Magelis Box PC

User Manual

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The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information that is contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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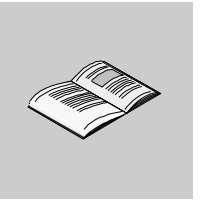
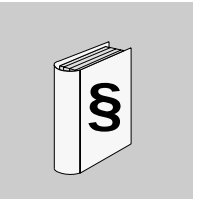


Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

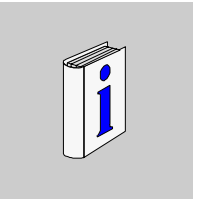
NOTICE
NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book



At a Glance

Document Scope

This manual describes the configuration and usage of the Universal and Performance Box PCs, part of the range of Magelis industrial PCs, for its cataloged and configured product offers.

The Box PC is designed to operate in an industrial environment.

1 Cataloged product offer:

- HMI BUCND1E•• - Box PC Universal Embedded 1 slot
  - 24 Vdc
  - 1.6 GHz Atom processor
  - 1024 MB RAM
  - 4 GB Compact Flash card
  - Windows® Embedded Standard 2009
- HMI BUFND1P•• - Box PC Universal 1 slot
  - 24 Vdc
  - 1.6 GHz Atom processor
  - 1024 MB RAM
  - 32 GB Flash drive (SSD)
  - Windows® XP Professional SP3
- HMI BUHND1P•• - Box PC Universal 1 slot
  - 24 Vdc
  - 1.6 GHz Atom processor
  - 1024 MB RAM
  - 250 GB Hard disk drive (HDD)
  - Windows® XP Professional SP3

- HMI BUFND2P•• - Box PC Universal 2 slots
  - 24 Vdc
  - 1.6 GHz Atom processor
  - 1024 MB RAM
  - 32 GB Flash drive (SSD)
  - Windows® XP Professional SP3
- HMI BUHND2P•• - Box PC Universal 2 slots
  - 24 Vdc
  - 1.6 GHz Atom processor
  - 1024 MB RAM
  - 250 GB Hard disk drive (HDD)
  - Windows® XP Professional SP3
- HMI BPFDD27•• - Box PC Performance 2 slots
  - 24 Vdc
  - 2.26 GHz Core 2 Duo processor
  - 2048 MB RAM
  - 32 GB Flash drive (SSD)
  - Windows® 7 Ultimate (64 bit)
- HMI BPHDD27•• - Box PC Performance 2 slots
  - 24 Vdc
  - 2.26 GHz Core 2 Duo processor
  - 2048 MB RAM
  - 250 GB Hard disk drive (HDD)
  - Windows® 7 Ultimate (64 bit)
- HMI BPFDD57•• - Box PC Performance 5 slots
  - 24 Vdc
  - 2.26 GHz Core 2 Duo processor
  - 2048 MB RAM
  - 32 GB Flash drive (SSD)
  - Windows® 7 Ultimate (64 bit)
- HMI BPHDD57•• - Box PC Performance 5 slots
  - 24 Vdc
  - 2.26 GHz Core 2 Duo processor
  - 2048 MB RAM
  - 250 GB Hard disk drive (HDD)
  - Windows® 7 Ultimate (64 bit)

NOTE: The part number for your unit may not be included in the user manual. Commercial part numbers listed in the user manual are for products available when the user manual was published. New part numbers may be added to the product range.

New and existing cataloged part numbers are always composed of a prefix (HMI), a space, followed by a serial arrangement of 9 characters (letters or numbers). Each one of the 9 characters matches with one characteristic of the cataloged Box PC, such as storage device size, storage device type, memory size, and bundled software.

The following table is a legend that identifies the features corresponding to each character of the part number:

Character Number		**Prefix**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Part Number Example		**HMI**		**B**	**P**	**H**	**N**	**D**	**5**	**7**	**0**	**1**
iPC Family	Box PC			B								
iPC Type	Performance				U							
	Universal				P							
Drive	Hard disk drive (HDD)					H						
	Flash drive (SSD)					F						
	Compact Flash (CF)					C						
CPU Type	Atom N270 (Universal)						N					
	Core 2 Duo P8400 (Performance)						D					
Power Supply	DC with battery backup							B				
	DC							D				
Expansion Slots	1								1			
	2								2			
	5								5			
Operating System	Windows XP Professional									P		
	Windows Embedded Standard 2009									E		
	Windows 7 Ultimate (32-bit for Universal and 64-bit for Performance English MUI)									7		
Bundled Software	None										0	
	Vijeo Citect RunTime 500 I/O Full										F	
	Vijeo Citect RunTime 1200 I/O Lite										L	
	Other application										•	
Hardware Iteration	Initial											1
	Second											2
	etc.											etc.

2 Configured product offer:

In addition to the catalog offer, other configurations may be available in some countries.

These configured offers use a fixed method of identification. The configured part numbers are always composed of an arrangement of 20 characters (letters or numbers). The 6 first characters are always HMI PCC. Each one of the following 14 characters matches with one characteristic of the configured Box PC, such as storage device size, storage device type, memory size, and bundled software.

This offer has similar characteristics and functionalities as the cataloged offer described in this manual.

In addition to this part number, a configuration number is printed on the product label.

The configuration number format is as follows:

Character Number	**Prefix (1-6)**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Part Number Example	**HMI PCC**	**P**	**1**	**7**	**1**	**B**	**D**	**2**	**3**	**S**	**2**	**1**	**V**	**0**	**0**
iPC Family	Box PC	B													
Product Generation	First generation		1												
	Second generation		2												
	Third generation		3												
Display	None (Box)			B											
Expansion Slots	0 slot				0										
	1 slot = 1 PCIe				C										
	1 slot = 1 PCI				1										
	2 slots = 1 PCI+1 PCIe				2										
	2 slots = 2 PCI				A										
	2 slots = other configuration				4										
	5 slots = 2 PCI+3 PCIe				5										
	5 slots = 4 PCI+1 PCIe				B										
	5 slots = other configuration				7										
CPU Type	Atom N270 (Universal)					B									
	Core 2 Duo P8400 (Performance)					C									
Power Supply	DC with interface for Battery backup						B								
	DC						D								
	DC with filter for marine						F								
	DC with interface for Battery backup and filter for marine						G								

Character Number	**Prefix (1-6)**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Part Number Example	**HMI PCC**	**P**	**1**	**7**	**1**	**B**	**D**	**2**	**3**	**S**	**2**	**1**	**V**	**0**	**0**
RAM (Configuration available depending on model)	1 GB (Universal only)							1							
	2 GB							2							
	3 GB = 1 GB + 2 GB (Universal only)							3							
	4 GB = 2 GB + 2 GB (Performance only)							4							
	6 GB = 2 GB + 4 GB (Performance only)							6							
	8 GB = 4 GB + 4 GB (Performance only)							8							
Operating System	None								0						
	Windows Embedded Standard 2009 (32-bit, English MUI)								1						
	Windows XP Professional (32-bit, English MUI)								3						
	Windows Embedded Standard 7 Premium (32-bit, English MUI)								4						
	Windows 7 Ultimate (32-bit, English MUI)								5						
	Windows 7 Ultimate (64-bit English MUI)								6						
Storage Device	None									N					
	CF 2 GB									B					
	CF 4 GB									C					
	CF 8 GB									D					
	HDD default size									K					
	SSD 15 GB									S					
	SSD 32 GB (default)									T					
Slide-in Equipment	None										0				
	DVD writer										1				
	HDD size same as default										2				
	SSD size same as default										3				
	DVD writer + HDD										4				
	DVD writer + SDD										5				

Character Number	Prefix (1-6)	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Part Number Example	**HMI PCC**	**P**	**1**	**7**	**1**	**B**	**D**	**2**	**3**	**S**	**2**	**1**	**V**	**0**	**0**
Options	None											0			
	RAID											1			
	Second DVI port											2			
	RAID + second DVI											3			
	Com port RS-422 - RS-485											4			
	Com port + second DVI											5			
	Com port + RAID											6			
	RAID + Second DVI + Com port RS-422 - RS-485											7			
Software Bundle	None												N		
	Vijeo Citect Lite 1200 I/O												L		
	Vijeo Citect Full 500 I/O												V		
	Vijeo Designer RT unlimited licence												H		
Reserved	None													0	
Reserved	None														0

NOTE: All instructions applicable to the enclosed product and all safety precautions must be observed.

Validity Note

This documentation is valid for Magelis Box PC.

The technical characteristics of the devices described in this manual also appear online. To access this information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the model number/product range. ● To get information on a grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you maybe need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Registered Trademarks

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Microsoft® and Windows® are registered trademarks of Microsoft Corporation.

Intel®, Atom®, and Core 2 Duo® are registered trademarks of Intel Corporation.

IBM® is a registered trademark of International Business Machines Corporation.

Related Documents

Title of Documentation	Reference Number
Installation Guide for Magelis Box PC	S1A75428
Vijeo Designer Tutorial	35007035

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Product Related Information

Some Box PCs are certified for use in Class I, Division 2 hazardous locations as defined in UL 1604, ANSI/ISA 12.12.01 or CSA C22.2 N° 213. Observe the following:

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.(1)
- Each implementation of a Magelis Box PC must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) For additional information, refer to *NEMA ICS 1.1 (latest edition)*, *"Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition),"Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or other applicable standards in your location.*

NOTE: The Box PC is a highly configurable device and is not based on a real-time operating system. Changes to the software and settings of the following must be considered new implementations as discussed in the previous warning messages. Examples of such changes include:

- System BIOS
- System Monitor *(see page 135)*
- Operating system
- Installed hardware
- Installed software

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Use only Schneider Electric software with the devices described in this manual.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

User Comments

We welcome your comments about this document. You can reach us by e-mail at techcomm@schneider-electric.com.

General Overview

I

Subject of this Part

This part provides an overview of the Magelis Box PC products.

What Is in This Part?

This part contains the following chapters:

Important Information

1

General

This chapter describes specific aspects related to the operation of the Box PC.

What Is in This Chapter?

This chapter contains the following topics:

Federal Communications Commission Radio Frequency Interference Statement - For U.S.A.

FCC Radio Interference Information

This equipment has been tested and found to comply with the Federal Communications Commission (FCC) limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial, industrial or business environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause or be subject to interference with radio communications. To minimize the possibility of electromagnetic interference in your application, observe the following two rules:

- Install and operate the Box PC in such a manner that it does not radiate sufficient electromagnetic energy to cause interference in nearby devices.
- Install and test the Box PC to ensure that the electromagnetic energy generated by nearby devices does not interfere with the Box PC's operation.

⚠ WARNING

ELECTROMAGNETIC / INTERFERENCE

Electromagnetic radiation may disrupt the Box PC's operations, leading to unintended equipment operation. If electromagnetic interference is detected:

- Increase the distance between the Box PC and the interfering equipment.
- Reorient the Box PC and the interfering equipment.
- Reroute power and communication lines to the Box PC and the interfering equipment.
- Connect the Box PC and the interfering equipment to different power supplies.
- Always use shielded cables when connecting the Box PC to a peripheral device or another computer.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Qualified Personnel

General

Only qualified personnel can install, operate, and maintain the product. A qualified person is one who has skills and knowledge related to the construction, operation, and installation of electrical equipment, and has received safety training to recognize and avoid the hazards involved. Refer to the most current release of NFPA 70E®, Standard for Electrical Safety in the Workplace, for electrical safety training requirements or other applicable standards in your location. Examples of qualified personnel may include:

- at the application design level, engineering department personnel who are familiar with automation safety concepts (for example, a design engineer)
- at the equipment implementation level, personnel who are familiar with the installation, connection and commissioning of automation equipment (for example, an installation assembly or cabling engineer or a commissioning technician)
- at the operation level, personnel who are experienced in the use and control of automation and computing equipment (for example, an operator)
- for preventive or corrective maintenance, personnel trained and qualified in regulating or repairing automated and computing devices (for example, an operating technician or after-sales service technician.)

Certifications and Standards

Agency Certifications

Schneider Electric submitted this product for independent testing and qualification by third-party agencies. These agencies have certified this product as meeting the following standards.

- Underwriters Laboratories Inc., UL 508 and CSA C22.2 N° 142, Industrial Control Equipment
- Underwriters Laboratories Inc., UL 1604, ANSI/ISA 12.12.01 and CSA C22.2 N° 213, Electrical Equipment for Use in Class I, Division 2 Hazardous (Classified) Locations

Schneider Electric is in the process of certifying compliance with the following standards.

- GOST certification. Please refer to product markings.
- ATEX certification by Technical Inspection Association. Please refer to product label.
- Merchant Navy rules. Products are designed to comply with Merchant Navy rules. Please refer to the Schneider Electric Web site for Merchant Navy rules installation guidelines.

For detailed information contact your local distributor and see the catalog and markings on the product.

Compliance Standards

Schneider Electric tested this product for compliance with the following compulsory standards.

United States:

- Federal Communications Commission, FCC Part 15

Europe: CE

- Directive 2006/95/EC (Low Voltage)
  Directive 2004/108/EC (EMC)
- Programmable Controllers: EN 61131-2 (Ed 3)
- EMI: EN55011 (Group 1, Class A), EN 61000-6-4
- EMS: EN 61000-6-2

Australia:

- Standard AS/NZS CISPR11 (C-Tick)

Qualification Standards

Schneider Electric voluntarily tested this product to additional standards. The additional tests performed, and the standards under which the tests were conducted, are specifically identified in Environmental Characteristics *(see page 45)*.

Hazardous Substances

This product is compliant with:

- WEEE, Directive 2002/96/EC
- RoHS, Directive 2002/95/EC
- RoHS China, Standard SJ/T 11363-2006
- REACh regulation EC 1907/2006

NOTE: Documentation about sustainable development is available on Schneider Electric web site (Product Environmental Profile and End of Life Instruction, RoHS and REACh certificates).

End of Life (WEEE)

The product contains electronic boards. It must be disposed of in specific treatment channels. The product contains cells and/or storage batteries which must be collected and processed separately, when they have run out and at the end of product life.

Refer to the section Maintenance *(see page 151)* to extract cells and batteries from the product. These batteries do not contain a weight percentage of heavy metals over the threshold notified by European Directive 2006/66/EC.

European (CE) Compliance

CE Compliance Note

The products described in this manual comply with the European Directives concerning Electromagnetic Compatibility and Low Voltage (CE marking) when used as specified in the relevant documentation, in applications for which they are specifically intended, and in connection with approved third-party products.

Hazardous Location Installations - For USA and Canada

General

The Box PC has been designed with the intention of meeting the requirements of Class I, Division 2 hazardous location applications. Division 2 locations are those locations where ignitable concentrations of flammable substances are normally confined, prevented by ventilation, or present in an adjacent Class I, Division 1 location, but where an abnormal situation might result in intermittent exposure to such ignitable concentrations.

While the Box PC is a non-incendive device under ANSI/ISA 12.12.01 and CSA C22.2 N° 213, it is not designed for, and should never be used within a Division 1 (normally hazardous) location.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations or in non-hazardous locations. Before installing or using your Box PC, confirm that the ANSI/ISA 12.12.01 or CSA C22.2 N° 213 certification appears on the product labeling

NOTE: Some Box PC devices are not yet rated as suitable for use in hazardous locations. Always use your product in conformance with the product labeling and this manual.

⚠ DANGER

EXPLOSION HAZARD

- Do not use your Box PC in hazardous environments or locations other than Class I, Division 2, Groups A, B, C, and D.
- Always confirm that your Box PC is suitable for use in hazardous locations by checking that the ANSI/ISA 12.12.01 or CSA C22.2 N° 213 certification appears on the product labeling.
- Do not install any Schneider Electric or OEM components, equipment, or accessories unless these have also been qualified as suitable for use in Class I, Division 2, Groups A, B, C, and D locations.
- In addition, confirm that any PCI controller cards have an adequate temperature code (T-code), and are suitable for a surrounding air temperature range of 0 to 50 °C (32 to 122 °F).
- Do not attempt to install, operate, modify, maintain, service, or otherwise alter the Box PC except as permitted in this manual. Unpermitted actions may impair the unit's suitability for Class I, Division 2 operation.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

EXPLOSION HAZARD

- Always confirm the ANSI/ISA 12.12.01 and CSA C22.2 N° 213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a Box PC installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incentive USB configuration.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

Failure to follow these instructions will result in death or serious injury.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

Ensure that the product is properly rated for the location. If the intended location does not presently have a Class, Division and Group rating, then users should consult the appropriate authorities having jurisdiction in order to determine the correct rating for that hazardous location.

In accordance with Federal, State/Provincial, and Local regulations, all hazardous location installations should be inspected prior to use by the appropriate authority having jurisdiction. Only technically qualified personnel should install, service, and inspect these systems.

Power Switch

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

The amount of input power required by systems with a Box PC classifies the power switch as an incendive device because the voltage and current across the make/break component are capable of generating a spark.

If using an ordinary power switch, hazardous location regulations require the power switch be located in an area specified as non-hazardous.

However, limits in cable length between the workstation and the power switch may apply. Otherwise the switch must be compliant with Class I, Division 1 requirements (intrinsically safe). These switches are built in a manner that prevents the possibility of a spark when contact is made or broken.

Use suitable UL listed and/or CSA Certified Class I, Division 1 switches in hazardous locations. These switches are available from a wide number of sources. It is the responsibility to ensure you select a power switch that conforms to the hazardous location rating for the installation.

Cable Connections

⚠ DANGER

EXPLOSION HAZARD

- Always confirm the ANSI/ISA 12.12.01 and CSA C22.2 N° 213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a Box PC installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incentive USB configuration.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

Failure to follow these instructions will result in death or serious injury.

Division 2 hazardous location regulations require that all cable connections be provided with adequate strain relief and positive interlock. Use only non-incendive USB devices as USB connections do not provide adequate strain relief to allow the use of Box PC USB connections *(see page 79)*. Never connect or disconnect a cable while power is applied at either end of the cable. All communication cables should include a chassis ground shield. This shield should include both copper braid and aluminum foil. The D-sub style connector housing must be a metal conductive type (e.g., molded zinc) and the ground shield braid must be terminated directly to the connector housing. Do not use a shield drain wire.

The outer diameter of the cable must be suited to the inner diameter of the cable connector strain relief so that a reliable degree of strain relief is maintained. Always secure the D-Sub connectors to the workstation-mating connectors via the two screws located on both sides.

Operation and Maintenance

The systems have been designed for compliance with relevant spark ignition tests.

⚠ DANGER

EXPLOSION HAZARD

In addition to the other instructions in this manual, observe the following rules when installing the Box PC in a hazardous location:

- Wire the equipment in accordance with the National Electrical Code article 501.10 (B) for Class I, Division 2 hazardous locations.
- Install the Box PC in an enclosure suitable for the specific application. Type 4 or IP65 enclosures are recommended even when not required by regulations.

Failure to follow these instructions will result in death or serious injury.

NOTE: Type 4 and IP65 are not part of UL certification for hazardous locations.

Physical Overview

2

Subject of this Chapter

This chapter provides a physical overview of the Box PC.

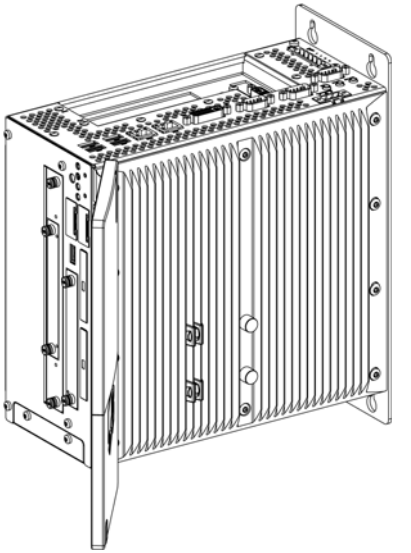
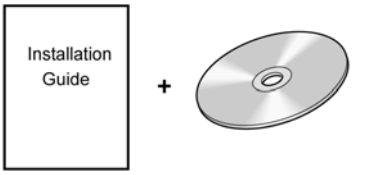
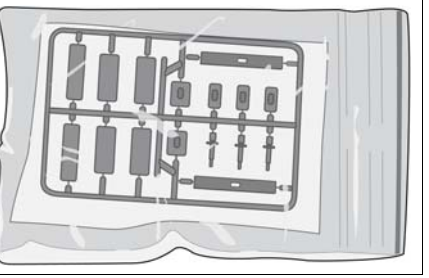
What Is in This Chapter?

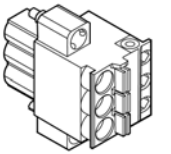
This chapter contains the following topics:

Package Contents

Items

The following items are included in the Magelis Box PC package. Before using the Box PC, please confirm that all items listed here are present.

HMIBU•••••••, HMIBP•••••••	
Restore & Documentation DVD-ROM containing the software required to reinstall the Operating System, the MS Windows EULA, and the Installation Guides and User Manuals for the HMIBU••••••• and HMIBP•••••••.	
Connector cover	

DC Connector	

This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local distributor immediately.

Box PC Description

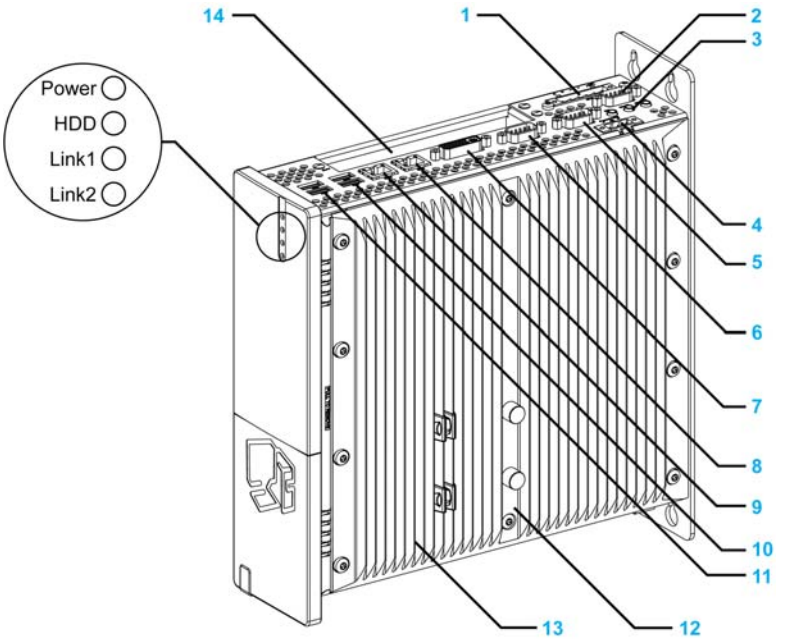
Introduction

During operation, surface temperatures of the heat sink may reach 70 °C (158 °F).

⚠ WARNING
RISK OF BURNS Do not touch the surface of the heat sink during operation. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Box PC Universal 1 slot Unit Description

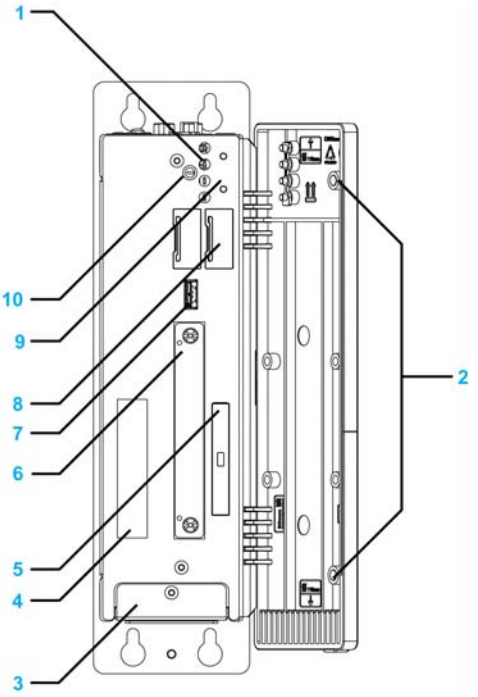
Interfaces top View



1 Add-on UPS slot
2 Add-on interface slot
3 MIC, Line IN/Line OUT
4 Supply voltage 24 Vdc
5 COM2

6 COM1
7 Monitor/Panel, DVI-I
8 ETH1 (10/100/1000 MBit)
9 ETH2 (10/100/1000 MBit)
10 USB2, USB4 (max 500mA)
11 USB1, USB3 (max 1A)
12 Warning sign/Heat sink seal
13 Heat sink
14 PCI slot (half-size)/PCI or PCIe

Interface Front View



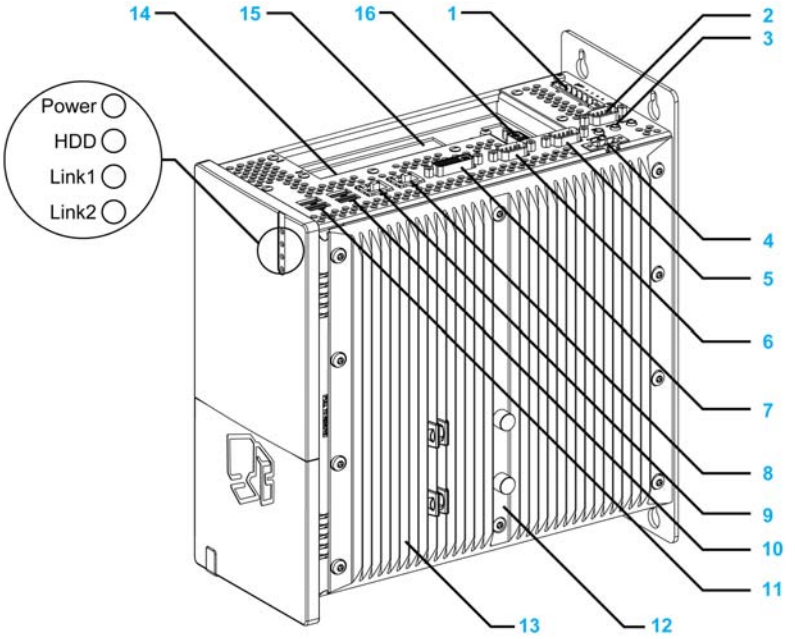
1 Status LEDs
2 Permanent magnet
3 Fan kit cover
4 Serial number sticker
5 CompactFlash slot CF1/Connection via IDE-PATA
6 Slide-in compact slot
7 Front USB (USB5 max. 1A)
8 Battery
9 Power/Reset button
10 CMOS Profile switch

NOTE: The front USB is a diagnostic interface for service and maintenance.

