User Manual

TPC-5212W/TPC-5182W/ TPC-5172T/TPC-5152T/ TPC-5122T/TPC-B500 Series

電腦
6th Generation Intel® Core™ i Computer

ADVANTECH

Enabling an Intelligent Planet

限用物質含有情況標示聲明書
Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：電腦 Equipment name	型號（型式）：TPC-5212W（系列型號參見說明書） Type designation (Type)					
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	－	○	○	○	○	○
面板	－	○	○	○	○	○
內外殼 （外殼、內部 框架 … 等）	－	○	○	○	○	○
其它固定組件 （螺絲、夾 具、卡筍）	－	○	○	○	○	○
配件（線材）	－	○	○	○	○	○
記憶卡	－	○	○	○	○	○

備考 1. " 超出 0.1 wt %" 及 " 超出 0.01 wt %" 係指限用物質之百分比含量超出百分比含量基準值。
Note 1： "Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考 2. " ○ " 係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2： " ○ " indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考 3. " － " 係指該項限用物質為排除項目。
Note 3： The " ？ " indicates that the restricted substance corresponds to the exemption.

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Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：電腦 Equipment name	型號（型式）：TPC-5182W（系列型號參見說明書） Type designation（Type）					
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	—	○	○	○	○	○
面板	—	○	○	○	○	○
內外殼 （外殼、內部 框架…等）	—	○	○	○	○	○
其它固定組件 （螺絲、夾 具、卡筍）	—	○	○	○	○	○
配件（線材）	—	○	○	○	○	○
記憶卡	—	○	○	○	○	○

備考 1. " 超出 0.1 wt %" 及 " 超出 0.01 wt %" 係指限用物質之百分比含量超出百分比含量基準值。
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備考 3. " — " 係指該項限用物質為排除項目。
Note 3：The "？" indicates that the restricted substance corresponds to the exemption.

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Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：電腦 Equipment name	型號（型式）：TPC-5172T（系列型號參見說明書） Type designation (Type)					
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	—	○	○	○	○	○
面板	—	○	○	○	○	○
內外殼 （外殼、內部框架…等）	—	○	○	○	○	○
其它固定組件 （螺絲、夾具、卡筍）	—	○	○	○	○	○
配件（線材）	—	○	○	○	○	○
記憶卡	—	○	○	○	○	○

備考1.“超出 0.1 wt %”及“超出 0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。
Note 1：“Exceeding 0.1 wt %”and“exceeding 0.01 wt %”indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2.“○”係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2：“○”indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3.“－”係指該項限用物質為排除項目。
Note 3：The“？”indicates that the restricted substance corresponds to the exemption.

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Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：電腦 Equipment name	型號（型式）：TPC-5152T（系列型號參見說明書） Type designation（Type）					
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls（PBB）	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	—	○	○	○	○	○
面板	—	○	○	○	○	○
內外殼 （外殼、內部 框架 … 等）	—	○	○	○	○	○
其它固定組件 （螺絲、夾 具、卡筍）	—	○	○	○	○	○
配件（線材）	—	○	○	○	○	○
記憶卡	—	○	○	○	○	○

備考 1.“超出 0.1 wt %”及“超出 0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。
Note 1："Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考 2.“○”係指該項限用物質之百分比含量未超出百分比含量基準值。
Note 2："○" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考 3.“—”係指該項限用物質為排除項目。
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限用物質含有情況標示聲明書
Declaration of the Presence Condition of the Restricted Substances Marking

設備名稱：電腦 Equipment name	型號（型式）：TPC-5122T（系列型號參見說明書） Type designation (Type)					
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr^{+6})	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
電路板	—	○	○	○	○	○
面板	—	○	○	○	○	○
內外殼 （外殼、內部 框架…等）	—	○	○	○	○	○
其它固定組件 （螺絲、夾 具、卡筍）	—	○	○	○	○	○
配件（線材）	—	○	○	○	○	○
記憶卡	—	○	○	○	○	○
備考 1."超出 0.1 wt %"及"超出 0.01 wt %"係指限用物質之百分比含量超出百分比含量基準值。 Note 1："Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition. 備考 2."○"係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2："○" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence. 備考 3."—"係指該項限用物質為排除項目。 Note 3：The "？" indicates that the restricted substance corresponds to the exemption.						

