: Speed LED

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2.2.9 Keyboard & Mouse PS2 connectors

The MXE-1200 controller provides connectors for connecting PS2 keyboard and mouse. The green connector is for a PS/2 mouse and the purple one is for a PS/2 keyboard.

2.2.10 Audio Jacks

The MXE-1200 controller implements Intel High Definition audio using a Realtek ALC262 chip. The HD audio supports up to 24-bit, 192 Kbps high quality headphone/speaker output and microphone input. Users can access the audio jacks on the front panel of MXE-1200 series. The pink jack is for microphone input, and the green jack is for speaker output.

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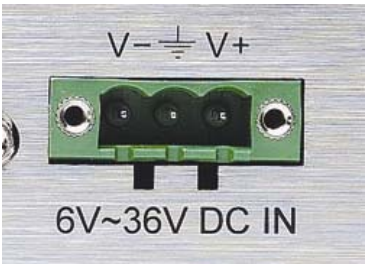
2.3 Rear Panel I/O Connectors

The MXE-1200 series controller has the same I/O connector configurations on the rear panel. The entire MXE-1200 series controller has DC power input connector, Antenna connector and 12x COM ports (four D-sub 9P connectors of COM10-COM4 and one D-sub 62P connector of COM5-COM12). And then the MXE-1212/232, MXE-1212/422, and MXE/1212-485 of MXE-1200 series controller support different serial ports of RS232/RS422/RS485 on these COM port connectors.



2.3.1 DC Power Input Connector

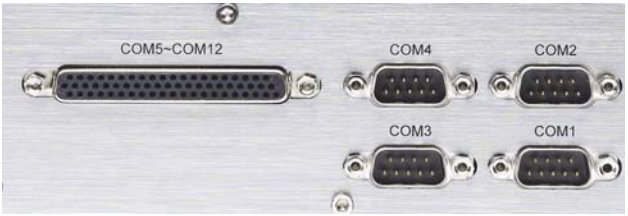
The DC power input connector of the MXE-1200 controller is on the rear panel. The power connector consists of three pins, V+, chassis ground, and V- from right to left respectively. V+ and V- pins are for DC power input and chassis ground pin allows you to connect the chassis to ground for better EMC compatibility. The DC power input of MXE-1200 series allows a voltage input from 6 V_{DC} to 36 V_{DC}.



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2.3.2 COM Ports

The MXE-1200 series controller provides 12 COM ports on the rear panel in the form of four D-sub 9P and one D-sub 62P connectors. The MXE-1200 series controller (MXE-1212/232, MXE-1212/422, and MXE-1212/485) provides different RS232/RS422/RS485 serial port options as shown in the following list. The COM1 and COM2 ports can also support RS232/RS422/RS485 through by BIOS setting. Please refer to Section 4.1 for details.



MXE-1212/232

- 2x Software-programmable RS-232/422/485 (COM1 and COM2) by DB9 connectors
- 2x RS-232 (COM3 and COM4) by DB9 connectors
- 8x RS-232 (COM5-COM12) by DB62 connector

MXE-1212/422

- 2x Software-programmable RS-232/422/485 (COM1 and COM2) by DB9 connectors
- 2x RS-232 (COM3 and COM4) by DB9 connectors
- 8x RS-422 (COM5-COM12) by DB62 connector

MXE-1212/485

- 2x Software-programmable RS-232/422/485 (COM1 and COM2) by DB9 connectors
- 2x RS-232 (COM3 and COM4) by DB9 connectors
- 8x RS-485 (COM5-COM12) by DB62 connector

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PIN	Signal Name		
	RS-232	RS-422	RS-485
1	DCD#	TX422n	485n
2	RXD#	TX422p	485p
3	TXD#	RX422p	
4	DTR#	RX422n	
5	GND		
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

Table 2-5: D-sub 9P COM1 and COM2 Ports Signal Names

PIN	Signal Name
	RS-232
1	DCD#
2	RXD#
3	TXD#
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

Table 2-6: D-sub 9P COM3 and COM4 Ports Signal Names

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Pin	Signal Name	Pin	Signal Name
1	TX0	32	DGND
2	DTR0	33	TX4
3	RX1	34	DTR4
4	DSR1	35	RX5
5	DCD1	36	DSR5
6	TX2	37	DCD5
7	DTR2	38	TX6
8	RX3	39	DTR6
9	DSR3	40	DGND
10	DCD3	41	TX7
11	RX4	42	DTR7
12	DSR4	43	CTS0
13	DCD4	44	RTS0
14	TX5	45	DGND
15	DTR5	46	CTS1
16	RX6	47	RTS1
17	DSR6	48	CTS2
18	DCD6	49	RTS2
19	RX7	50	DGND
20	DSR7	51	CTS3
21	DCD7	52	RTS3
22	RX0	53	CTS4
23	DSR0	54	RTS4
24	DCD0	55	DGND
25	TX1	56	CTS5
26	DTR1	57	RTS5
27	RX2	58	DGND
28	DSR2	59	CTS6
29	DCD2	60	RTS6
30	TX3	61	CTS7
31	DTR3	62	RTS7

Table 2-7: D-sub 62P Signal Names

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PIN	Signal Name		
	RS-232	RS-422	RS-485
1	DCD#	TX422n	485n
2	RXD#	TX422p	485p
3	TXD#	RX422p	
4	DTR#	RX422n	
5	GND		
6	DSR#		
7	RTS#		
8	CTS#		
9	RI#		

Table 2-8: D-sub 9P COM5-COM12 Ports of the D-sub 62P Signal Names

2.3.3 Antenna connector

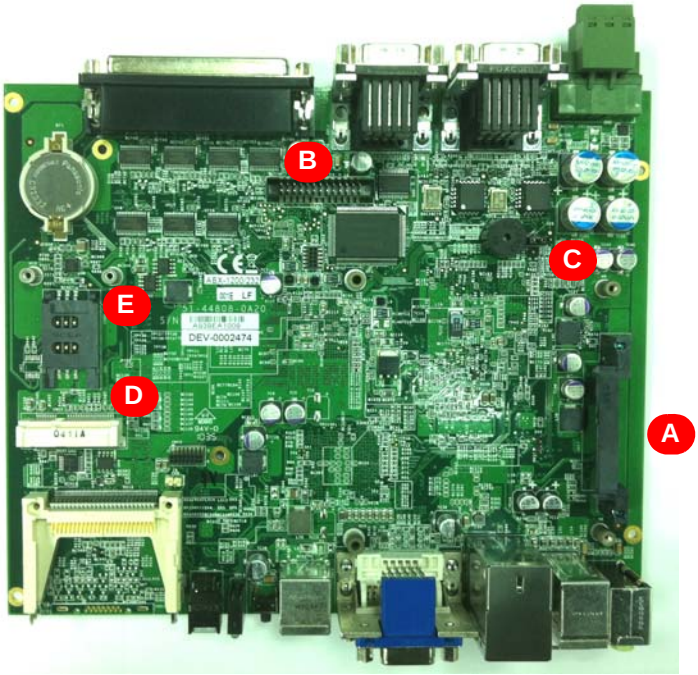
The MXE-1200 series controller provides a SMA type antenna connector which preparing for WiFi or 3.5G module of internal PCIE card.