NOTICE
UNINTENDED EQUIPMENT OPERATION • Do not use the front USB while the machine is in operation. • Always keep the front door closed during normal operation. **Failure to follow these instructions can result in equipment damage.**

Box PC Universal and Performance 2 slot Unit Description

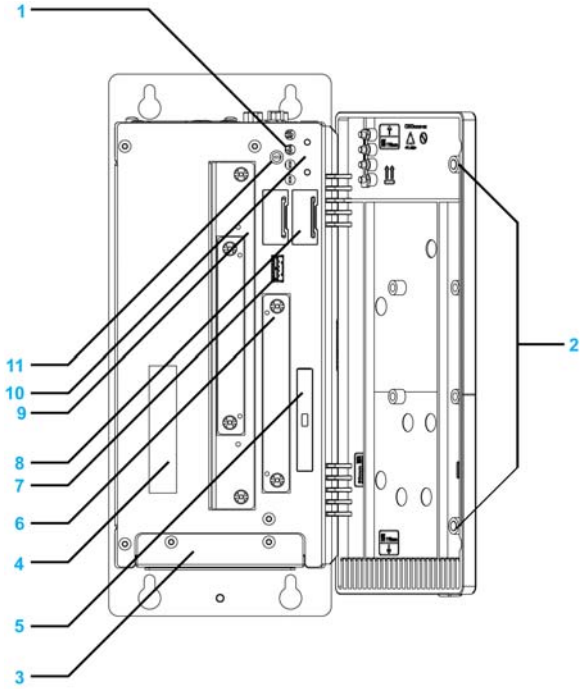
Interface Top View



1 Add-on UPS slot
2 Add-on interface slot
3 MIC, Line IN, Line out
4 Supply voltage 24 Vdc
5 COM2
6 COM1
7 Monitor/Panel, DVI-I
8 ETH1 (10/100/1000 MBit)
9 ETH2 (10/100/1000 MBit)
10 USB2, USB4 (max.500 mA)
11 USB1, USB3 (max.1A)

12 Warning sign/H
13 Heat sink
14 PCI slot 1 (half-size)/PCI or PCIe
15 PCI slot 2 (half-size)/PCI or PCIe
16 Add-on second DVI slot

Interface Front View



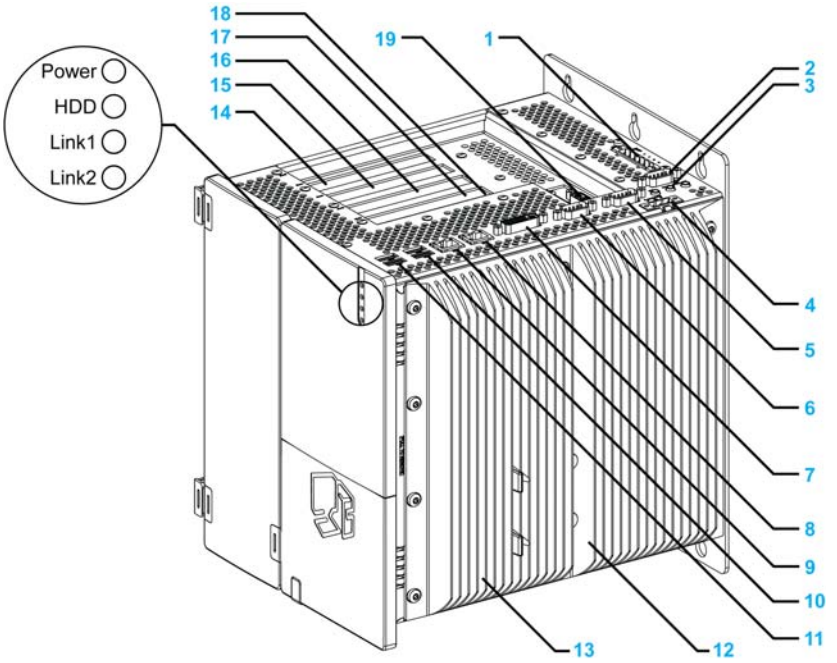
1 Status LEDs
2 Permanent magnet
3 Fan kit cover
4 Serial number sticker
5 CompactFlash slot CF1/Connection via IDE-PATA
6 Slide-in compact slot (Connection via SATA)
7 Front USB (USB5 max. 1 A)
8 Battery
9 Slide-in slot 1 (connection via SATA)
10 Power/Reset button
11 CMOS Profile switch

NOTE: The front USB is a diagnostic interface for service and maintenance.

NOTICE
UNINTENDED EQUIPMENT OPERATION • Do not use the front USB while the machine is in operation. • Always keep the front door closed during normal operation. **Failure to follow these instructions can result in equipment damage.**

Box PC Performance 5 slot Unit Description

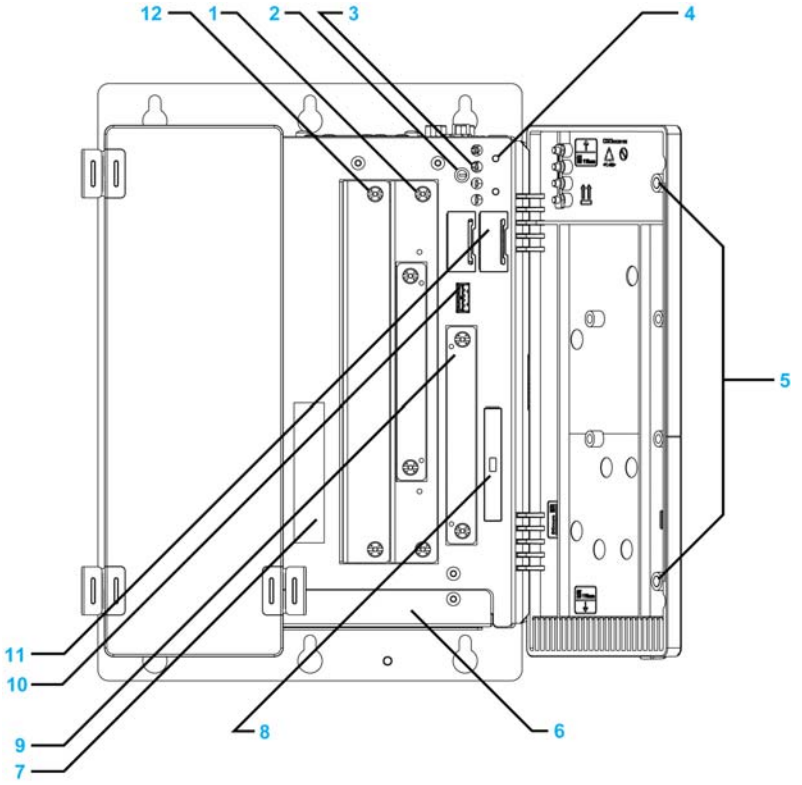
Interface Top View



1 Add-on UPS slot
2 Add-on interface slot
3 MIC, Line IN, Line OUT
4 Supply voltage 24 Vdc
5 COM 2
6 COM 1
7 Monitor/panel, DVI-I
8 ETH1 (10/100/1000 MBit
9 ETH2 (10/100/1000 MBit)
10 USB2, USB4 (max. 500 mA)

11 USB1, USB3 (max. 1 A)
12 Warning sign/Heat sink seal
13 Heat sink
14 PCI slot 5 (half-size)/PCI or PCIe
15 PCI slot 4 (half-size)/PCI or PCIe
16 PCI slot 3 (half-size)/PCI or PCIe
17 PCI slot 2 (half-size)/PCI or PCIe
18 PCI slot 1 (half-size)/PCI or PCIe
19 Add-on second DVI slot

Interface Front View



1 Slide-in slot 1 (Connection via SATA)
2 CMOS profile switch
3 Status LEDs
4 Power/Reset button
5 Permanent magnet
6 Fan kit cover
7 Serial number sticker
8 CompactFlash slot CF1/Connection via IDE - PATA

9 Slide-in compact slot (Connection via SATA)
10 Front USB (USB5 max. 1 A)
11 Battery
12 Slide-in slot 2 (Connection via SATA)

NOTE: The front USB is a diagnostic interface for service and maintenance.

NOTICE

UNINTENDED EQUIPMENT OPERATION

- Do not use the front USB while the machine is in operation.
- Always keep the front door closed during normal operation.

Failure to follow these instructions can result in equipment damage.

Characteristics

3

Subject of this Chapter

This chapter lists the product characteristics.

What Is in This Chapter?

This chapter contains the following topics:

Characteristics of the Box PC

Product Characteristics

The characteristics of the Box PC models are given below:

Element	Characteristics			
Expansion slots	1 slot Universal	2 slots Universal	2 slots Performance	5 slots Performance
	1 = 1 PCI	2 = 1 PCI + 1 PCIe on cataloged Part Number 2 = 2 PCI also available on configured Part Number	2 = 1 PCI + 1 PCIe on cataloged Part Number 2 = 2 PCI also available on configured Part Number	5 = 2 PCI + 3 PCIe on cataloged Part Number 5 = 4 PCI + 1 PCIe also available on configured Part Number
Intel chipset and processor	945GME + AtomN270@1.60 GHz + 512 KB L2 cache		GM45 + Core2Duo P8400@2.26 GHz + 3 MB cache	
Cooling method	Passive heat sink, Fanless operation		Fan kit with filter	
RAM	DDR2 667 MHz - 1 GB to 3 GB max		DDR3 1067 MHz - 2 GB to 8 GB max	
Graphics				
Controller	Intel® Graphics Media Accelerator 950		Intel® Graphics Media Accelerator (GMA) 4500 MHD	
Video memory	Up to 224 MB (reserved from main memory)		Up to 384 MB (reserved from main memory)	
Color depth	32 bit (maximum)		32 bit (maximum)	
Resolution				
RGB	400 MHz RAMDAC, up to 2048 x 1536 @75 Hz (QXGA) including 1920 x 1080 @ 85 Hz (HDTV)		300 MHz RAMDAC, up to 2048 x 1536 @75 Hz (QXGA) including 1920 x 1080 @ 85 Hz (HDTV)	
DVI	2x Intel compliant SDVO port, 1920 x 1080		2x Intel compliant SDVO port, 1920 x 1080	
Slide in compact	1 slot equipped according to model and operating system • Not equipped for models running Windows Embedded Standard 2009 • HDD or Flash drive for models running Windows XP Professional or Windows 7			
Compact Flash	1 slot type 1 equipped according to model and Operating system • 2 GB or 4 GB CF for models running Windows Embedded Standard 2009 • Not equipped for models running Windows XP Professional or Windows 7			

Element	Characteristics			
Slide in drive	None	1 slot equipped with: ● DVD-RW on cataloged PN ● HDD, SSD and drive adapter also available on configured PN	1 slot equipped with: ● DVD-RW on cataloged PN ● HDD, SSD and drive adapter also available on configured PN	2 slots with 1 equipped with: ● DVD-RW on cataloged PN ● DVD-RW-HDD and DVD-RW+SSD also available on configured PN
SRAM				
Battery-buffered	Yes			
Quantity	512 kB			
Reset button	Yes, accessible behind the front doors			
Buzzer	Yes			
Power supply Rated voltage Rated current Inrush current	24 Vdc ±25% 6 A Typically 7 A, 50 A < 300µs			
Battery backup UPS	Optional			
Outer dimensions (Width x Height x Depth)	82 x 270 x 250 mm (3.23 x 10.63 x 9.84 in.)	121 x 270 x 250.5 mm (4.76 x 10.63 x 9.86 in.)	136 x 270 x 250.5 mm (5.35 x 10.63 x 9.86 in.)	217 x 270 x 250.5 mm (8.54 x 10.63 x 9.86 in.)
Weight	Approx. 4 kg (8.81 lbs)	Approx. 5 kg (11.02 lbs)	Approx. 6 kg (13.22 lbs)	Approx. 7 kg (15.43 lbs)

Box PC Interface Characteristics

Serial Interface

Element	Characteristics
Amount	2
Type	RS-232C, modem-capable, not electrically isolated
UART	16550-compatible, 16-byte FIFO
Transfer Rate	Maximum 115 kbps
Connection	D-Sub 9-pin, male *(see page 80)*

USB Interface

Element	Characteristics
Type	USB 2.0
Amount	5 (4 top side and 1 front side)
Transfer Rate	Low speed (1.5 Mbit/s), full speed (12 Mbit/s), to high speed (480 Mbit/s)
Connection	Type A *(see page 79)*
Current load	Maximum 500 mA per connection for USB2, USB4 Maximum 1 A per connection for USB1, USB3, USB5

Ethernet Interface

Element	Characteristics
Amount	2 x RJ45
Speed	10/100/1000 Mbit/s

Environmental Characteristics

Characteristics

The environmental characteristics of the Box PC are as follows:

Characteristics	Value	Standards
Degree of Protection	IP20	EN/IEC 61131-2
Pollution Degree	For use in Pollution Degree 2 environment	EN/IEC 61131-2
Surrounding air temperature during operation	0...50 °C (32...122 °F) 0...45 °C (32...113 °F): ● when using RAID option ● when using Gigabit Ethernet on products with HDD storage device 5...45 °C (41...113 °F): ● when using DVD writer	EN/IEC 61131-2, UL 508
Storage temperature	– 20...60 °C (– 4...140 °F)	IEC 60068-2-2 tests Bb, IEC 60068-2-14 tests Na
Operating altitude	2000 m (6560 ft) max	EN/IEC 61131-2
Vibration		IACS E10 and EN/IEC 60068-2-6 Fc
Operation (continuous) for products with SSD or CF card storage device.	2...9 Hz: 1.75 mm (0.07 in.) 9...200 Hz: 0.5 g	
Operation (continuous) for products with HDD storage device.	5...100 Hz: 0.125 g	
Operation (occasional) for products with SSD or CF card storage device.	2...9 Hz: 3.5 mm (0.14 in.) 9...200 Hz:1 g	
Operation (occasional) for products with HDD storage device.	5...100 Hz: 0.250 g	
Merchant navy (continuous)	3...13.2 Hz: 1 mm (0.04 in.) 13.2...100 Hz: 0.7 g	
Shock Resistance (in operation)	15 g for a duration of 11 ms	IEC 60068-2-27 Ea test
Surrounding air humidity during operation	10...85 % RH (Wet bulb temperature: 29 °C (84.2 °F) max. - no condensation)	EN/IEC 60068-2-78 Cab
Storage humidity	10...85 % RH (Wet bulb temperature: 29 °C (84.2 °F) max. - no condensation)	EN/IEC 60068-2-30 Db
NOTE: IEC 61131-2 and IP65 are not part of UL certification for hazardous locations.		

Characteristics	Value	Standards
Electromagnetic Compatibility (EMC)	Immunity to High Frequency Interference	EN/IEC 61131-2, IEC 61000-4-x
	Electromagnetic Emissions Class A	EN 55022, EN 55011
NOTE: IEC 61131-2 and IP65 are not part of UL certification for hazardous locations.		

Dimensions/Assembly

4

Subject of this Chapter

This chapter describes Box PC dimensions and installation panels.

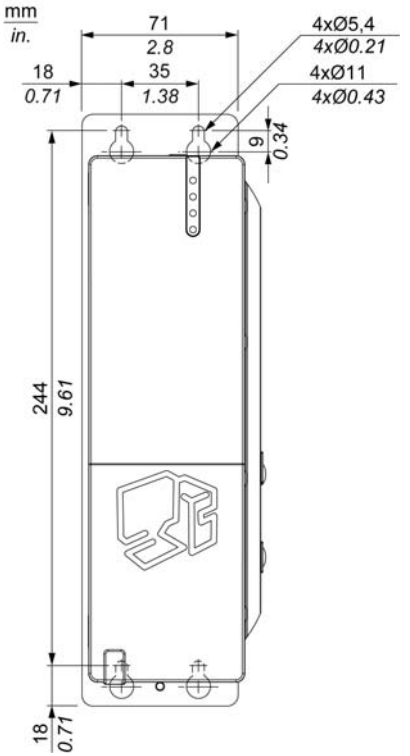
What Is in This Chapter?

This chapter contains the following topics:

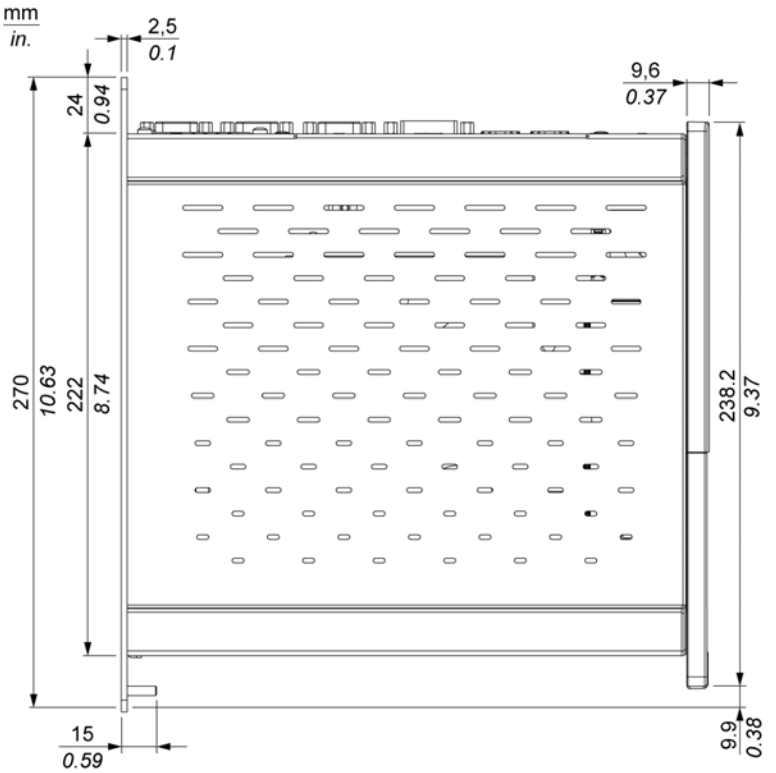
Dimensions

Dimensions of the 1 slot Unit

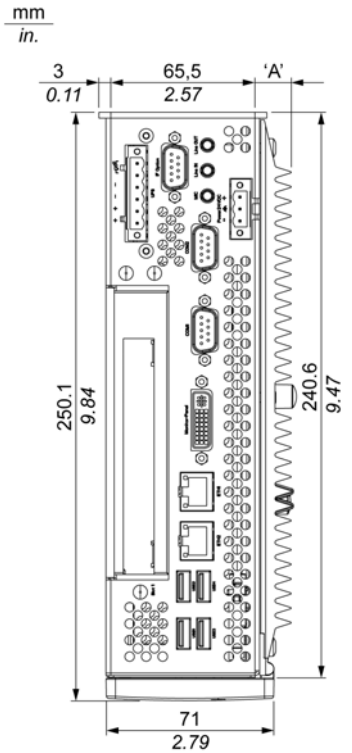
The illustration below shows the dimensions of front view:



The illustration below shows the dimensions of side view:



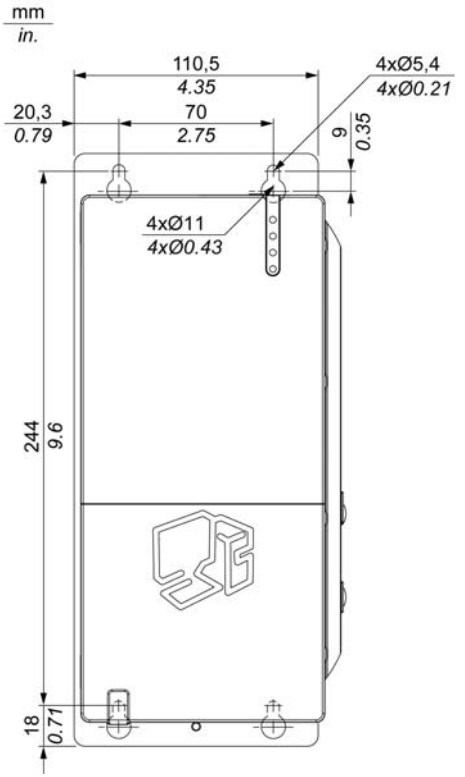
This illustration below shows the dimensions of top view:



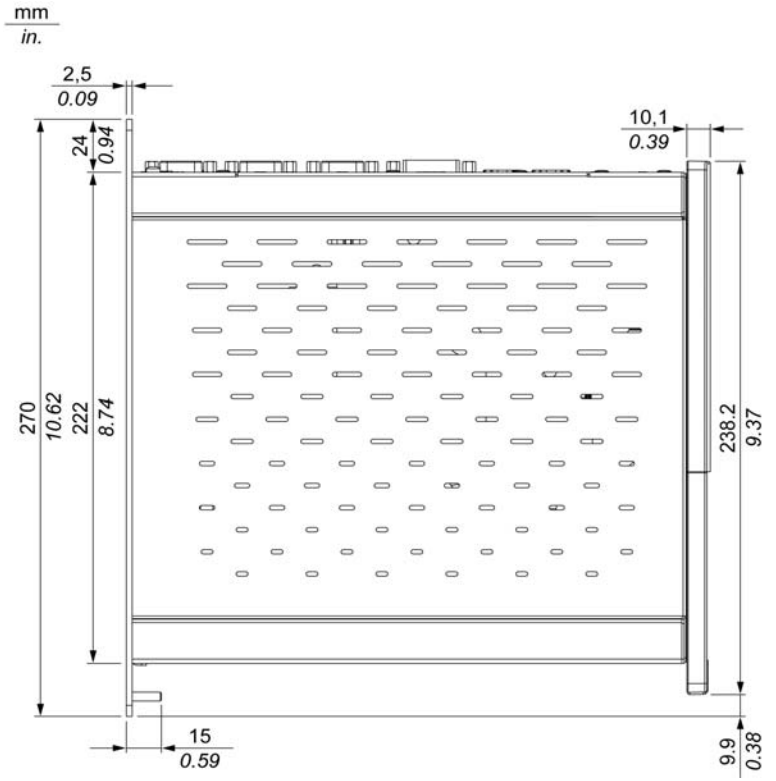
NOTE: Measurement “A” depends on which heat sink is used *(see page 56)*.