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This manual is applicable to the following models:

■ **TPC-5212W**

TPC-5212W-633AE;

TPC-5212W-673AE;

TPC-5212W-634AE;

TPC-5212W-674AE;

TPC5212W63A1701ET; TPC5212W63A1702ET; TPC5212W63A1703E-T;
TPC5212W63A1704ET; TPC5212W63A1705ET; TPC5212W63A1801ET;
TPC5212W63A1802ET; TPC5212W63A1803E-T; TPC5212W63A1804ET;
TPC5212W63A1805ET; TPC5212W63A1901ET; TPC5212W63A1902ET;
TPC5212W63A1903E-T; TPC5212W63A1904ET; TPC5212W63A1905ET;
TPC5212W63A2001ET; TPC5212W63A2002ET; TPC5212W63A2003E-T;
TPC5212W63A2004ET; TPC5212W63A2005ET; TPC5212W67A1701ET;
TPC5212W67A1702ET; TPC5212W67A1703E-T; TPC5212W67A1704ET;
TPC5212W67A1705ET; TPC5212W67A1801ET; TPC5212W67A1802ET;
TPC5212W67A1803E-T; TPC5212W67A1804ET; TPC5212W67A1805ET;
TPC5212W67A1901ET; TPC5212W67A1902ET; TPC5212W67A1903E-T;
TPC5212W67A1904ET; TPC5212W67A1905ET; TPC5212W67A2001ET;
TPC5212W67A2002ET; TPC5212W67A2003E-T; TPC5212W67A2004ET;

TPC5212W67A2005ET

■ **TPC-5182W**

TPC-5182W-633AE;

TPC-5182W-673AE;

TPC-5182W-634AE;

TPC-5182W-674AE;

TPC5182W63A1701E-T; TPC5182W63A1702E-T; TPC5182W63A1703E-T;
TPC5182W63A1704E-T; TPC5182W63A1705E-T; TPC5182W63A1801E-T;
TPC5182W63A1802E-T; TPC5182W63A1803E-T; TPC5182W63A1804E-T;
TPC5182W63A1805E-T; TPC5182W63A1901E-T; TPC5182W63A1902E-T;
TPC5182W63A1903E-T; TPC5182W63A1904E-T; TPC5182W63A1905E-T;
TPC5182W63A2001E-T; TPC5182W63A2002E-T; TPC5182W63A2003E-T;

TPC5182W63A2004E-T; TPC5182W63A2005E-T; TPC5182W67A1701E-T;
TPC5182W67A1702E-T; TPC5182W67A1703E-T; TPC5182W67A1704E-T;
TPC5182W67A1705E-T; TPC5182W67A1801E-T; TPC5182W67A1802E-T;
TPC5182W67A1803E-T; TPC5182W67A1804E-T; TPC5182W67A1805E-T;
TPC5182W67A1901E-T; TPC5182W67A1902E-T; TPC5182W67A1903E-T;
TPC5182W67A1904E-T; TPC5182W67A1905E-T; TPC5182W67A2001E-T;
TPC5182W67A2002E-T; TPC5182W67A2003E-T; TPC5182W67A2004E-T;
TPC5182W67A2005E-T

■ **TPC-5172T**

TPC-5172T-633AE;

TPC-5172T-673AE;

TPC-5172T-634AE;

TPC-5172T-674AE;

TPC5172T63A1701E-T; TPC5172T63A1702E-T; TPC5172T63A1703E-T;
TPC5172T63A1704E-T; TPC5172T63A1705E-T; TPC5172T63A1801E-T;
TPC5172T63A1802E-T; TPC5172T63A1803E-T; TPC5172T63A1804E-T;
TPC5172T63A1805E-T; TPC5172T63A1901E-T; TPC5172T63A1902E-T;
TPC5172T63A1903E-T; TPC5172T63A1904E-T; TPC5172T63A1905E-T;
TPC5172T63A2001E-T; TPC5172T63A2002E-T; TPC5172T63A2003E-T;
TPC5172T63A2004E-T; TPC5172T63A2005E-T; TPC5172T67A1701E-T;
TPC5172T67A1702E-T; TPC5172T67A1703E-T; TPC5172T67A1704E-T;
TPC5172T67A1705E-T; TPC5172T67A1801E-T; TPC5172T67A1802E-T;
TPC5172T67A1803E-T; TPC5172T67A1804E-T; TPC5172T67A1805E-T;
TPC5172T67A1901E-T; TPC5172T67A1902E-T; TPC5172T67A1903E-T;
TPC5172T67A1904E-T; TPC5172T67A1905E-T; TPC5172T67A2001E-T;
TPC5172T67A2002E-T; TPC5172T67A2003E-T; TPC5172T67A2004E-T;
TPC5172T67A2005E-T