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2.4 Internal I/O Connectors

This section describes the internal I/O connectors of the MXE-1200 controller. The figure shown below is a picture of the inside of the MXE-1200 series.



A. SATA connector
B. Pin head connector for LPT port and USB
C. Clear CMOS jumper
D. Mini PCIe connector
E. USIM socket

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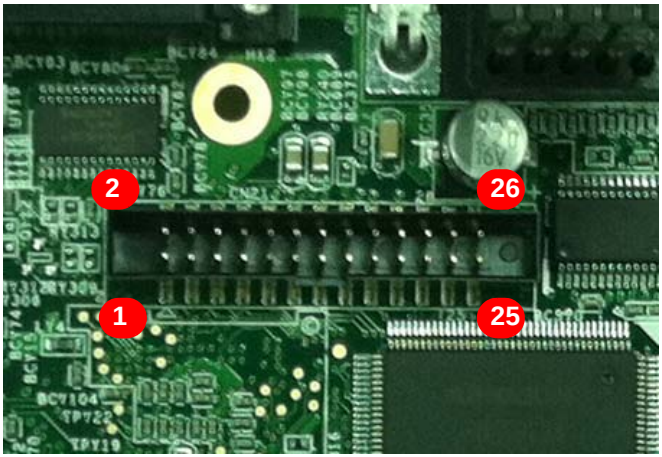
2.4.1 SATA Connector

The MXE-1200 series controller provides a SATA port of Gen.1 (1.5 Gbit/s) speed. The SATA host controller supports two modes of operation, the legacy mode using I/O space and AHCI mode using memory space. This SATA connector is designed for installing a 2.5 inches hard disk drive (HDD) or solid state disk (SSD). The HDD or SSD must be installed into SATA connector with a HDD bracket. Please refer to Section 3.1 for the illustration of installing a 2.5 inches HDD or SSD.

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2.4.2 Connector for LPT Port & USB

The CN21 is a proprietary 26-pin connector which provides both LPT and USB functions. It's designed to internally connect a LPT or USB device, such as a LPT or USB dongle, inside the chassis. Please refer the pin assignment showed below if you need to use this connector.



PIN	SINGAL	PIN	SIGNAL
1	nStrobe	2	Linefeed
3	Data0	4	nError
5	Data1	6	nInitialize
7	Data2	8	GND
9	Data3	10	GND
11	Data4	12	GND
13	Data5	14	GND
15	Data6	16	GND
17	Data7	18	GND
19	nAck	20	GND
21	Busy	22	USB-n
23	Paper Out	24	USB-p
25	Select	26	5V for USB

Table 2-9: Connector for LPT Port & USB

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2.4.3 Clear CMOS Jumper

When encountering the abnormal condition that causes the MXE-1200 controller failed to boot, you can try to clear the BIOS content stored in CMOS and restore to the default setting. To clear CMOS, please shorten pin#2 and pin#3 of JP1 and then restore to normal mode (short pin#1 and pin#2).

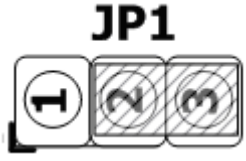
Normal	Clear
	

Table 2-10: Clear CMOS Jumper

2.4.4 Mini-PCIe Connector

The MXE-1200 controller features a mini-PCIe connector inside the chassis to provide function expansion by installing a 3rd-party mini-PCIe module. You can expand the functionality of the MXE-1200 series by installing a third-party mini-PCIe module, such as Wi-Fi module, 3.5G module and etc.

2.4.5 USIM Socket

When using a 3.5G mini-PCIe module, you usually need a SIM card to enable the 3.5G communication with your telecom operator. The MXE-1200 controller provides a USIM socket which is connected to mini-PCIe connector. You can insert the SIM card with 3.5G mini-PCIe module installed to fulfill the 3.5G communication.

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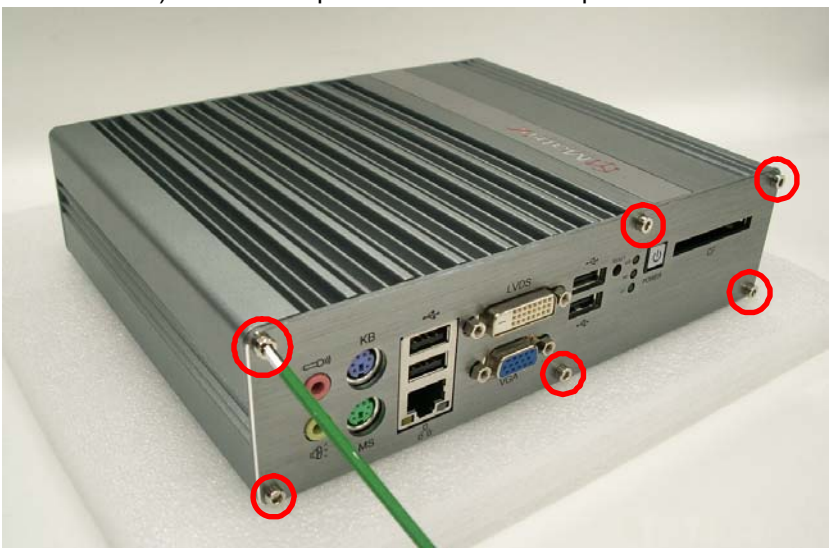
3 Getting Started

This chapter demonstrates how to install the hard drive and CompactFlash card into system. Additional COM ports jumper settings and MXE-1200 series wall-mount installation are also discussed.