Dimensions of the 2 slot Unit

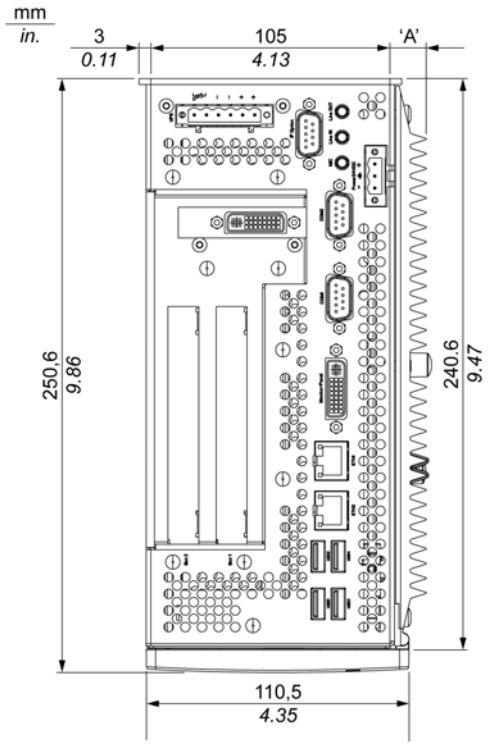
This illustration below shows the dimensions of front view:



This illustration below shows the dimensions of side view:



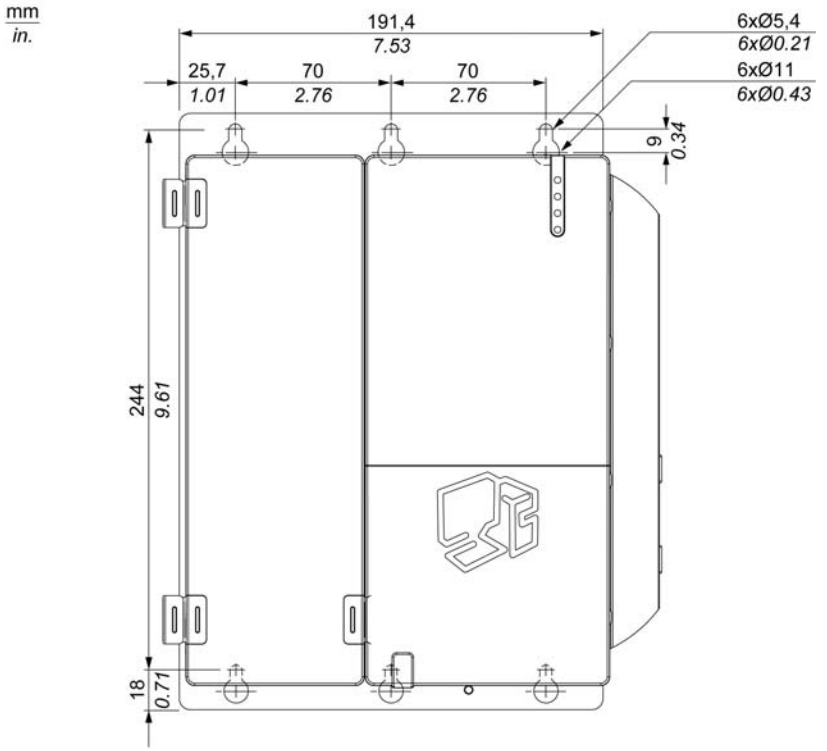
This illustration below shows the dimensions of top view:



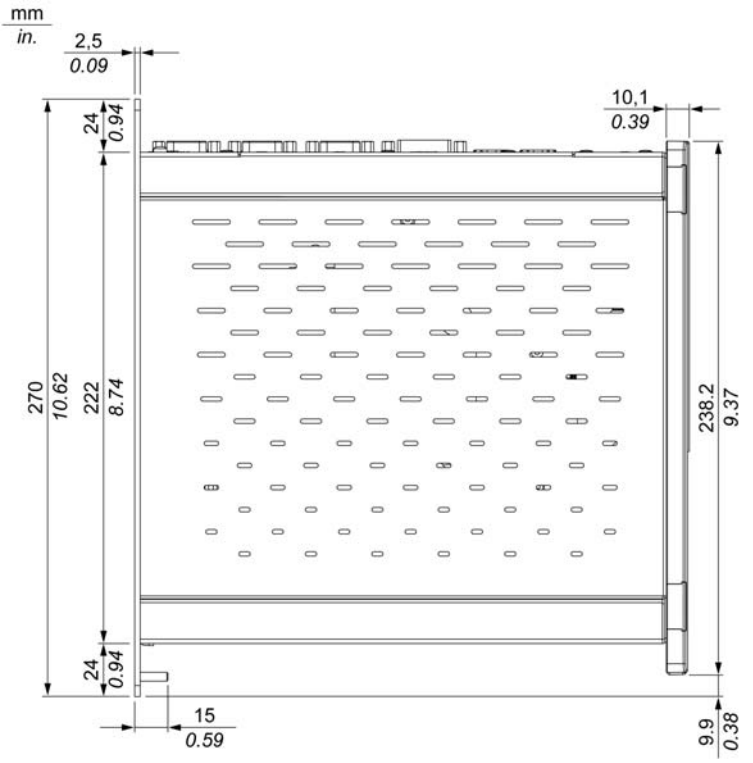
NOTE: Measurement “A” depends on which heat sink is used *(see page 56)*.

Dimensions of the 5 slot Unit

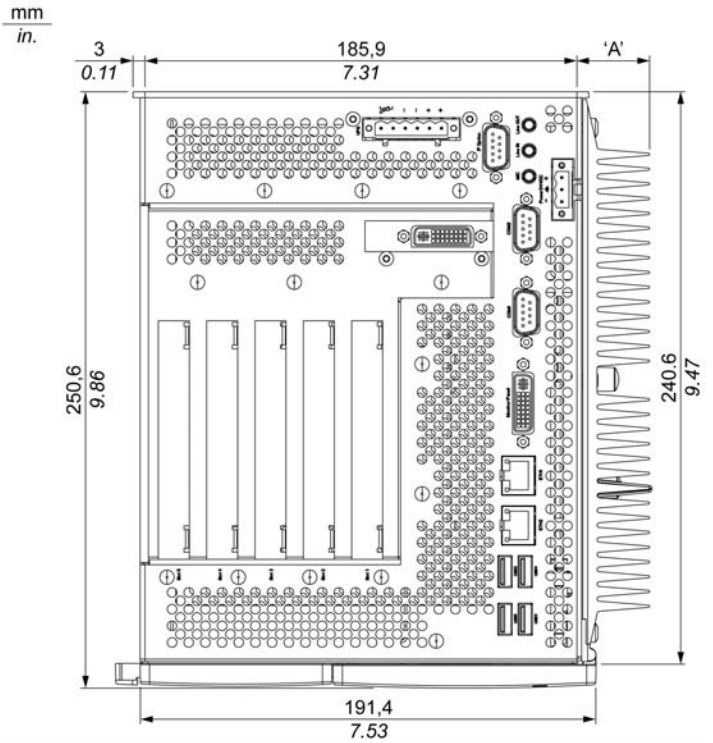
This illustration below shows the dimensions of front view:



This illustration below shows the dimensions of side view:



This illustration below shows the dimensions of top view:



NOTE: Measurement “A” depends on which heat sink is used *(see page 56)*.

Values

Measurement “A” depends on which heat sink is used:

Slot numbers	Value
1 slot Unit	12.8 mm (0.503 in.)
5 slot Unit	28 mm (1.103 in.)
2 slot Unit Performance	28 mm (1.103 in.)
2 slot Unit Universal	12.8 mm (0.503 in.)

The following table gives the general tolerance for the Box PC dimension figures:

Nominal measurement area	**General tolerance acc. DIN ISO 2768 medium**
up to 6mm (up to 0.236 in.)	±0.1 mm (±0.004 in.)
over 6 to 30 mm (over 0.236 to 1.181 in.)	±0.2 mm (±0.0078 in.)
over 30 to 120 mm (over 1.18 to 4.724 in.)	±0.3 mm (±0.012 in.)
over 120 to 400 mm (over 4.724 in. to 15.747 in.)	±0.5 mm (±0.02 in.)
over 400 to 1000 mm (over 15.747 to 39.37 in.)	±0.8 mm (±0.031 in.)

Box PC Mounting

Installation Location

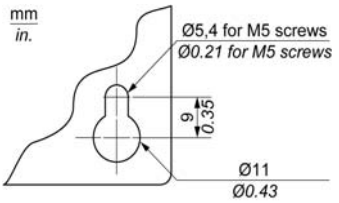
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not place the Box PC next to other devices that might cause overheating.
- Keep the Box PC away from arc-generating devices such as magnetic switches and non-fused breakers.
- Avoid using the Box PC in environments where corrosive gases are present.
- Install the Box PC in a location providing a minimum clearance of 50 mm (1.96 in.) or more on the left and right sides, and 100 mm (3.93 in.) or more above and below the product from all adjacent structures and equipment.
- Install the Box PC with sufficient clearance to provide for cable routing and cable connectors.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Mount the Box PC system with the mounting plates found on the housing. The plates are designed for M5 screws.



Use the Drilling templates to see the exact positioning of the mounting holes Drilling templates. *(see page 59)*

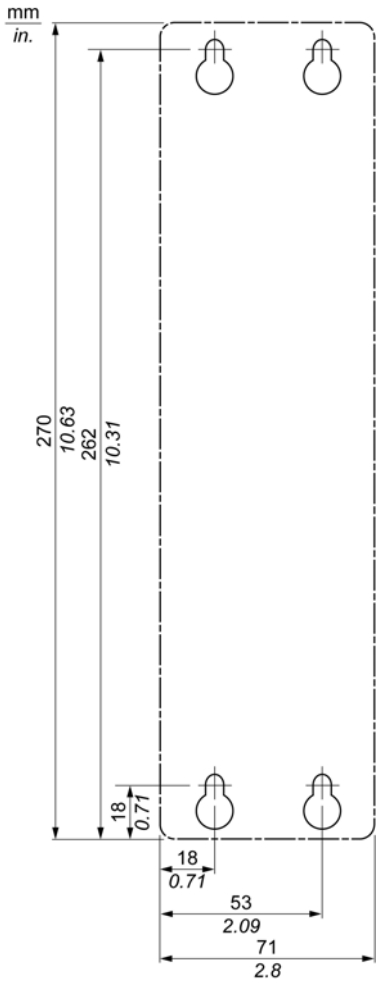
Important mounting information

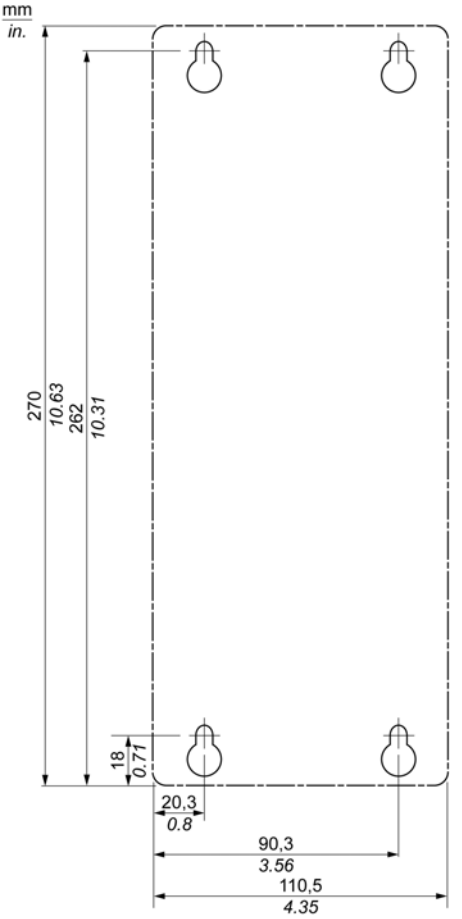
- Environmental Characteristics. *(see page 45)*
- The Box PC is only permitted for operation in closed rooms.
- The Box PC cannot be situated in direct sunlight.
- The Box PC vent holes must not be covered.
- When mounting the Box PC, adhere to the allowable Mounting angle *(see page 61)*
- Be sure the wall or switching cabinet can support a minimum four times the total weight of the Box PC.
- When connecting certain cable types (DVI, USB, and so on), keep the flex radius of the cable in mind.

Drilling templates

Included with the Box PC are drilling templates that assist you with mounting the unit correctly.

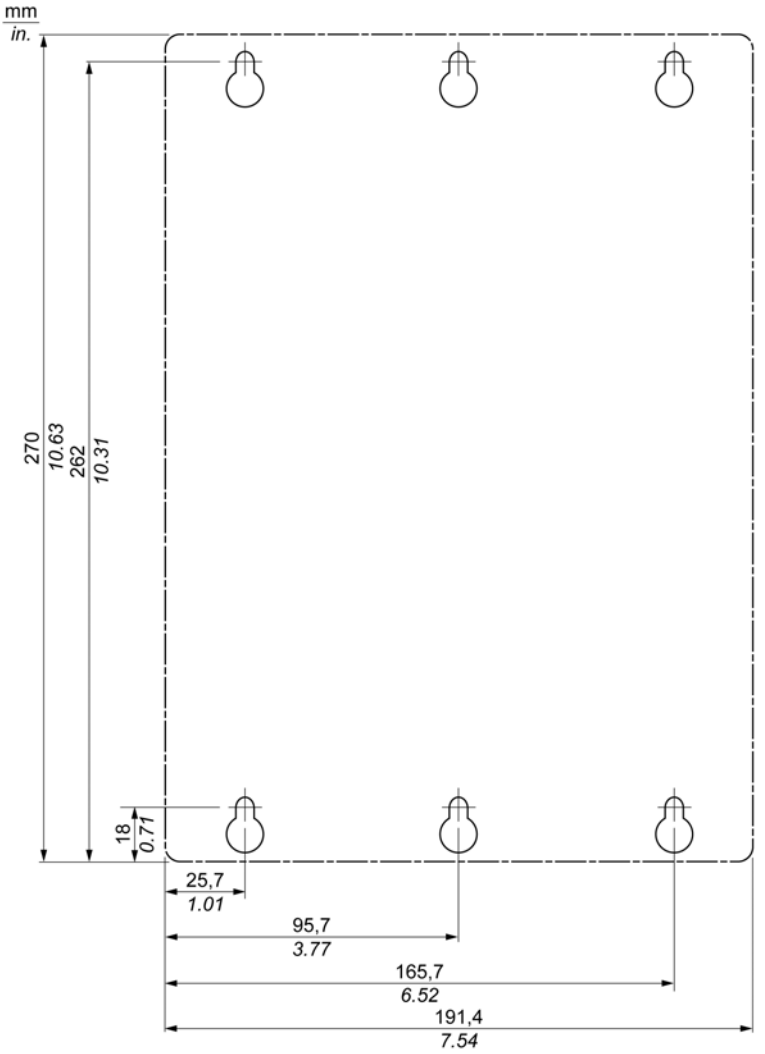
Box PC 1 card slot	Box PC 2 card slot
Mounting plate outline (Box PC)	Mounting plate outline (Box PC)





Box PC 5 card slot

Mounting plate outline (Box PC)

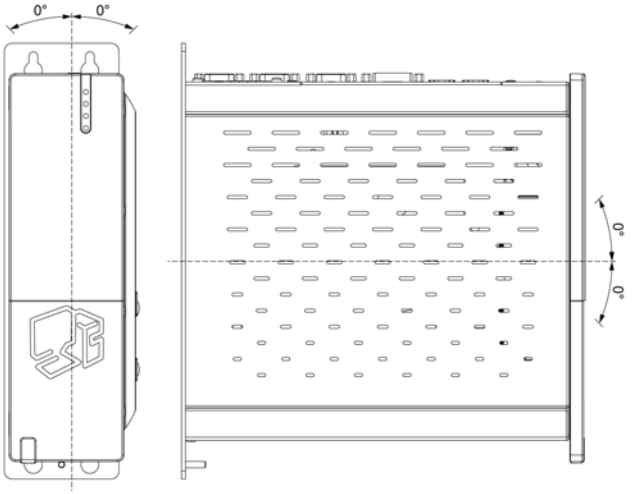


Mounting angle

The Box PC system must be mounted as described in the following figures.

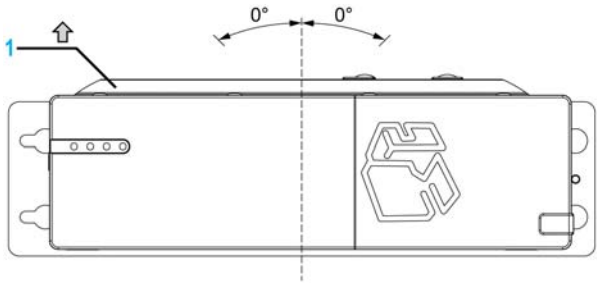
Standard mounting - vertical

Standard mounting refers to vertical mounting orientation. Box PC systems with or without a fan kit can be mounted this way.



Optional mounting - flat (not available for Fanless model)

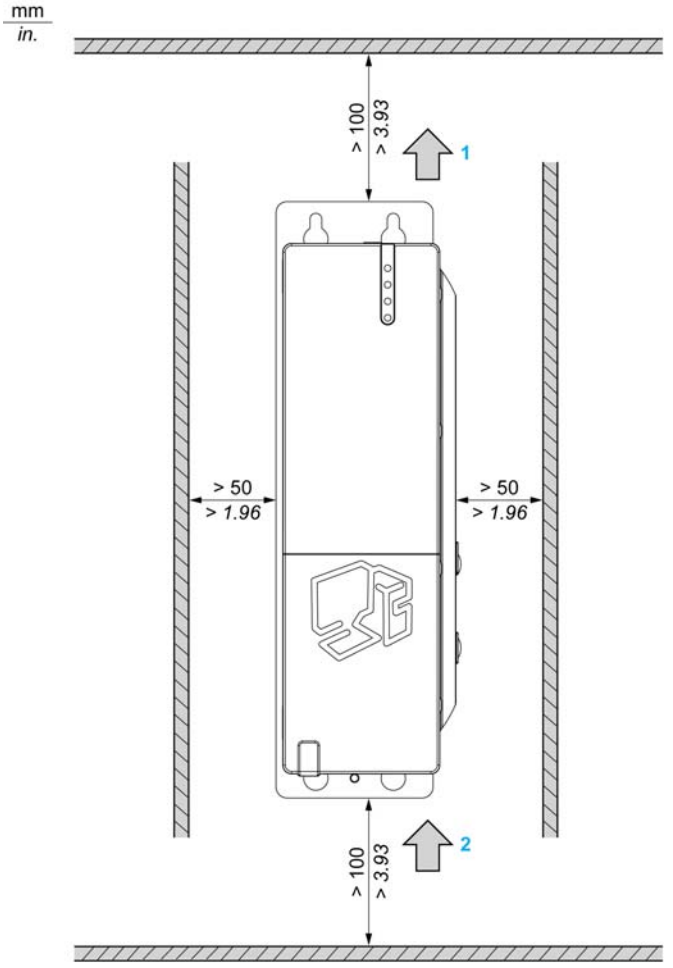
Operation in the optional flat mounting position (heat sink on top) is available for models with Fan kit *(see page 126)*. The maximum ambient temperature specification must be lowered by 5 °C (41 °F).



1 Heat sink

Spacing for air circulation

In order to provide sufficient air circulation, mount the system so that the spacing on the top, bottom, and sides is as follows:



1 Air out
2 Air in

These defined distances are valid for both vertical and flat mounting of the Box PC.

Preparing to Install the Box PC

Vibration and Shocks

Extra care should be taken with respect to vibration levels when installing or moving the Box PC. If the Box PC is moved, for example, while it is installed in a rack equipped with caster wheels, the unit can receive excessive shock and vibration.

⚠ CAUTION

EXCESSIVE VIBRATION

- Plan your installation activities so that shock and vibration tolerances in the unit are not exceeded.
- The recommended torque for mounting the Box PC is 0.5 Nm (4.5 lb-in).

Failure to follow these instructions can result in injury or equipment damage.

Implementation

II

Subject of this Part

This part describes setting up the product.

What Is in This Part?

This part contains the following chapters:

Getting Started

5

First Power-up

License Agreement

Limitations on your usage of the Microsoft Windows Operating System are noted in Microsoft's End User License Agreement (EULA). This EULA is included on the DVD-ROM. Read this document before first powering-up.

On first power-up of your HMIBP••••••• or HMIBU•••••••, to customize and set the parameters for your system, refer to the Magelis Installation Guide.

Install and customize the Schneider Electric applications (Vijeo Designer, Vijeo Designer Lite, OFS).

EWF Manager (Enhanced Write Filter Manager)

The Magelis Box PC HMIBUC•••••• operating system, Windows® Embedded Standard 2009, is installed on a memory card. This card is a re-writable Compact Flash card that allows approximately 100,000 write operations.

The EWF Manager (Enhanced Write Filter Manager) minimizes the number of write operations to help extend the life of the CF Card. It loads temporary data (for example, system updates and software operations) into RAM, and does not write this information to the CF Card.

As a result, when using the EWF Manager, restarting the Box PC causes any changes the user made to the system to be overwritten. The following types of modifications may be overwritten if the EWF Manager is active and the system is restarted:

- Newly installed applications.
- Newly installed peripherals.
- Newly created or modified user accounts.
- Network configuration changes (e.g. IP address, default gateway, and so on).
- Operating System customizations (e.g.background pictures, and so on).

NOTICE

DATA AND CONFIGURATION LOSS

- Disable the EWF Manager before making any permanent changes to the hardware, software, or Operating System of the Box PC. Confirm that the EWF icon in the Windows system tray has a red "X".
- Re-enable the EWF Manager after making permanent changes and confirm that the EWF icon in the Windows system tray does not have a red "X". This can help extend the operating life of the CF Card.
- Back up all CF Card data regularly to another storage media.

Failure to follow these instructions can result in equipment damage.

Enabling/Disabling the EWF Manager

The status of the EWF Manager may be changed by running the `ChangeEWFState.exe` program located in the `C:\Program Files\Change EWF State\` directory. After running this program, you need to restart the system for the change to take effect. You need administrator privileges to enable and disable the EWF Manager.

Box PC Connections

6

Subject of this Chapter

This chapter describes the connection of the Box PC to the main power supply. It also describes the USB ports and identifies the serial interface pin assignment.

What Is in This Chapter?

This chapter contains the following topics:

Grounding

Overview

The grounding resistance between the Box PC ground and the ground must be 100 Ω or less. When using a long grounding wire, check the resistance and, if required, replace a thin wire with a thicker wire and place it in a duct. In addition, refer to the table below for maximum lengths of various wire thicknesses.

Ground Wire Dimensions

Wire Cross-section	Maximum Line Length
2.5 mm^2 (AWG 13)	30 m (98 ft)
	60 m (196 ft) round trip.

Precaution

⚠ WARNING

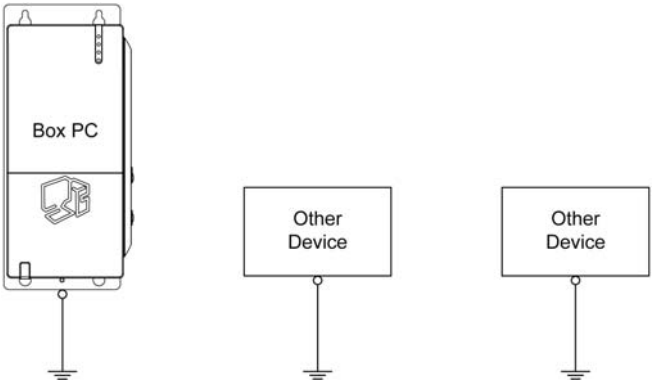
UNINTENDED EQUIPMENT OPERATION

- Use only the authorized grounding configurations shown below.
- Confirm that the grounding resistance is 100 Ω or less.
- Test the quality of your ground connection before applying power to the device. Excess noise on the ground line can disrupt operations of the Box PC.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

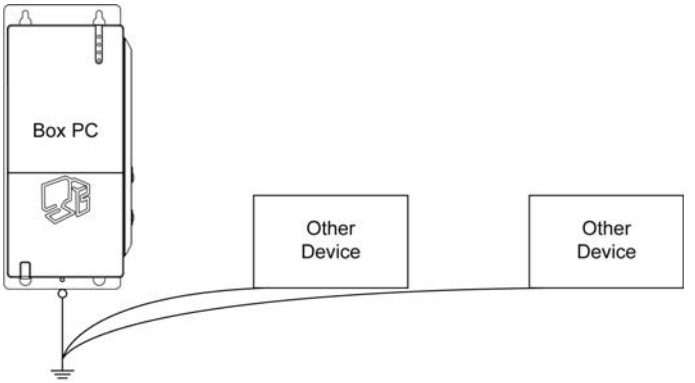
Dedicated Ground

Connect the Box PC ground to a dedicated ground:



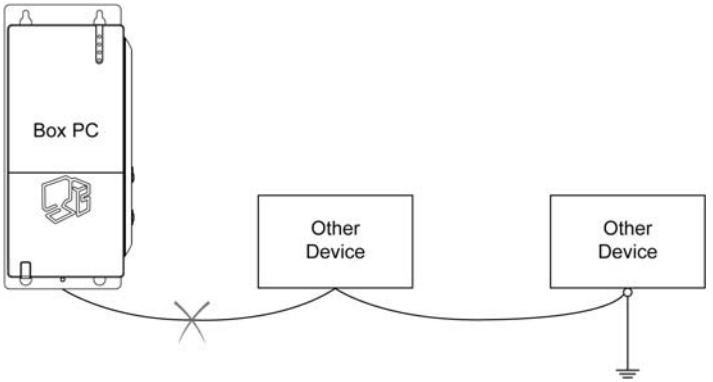
Shared Ground Allowed

If a dedicated ground is not possible, use a shared ground, as shown below:



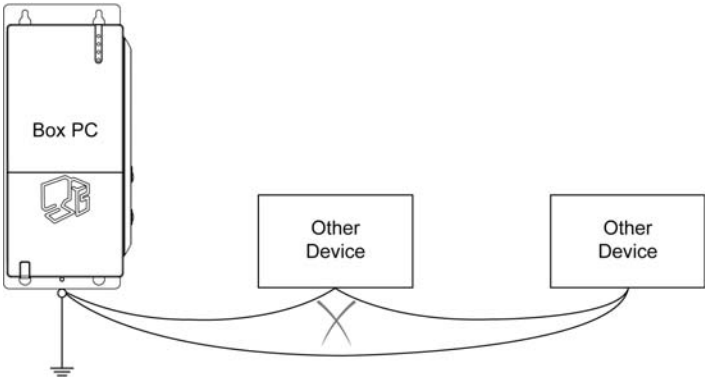
Shared Ground not Allowed

Do not connect the Box PC to ground through other devices using shared ground terminals:



Shared Ground - Avoid Ground Loop

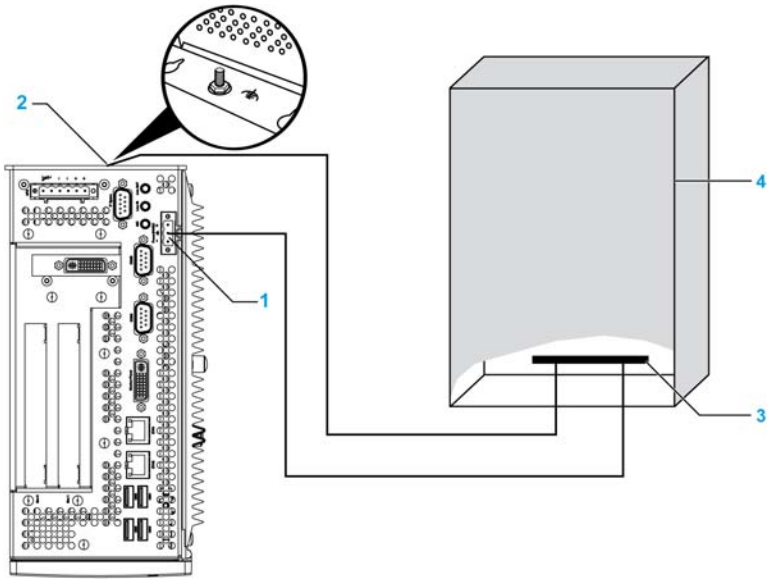
When connecting an external device to a Box PC with the shield ground (SG), ensure that a ground loop is not created. The Box PC's ground connection screw and SG are connected internally.