■ **TPC-5152T**

TPC-5152T-633AE;

TPC-5152T-673AE;

TPC-5152T-634AE;

TPC-5152T-674AE;

TPC5152T63A1701E-T; TPC5152T63A1702E-T; TPC5152T63A1703E-T;
TPC5152T63A1704E-T; TPC5152T63A1705E-T; TPC5152T63A1801E-T;
TPC5152T63A1802E-T; TPC5152T63A1803E-T; TPC5152T63A1804E-T;
TPC5152T63A1805E-T; TPC5152T63A1901E-T; TPC5152T63A1902E-T;
TPC5152T63A1903E-T; TPC5152T63A1904E-T; TPC5152T63A1905E-T;
TPC5152T63A2001E-T; TPC5152T63A2002E-T; TPC5152T63A2003E-T;
TPC5152T63A2004E-T; TPC5152T63A2005E-T; TPC5152T67A1701E-T;
TPC5152T67A1702E-T; TPC5152T67A1703E-T; TPC5152T67A1704E-T;
TPC5152T67A1705E-T; TPC5152T67A1801E-T; TPC5152T67A1802E-T;
TPC5152T67A1803E-T; TPC5152T67A1804E-T; TPC5152T67A1805E-T;
TPC5152T67A1901E-T; TPC5152T67A1902E-T; TPC5152T67A1903E-T;
TPC5152T67A1904E-T; TPC5152T67A1905E-T; TPC5152T67A2001E-T;
TPC5152T67A2002E-T; TPC5152T67A2003E-T; TPC5152T67A2004E-T;
TPC5152T67A2005E-T

■ **TPC-5122T**

TPC-5122T-633AE;
TPC-5122T-673AE;
TPC-5122T-634AE;
TPC-5122T-674AE;
TPC5122T63A1701E-T; TPC5122T63A1702E-T; TPC5122T63A1703E-T;
TPC5122T63A1704E-T; TPC5122T63A1705E-T; TPC5122T63A1801E-T;
TPC5122T63A1802E-T; TPC5122T63A1803E-T; TPC5122T63A1804E-T;
TPC5122T63A1805E-T; TPC5122T63A1901E-T; TPC5122T63A1902E-T;
TPC5122T63A1903E-T; TPC5122T63A1904E-T; TPC5122T63A1905E-T;
TPC5122T63A2001E-T; TPC5122T63A2002E-T; TPC5122T63A2003E-T;
TPC5122T63A2004E-T; TPC5122T63A2005E-T; TPC5122T67A1701E-T;
TPC5122T67A1702E-T; TPC5122T67A1703E-T; TPC5122T67A1704E-T;
TPC5122T67A1705E-T; TPC5122T67A1801E-T; TPC5122T67A1802E-T;
TPC5122T67A1803E-T; TPC5122T67A1804E-T; TPC5122T67A1805E-T;
TPC5122T67A1901E-T; TPC5122T67A1902E-T; TPC5122T67A1903E-T;
TPC5122T67A1904E-T; TPC5122T67A1905E-T; TPC5122T67A2001E-T;
TPC5122T67A2002E-T; TPC5122T67A2003E-T; TPC5122T67A2004E-T;
TPC5122T67A2005E-T

Product Warranty (2 years)

Advantech warrants the original purchaser that all of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. However, if an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers are billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product is defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any relevant information readily available.

3. If your product is diagnosed as defective, obtain a return merchandize authorization (RMA) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.

5. Write the RMA number clearly on the outside of the packaging and ship the package prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

This equipment has been tested and found to comply with the 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In such cases, users are required to correct the interference at their own expense.

警告使用者

這是甲類測試產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Technical Support and Assistance

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

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from any AC outlet before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Ensure that the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
12. Never pour liquid into any opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following occurs, have the equipment checked by service personnel:
    – The power cord or plug is damaged.
    – Liquid has penetrated the equipment.
    – The equipment has been exposed to moisture.
    – The equipment is malfunctioning, or does not operate according to the user manual.
    – The equipment has been dropped and damaged.
    – The equipment has obvious signs of breakage.
15. Do not leave this equipment in an environment where the storage temperature may fluctuate below -20 °C (-4 °F) or above 60 °C (140 °F).
16. Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

In accordance with the IEC 704-1:1982 specifications, the sound pressure level at the operator position does not exceed 70 dB (A).