3.1 Installing a hard disk drive

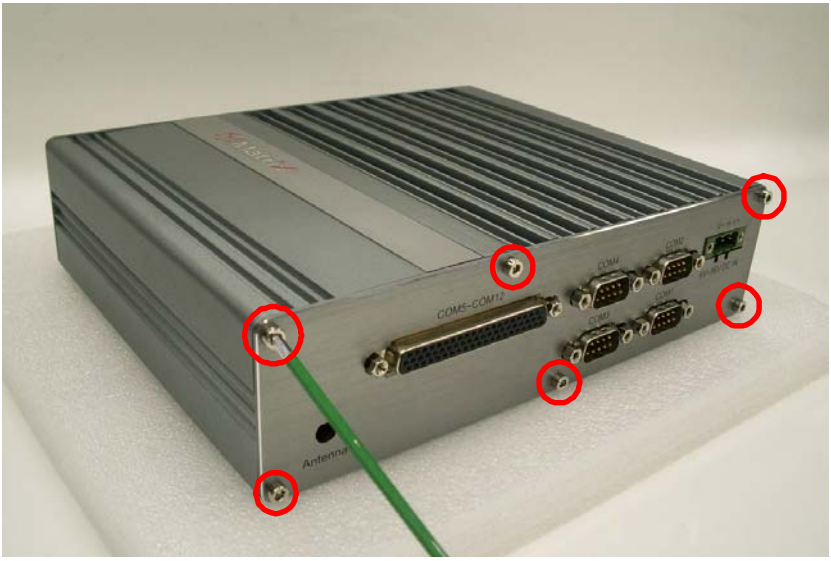
Before installing a hard disk drive, user should remove the front panel, rear panel, and bottom chassis first. Please follow the instructions below.

1. Use a #3 hex wrench to unscrew all six screws (M3 hex bolts) on the front panel and remove the panel.



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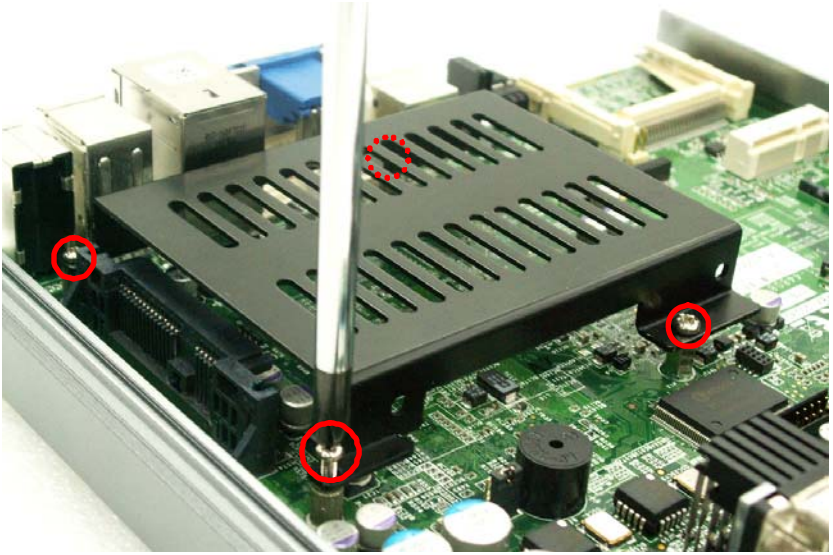
2. Unscrew all the six screws on the rear panel and remove the panel.



3. Remove the bottom shell by sliding it off the chassis.

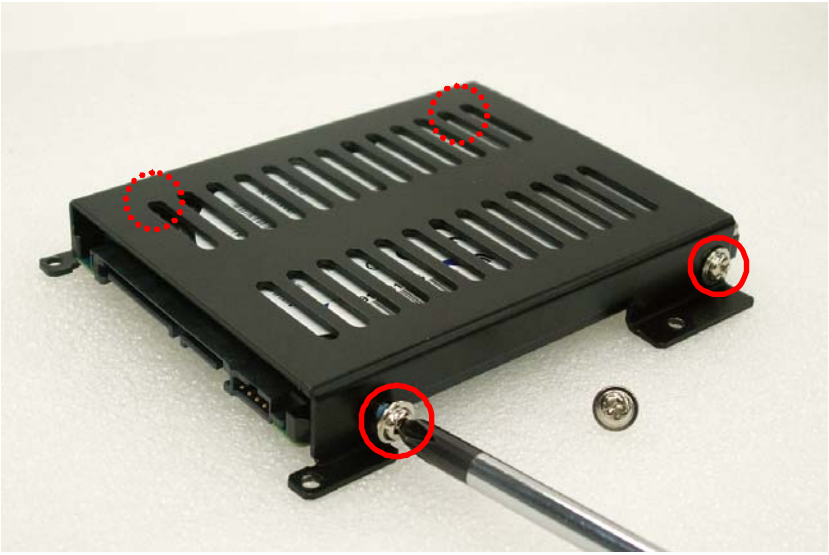


4. After removing the bottom chassis, the MXE-1200 series SBC with an empty HDD bracket fixed on it is exposed. Use a screw driver to unscrew 4 screws to remove the HDD bracket.



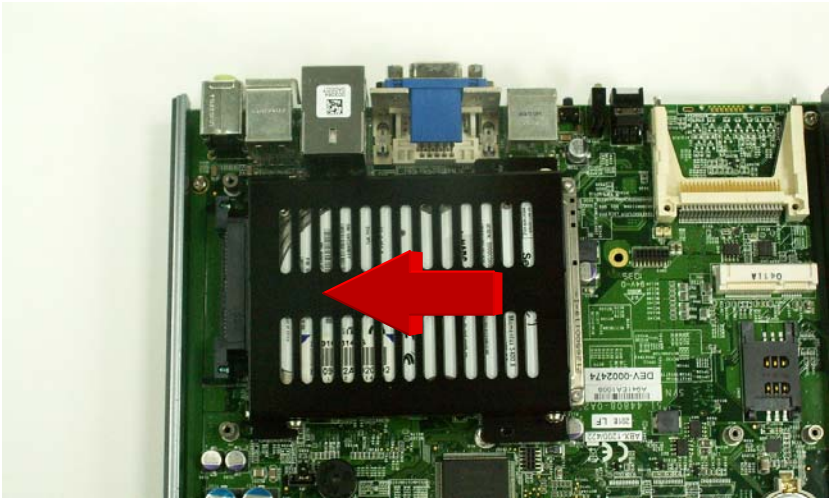
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5. Four M3 screws are found as accessories in the package. Fasten the four screws to attach your 2.5" HDD or SSD to the bracket.