Grounding Procedure

The Box PC ground has 2 connections:

- Supply voltage
- Ground connection screw



1 Supply voltage
2 Ground connection screw
3 Grounding strip
4 Switching cabinet

When grounding, follow the procedure below:

Step	Action
1	Check that the grounding resistance is 100 Ω or less.
2	When connecting the SG line to another device, ensure that the design of the system/connection does not produce a ground loop. **NOTE:** The SG and ground connection screw are connected internally in the Box PC.
3	Use 2.5 mm^2 (AWG 13) wire to make the ground connection. Create the connection point as close to the Box PC as possible and make the wire as short as possible.

Grounding I/O Signal Lines

⚠ DANGER

EXPLOSION HAZARD

- Always confirm the ANSI/ISA 12.12.01 and CSA C22.2 N° 213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a Box PC installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incentive USB configuration.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

Failure to follow these instructions will result in death or serious injury.

Electromagnetic radiation may interfere with the control communications of the Box PC.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- If wiring of I/O lines near power lines or radio equipment is unavoidable, use shielded cables and ground one end of the shield to the Box PC ground connection screw.
- Do not wire I/O lines in proximity to power cables, radio devices, or other equipment that may cause electromagnetic interference.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Connecting the DC Power Cord

Precaution

When connecting the power cord to the power connector on the Box PC, first ensure that the power cord is disconnected from the DC power supply.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

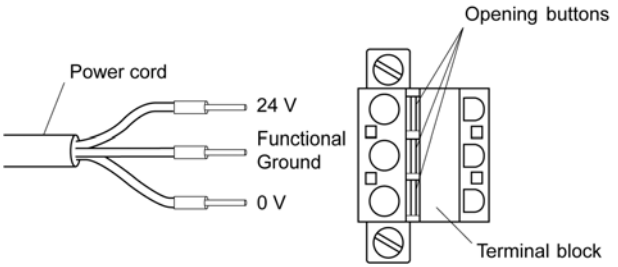
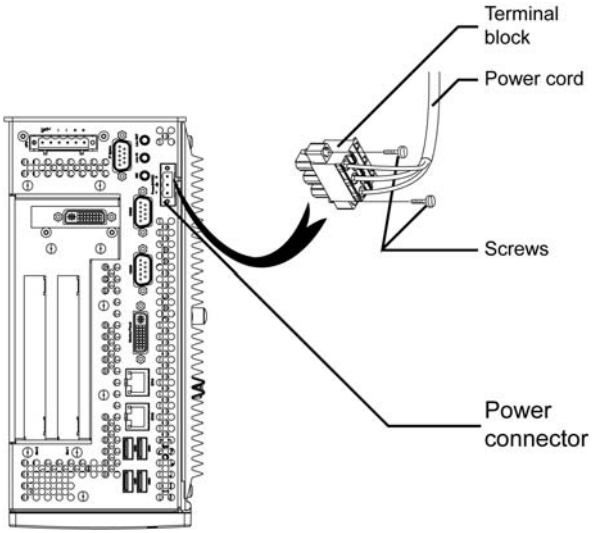
UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only commercially available USB cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Wiring and Connecting the Terminal Block

The table below describes how to connect the power cord to the DC Box PC:

Step	Action
1	Remove all power from the Box PC and confirm that the DC power supply has been disconnected from its power source.
2	Remove the terminal block from the power connector and connect the power cord to the terminal block as shown below:  75C wire is to be used. Use wire with cross-section 0.75 to 2.5 mm^2 (AWG 18 to AWG 12).
3	Place the terminal block in the power connector and tighten the screws.  **NOTE:** The recommended torque to tighten these screws is 0.5 Nm (4.5 lb-in).

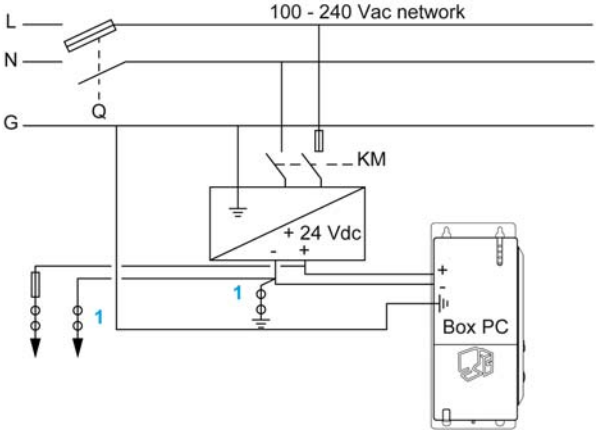
Marine Certification Connection

If the product is used in an environment requiring marine certification, a power line filter must be in the power line.

The line filter must be ordered in addition to the product using the reference HMIYLFIMAR11.

Possible Connection

Connection to a Ground-Referenced DC Power System:



Q : Main Power Contact
KM : Line contacts
1 : Residual Current Detector for detecting grounding faults

Box PC Interface Connections

Introduction

The information below describes usage of the interface connections of the Magelis Box PC in Class I, Division 2 Groups A, B, C, and D hazardous locations.

⚠ DANGER

EXPLOSION HAZARD

- Always confirm the ANSI/ISA 12.12.01 and CSA C22.2 N° 213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a Box PC installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incentive USB configuration.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

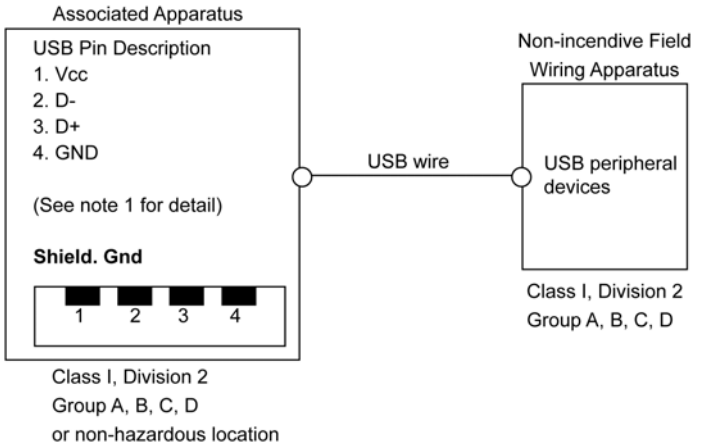
- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only commercially available USB cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

USB Connections

Non-incentive equipment (keyboards, mouse) are permitted for use on the Box PC (Associated Apparatus) USB ports 1, 2, 3, 4 (not for USB 5, which is only used for maintenance). In addition to being non-incentive, any equipment connected to the USB ports 1, 2, 3, 4 must satisfy the following criteria.

The following figure shows the USB cable wiring:



Notes:

1. The following table gives the Non-incentive Circuit Parameters:

Circuit Parameters	USB ports 1 and 3	USB ports 2 and 4
Open-circuit voltage = V_{oc}	5.066 V	5.26 V
Short-circuit current = I_{sc}	1320 mA	830 mA
Associated capacitance = C_a	20 µF	20 µF
Associated inductance = L_a	16.8 µH	16.8 µH

The Entity Concept allows interconnection of non-incendive apparatus with associated apparatus – not specifically examined combinations – as a system when the approved values of V_{oc} (or U_o) and I_{sc} (or I_o) for the associated apparatus are less than or equal to Vmax (U_i) and Imax (I_i) for the non-incendive apparatus, and the approved values of C_a (C_o) and L_a (L_o) for the associated apparatus are greater than or equal to $C_i + C_{cable}$ and $L_i + L_{cable}$, respectively, for the non-incendive field wiring apparatus.

2. Associated Non-incendive Field Wiring Apparatus shall satisfy the following:

Magelis Box PC	**-**	**Associated Non-incendive Field Wiring Apparatus (Mouse, Keyboard)**
V_{oc} I_{sc} C_a L_a	≤ ≤ ≥ ≥	V_{max} I_{max} $C_i + C_{cable}$ $L_i + L_{cable}$

3. If the electrical parameters of the cable are unknown, the following values may be used:

- C_{cable} = 196.85 pF/m (60 pF/ft)
- L_{cable} = 0.656 µH/m (0.20 µH/ft)

4. Wiring methods must be in accordance with the electrical code of the country in use.

The Box PC must be installed in an enclosure. If installed in a Class I, Division 2 Location, the enclosure must be capable of accepting one or more Division 2 wiring methods.

⚠ DANGER

EXPLOSION HAZARD

- Substitution of components may impair suitability for Class I, Division 2.
- Do not energize or disconnect the device while area is known to be hazardous.
- The associated non-incendive field wiring apparatus shall not be connected in parallel unless permitted by the associated non-incendive apparatus approval.

Failure to follow these instructions will result in death or serious injury.

The Box PC is suitable for use in Class I, Division 2, Groups A, B, C, D and provides non-incendive field wiring to apparatus in Class I, Division 2, Groups A, B, C, D.

Serial Interface Connections

This interface is used to connect Box PC to remote equipment, via an RS-232C cable. The connector is a D-Sub 9-pin male connector.

By using a long PLC cable to connect to the Box PC, it is possible that the cable can be at a different electrical potential than the panel, even if both are connected to ground.

The Box PC serial port is not isolated. The SG (signal ground) and the functional ground (FE) terminals are connected inside the panel.

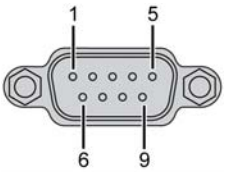
⚠⚠ DANGER

ELECTRIC SHOCK

- Make a direct connection between the ground connection screw and ground.
- Do not connect other devices to ground through the ground connection screw of this device.
- Install all cables according to local codes and requirements. If local codes do not require grounding, follow a reliable guide such as the US National Electrical Code, Article 800.

Failure to follow these instructions will result in death or serious injury.

The following table shows the D-Sub9 pin assignments:

Pin	Assignment	
1	DCD	D-Sub9 pin male connector: 
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

Any excessive weight or stress on communication cables may disconnect the equipment.

⚠ CAUTION

LOSS OF POWER

- Ensure that communication connections do not place excessive stress on the communication ports of the Box PC.
- Securely attach communication cables to the panel or cabinet.
- Use only D-Sub 9 pin cables with a locking system in good condition.

Failure to follow these instructions can result in injury or equipment damage.

Configuration of the BIOS

7

What Is in This Chapter?

This chapter contains the following topics:

BIOS Options

General Information

BIOS stands for “Basic Input Output System”. It is the most basic communication between the user and the hardware. The BIOS used in the Box PC is produced by Schneider Electric.

The BIOS Setup Utility lets you modify basic system configuration settings. These settings are stored in CMOS and in an EEPROM (as a backup).

The CMOS data is buffered by a battery (if present), and remains in the Box PC even when the power is turned off (24 Vdc power supply is disconnected).

BIOS Setup and Boot Procedure

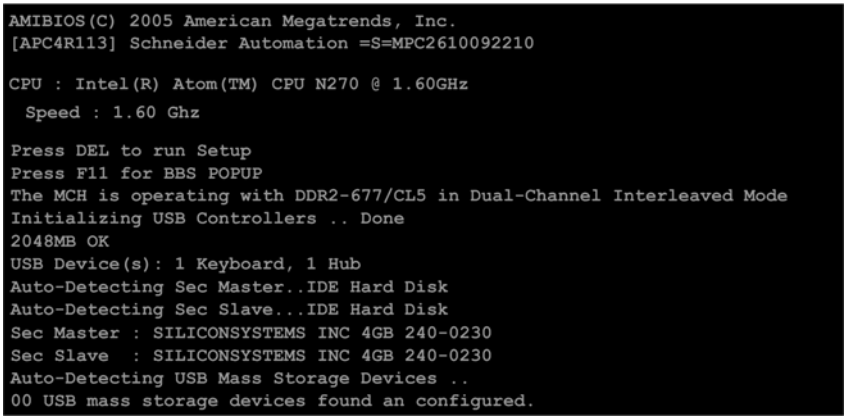
BIOS is immediately activated when switching on the power supply of the Box PC or pressing the power button. The system checks if the setup data from the EEPROM is OK. If the data is OK, then it is transferred to CMOS. If the data is not OK, then the CMOS data is checked for validity. A message appears if the CMOS data contains anomalies, but you can continue the boot procedure by pressing the [F1] key. To prevent the message from appearing at each restart, open the BIOS setup by pressing the [DEL] key and re-save the settings.

BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the Power On Self Test (POST).

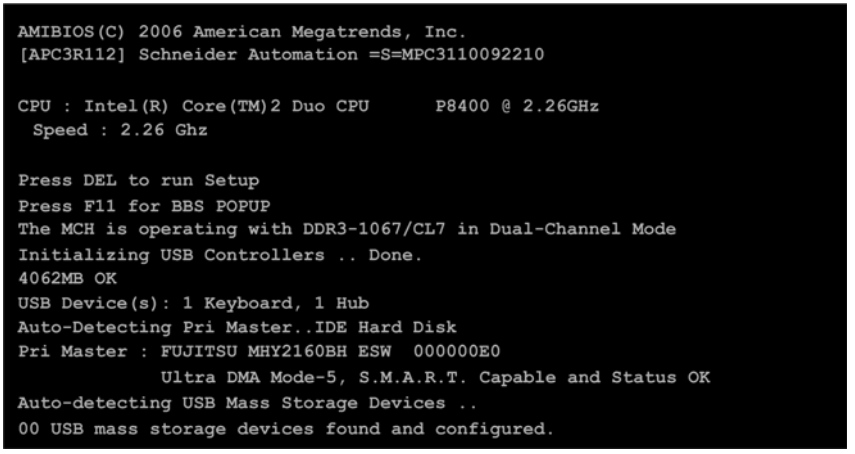
When these preliminaries are complete, the BIOS seeks the operating system from the data storage devices available (hard drive, floppy drive, and so on). BIOS launches the operating system and hands over to the operating system control of system operations.

To enter BIOS Setup, press the [DEL] key after the USB controller has been initialized, and as soon as the following message appears on the monitor (during POST): “Press DEL to run Setup”.

The following figure shows an example Universal BIOS startup screen:



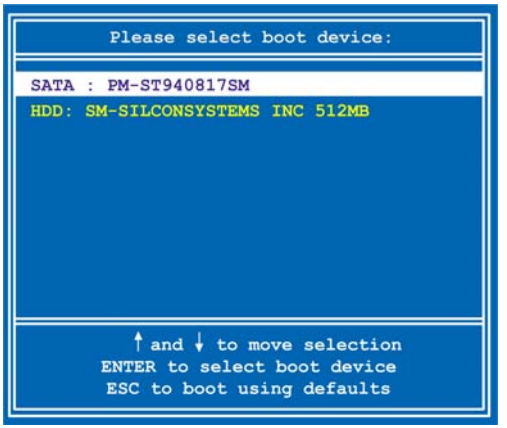
The following figure shows an example Performance BIOS startup screen:



NOTE: When you press the [DEL] key during startup, the Main BIOS setup menu appears *(see page 88)*.

BIOS Setup Keys

The following keys are enabled during the POST:

Key	Function
DEL	Enters the BIOS setup menu
F12	Using the [F12] key, you can boot from the network.
F11	Displays the boot menu. Lists all bootable devices that are connected to the system. Use the up cursor ↑ and down cursor ↓and then press the [Enter] key to select the boot device. 
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the POST.

NOTE: Keys input from the USB keyboard are only registered after the USB controller has been initialized.

You can use the following keys after entering the BIOS setup:

Key	Function
F1	General help.
Cursor ↑	Moves to the previous item.
Cursor ↓	Goes to the next item.
Cursor ←	Moves to the previous item.
Cursor →	Goes to the next item.
±	Changes the value of the selected item.
Enter	Changes to the selected menu.
PgUp ↑	Changes to the previous page.
PgDn ↓	Changes to the next page.
Start	Jumps to the first BIOS menu item or object.

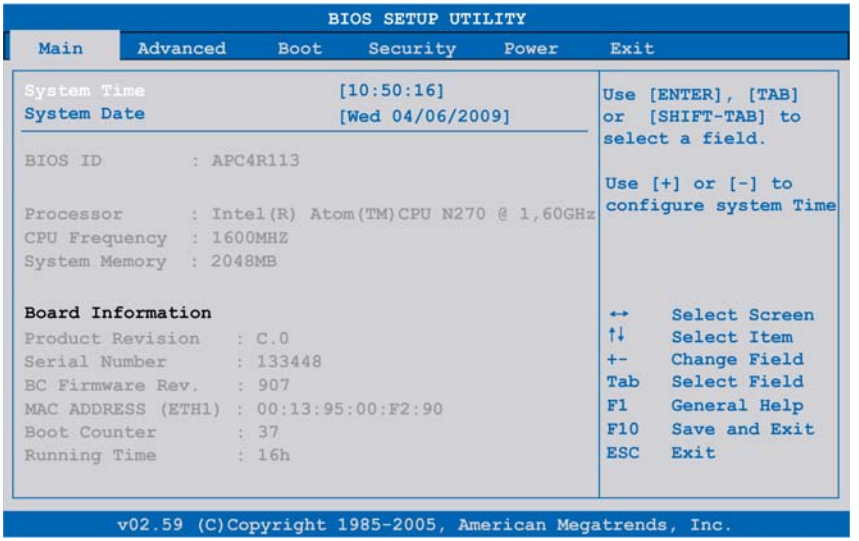
Key	Function
End	Jumps to the last BIOS menu item or object.
F2/F3	Switches the colors of the BIOS setup.
F7	Resets any changes.
F9	Loads these settings for all BIOS configurations.
F10	Saves and closes BIOS setup.
Esc	Exits the submenu.

Main Menu

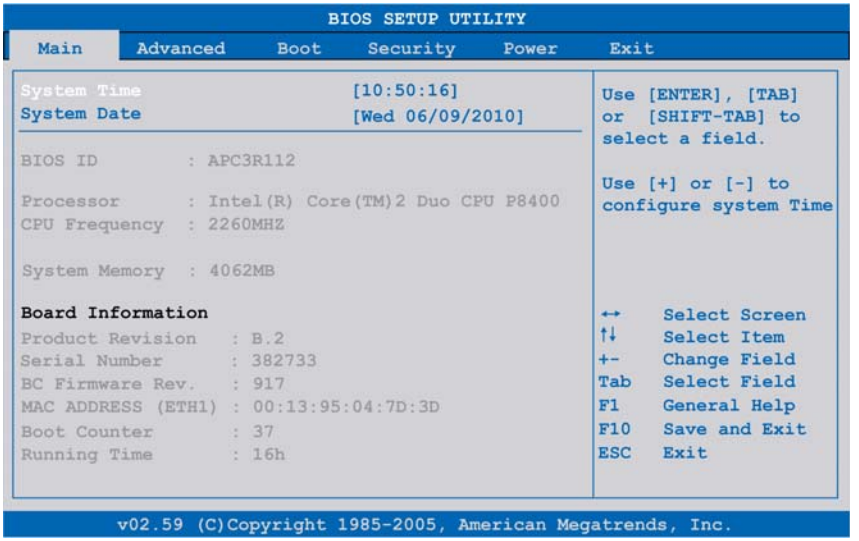
Main Menu

When you press the [DEL] key during startup, the **Main** BIOS setup menu appears.

The following figure shows the **Main** menu for Universal Box PC:



The following figure shows the **Main** menu for Performance Box PC:

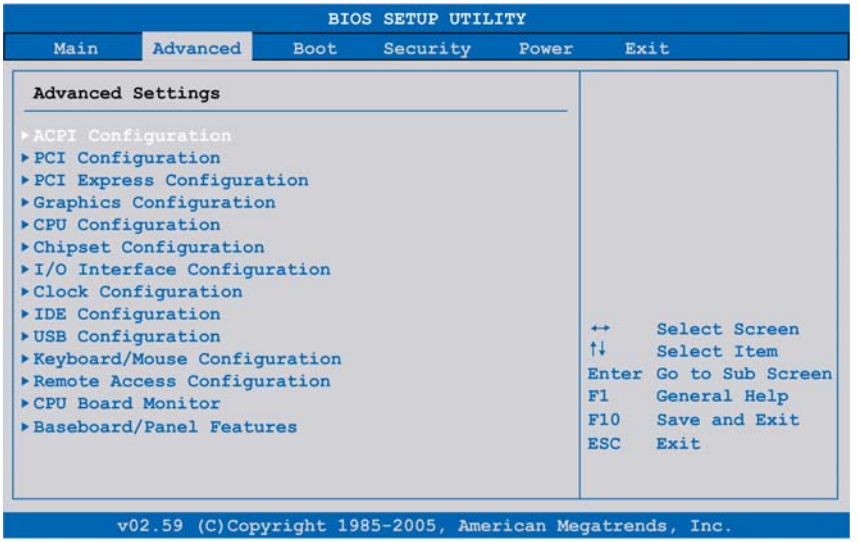


The following table shows the **Main** menu setting options:

BIOS Setting	Description	Setting Options	Effect
System Time	This is the current time setting. The time is maintained by the battery (CMOS battery) when the unit is turned off.	Change the time	Set the time using the format Hours:Minutes:Seconds (hh:mm:ss).
System Date	This is the current date setting. The time is maintained by the battery (CMOS battery) when the unit is turned off.	Change the date	Set the date using the format Month:Day:Year (mm:dd:yyyy).
BIOS ID	Displays the BIOS detected.	None	-
Processor	Displays the processor type	None	-
CPU Frequency	Displays the processor frequency	None	-
System Memory	Displays the system memory size	None	-
Product Revision	Displays the CPU board HW revision.	None	-
Serial Number	Displays the CPU board serial number.	None	-
BC Firmware Rev.	Displays the CPU board controller firmware revision.	None	-
MAC Adresse (ETH1)	Displays the MAC addresses assigned for the ETH1 interface.	None	-
Boot Counter	Displays the boot counter - each restart increments the counter by one (max. 16777215).	None	-
Running Time	Displays the running time in hours. (max. 65535).	None	-

Advanced Menu - USB Configuration

Advanced Menu

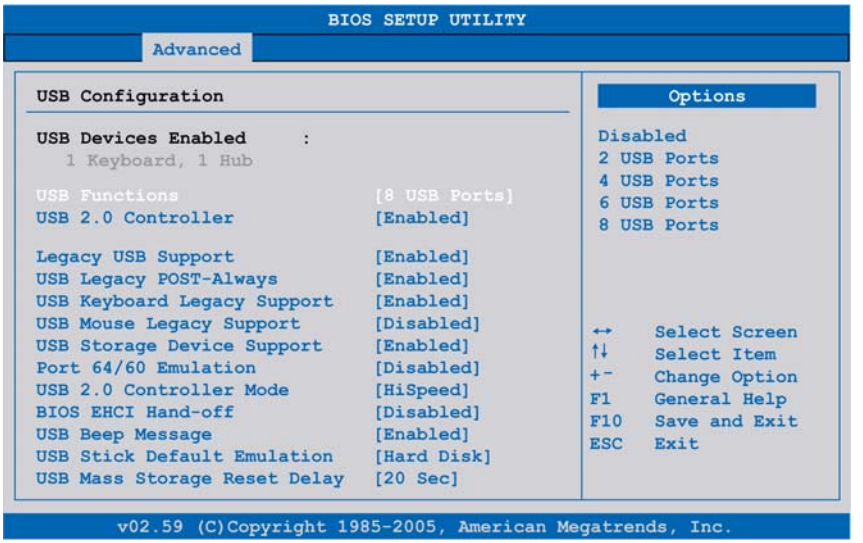


The following tables shows the accessible submenus from **Advanced** menu:

BIOS Setting	Description	Setting Options	Effect
ACPI Configuration	Configures APCI devices.	Enter	Opens submenu
PCI Configuration	Configures PCI devices.	Enter	Opens submenu
PCI Express Configuration	Configures the PCI Express.	Enter	Opens submenu
Graphics Configuration	Configures the graphic settings.	Enter	Opens submenu
CPU Configuration	Configures CPU settings.	Enter	Opens submenu
Chipset Configuration	Configures the chipset functions.	Enter	Open submenu
I/O Interface Configuration	Configures the I/O devices.	Enter	Opens submenu
Clock Configuration	Configures clock settings.	Enter	Opens submenu
IDE Configuration	Configures the IDE functions.	Enter	Opens submenu
USB Configuration	Configures USB settings	Enter	Opens submenu *(see page 91)*
Keyboard/Mouse Configuration	Configures the keyboard/mouse options	Enter	Opens submenu
Remote Access Configuration	Configures the remote access settings.	Enter	Opens submenu

BIOS Setting	Description	Setting Options	Effect
CPU Board Monitor	Displays the current voltage and temperature of the processor	Enter	Opens submenu
Baseboard/Panel Features	Displays device specific information and setup of device specific values.	Enter	Opens submenu

USB Configuration Submenu



The following table shows the **USB Configuration** menu setting options:

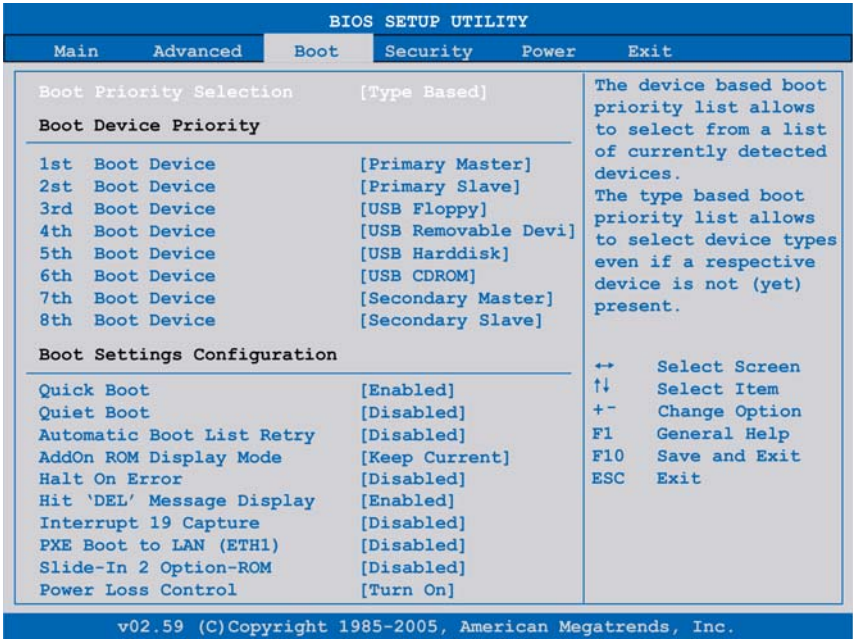
BIOS Setting	Description	Setting Options	Effect
USB Functions	You can enable or disable USB ports here. USB port numbers (for example, USB1, USB3, and so on) are printed on the Box PC housing.	Disabled	Disables the USB port.
		2 USB Ports	USB1, USB3 are enabled.
		4 USB Ports	USB1, USB2, USB3, USB4, are enabled.
		5 USB Ports	USB1, USB2, USB3, USB4, USB5 are enabled.
USB 2.0 Controller	Option for enabling or disabling USB 2.0.	Enabled	All USB interfaces run in USB 2.0 mode.
		Disabled	All USB interfaces run in USB 1.1 mode.

BIOS Setting	Description	Setting Options	Effect
Legacy USB Support	You can enable/disable Legacy USB support here. USB interfaces do not function during startup. USB is supported after the operating system has started. USB keyboard is recognized during the POST.	Disabled	Disables this function.
		Enabled	Enables this function.
		Auto	Automatic enabling.
USB Legacy POST-Always	Option to enable Legacy USB Support during the POST (Power On Self Test), the same as the Legacy USB Support setting.	Enabled	Enables calling the BIOS Setup during the POST with a USB keyboard.
		Disabled	Disables this function.
USB Keyboard Legacy Support	You can enable/disable USB keyboard support here.	Disabled	Disables this function.
		Enabled	Enables this function.
USB Mouse Legacy Support	You can enable/disable USB mouse support here.	Disabled	Disables this function.
		Enabled	Enables this function.
USB Storage Device Support	You can enable/disable USB storage device support here.	Disabled	Disables this function.
		Enabled	Enables this function.
Port 64/60 Emulation	You can enable/disable Port 64/60 emulation here.	Disabled	USB keyboard functions in all systems excluding Windows NT.
		Enabled	USB keyboard functions in Windows NT.
USB 2.0 Controller Mode	Defines settings for the USB controller.	Full speed	12 Mbps
		Hi speed	480 Mbps
BIOS EHCI Hand-Off	Defines operating system support for the fully automatic EHCI function.	Disabled	Disables this function.
		Enabled	Enables this function.
USB Beep Message	Option for outputting a tone each time a USB device is detected by the BIOS during the POST.	Disabled	Disables this function.
		Enabled	Enables this function.

BIOS Setting	Description	Setting Options	Effect
USB Stick Default Emulation	You can set how to use the USB devices.	Auto	USB devices with less than 530 MB of memory are simulated as floppy disk drives. Devices with larger capacities are simulated as hard drives.
		Hard disk	An HDD-formatted drive (such as Zip drive) can be used as a FDD for starting the system.
USB Mass Storage Reset Delay	You can define the amount of time the USB device POST waits after the device start command. **NOTE:** The message “No USB mass storage device detected” will appear if no USB memory device is installed.	10 Sec, 20 Sec, 30 Sec, 40 Sec	Manually define the delay time.

Boot Menu

Boot Menu



Boot Device Priority Settings

Boot Setting	Description	Setting Options	Effect
Boot Priority Selection	You can define the drive used to boot up the machine.	Device based	Only devices that are recognized by the system are listed. You can change the sequence of items in the device list.
		Type based	You can change the sequence of items in the device list. You can add to the list device types that are not connected.

Boot Setting	Description	Setting Options	Effect
1st Boot Device	Use this option to define the boot drive.	Disabled, Primary Master, Primary Slave, Secondary Slave, Legacy Floppy, USB Floppy, USB CDROM, USB Removable Device, Onboard LAN, External LAN, PCI Mass Storage, PCI SCSI Card, Any PCI, BEV Device, Third Slave, PCI RAID, Local BEV ROM	Select the desired boot sequence.
2nd Boot Device			
3rd Boot Device			
4th Boot Device			
5th Boot Device			
6th Boot Device			
7th Boot Device			
8th Boot Device			

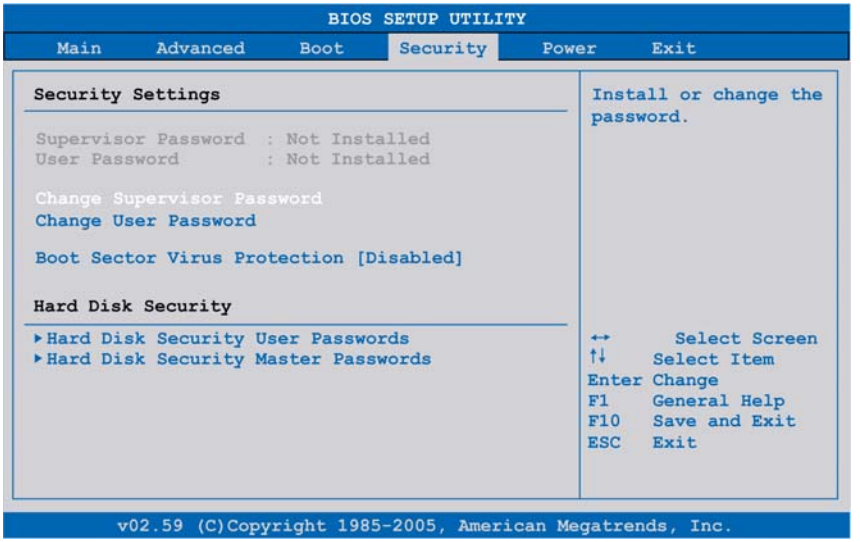
Boot Settings Configuration

Boot Setting	Description	Setting Options	Effect
Quick Boot	This function reduces the boot time by skipping some POST procedures.	Disabled	Disables this function.
		Enabled	Enables this function.
Quiet Boot	Determines if POST message or OEM logo (default = black background) is displayed.	Disabled	POST message display.
		Enabled	OEM logo display instead of POST message.
Automatic Boot List Retry	With this option, the operating system attempts to automatically restart following startup failure.	Disabled	Disables this function.
		Enabled	Enables this function.
Add On ROM Display Mode	Sets the display mode for ROM (during the boot procedure).	Force BIOS	Displays an additional BIOS part.
		Keep Current	Displays BIOS information.
Hold On Errors	This option sets whether the system should pause the Power On Self Test (POST) when it encounters an anomaly.	Disabled	The system does not pause. Ignores all anomalies.
		Enabled	System pause. The system pauses every time an anomaly is encountered.
Hit 'DEL' Message Display	You can define to display the "Hit 'DEL' Message" on startup. **NOTE:** When Quiet Boot is enabled, the message will not display.	Disabled	The message does not displayed.
		Enabled	The message will display.
Interrupt 19 Capture	Controls BIOS interrupt.	Disabled	Disables this function.
		Enabled	Enables this function.
PXE Boot to LAN (ETH1)	Enables/disables the ability to boot from LAN (ETH1).	Disabled	Disables this function.
		Enabled	Enables this function.

Boot Setting	Description	Setting Options	Effect
Slide-In 2 Optional ROM	Enables/disables optional ROM for a slide-in 2 drive.	Disabled	Disables this function.
		Enabled	Enables this function.
Power Loss Control	Determines if the system turns on/off following power loss.	Remain Off	Remains off
		Turn On	Powers on
		Last State	Enables the previous state.

Security Menu

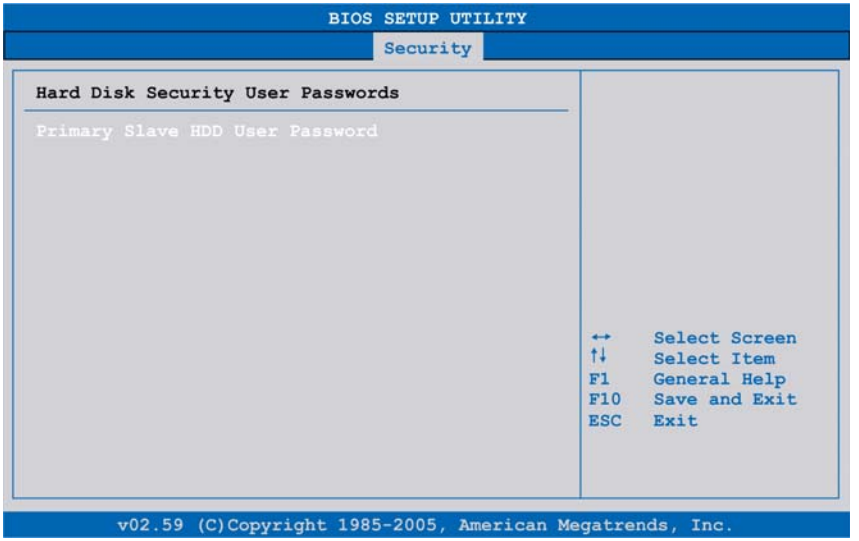
Security Menu



The following table shows the **Security** menu setting options:

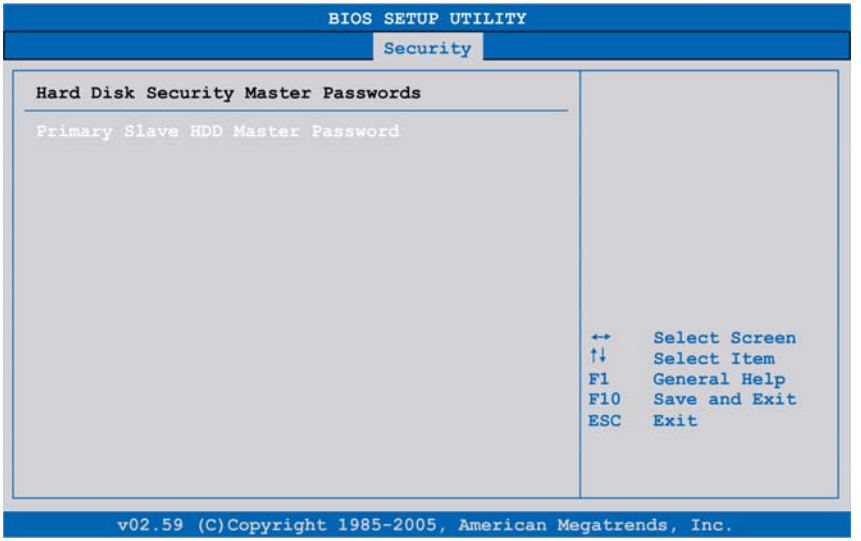
BIOS Setting	Description	Setting Options	Effect
Supervisor Password	Displays whether or not a supervisor password has been set.	None	-
User Password	Displays whether or not a user password has been set.	None	-
Change Supervisor Password	Enter/change the supervisor password. A supervisor password is necessary to edit BIOS settings.	Enter	Enter password.
Change User Password	Enter/change a user password. A user password allows the user to edit certain BIOS settings.	Enter	Enter password.
Boot Sector Virus Protection	With this option, a warning is issued when the boot sector is accessed through a program or virus. **NOTE:** With this option, only the boot sector, not the entire hard drive, is protected.	Disabled	Disables this function.
		Enabled	Enables this function.
Hard Disk Security User Password	You can create the hard disk security user password here.	Enter	Opens submenu *(see page 98)*.
Hard Disk Security Master Password	You can create the hard disk security master password here.	Enter	Opens submenu *(see page 99)*.

Hard Disk Security User Passwords



BIOS Setting	Description	Setting Options	Effect
Primary Slave HDD User Password	With a valid user password, you can change or configure hard drives without rebooting the device. A user password allows the user to edit specific BIOS settings.	Enter	Enter password.

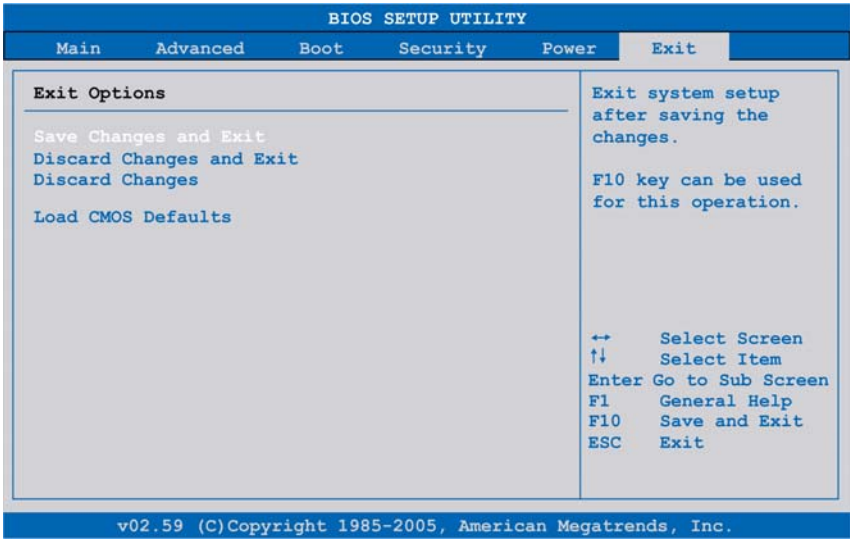
Hard Disk Security Master Passwords



BIOS Setting	Description	Setting Options	Effect
Primary Slave HDD Master Password	With a valid user password, you can change or configure hard drives without rebooting the device.	Enter	Enter password.

Exit Menu

Exit Menu



The following table shows the **Exit** menu setting options:

BIOS Setting	Description	Setting Options	Effect
Save Changes and Exit	Displays a confirmation message box. On confirming you want to save changes to the BIOS settings, saves the new settings to CMOS, and restarts the system.	OK / Cancel	-
Discard Changes and Exit	Exits the BIOS settings without making any changes, and restarts the system.	OK / Cancel	-
Discard Changes	Restores the previously saved BIOS settings and discards any changes that were made during the current session.	OK / Cancel	-
Load CMOS Defaults	Loads the CMOS default values, defined by the DIP switch settings. This command loads CMOS default values for all BIOS configurations.	OK / Cancel	-

BIOS Default Settings

The CMOS profile switches, located on the front side of the unit near the LEDs, are used to load pre-defined BIOS profile settings, which are based on the position of the switches.

The switch positions at delivery represents the optimum BIOS default values and should not be changed.

Hardware Modifications

8

Subject of this Chapter

This chapter is about the hardware modifications for the Magelis Box PC.

You can use optional units, Main Memory and CF cards manufactured by Schneider Electric, as well as commercial devices and boards with this product.

What Is in This Chapter?

This chapter contains the following topics:

Before Modifications

Overview

For detailed installation procedures for optional units, refer to the OEM (Original Equipment Manufacturer) Installation Guide included with the optional unit.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

EXPLOSION HAZARD

- Always confirm the ANSI/ISA 12.12.01 and CSA C22.2 N° 213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a Box PC installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incentive USB configuration.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

Failure to follow these instructions will result in death or serious injury.

During operation, surface temperatures of the heat sink may reach 70 °C (158 °F).

⚠ WARNING

RISK OF BURNS

Do not touch the surface of the heat sink during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the plastic installation fastener.
- When installing or removing screws, ensure that they do not fall inside the Box PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

⚠ CAUTION

STATIC SENSITIVE COMPONENTS

Box PC internal components, including accessories such as RAM modules and expansion boards, can be damaged by static electricity.

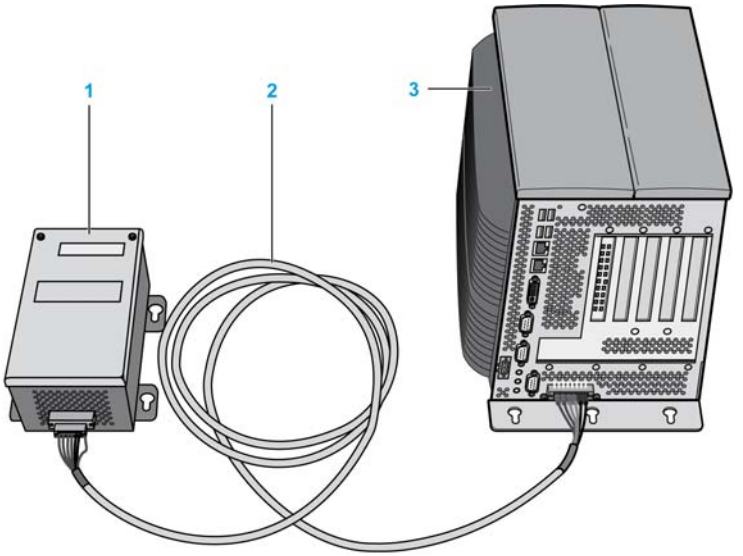
- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate work area.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid unnecessary contact with exposed conductors and component leads with skin or clothing.

Failure to follow these instructions can result in injury or equipment damage.

Uninterruptible Power Supply (UPS)

Overview

The following figure shows a Box PC equipped with the UPS option:



1 Battery unit
2 UPS connection cable 3 m (9.84 ft)
3 Box PC with integrated UPS module interface card (pre-installed)

The main features of the UPS option are:

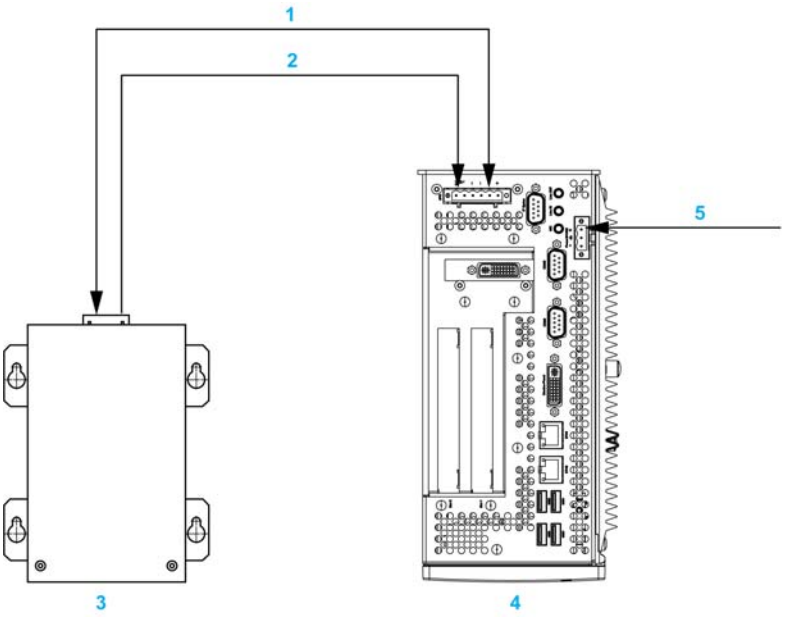
- Long-lasting, maintenance-free rechargeable batteries
- Communication via integrated interfaces
- Temperature sensor
- Deep discharge protection

UPS Principle

With the optionally integrated UPS, the Box PC system completes write operations even after a power loss. When the UPS detects a power loss, it switches to battery operation immediately without interruption. This means that all running programs are ended properly by the UPS software. This prevents the possibility of inconsistent data.

NOTE:

- This function is only available if the UPS is configured and its driver is activated *(see page 145)*.
- The monitor is not handled by the UPS and will shut off when the power fails.



1 Battery / Load mode
2 Temperature
3 UPS battery unit
4 Magelis Box PC with integrated UPS module
5 Supply voltage 24 Vdc

Integrated UPS Module Description

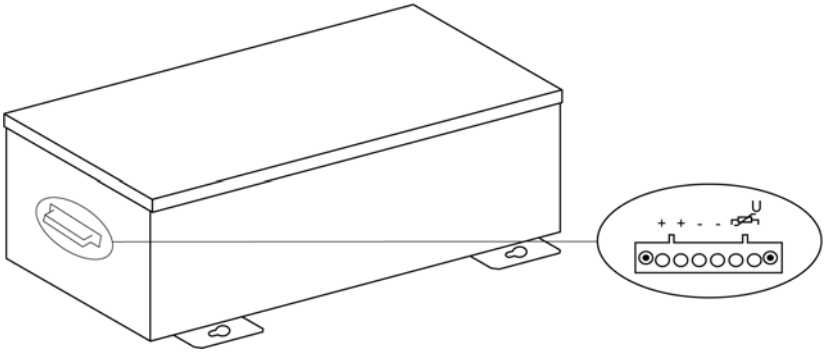
The following table gives the technical data of the UPS module integrated in the Box PC with the UPS option:

Features	Values
Switching Threshold Mains / Battery Operation	15 / 13 V
Mains Failure Bridge-over Time	Max. 20 min at 150 W load
Charging Current	Max. 0.5 A
Deep Discharge Protection	At 10 Vdc on the battery unit
Short Circuit Protection	No
Power Requirements	Max. 7.5 W
Status Indicators	Via the system monitor *(see page 140)*
Configuration	Via the system monitor settings *(see page 145)*

Battery Unit Description

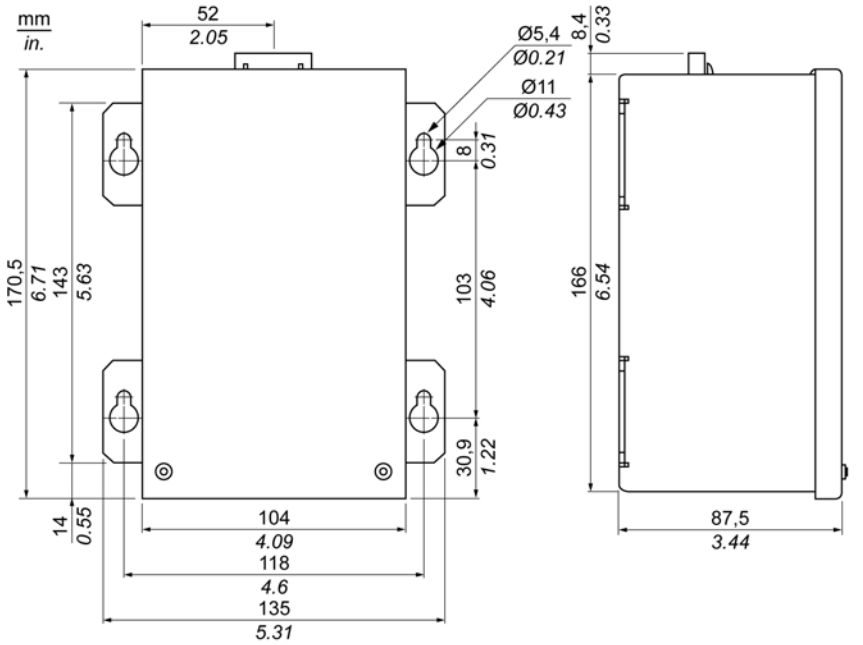
The battery unit is subject to wear and should be replaced regularly (at least following the specified lifespan).