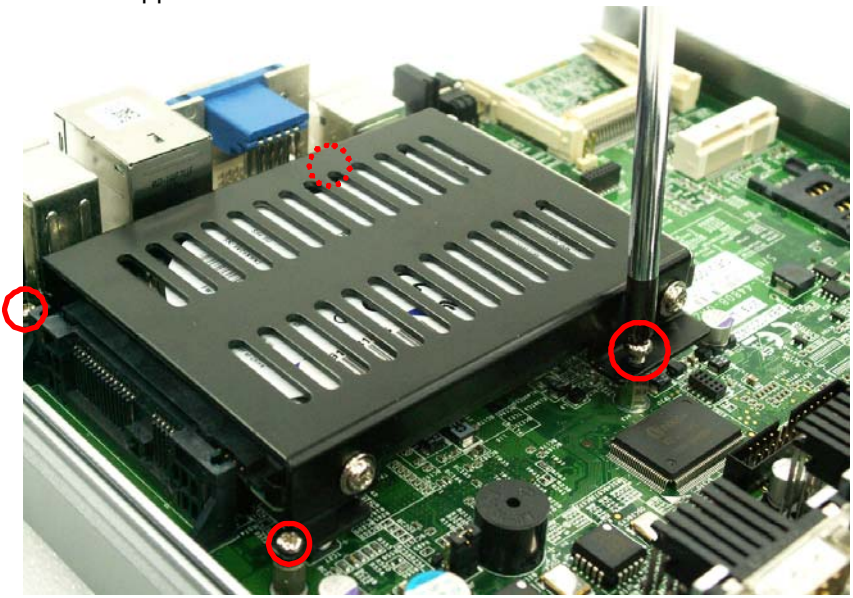


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6. Install the 2.5" HDD or SSD by gently push the HDD/ SSD connector (plug) into the SATA connector (receptacle) on the PCB.

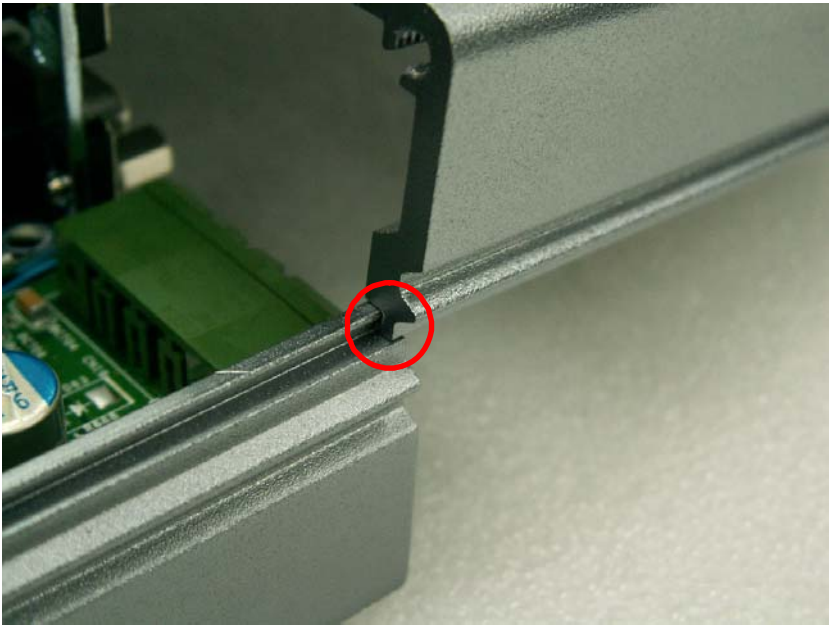


7. Fasten the four screws to attach the HDD bracket to the copper nuts.



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8. Put the bottom chassis back by sliding it on the chassis.



9. Screw in the 12 screws (M3 hex bolts) on the front and rear panels.

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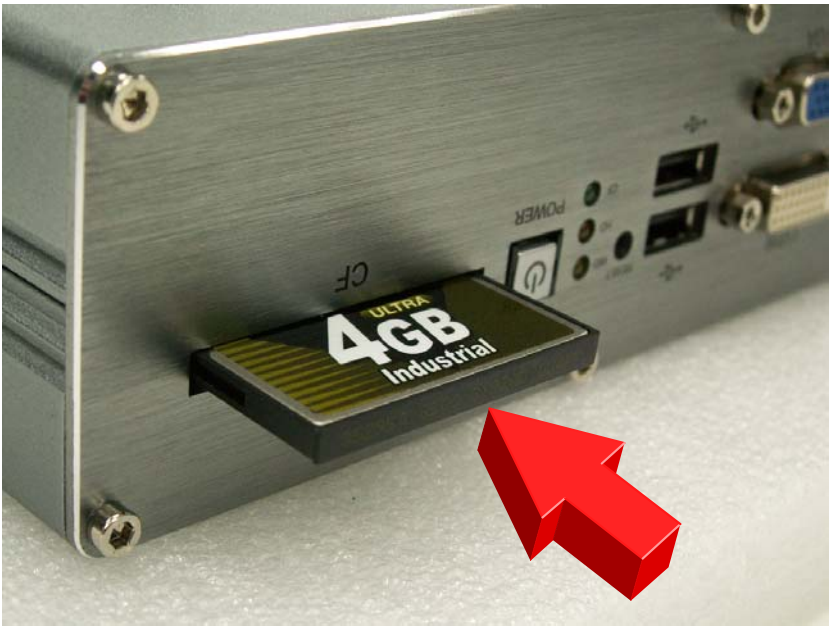
3.2 Installing a CompactFlash Card

The MXE-1200 series controller provides a CompactFlash socket on the front panel to accommodate a CF card as a replacement of hard disk drive. You can also install a SATA hard disk drive and CF card simultaneously and set the boot device preferences in BIOS. Please follow the instructions below to install the CF card.

Note: The connectors of the MXE-1200 series controller are placed upside down. To avoid the possibility that a CF card falls into the chassis, we strongly suggest you place the chassis upside down before you install the CF card.

---

1. Place the system upside down and insert the CF card, face up, into the CF socket on the front panel.



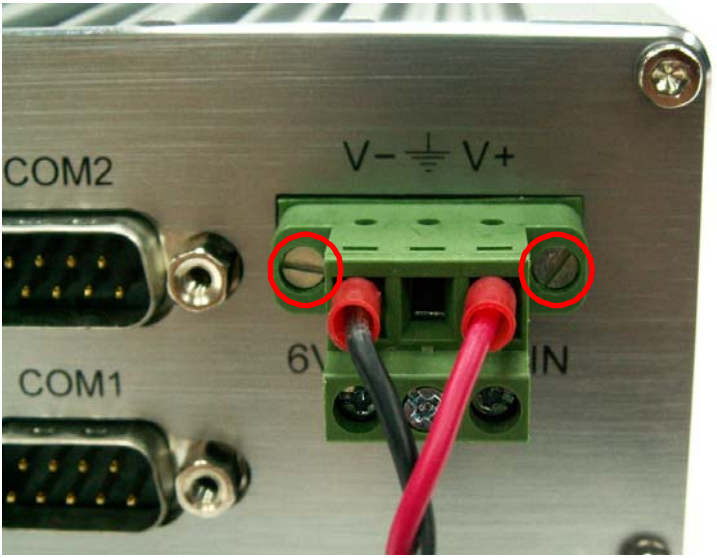
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2. Align with the guide of CF socket and push the CF card to the bottom of the CF socket.



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The DC power input connector of the MXE-1200 series controller is located on the rear panel. It has three pins, V+, chassis ground, and V- from right to left respectively. The DC power input accepts an input voltage as shown in the specification mentioned in the earlier chapter. Connect the DC power as shown in the figure below. Tighten the two screws to fasten the connector.



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3.3 Mounting the MXE-1200 Using the Wall-mount Kit

The MXE-1200 series controller is shipped with a VESA 100 wall-mount bracket. The bracket has four M4 mounting holes with a pitch of 100 mm so you attach it to any VESA 100 compatible mounting mechanism. With the mounting bracket, you can either mount the MXE-1200 series controller on the wall or on the back of a monitor.

The procedure of mounting the MXE-1200 series is illustrated step by step below:

1. Find the wall-mount bracket shipped with chassis and four M4 screws in the screw pack.



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2. Fasten the four screws to attach the bracket to where the MXE-1200 series controller is to be mounted (a wall or a monitor as in this photo).

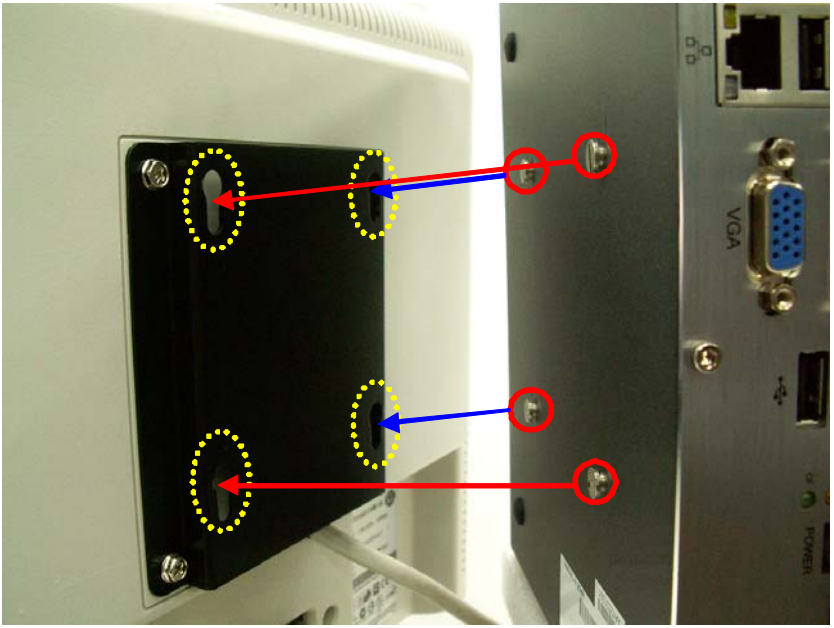


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3. Find the four specially-made screws for mounting in the screw pack. Fasten these 4 screws into the holes on the bottom of MXE-1200 series controller.

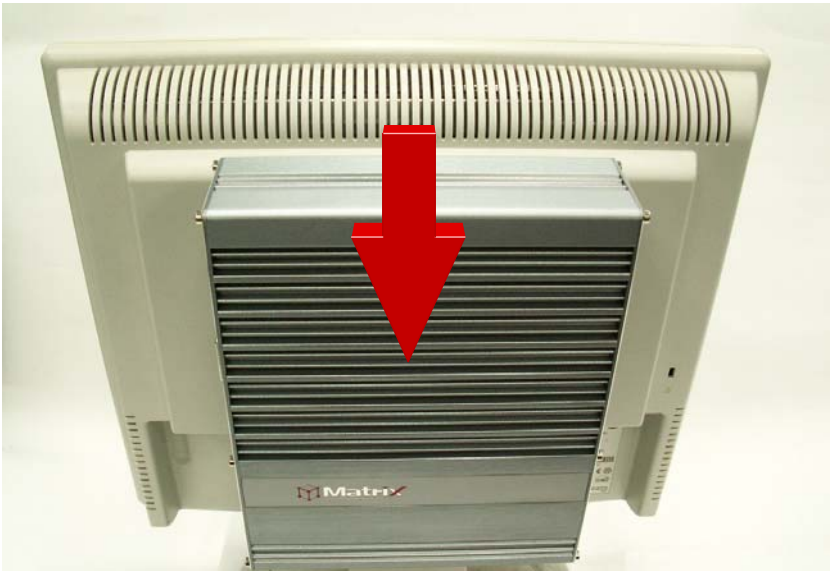


4. Join the screws on the bottom of chassis and the key holes on the bracket.



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5. Push the MXE-1200 series controller down until there is a click to lock the chassis to the mounting bracket.



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3.4 Cooling Considerations

The hot components of MXE-1200 series controller (such as CPU, North Bridge and South Bridge) are all placed on the top side of PCB. These components are in direct contact to the aluminum top cover via thermal pads. Heat generated by components is mostly dissipated though the aluminum top cover. To have better efficiency of heat dissipation, please keep a minimum 2 inches (5 cm) clearance on the top side of the MXE-1200 series controller.