The following figure shows the connector of the battery unit:



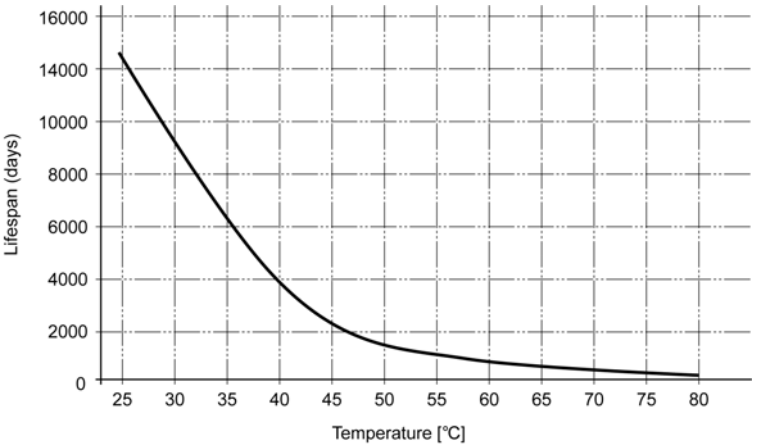
Features	Values
Battery: Type Method	 Enersys Cyclon 12 V 5 Ah (6 connected in series) Single cell (X cell)
Rated Voltage	12 Vdc
Operating Current	Max. 8 A
Deep Discharge Voltage	10 Vdc
Temperature Sensor	NTC resistance
Weight	Approx. 3.2 kg (7.05 lbs)
Ambient Temperature: Operation Storage Transport	 –40...80 °C (–40...176 °F) –65...80 °C (–85...176 °F) –65...80 °C (–85...176 °F)
Relative Humidity: Operation Storage Transport	 5...95 %, non-condensing 5...95 %, non-condensing 5...95 %, non-condensing
Altitude	Max. 3000 meters (9843 feet)
Lifespan	10 years at 25 °C (77 °F) (up to 80 % battery capacity)
Maintenance Interval (During Storage)	Charge once every 6 months
Typical Recharge Time at Low Battery	15 hours

The following figure shows the dimensions of the battery unit:

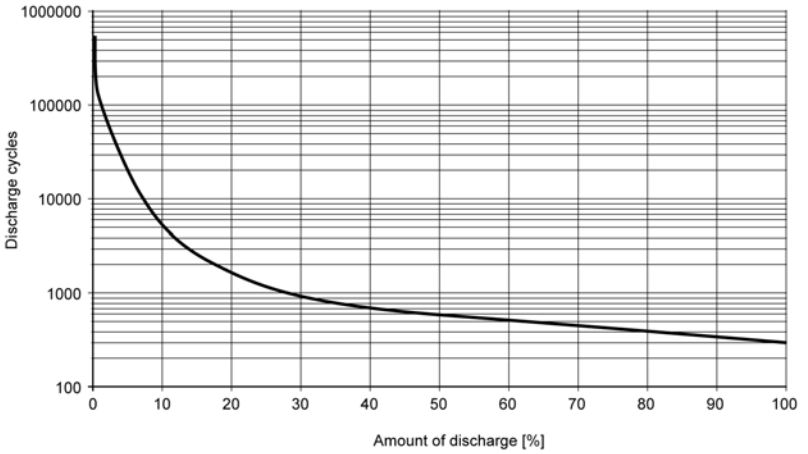


Temperature Lifespan Diagram up to 20 % Battery Capacity

Temperature	Lifespan (days)	Diagram
25 °C (77 °F)	14600	
30 °C (86 °F)	9467	
35 °C (95 °F)	6139	
40 °C (104 °F)	3980	
45 °C (113 °F)	2581	
50 °C (122 °F)	1674	
55 °C (131 °F)	1085	
60 °C (140 °F)	704	
65 °C (149 °F)	458	
70 °C (158 °F)	298	
75 °C (167 °F)	192	
80 °C (176 °F)	124	



Deep Discharge Cycles



UPS Connection Cable

The UPS connection cable has two different shapes of 6-pin connectors to help prevent a cable connector from being inserted in the incorrect connector (UPS battery or Box PC side):

1 6-pin plug connector
2 6-pin socket connector

The following table gives the technical data for the UPS connection cable:

Features	Values
Length	3 m (9.843 ft)
Outer Diameter	8.5 mm ±0.2 mm (0.33 in. ±0.0078 in.)
Connector Type	6-pin plug connectors, tension clamp connection 6-pin socket connectors, tension clamp connection
Wire Cross Section Temperature Sensor Wire Voltage Wire	 2 x 0.5 mm^2 (AWG 20) 4 x 2.5 mm^2 (AWG 13)

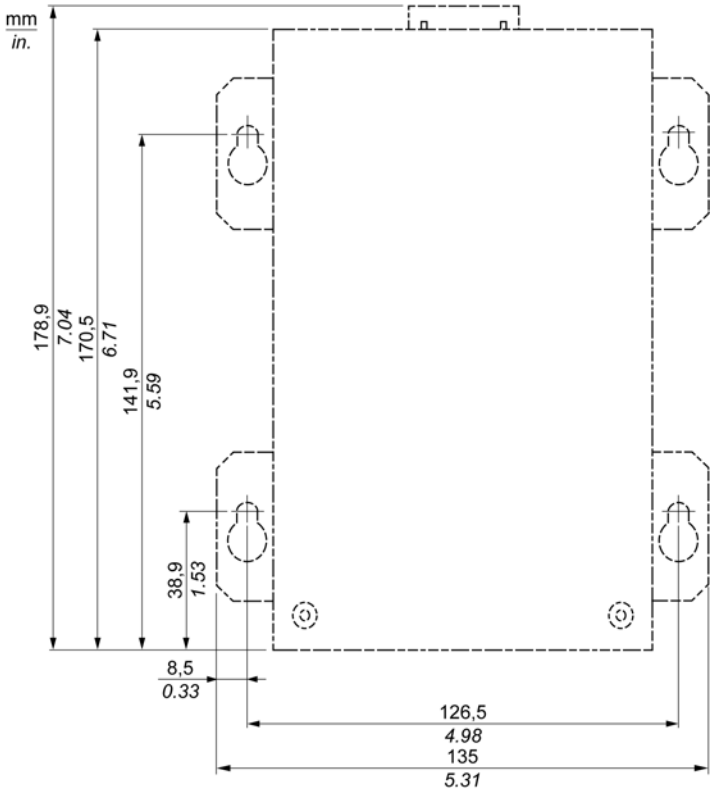
Features	Values
Line Resistance 0.5 mm^2 2.5 mm^2	 Max. 39 Ω/km (63 Ω/mile) Max .7.98 Ω/km (13 Ω/mile)
Flex Radius Fixed Installation Free-moving	 5 x wire cross-section 10 x wire cross-section
Temperature Range Operation Storage	 –5...80 °C (23...176 °F) –30...80 °C (–22...176 °F)
Weight	Approx. 143 kg/km (230 kg/miles)
Materials Cable Shielding Color	 Thermoplastic PVC-based material Window gray (similar to RAL 7040)
Peak Operating Voltage	12 Vdc
Testing AC Voltage Wire/wire	 1500 Vac
Operating Voltage	Max. 300 Vac
Current Load	10 A at 20 °C (10 A at 68 °F)

Mounting Instructions

By integrating the charging circuit in the Box PC housing, installation is reduced to merely attaching the connection cable to the battery unit mounted next to the Box PC.

Due to the construction of these batteries, you can store and operate the battery unit in any position.

For mounting the battery unit, use the following figure as the drilling template:



PCI / PCIe Card Installation

Overview

Before installing or removing a PCI / PCIe card, shut down Windows® in an orderly fashion and remove all power from the device.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

PCI / PCIe Cards with Cables

When using a PCI / PCIe card with an external cable attached, install a clamp or other device to secure the cable.

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration environment when making this determination.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only commercially available USB cables.

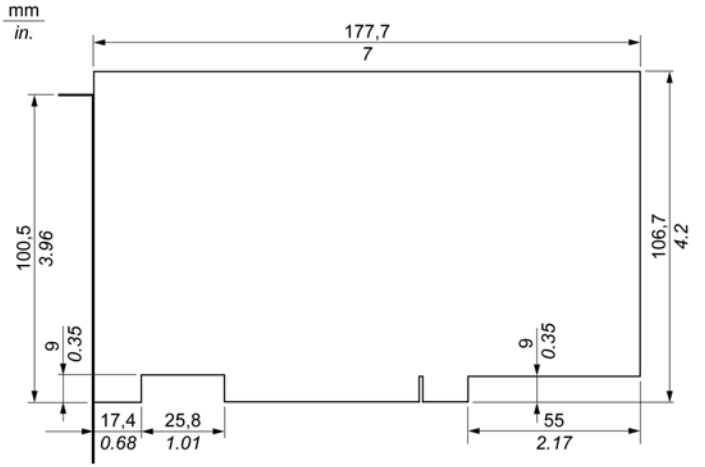
Failure to follow these instructions can result in death, serious injury, or equipment damage.

PCI or PCIe Card Dimensions

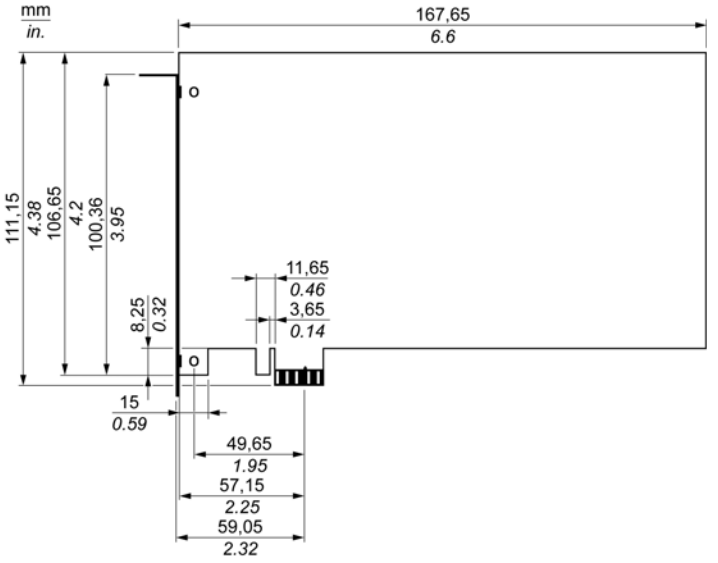
Depending on the bus type, you can use standard PCI 2.2 half-size cards or PCI Express (PCIe) half-size cards.

NOTE: PCI or PCIe cards cannot exceed the following dimensions.

The following figure shows the dimensions of the standard half-size PCI card:

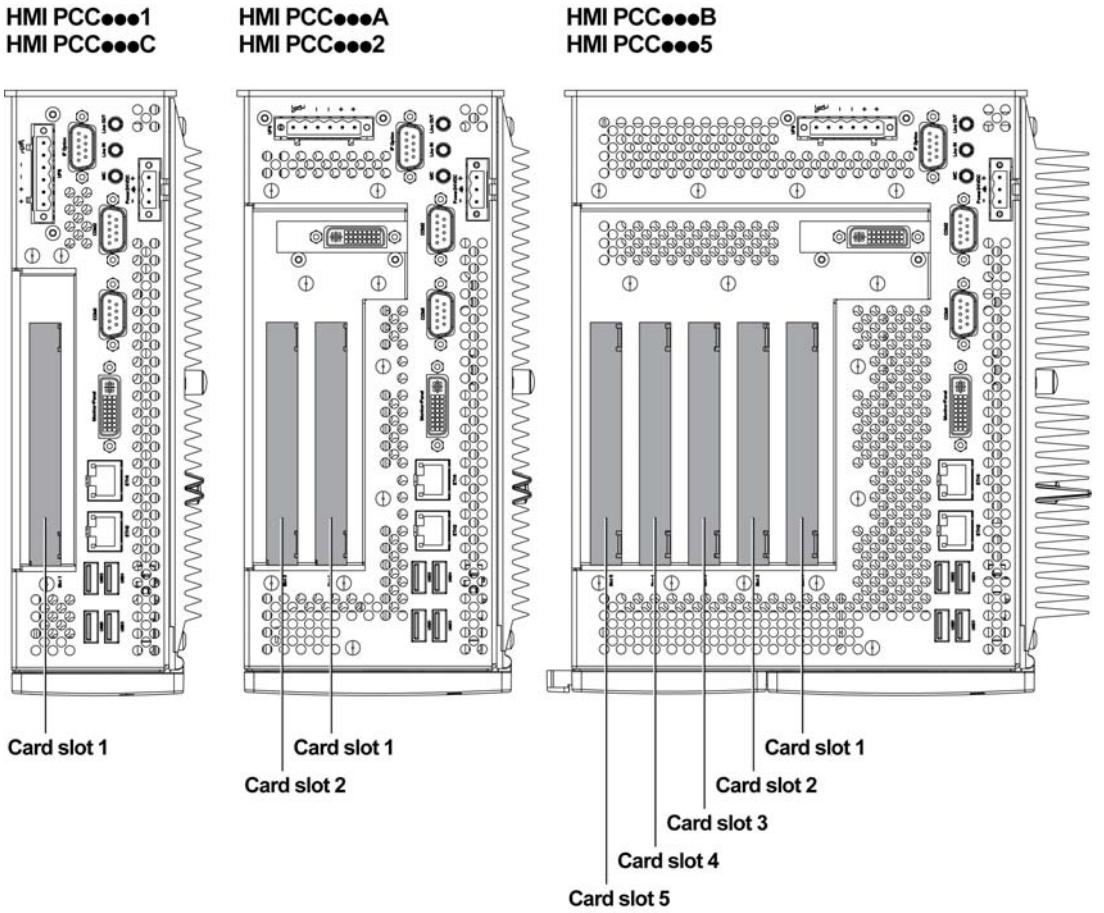


The following figure shows the dimensions of the standard half-size PCIe card:



PCI Card Slot Position

The following figure shows the PCI card slot position:



NOTE: Take into account the PCI/PCIe card type restriction according to the table below.

The following table provides an overview of the card slots where inserting 64-bit cards is possible:

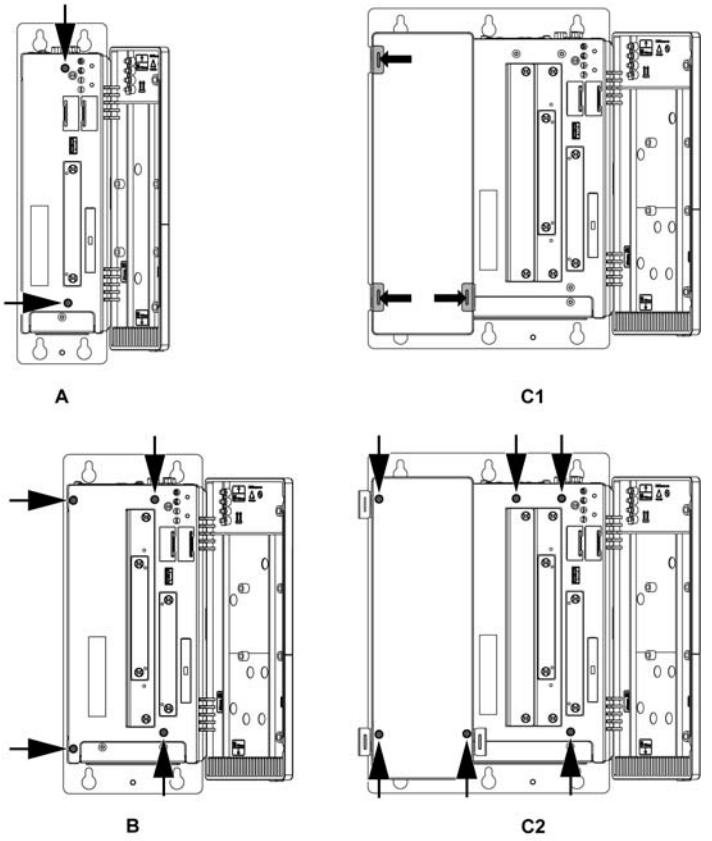
Box PC	Part Number	Card Slot 1	Card Slot 2	Card Slot 3	Card Slot 4	Card Slot 5
1 slot	**HMI PCC•••1**	32-bit PCI	–	–	–	–
	HMI PCC•••C	PCIe	–	–	–	–
2 slots	**HMI PCC•••A**	32-bit and 64-bit PCI	32-bit PCI	–	–	–
	HMI PCC•••2	32-bit and 64-bit PCI	PCIe	–	–	–
5 slots	**HMI PCC•••B**	32-bit and 64-bit PCI	32-bit and 64-bit PCI	32-bit and 64-bit PCI	32-bit PCI	PCIe
	HMI PCC•••5	32-bit and 64-bit PCI	32-bit and 64-bit PCI	PCIe	PCIe	PCIe

PCI/PCIe Card Installation

NOTICE
ELECTROSTATIC DISCHARGE Take the necessary protective measures against electrostatic discharge before attempting to remove the Box PC cover. **Failure to follow these instructions can result in equipment damage.**

NOTE: Be sure to remove all power before attempting this procedure.

The table below describes how to install a PCI or PCIe card:

Step	Action
1	Disconnect the power cord to the Box PC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Open the green side covers and remove the Torx screws of the Box PC:  **A** **C1** **B** **C2** **A** 2 Torx screws (T10) for Box PC 1 slots **B** 4 Torx screws (T10) for Box PC 2 slots **C1** Only for Box PC 5 slots, slide the covers on the left plastic cover as shown before removing the Tork screws (C2). **C2** 6 Torx screws (T10) for Box PC 5 slots
4	Remove the side cover by sliding it towards the front.

Step	Action
5	Unscrew the screw from the empty panel and remove the blank panel. Insert the PCI/PCIe board into the expansion board connector and secure in place using the filler panel screw. **NOTE:** The recommended torque to tighten these screws is 0.5 Nm (4.5 lb-in).
6	Replace the side cover and secure it by inserting the Torx screws.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the plastic installation fastener.
- When installing or removing screws, ensure that they do not fall inside the Box PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Compact Flash (CF) Card Installation and Removal

Preparing to Use a CF Card

The Box PC operating system views the CF Card as a hard disk. Proper handling and care of the CF Card helps extend the life of the Card. Familiarize yourself with the Card prior to attempting insertion or removal of the Card.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

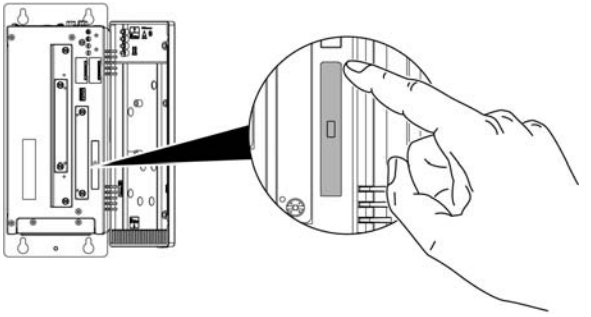
COMPACT FLASH CARD DAMAGE AND DATA LOSS

- Remove all power before making any contact with an installed CF card.
- Use only CF cards manufactured by Schneider Electric. The performance of the Box PC has not been tested using CF cards from other manufacturers.
- Confirm that the CF card is correctly oriented before insertion.
- Do not bend, drop, or strike the CF card.
- Do not touch the CF card connectors.
- Do not disassemble or modify the CF card.
- Keep the CF card dry.

Failure to follow these instructions can result in injury or equipment damage.

Inserting the CF Card

The procedure below describes how to insert the CF Card.

Step	Action
1	Shut down Windows® in an orderly fashion and remove all power from the device.
2	Remove the CF card cover: 
3	Insert the CF Card firmly into the CF card slot, and check that the eject button pops out.
4	Replace the CF Card cover.

Removing the CF Card

The procedure below describes how to remove the CF Card.

Step	Action
1	Shut down Windows® in an orderly fashion and remove all power from the device.
2	Remove the CF card cover *(see page 118)*.
3	Press the eject button all the way to remove the CF Card from the CF Card slot. **NOTE:** The best way to do this is to use a pointed object such as a small screwdriver.
4	After removing the CF card, replace the CF Card cover.

Data Writing Limitation

The CF Card is limited to approximately 100,000 write operations. Back up all CF Card data regularly to another storage media.

CF Card Data Backup

Refer to the relevant procedure in the Software Installation Guide for Magelis Industrial Box PC and Terminals, shipped with the product.

RAID Option Installation

Introduction

RAID option is a PCI board including two HDD.

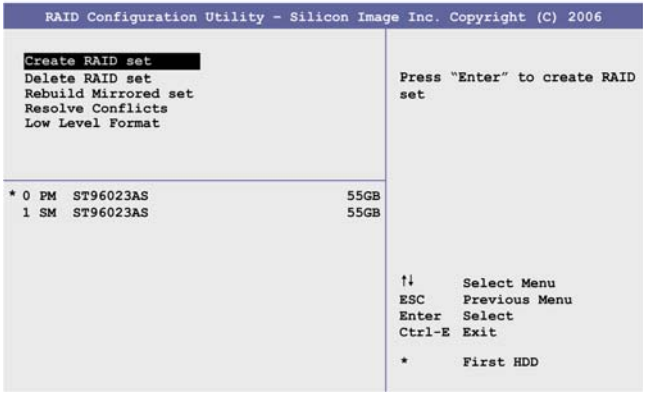
The RAID option installation is carried out in 4 main phases:
Pase A: Hardware installation
Phase B: Configuration of SATA RAID area
Phase C: RAID driver installation (only required for Windows® Embedded Standard 2009 and Windows® Embedded Standard 7)
Phase D: Installation of RAID tool

Phase A - Hardware Installation

Install the RAID PCI board according to procedure in previous section PCI/PCIe card installation *(see page 111)*.

Phase B - Configuration of SATA RAID Area

During the boot sequence, press **F4** or **Ctrl+S** to enter the RAID configuration utility.



The following keys can be used after entering the BIOS setup:

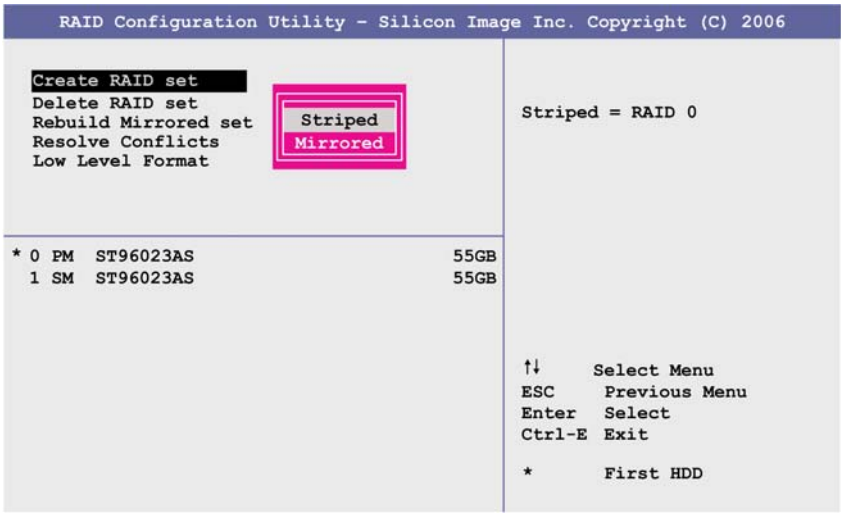
Key	Function
Up cursor ↑	Go to previous item.
Down cursor ↓	Go to the next item.
Enter	Select an item or open a submenu.
ESC	Go back to previous menu.
Ctrl+E	Exit setup and save the changed settings.