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4 BIOS Settings and Driver Installation

4.1 BIOS Setting

The Basic Input/Output System (BIOS) is a program that provides a basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features applied to the MXE-1200 controller. The BIOS setup program includes menus for configuring settings and enabling features of MXE-1200 series. Most users do not need to use the BIOS setup program, as the MXE-1200 controller ships with default settings that work well for most configurations.

In this section, BIOS options are illistrated.

Warning: Changing BIOS settings may lead to incorrect controller behavior and possibly an unbootable controller. If this happens, follow the instructions in Section 2.4.4 to clear CMOS and then restore the default settings. In general, do not change a BIOS setting unless you are absolutely certain of what it does.

4.1.1 Main

4.1.1.1 System Time/System Date

Use this option to specify the system time and date. Highlight System Time or System Date using the up or down <Arrow> keys. Enter new values using the keyboard then press <Enter> key. Press the < Tab > key to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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4.1.2 Advanced

4.1.2.1 CPU Configuration

Hyper Threading Technology
This option allows you to Enable/Disable Hyper-Threading Technology.

Intel® SpeedStep™ Tech
This option enables or disables Intel SpeedStep™ technology.

4.1.2.2 IDE Configuration

ATA/IDE Configuration
This option specifies whether the IDE channels should be initialized in Compatible Mode or Enhanced Mode. The settings are Disabled, Compatible and Enhanced. The default option is Compatible.

Configure SATA as
Show this item when select ATA/IDE Configuration to Enhanced. The options are IDE, no AHCI or RAID support.

Primary IDE Master
Press < Enter > to configure the first device (master) on IDE interface.

Primary IDE Slave
Press < Enter > to configure the second device (slave) on IDE interface.

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4.1.2.3 SuperIO Configuration

Serial Port1/ Port2/ Port3/ Port4 Address
These four options specify the base I/O port address of serial port1 to serial port4.

Note: Do not set the same value for different serial ports to avoid resource conflict.

Parallel Port Address
This option specifies the base I/O address of parallel port.

Parallel Port Mode
This option specifies the operation mode of parallel port.

Option	Description
Normal	This option specifies standard parallel port mode.
Bi-Directional	This option specifies bidirectional communication mode.
ECP	This option specifies devices that adhere to the Extended Capabilities Port (ECP) specification.
EPP	This option specifies devices that adhere to the Enhanced Parallel Port (EPP) specification.
ECP & EPP	This option specifies both the ECP and EPP modes simultaneously.

Table 4-1: Parallel Port Modes

Parallel Port IRQ
This option specifies the IRQ used by the parallel port.

4.1.2.4 Hardware Health Configuration

The hardware health option allows users to monitor hardware status including CPU temperature, system temperature, and system voltages (Vcore, +5V, +3.3V, +12V, +1.8V, 5VSB, VBAT).

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4.1.2.5 Remote Access Configuration

This option allows a remote access by another computer to get POST messages and send commands through serial port access.

Remote Access
Select this option to Enable or Disable the BIOS remote access feature.

Note: Enabled Remote Access requires a dedicated serial port connection. Once the corresponding serial port is disabled in SuperIO Configuration, you shall not use it for remote access to avoid abnormal operation.

Serial Port Number
Specify the serial port you want to use for remote access. Available options are COM1, COM2, COM3 and COM4.

Note: If you change the serial port settings in Advanced ⇒ SuperIO Configuration, you need to Save Changes and Exit, and then reboot the system so that the changes will be reflected in the Remote Access options.

Serial Port Mode
Specify the baud rate of the serial port for console redirection. Available options are 115200 8,n,1; 57600 8,n,1; 19200 8,n,1; and 9600 8,n,1.

Flow Control
Specify Flow Control mode for console redirection. Available options are None, Hardware, and Software.

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Redirection after BIOS POST
This option allows you to set Redirection configuration after BIOS POST. Available options are Disabled, Boot Loader, and Always.

Option	Description
Disabled	Turn off the redirection after POST.
Boot Loader	Activate the redirection during POST and Boot Loader.
Always	Always activate the redirection.

Table 4-2: Redirection after BIOS POST

Terminal Type
This option is used to specify either VT100/VT-UTF8 or ANSI terminal type. Availablevalue is ANSI, VT100, or VT-UTF8.

VT-UTF8 Combo Key Support
This option enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals. Available options are Enabled and Disabled.

Sredir Memory Display Delay
This option specifies the delay in seconds to display memory information. Available options are Delay, Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

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4.1.2.6 ACPI Configuration

Suspend Mode
This setting specifies either S1 (POS) or S3 (STR) system suspend mode. The Optimal and Fail-Safe Default setting is S3 (STR).

Option	Description
S1 (POS)	Power On Suspend - Maintain current system status, such as power supply and memory context, except for CPU is not executing instructions. Devices that can wake-up the system can cause CPU to continue execute from where it left off.
S3 (STR)	Suspend to RAM - System enters a low power state instead of completely shut-off. Standby power and power supply for memory are maintained.
Auto	Depends on OS, OS automatically selects suspend mode it supports.

Table 4-3: Suspend Mode

Power Button Mode
Specify the behavior when pressing power button in DOS environment.

Option	Description
On/Off	Turn off system directly when pressing power button.
Suspend	Turn system to suspend mode when pressing power button.

Table 4-4: Power Button Mode

Resume On LAN RTL8111C
This option specifies to enable or disable RTL8111C LAN wake-up function. If you enable the LAN wake-up function, you can send a "magic packet" via Ethernet from a remote computer to turn on the MXE-1200 controller.

Resume On RTC Alarm
This option selects to enable or disable RTC (Real Time Clock) wake-up function. RTC wake-up function allows you to turn on the MXE-12000 controller at specific date/time automatically.

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RTC Alarm Date (Days)
This option appears when Resume On RTC Alarm select Enabled. Please key in [+] or [-] to select, options are "Every Day" and "1"~"31", indicate the alarm generate days.

RTC Alarm Time
This option appears when Resume On RTC Alarm select Enabled. Key [ENTER], [TAB] or [SHIFT-TAB] to select a field, Key in [+] or [-] to configure the system time.

4.1.2.7 USB Configuration

Legacy USB Support
Legacy USB Support also refers to USB mouse and keyboard support. Normally if this option is not enabled, attached USB mouse or keyboard will not be available until a USB compatible operating system fully boots up with USB drivers loaded. With this option enabled, attached USB mouse or keyboard is usable even when no USB drivers loaded.