You can access the following screens from the BIOS setup:

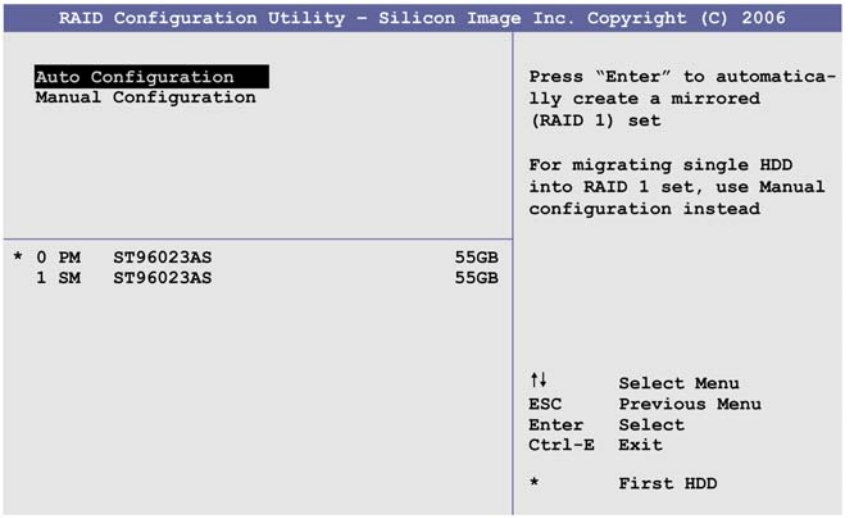
- Create RAID set
- Create RAID set - mirrored
- Delete RAID set
- Rebuild mirrored set
- Resolve conflicts
- Low level format

Create RAID Set

The RAID system can be recreated as **Mirrored** = RAID1 using the **Create RAID Set** menu:



Create RAID Set-mirrored

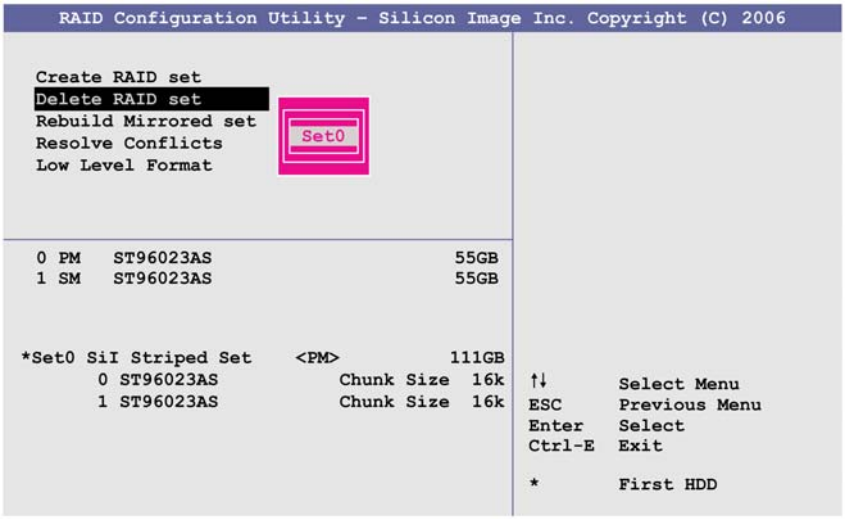


Auto Configuration optimizes all settings.

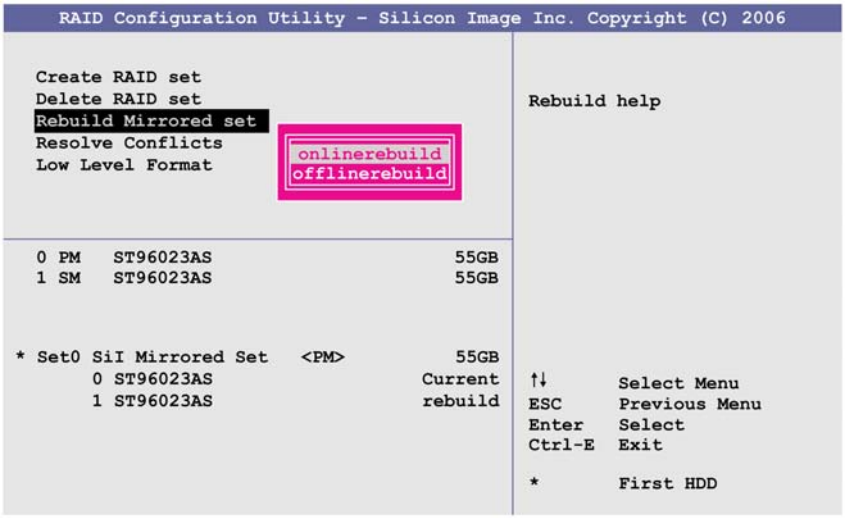
Manual Configuration makes it possible to specify the **Source** and **Target** HDD, and also to specify whether a rebuild (mirror) should be performed immediately.

Delete RAID Set

You can delete an existing RAID by using the **Delete RAID set** menu:



Rebuild Mirrored Set



You can use the **Rebuild mirrored set** menu to restart a rebuild procedure in a RAID 1 network if an error is detected, after first interrupting the rebuild procedure or when exchanging a hard disk.

If **onlinerebuild** is selected, then the rebuild is executed during operation after the system is booted. An event pop-up is displayed by the installed SATA RAID configuration program: **SATARaid detected a new event** and the rebuild is started.

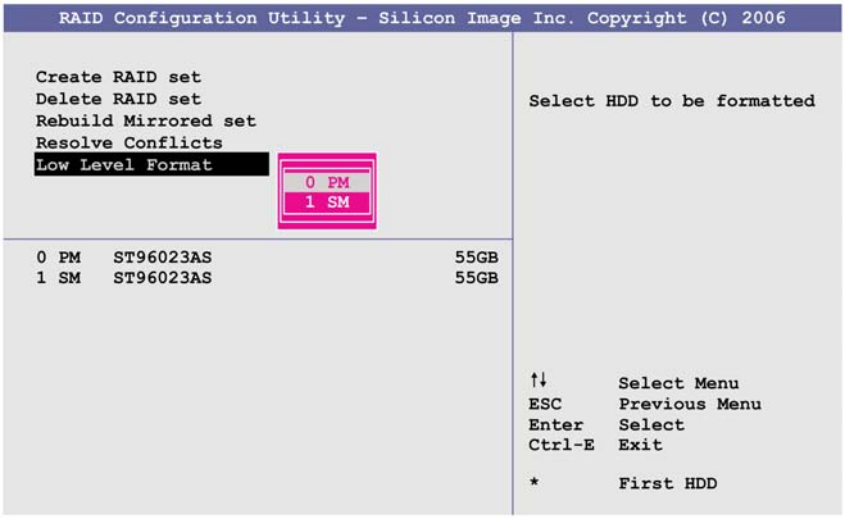
If **offlinerebuild** is selected, then a rebuild is performed immediately before starting the operating system.

Resolve Conflicts

You can resolve conflicts in a RAID set by using the **Resolve conflicts** menu.

NOTE: This function is only available if the status of the hard disk is **conflict**.

Low Level Format



Configure individual hard disks using the **Low Level Format** menu.

NOTE: This can only be done if a RAID set is not configured.

Phase C - RAID Driver Installation

NOTE: This phase is only required for Windows® Embedded Standard 2009 and Windows® Embedded Standard 7 operating systems.

Format the RAID area disks with the windows format tool before beginning the procedure.

If your Box PC is not equipped with a DVD drive, use another PC to copy the RAID driver and RAID tool from the restore DVD on to a USB key.

Step	Action
1	In **Start** menu, right click **My Computer** →**Properties**
2	In **System Properties** window, select the **Hardware** tab and then click **Device Manager**.
3	In the device list, search the **RAID controller**.
4	Right click the **RAID Controller** and then click **Update Device Software** (Windows 7) or **Update Drivers** (Windows XP Professional).
5	Browse the computer to the appropriate RAID driver (either on DVD or USB key).
6	When the wizard indicates that it found a driver for the device, install it.
7	The wizard will now copy the required files to the system and start the driver. After starting the driver the wizard will display a completion dialog.
8	If the software driver was not successfully installed, a popup message will appear. You need to reinstall, beginning at Step 1.

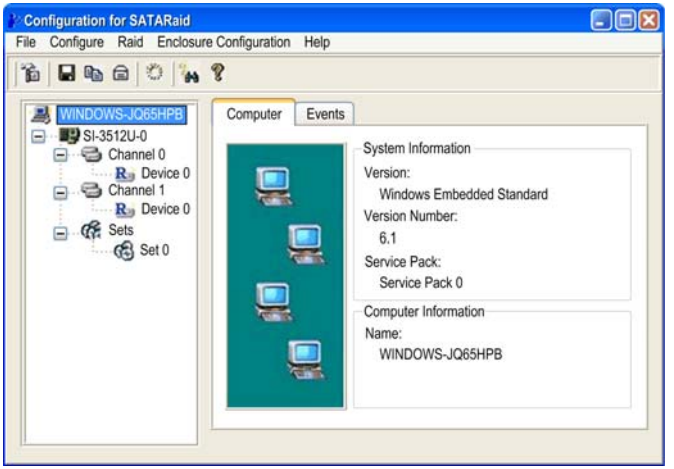
Phase D - Installation of RAID Tool

Step	Action
1	Install the RAID tool available on the restore DVD or (USB key) according to the operating system running on the Box PC.
2	**For Windows XP Operating system:** Follow instruction in the read me available inside the tool folder. **For Windows 7 Operating system:** Double click setup.

Configuration for SATA RAID Option

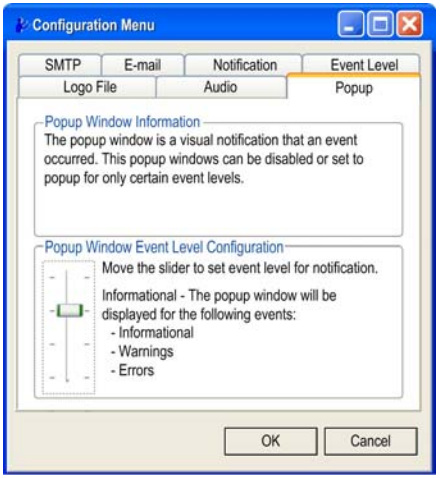
When installation is completed, a new SATARaid icon is available inside the task bar.

Double click the SATARaid icon and the **Configuration for SATARaid** dialog box appears:



Configuration Menu

Click **Configure** →**Configure** and the following dialog box appears:



The above screenshot shows the different tabs that are used to configure the RAID option.

Fan Kit Installation

Overview

The fan kit *(see page 159)* is used in two purposes:
- for flat mounting of fanless Box PC or,
- replacement of Box PC with fan.

Before installing or replacing the fan kit remove all power from the device.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

Installing the Fan Kit

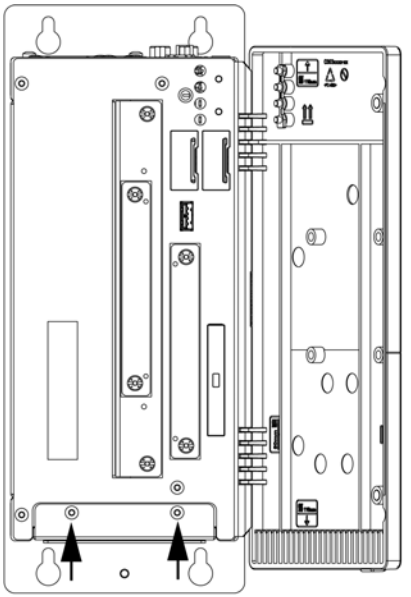
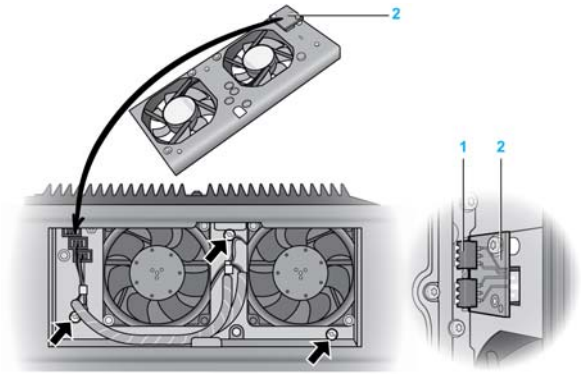
NOTICE

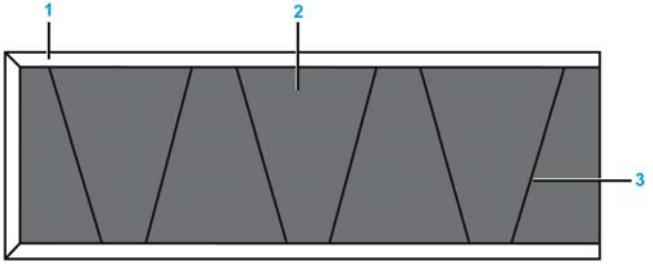
ELECTROSTATIC DISCHARGE

Take the necessary protective measures against electrostatic discharge before attempting to remove the Box PC cover.

Failure to follow these instructions can result in equipment damage.

The table below shows how to install the fan kit:

Step	Action
1	Remove side covers *(see page 114)* of the Box PC.
2	After the screws have been removed, the fan kit cover can be removed toward the front:  **NOTE:** The 1 slot Box PC has only one screw to be removed.
3	Insert the frame as illustrated below and fasten the 1/4 turn screws:  **1** Contact board **2** Sliding contact **NOTE:** Mount the contact board side to the sliding contacts on the system unit.

Step	Action
4	Place the dust filter in the fan kit cover and secure with the filter clasp.  **1** Fan kit cover **2** Dust filter **3** Filter clasp
5	Place the fan kit cover in the housing and fasten using the Torx screws removed at step 2. **NOTE:** The recommended torque to tighten these screws is 0.5 Nm (4.5 lb-in).

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the plastic installation fastener.
- When installing or removing screws, ensure that they do not fall inside the Box PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Installation

III

Subject of this Part

This part describes the product installation.

What Is in This Part?

This part contains the following chapters:

Connections to PLCs

9

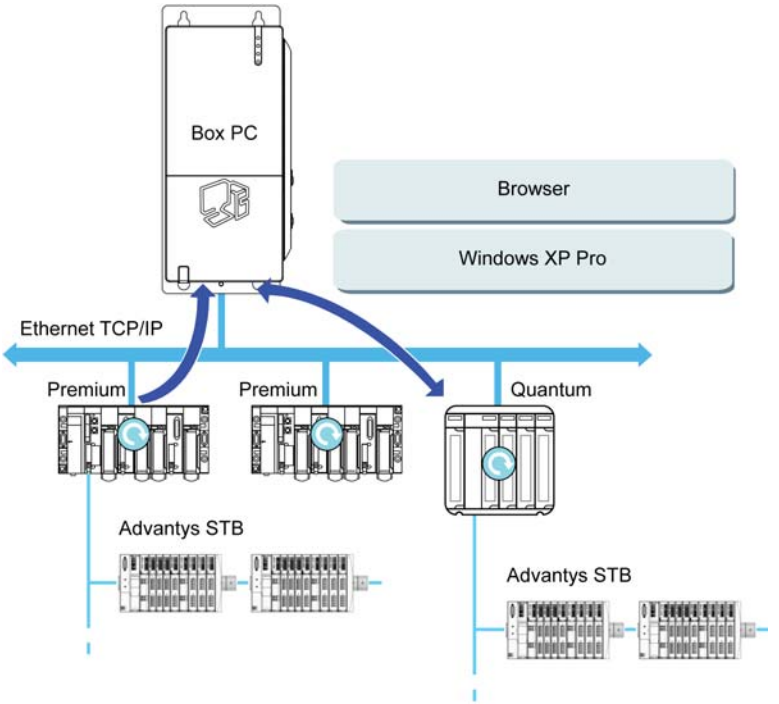
Connection to PLCs

Introduction

Two different kinds of architecture are possible when connecting the Box PC to PLCs:

- Transparent Ready Architecture
- Traditional Architecture

Transparent Ready Architecture

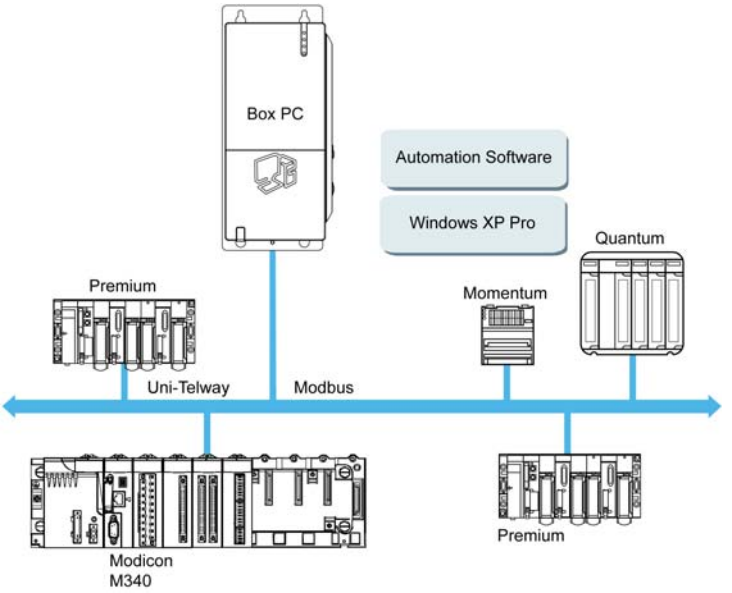


With its built-in Ethernet 10/100 Mbps ports, you can integrate the Box PC into *full Ethernet* architectures, such as Transparent Ready. Transparent Ready devices in this type of architecture enable transparent communication over the Ethernet TCP/IP network. Communication services and Web services permit the sharing and distribution of data between levels 1, 2 and 3 of the Transparent Ready architecture.

Used as a client station, the Box PC makes it easier to implement Web Client solutions for:

- Basic servers embedded in field devices (Advantys STB/Momentum distributed I/O, ATV 71/38/58 starters, OsiSense identification systems, and so on).
- FactoryCast Web servers embedded in Modicon PLCs (TSX Micro, Premium and Quantum) or the FactoryCast gateway. The following services are available as standard (without the need for additional programming): alarm management, comprehensive view management and Web home pages created by users.
- FactoryCast HMI Web servers embedded in Modicon Premium and Quantum PLCs which also provide basic data management services, automatic e-mail sending triggered by specific process events and arithmetic and logic calculations for data preprocessing.

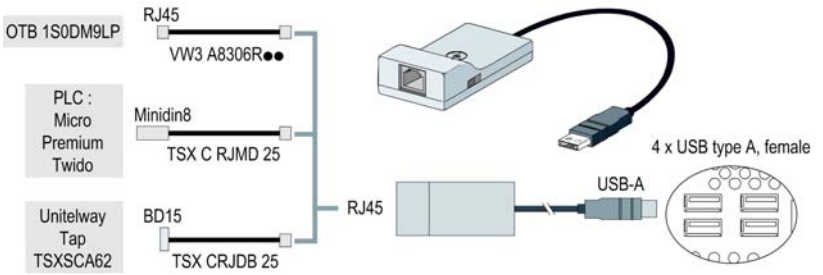
Traditional Architecture



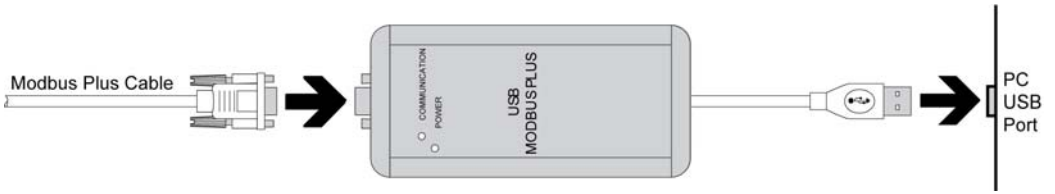
The Box PC terminal with Vijeo Designer automation software can be used in fieldbus architectures such as Uni-Telway/Modbus or Fipway/Modbus Plus.

The Box PC terminal can connect to Uni-Telway, Modbus, and Fipway networks, but different connection devices are required depending on the network and on the communication port used. These devices are specified below:

- For USB slot:
  - Modbus and Uni-Telway with the TSXCUSB485 converter enables the iPC to connect to remote devices using an RS-485 interface.
    The Box PC, compatible with Modbus and Uni-Telway, requires the standard Schneider drivers provided with software such as Unity Pro, PL7-Pro or a driver on the CD called TLXCDDRV20M. An example is provided in the drawing below:



- Modbus Plus network with the TSXCUSBMBP converter. This converter is compatible with PCs equipped with CONCEPT, ProWORX or Unity Pro. An example is provided in the drawing below:



(1) Requires the *X-Way drivers* CD-ROM, TLXCDDRV20M.

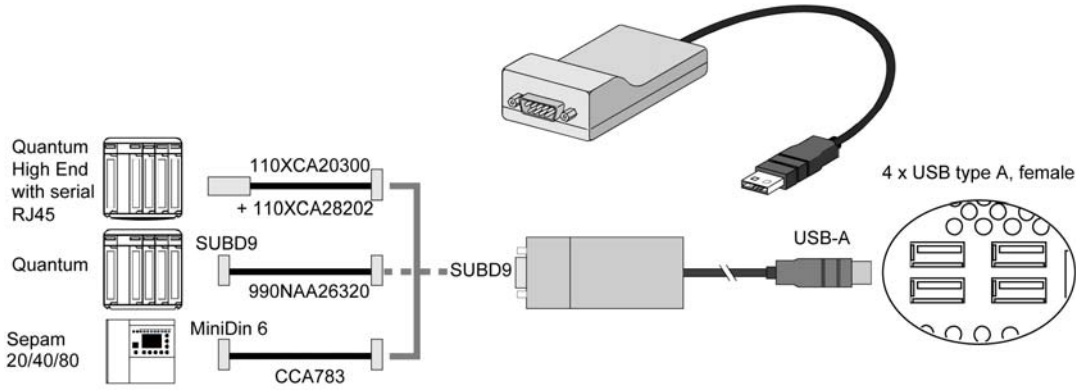
Cables and Converters

For using different types of PLCs, the following cables and converters are required:

- TSX PCX 1031 connection cable for Nano, Micro and Premium.
  This cable is supplied with Unity Pro, PL7 Pro and PL7 Junior software.
- FT20CBCL30 connection cable for the Series 7 family (including TSX 27 PLCs, and TSX/PMX 47/67/87/107 PLCs).
  This cable is supplied with the XTEL Pack software.
- TSX17ACCPC converter for TSX 17 LCs.
- TSXCUSB232 converter for connecting the iPC, via an USB port, to remote devices using an RS-232C interface.

NOTE: This device, compatible with Modbus and Uni-Telway, requires the standard Schneider drivers provided with software such as Unity Pro, PL7-Pro or a driver on the CD called TLXCDDRV20M.

An example using the TSXUSB232 converter is provided in the drawing below:



System Monitor

10

Subject of this Chapter

This chapter describes the system monitor features of the Box PC.

What Is in This Chapter?

This chapter contains the following topics:

System Monitor Interface

Overview

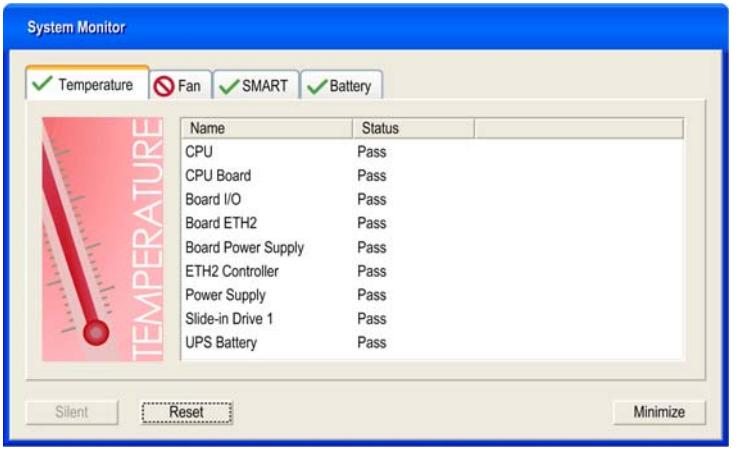
The System Monitor software enables you to monitor the following system parameters:

- **Temperature**
- **Fan**
- **SMART**
- **Battery**

Depending on the configuration *(see page 142)*, if thresholds are exceeded the System Monitor Software alerts via a popup message *(see page 141)*, sound, buzzer and an entry in the windows event log. You can configure *(see page 146)* a system shutdown when an alarm occurs.

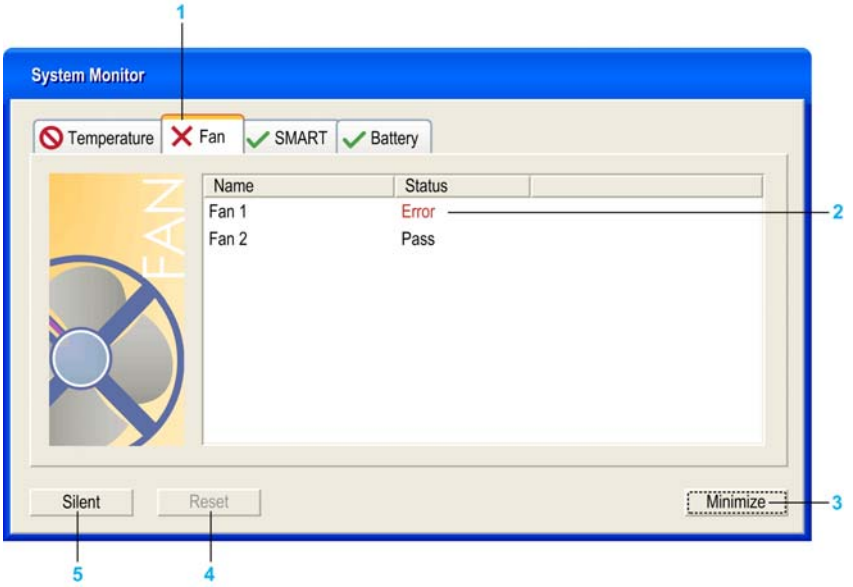
Accessing the System Monitor

The procedure below shows how to access the System Monitor interface:

Step	Action
1	Start the Box PC operating system.
2	In the task bar, double-click the following icon:  **NOTE:** If you cannot see the icon in the task bar, launch the System Monitor software by double-clicking the *SysMonGui.exe* file located in the following path: *C:\Utility\SysMon*. The following figure shows the System Monitor main window: 

System Monitor Interface Description

The System Monitor interface shows all possible parameters and their actual status in system parameter tabs.