Option	Description
Disabled	Set this value to prevent the use of any USB device during system boot or in DOS environment.
Enabled	Set this value to allow the use of USB devices during system boot or in DOS environment.
Auto	This option automatically detects USB keyboard or mouse and if found, allows the usage during system boot or in DOS environment.

Table 4-5: Legacy USB Support

USB 2.0 Controller Mode
The USB 2.0 Controller Mode configures the data rate of the USB port. Available options are FullSpeed (12 Mbps) and HiSpeed (480 Mbps).

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BIOS EHCI hand-off

This option provides a workaround for OSes without ECHI hand-off support. The change of EHCI ownership should be claimed by the EHCI driver.

USB Mass Storage Device Configuration

This is a submenu for configuring the USB Mass Storage Class Devices which are in use on the USB ports found by BIOS. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530 MB will be emulated as Floppy and those greater than 530 MB will remain as hard drive. The Forced FDD option can be used to force a hard disk type drive to boot as FDD (Ext. ZIP Drive).

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4.1.3 Chipset

4.1.3.1 North Bridge Configuration

DRAM Frequency
Specify DRAM frequency. You can specify whether to let the BIOS set theDRAM frequency automatically or configure it manually (400 MHz or 533 MHz).

Configure DRAM Timing by SPD
Specify Enable to allow the timing setting of the DRAM to be configured from the SPD or Disable to configure it manually.

Boots Graphic Adapter Priority
Specify which graphics controller to use as the primary boot display device. Only supports IGD (integrated graphic devices).

Internal Graphics Mode Select
Specify the size of system memory used by internal graphics device. 8MB is recommended.

Boot Display Device
Select system boot display device, options are VGA or VGA+LVDS. The default option is VGA+LVDS.

Flat Panel Type
Select the display resolution of flat panel, supported options are "640x480" with type 1, "800X600" with type 2, "1024X768" with type 3, and "1366x768" with type 4.

Local Flat Panel Scaling
Enable or disable the ability of local flat panel scaling, or forced scaling.

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DVMT Mode Select

Dynamic Video Management Technology (DVMT) allows additional system memory to be dynamically allocated in operating system for graphics usage. Once the application is closed, the allocated memory is released and is then available for system usage. DVMT ensures a solid balance between system performance and graphics performance.

Option	Description
Fixed Mode	The graphics driver reserves a fixed portion of the system memory as graphics memory.
DVMT Mode	The graphics driver dynamically allocates system memory for graphics usage, according to system and application demands.
Combo Mode	The graphics driver reserves a fixed amount of memory as dedicated graphics memory, as well as dynamically allocates system memory in operating system according to system and application demands.

Table 4-6: DVMT Mode Select

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4.1.3.2 South Bridge Configuration

USB Function
Specify the number of USB ports enabled in Matrix controller. The default value is 8 USB ports.

USB 2.0 Controller
Specify whether to enable or disable built-in USB 2.0 controller in south bridge chip.

Restore on Power Loss
Determine the system status when external power is restored after a power loss.

Option	Description
Power Off	Set this value to always power off the system while power is restored.
Power On	Set this value to always power on the system while power is restored.
Last State	Set this value to power off/on the system depending on the last system power state while power is restored.

Table 4-7: Restore on Power Loss

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4.1.4 Security

The Security setup menu provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

To uninstall the passwords, you can simply set a NULL password.

Change Supervisor Password
Select **Change Supervisor Password** and press < Enter >. And enter your password in the appearing message box as prompted. The password is stored in NVRAM after setup completes.

User Access Level
This option appears after specifying Supervisor password, and allows you to specify the access level for users.

Option	Description
No Access	Users are not allowed to access the BIOS setting.
View Only	Users are allowed to view BIOS setting but not allowed to change it.
Limited	Users are allowed only to change limited items in BIOS.
Full Access	Users are allowed to access and change all setting items in BIOS.

Table 4-8: User Access Level

Change User Password
Select **Change User Password** and press < Enter >. And enter your password in the appearing message box as prompted. The password is stored in NVRAM after setup completes.

Password Check
This option appears after specifying Supervisor password.

Option	Description
Setup	Check password when entering BIOS setup.
Always	Check password when system booting.

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Virus Boot Protection
This option appears after specifying Supervisor password.

Option	Description
Disabled	The BIOS will not protect the boot sector from a virus.
Enabled	The BIOS will protect the boot sector from a virus.

4.1.5 Boot

4.1.5.1 Boot Settings Configuration

Quick Boot

Option	Description
Disabled	Specify BIOS to perform all POST tests.
Enabled	Specify BIOS to skip certain POST test to boot faster.

Quiet Boot

Option	Description
Disabled	Specify BIOS to display POST messages.
Enabled	Specify BIOS to display the OEM logo.

Bootup Num-Lock
Specify whether the Number Lock is on or off after power-on.

Wait for 'F1' If Error
If this option is specified as Disabled, BIOS does not wait for users to press the <F1> key if any error occurs.

Hit 'DEL' Message Display
If this option is specified as Enabled, the system displays the message "Press DEL to run Setup during POST"

RTL8111C PXE ROM
Disable/Enable the RTL8111C PXE function.

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4.1.5.2 Boot Device Priority

Specify the priority of boot devices. All installed boot devices are detected during POST and displayed on the screen. You can refer to the following steps to specify different boot device.

Boot from a SATA hard drive

1. Select **Hard Disk Drives** and press Enter.
2. Your SATA hard drive is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select your SATA hard drive in **1st Boot Device**.

Boot from CF card

1. Select **Hard Disk Drives** and press Enter.
2. Your CF card is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select your CF card in **1st Boot Device**.

Boot from USB CD/DVD drive

1. Select **USB Drives** and press Enter.
2. Your CD/DVD drive is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select your CD/DVD drive in **1st Boot Device**.

Boot from USB Flash disk

1. Select **USB Drives** and press Enter.
2. Your USB flash disk is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select your USB flash disk in **1st Boot Device**.

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Boot from USB external hard drive

1. Select **USB Drives** and press Enter.
2. Your USB external hard drive is displayed with its identification string. Specify it as **1st Drive**.
3. Go back to upper level and select your USB external hard drive in **1st Boot Device**.

4.1.6 Exit

Save Changes and Exit
When you finish BIOS setting, please select this option to save all changes and reboot the system to make new setting takes effect.

Discard Changes and Exit
Select this option to discard all changes and exit BIOS setup..

Discard Changes
Select this option to discard all changes without exiting BIOS setup..

Load Optimal Defaults
Select this option to set all BIOS options to a complete set of default setting. The Optimal setting is designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer encounters system configuration problems.

Load Failsafe Defaults
Select this option to set all BIOS options to a complete set of default setting. The Failsafe setting is designed for maximum system stability, but not maximum performance. Select the Fail-Safe Setup options if your computer encounters system configuration problems.

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4.2 Driver Installation

After installing the operating system, you need to install all related drivers to make your system work accordingly. This section describes the drivers needed for Windows operating systems and the procedures to install them. For other OS support, please contact ADLINK for further information.

To install Windows drivers, please follow the steps below:

1. Properly install Windows before installing any drivers. Most of the standard I/O device drivers have been included in Windows.
2. Install the chipset driver.
3. Install the graphics driver.
4. Install the Ethernet driver.
5. Install the audio driver.
6. Install the WDT (watchdog timer) driver.

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4.2.1 Install the Chipset Driver

This section describes the procedure to install the chipset driver of MXE-1200 series. The chipset driver outlines to the operating system how to configure the Intel® 945GSE chipset components in order to ensure that the following features function properly:

- Core PCI and ISAPNP Services
- PCIe Support
- SATA Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

One of the following operating systems must be fully installed and running on the system before installing this software:

- Microsoft Windows* Server 2003
- Microsoft Windows XP
- Microsoft Windows 2000
- Microsoft windows Vista

Please follow the following steps to install the chipset driver for the MXE-1200 series:

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-1200\Chipset\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot your system.

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4.2.2 Install the Graphics Driver

This section describes the procedure to install the graphics driver of MXE-1200 series. The MXE-1200 series is equipped with Intel® GMA950 graphics media accelerator integrated in Intel Mobile Intel® 945GSE chipset. The Intel® Graphics Media Accelerator Driver package supports the following operating systems:

- Windows 2000
- Windows XP.

Please follow the following steps to install graphics driver.

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-1200\Graphics\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot your system.

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4.2.3 Install the Ethernet Driver

This section describes the procedure to install the Ethernet driver of MXE-1200 series controller. Please follow the steps to install the driver for Realtek 8111C Gigabit Ethernet controller.

For Windows 2000 and XP users:

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-1200\LAN-Realtek\
   where x: denotes the DVD-ROM drive.
3. Execute setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot your system.

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4.2.4 Install the Audio Driver

This section describes the procedure to install the audio driver of MXE-1200 series. The MXE-1200 controller supports Intel High Definition audio using Realtek ALC262 chip, which provides up to 24-bit, 192Kbps high quality audio input/output. Please follow the following steps to install audio driver for MXE-1200 series.

For Windows 2000, XP and Vista users:

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The chipset driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-1200\Audio\
   where x: denotes the DVD-ROM drive.
3. Execute Setup.exe and follow on-screen instructions to complete the setup.
4. After installation completes, reboot your system.

4.2.5 Install the WDT Driver

A WDT (watchdog timer) is a hardware mechanism to reset the system when the operating system or application is halted. A typical usage of WDT is to start the timers and periodically reset the timer, and when timer is expired, the system resets. You need to install the WDT driver to program the WDT.

Please follow the following steps to install WDT driver for MXE-1200 series

1. Close any running application.
2. Insert the ADLINK All-in-One DVD. The WDT driver is located in the directory:
   x:\Driver Installation\Matrix\MXE-1200\WDT\
   where x: denotes the DVD-ROM drive.
3. Execute setup.exe and follow on-screen instructions to complete the setup.
4. Reboot your system.

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A Appendix

A.1 Watchdog Timer (WDT) Function Reference

This appendix describes the usage of the watchdog timer (WDT) function library for the MXE-1200 controller. Watchdog timer is a hardware mechanism to reset the system in case the operating system or an application halts. After starting watchdog timer, you need to periodically reset the watchdog timer in the application before the timer expires. Once watchdog timer expires, a hardware-generated signal is sent to reset the system.

To use the WDT function library for MXE-1200 series, you need to include the header file WDT.h and linkage library WDT.lib in your C++ project.

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InitWDT

@ **Description**

Initialize the watchdog timer function of MXE-1200 controller. InitWDT must be called before the invocation of any other WDT function.

@ **Supported controllers**

MXE-1200

@ **Syntax**

C/C++

```
BOOL InitWDT()
```

@ **Parameters**

None

@ **Return code**

TRUE if watchdog timer is successfully initialized.

FALSE if watchdog timer is failed to initialize.

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SetWDT

@ Description

Set the timeout value of watchdog timer. There are two parameters for this function to indicate the timeout ticks and unit. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXE-1200

@ Syntax

C/C++

```
BOOL SetWDT(BYTE tick, BYTE unit)
```

@ Parameters

`tick`

Specify the number of tick for watchdog timer. A valid value is 1 - 255.

`unit`

Specify the timeout ticks of the watchdog timer.

Value	Description
0	The unit of tick is second. For example, when you specify tick as 100 and unit as 0, the timeout value is 100 seconds.
1	The unit of tick is minute. For example, when you specify tick as 100 and unit as 1, the timeout value is 100 minutes.

@ Return codes

TRUE if timeout value of watchdog timer is successfully set.

FALSE if timeout value of watchdog timer is failed to set.

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StartWDT

@ Description

Start the watchdog timer function. Once the StartWDT is invoked, the countdown of watchdog timer starts. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXE-1200

@ Syntax

C/C++

```
BOOL StartWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully started.

FALSE if watchdog timer is failed to start.

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ResetWDT

@ Description

Reset the watchdog timer. The invocation of ResetWDT allows users to restore the watchdog timer to the initial timeout value specified in SetWDT function. Users should call ResetWDT or StopWDT before the expiration of watchdog timer, or the system will be reset.

@ Supported controllers

MXE-1200

@ Syntax

C/C++

```
BOOL ResetWDT()
```

@ Parameters

None

@ Return codes

TRUE if watchdog timer is successfully reset.

FALSE if watchdog timer is failed to reset.

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StopWDT

@ **Description**

Stop the watchdog timer.

@ **Supported controllers**

MXE-1200

@ **Syntax**

C/C++

```
BOOL StopWDT()
```

@ **Parameters**

None

@ **Return codes**

TRUE if watchdog timer is successfully stopped.

FALSE if watchdog timer is failed to stop.

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