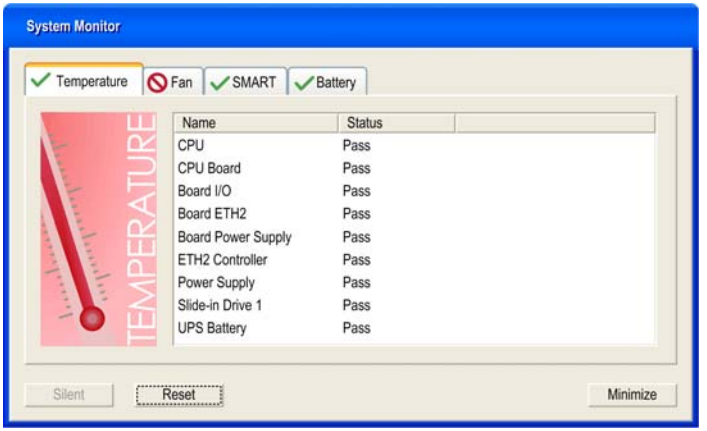
1 Icon specific tab (Refer to the table below).
2 Item name and status
3 Minimize the System Monitor to the system tray.
4 Resets alarmed item.
5 Disable buzzer and sound. Only active when sound or buzzer is playing.

The following table describes the icons of the system parameter tab:

Icon	Status	Meaning
	Ok	No alarm detected
	Disabled	The system parameter is not monitored.
	Alarm	At least one detected alarm.

Temperature Status

The following figure shows the **Temperature** tab:

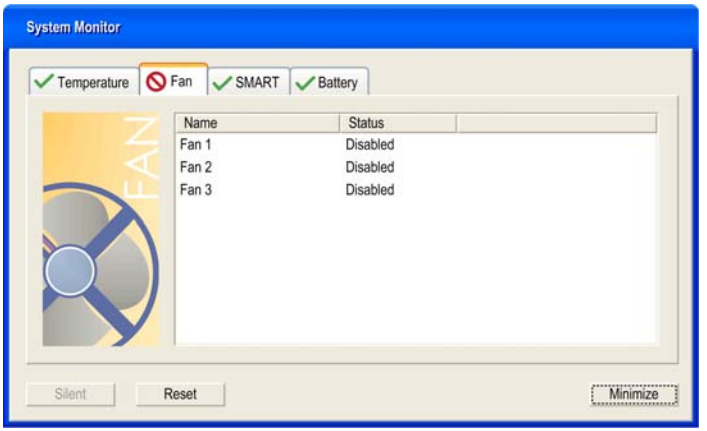


The following table describes the status messages of temperature parameters:

Status	Meaning
Pass	No alarm detected
Error	Alarm (limit exceeded)
Disabled	No alarm monitoring
***	Service is not running

Fan Status

The following figure shows the **Fan** tab:



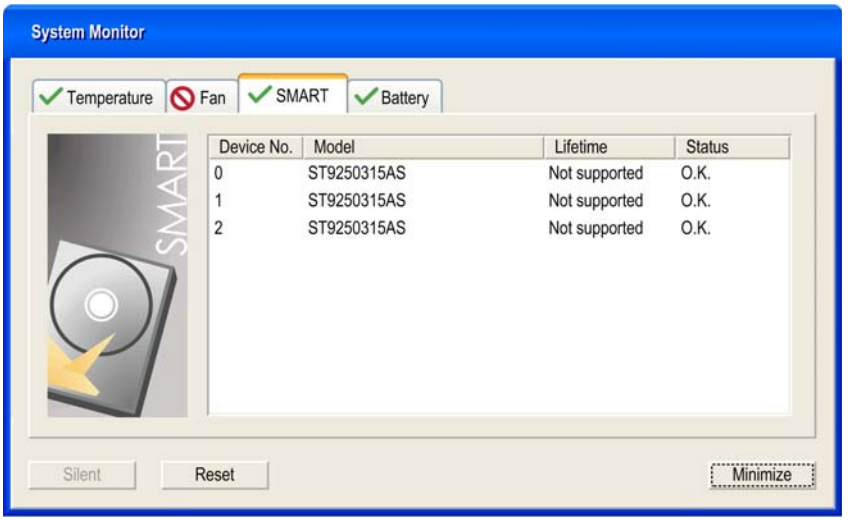
The following table describes the status messages of fan parameters:

Status	Meaning
Pass	No alarm detected
Error	Alarm (a fan does not function as expected)
Disabled	No alarm monitoring
***	Service is not running

SMART Status

The **SMART** status monitors the hard disk.

The following figure shows the **SMART** tab:



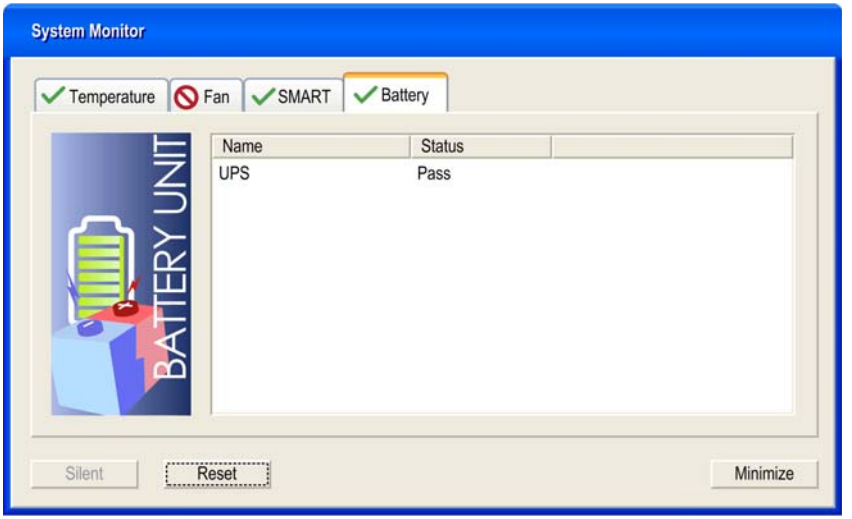
NOTE: In addition to the **Status** column, the **SMART** tab shows a column for the device lifetime. If the device has lifetime support, a **Lifetime** value in percent with a bar graph is displayed, otherwise "**Not supported**" is shown.

The following table describes the status message of the Box PC drives:

Status	Meaning
O.K.	No alarm detected
Alert	Failure reported by SMART or disk life-time reached
Disabled	No alarm monitoring
***	Service is not running

Battery Status

The following figure shows the **Battery** tab:

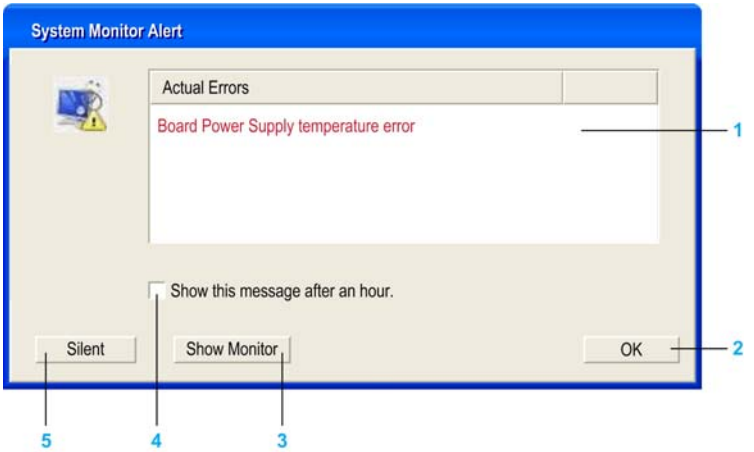


The following table describes the status message of the battery parameters:

Status	Meaning
Pass	No alarm detected.
Error	Battery unit detected a failure, e.g. battery is disconnected.
On Battery	Power failure - system is running on battery.
Low Battery	Battery level is critically low.
No Battery	No battery connected.
Low Battery Shutdown	Power failure - system is running on battery and battery level is critically low –> system shutdown is initiated.
Disabled	No alarm monitoring.
***	Service is not running.

Popup Window Description

When an alarm is detected the following popup window is displayed:



1 Shows the alarm or item that can be reset.
2 Closes the System Monitor Alert window.
3 Shows the main window.
4 If the check box is selected, closes the window for one hour even though the alarm is active. (A new alarm shows the window again).
5 Disable buzzer and sound. Only active when sound or buzzer is playing.

System Monitor Setting

Overview

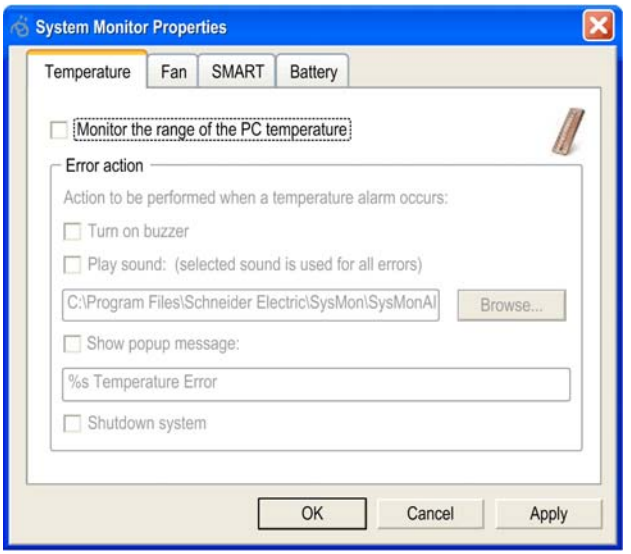
You can set the System Monitor parameters and specify the type of alarm in the System Monitor applet in the Windows Control Panel.

Each system parameter has its own tab.

Use the following dialog box tabs to display the monitoring parameters and set up the various elements to monitor.

Temperature - System Monitor Properties

The screenshot below shows the **Temperature** tab:

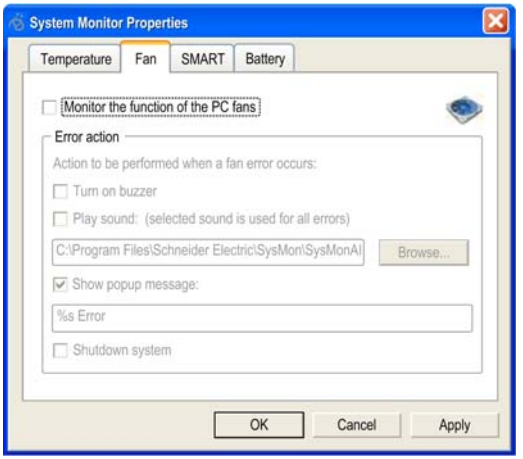


Field	Description
Monitor the range of the PC temperature	Select this check box to enable and begin monitoring the PC temperature. When enabled *(see page 146)*, set the **Error action**.

Fan - System Monitor Properties

NOTE: Only available for Box PC with Fan kit.

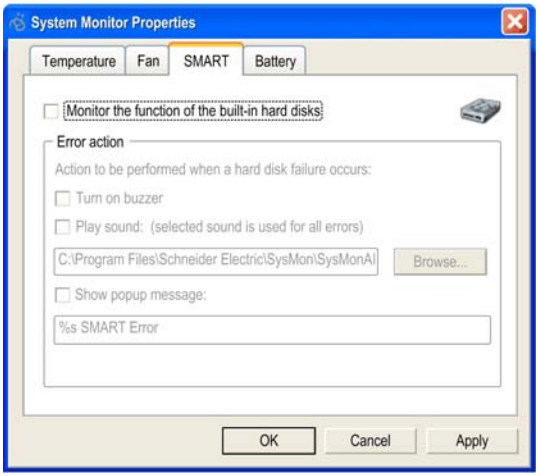
The screenshot below shows the **Fan** tab:



Field	Description
Monitor the function of the PC fans	Select this check box to enable and begin monitoring the function of fans. When enabled *(see page 146)*, set the **Error action**.

SMART - System Monitor Properties

The screenshot below shows the **SMART** tab:

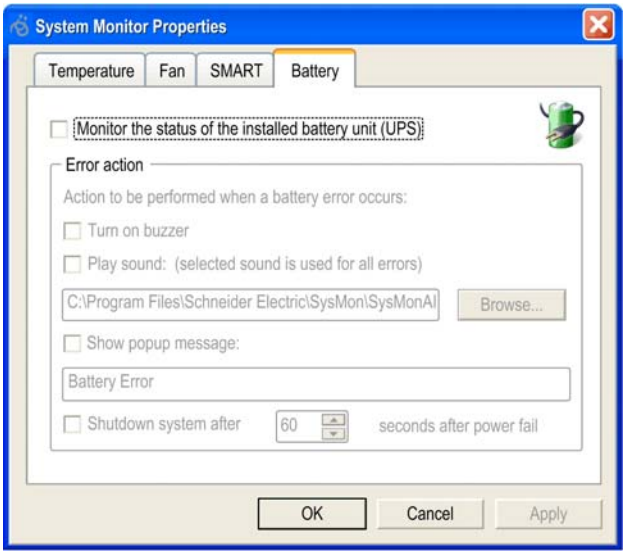


Field	Description
Monitor the function of the built-in hard disks	Select this check box to enable and begin monitoring the built-in hard disks. When enabled *(see page 146)*, set the **Error action**.

Battery - System Monitor Properties

NOTE: Only available for Box PC with UPS option.

The screenshot below shows the **Battery** tab:



Field	Description
Monitor the status of the installed battery unit (UPS)	Select this check box to enable and begin monitoring the installed battery unit. When enabled *(see page 146)*, set the **Error action**.

Error Action Configuration

Field	Description
Turn on buzzer	Select this check box to enable the buzzer.
Play sound	Select this check box to enable the sound that is used for all detected errors. Specify the sound file path (**Browse...** button).
Show popup message	When this check box is selected, status messages are diplayed in the form of a popup.
Shutdown system	If you want the system to stop when an error is detected, select this check box. Not available in **SMART** tab.

Maintenance

11

Subject of this Chapter

This chapter covers maintenance of the Box PC.

What Is in This Chapter?

This chapter contains the following topics:

Reinstallation Procedure

Introduction

In certain cases, it may be necessary to reinstall the operating system.

Precautions to be taken:

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate work area.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid unnecessary contact with exposed conductors and component leads with skin or clothing.

Before Reinstallation

Hardware required:

- Reinstallation DVD-ROM
- External DVD drive, compatible with DVD+R DL format, and with USB connection for Box PC without DVD drive.

Setting up the hardware:

- Shut down Windows® in an orderly fashion and remove all power from the device. Then, follow the applicable instructions described in *Uninterruptible Power Supply (UPS) (see page 104)*.
- Disconnect all external peripherals.

NOTE: Save all important data on the hard drive or Compact Flash card (the reinstallation process will erase all data). The reinstallation process will return the computer to its factory settings.

Reinstallation

Refer to the relevant procedure in the Restore & Documentation DVD-ROM.

Regular Cleaning and Maintenance

Introduction

Inspect the Box PC periodically to determine its general condition. For example:

- Are all power cords and cables connected properly? Have any become loose?
- Are all installation fasteners holding the unit securely?
- Is the ambient temperature within the specified range?
- Are there any scratches or traces of dirt on the installation gasket?

The following describes service/maintenance work which can be carried out by a trained, qualified user.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Box PC and the power supply.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only 24 Vdc when operating the Box PC.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

EXPLOSION HAZARD

- Always confirm the ANSI/ISA 12.12.01 and CSA C22.2 N° 213 hazardous location rating of your device before installing or using it in a hazardous location.
- To power on or power off a Box PC installed in a Class I, Division 2 hazardous location, you must either:
  - Use a switch located outside the hazardous environment, or
  - Use a switch certified for Class I, Division 1 operation inside the hazardous area.
- Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous. This applies to all connections including power, ground, serial, parallel, and network connections.
- Never use unshielded / ungrounded cables in hazardous locations.
- Use only non-incentive USB configuration.
- When enclosed, keep enclosure doors and openings closed at all times to avoid the accumulation of foreign matter inside the workstation.

Failure to follow these instructions will result in death or serious injury.

During operation, surface temperatures of the heat sink may reach 70 °C (158 °F).

⚠ WARNING

RISK OF BURNS

Do not touch the surface of the heat sink during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Cleaning Solutions

⚠ CAUTION

HARMFUL CLEANING SOLUTIONS

Do not clean the unit or any component of the unit with paint thinner, organic solvents, or strong acids.

Failure to follow these instructions can result in injury or equipment damage.

Lithium Battery

The Box PC contains one battery, which is needed for backing up the real-time clock (RTC).

NOTE: The following characteristics, features and limits only apply to this accessory and can deviate from those specified for the entire device. For the device where this accessory is installed, refer to the data provided specifically for the device.

Features	Values
Capacity	950 mAh
Voltage	3 Vdc
Self Discharge at 23 °C (73.4 °F)	< 1 % per year
Storage Time	Max. 3 years at 30 °C (86 °F)
Environmental Characteristics	
Storage Temperature	–20...60 °C (–4...140 °F)
Relative Humidity	0...95 % non-condensing

Replacing the Battery

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read and understand the safety information in the Regular Cleaning and Maintenance section *(see page 149)* before attempting this procedure.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

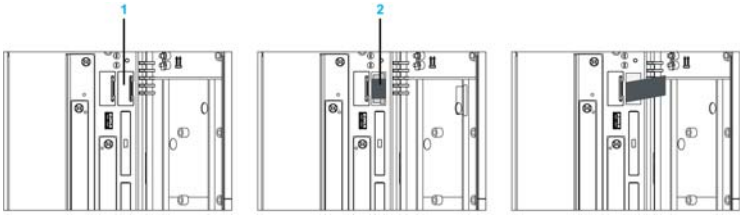
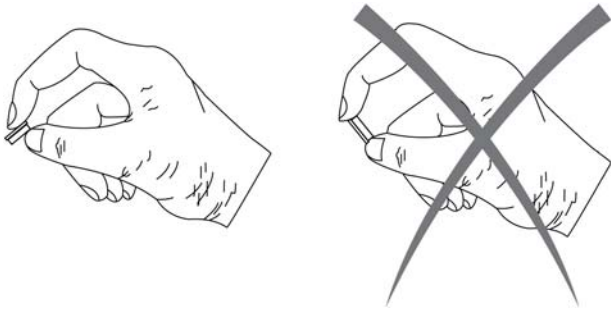
EXPLOSION, FIRE, OR CHEMICAL HAZARD

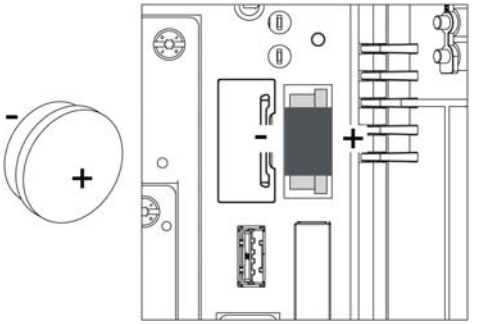
- Replace battery with identical type.
- Follow all battery manufacturer's instructions.
- Do not recharge, disassemble, heat above 100 °C (212 °F), or incinerate.
- Use your hands or insulated tools to remove or replace the battery.
- Maintain proper polarity when inserting and connecting a new battery.
- Remove all replaceable batteries before discarding the Box PC.
- Recycle or properly dispose of used batteries.

Failure to follow these instructions will result in death or serious injury.

NOTE:

- The product design allows you to change the battery with the Box PC either on or off. In some countries, safety regulations do not allow you to change batteries while the unit is on.
- Saved settings will be restored when changing the battery with the power turned off (as the settings are stored in non-volatile EEPROM). However, the date and time must be reset because this data is lost when changing the battery.
- Only qualified personnel can change the battery.

Step	Action
1	Disconnect the power supply to the Magelis Box PC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	 **1** Remove the black plastic cover from the battery compartment **2** Carefully pull out the battery using removal strips
4	The battery should not be held by its edges. Insulated tweezers may also be used for inserting the battery. 

Step	Action
5	Insert the new battery with correct polarity. 
6	To make the next battery change easier, be sure the removal strip is in place when inserting battery.
7	Reconnect the power supply to the Box PC (plug in power cable and press power button).
8	You may need to reset the date and time in the BIOS settings.

NOTE: Replacement of the battery in the Box PC other than with the type specified in this documentation may present a risk of fire or explosion.

⚠ WARNING

IMPROPER BATTERY CAN PROVOKE FIRE OR EXPLOSION

Replace battery only with identical type: Type CR2477N.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Replacing the Fan Filter

⚠ DANGER

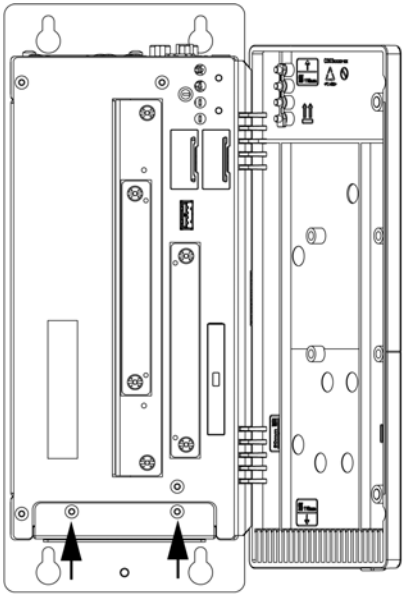
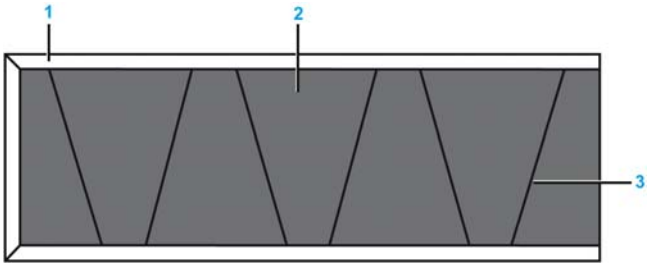
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read and understand the safety information in the Regular Cleaning and Maintenance section *(see page 149)* before attempting this procedure.

Failure to follow these instructions will result in death or serious injury.

The fan filters are subject to wear, and should be checked with appropriate frequency to determine whether the air flow provides sufficient cooling. An exchange or cleaning of the filter kit is appropriate at that time.

The table below shows how to replace the fan filter:

Step	Action
1	Remove side covers *(see page 114)* of the Box PC.
2	After the screws have been removed, the fan kit cover can be removed toward the front:  **NOTE:** The 1 slot Box PC has only one screw to be removed.
3	Replace the dust filter in the fan kit cover and secure with the filter clasp.  **1** Fan kit cover **2** Dust filter **3** Filter clasp
4	Place the fan kit cover in the housing and fasten using the Torx screws removed at step 2. **NOTE:** The recommended torque to tighten these screws is 0.5 Nm (4.5 lb-in).

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the plastic installation fastener.
- When installing or removing screws, ensure that they do not fall inside the Box PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Replacing the Fan Kit

The fan kit help keep the Box PC from overheating. If necessary to replace the fan kit, follow the fan kit installation procedure *(see page 126)* to perform this task.

Appendices

Accessories

A

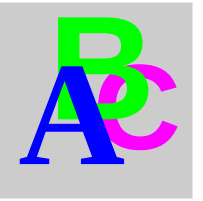
Accessories for the Box PC

Available Accessories

Accessories are available as options. The list of accessories available for the Box PC is shown below:

Description	Reference
Maintenance kit	HMIYBMKT11
Hard disk drive 250 GB	HMIYHDD025011
Flash disk SDD 32 GB	HMIYSDD003211
Compact Flash 2 GB	HMIYCFS0211
Compact Flash 4 GB	HMIYCFS0411
Compact Flash 8 GB	HMIYCFS0811
Additional DVI-I interface	HMIYINDVIRGB11
Adaptor from DVI-I output to RGB	HMIYADDVIRGB11
DVD drive, reader/writer for slide-in	HMIYDRDVDRW11
Adaptor for storage drive in slide-in	HMIYADSLIDEIN11
RS-232/422/485 interface without SRAM	HMIYBINSL11
RAID PCI redundant hard disk drive	HMIYRAIDPCI11
Replacement RAID hard disk drive	HMIYRAIDD025011
UPS kit ext. UPS battery + 3 m cable	HMIYUPSKT11
Power line filter for marine certification	HMIYLFIMAR11
Fan kit for Box PC 1 slot PCI/PCIe	HMIYBFKT11
Fan kit for Box PC 2 slots PCI/PCIe	HMIYBFKT21
Fan kit for Box PC 5 slots PCI/PCIe	HMIYBFKT51

Index



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