DISCLAIMER: These instructions are provided according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Caution! *Danger d'explosion si la batterie est mal remplace. Remplacer uniquement par le meme type ou equivalent recommandé par le fabricant. Jeter les piles usagées selon les instructions du fabricant.*

安全指示

1. 請仔細閱讀此安全操作說明。
2. 請妥善保存此用戶手冊供日後參考。
3. 用濕抹布清洗設備前，請確認拔除電源線。請勿使用液體或去污噴霧劑清洗設備。
4. 對於使用電源線的設備，設備周圍必須有容易接觸到的電源插座。
5. 請勿在潮濕環境中使用設備。
6. 請在安裝前確保設備放置在可靠的平面上，意外摔落可能會導致設備損壞。
7. 設備機殼的開孔適用於空氣對流，從而防止設備過熱。**請勿覆蓋開孔。**
8. 當您連接設備到電源插座前，請確認電源插座的電壓符合要求。
9. 請將電源線布置在人們不易絆倒的位置，請勿在電源線上覆蓋任何雜物。
10. 請注意設備上所有的警告標示。
11. 如果長時間不使用設備，請拔除與電源插座的連結，避免設備被超標的電壓波動損壞。
12. 請勿讓任何液體流入通風口，以免引起火災或短路。
13. 請勿自行打開設備。為了確保您的安全，請透過經認證的工程師來打開設備。
14. 如欲下列情況，請由專業人員維修：
    - 電源線或插頭損壞；
    - 設備內部有液體流入；
    - 設備曾暴露在過度潮濕環境中使用；
    - 設備無法正常工作，或您無法透過用戶手冊來正常工作；
    - 設備摔落或損壞；
    - 設備有明顯外觀損壞。
15. 請勿將設備放置在超出建議溫度範圍的環境，即不要低於 -20 °C（-4 °F）或高於 60 °C（140 °F），否則可能會造成設備損壞。
16. 注意：若電池更換不正確，將有爆炸危險。因此，只可以使用製造商推薦的同一種或者同等型號的電池進行替換。請按照製造商的指示處理舊電池。
17. 根據 IEC 704-1:1982 規定，操作員所在位置音量不可高於 70 分貝。
18. 限制區域：請勿將設備安裝於限制區域使用。
19. 免責聲明：該安全指示符合 IEC 704-1 要求。研華公司對其內容之準確性不承擔任何法律責任。
20. 使用過度恐傷害視力。
21. 使用 30 分鐘請休息 10 分鐘。
22. 未滿 2 歲幼兒不看螢幕 ，2 歲以上每天看螢幕不要超過 1 小時。

Contents

Chapter 1

General Information

1.1 Introduction

The TPC-5000 touch panel computer is a state-of-the-art modular human-machine interface that features a 12" to 21.5" display and 6th Gen Intel Core i processor that delivers high-performance computing in a compact, fanless system.

The key features are as follows:

- **Modular Design**
  The front panel and computing box are separate modules that enable flexible configuration, easy upgrades and maintenance, and rapid customization.

- **6th Generation Intel Core i7/i3/Celeron CPU with 8/4 GB DDR4 SDRAM**
  The inclusion of the latest Intel processor enhances performance by up to 20%.

- **mPCIe Slot**
  Internally mounted expansion cards replace the mSATA standard and support 6 Gbit/s speed.

- **Fanless**
  By featuring a low-power processor, the system does not require cooling fans, which are often unreliable and cause dust to circulate inside the equipment.

- **Bright Display**
  The TFT LED LCD satisfies industrial demands for clear and precise interfaces and features a wide operating temperature range with isolation protection.

1.2 Features

1.2.1 System Kernel

- **CPU:**
  6th Generation Intel Core i7-6600U 2.60 GHz
  6th Generation Intel Core i3-6100U 2.30 GHz
  6th Generation Intel Celeron 3955U 2.00 GHz
- **BIOS:** AMI UEFIBIOS
- **VGA:**
  Intel® HD Graphics 520 for i7/i3 model
  Intel® HD Graphics 510 for Celeron model
- **Ethernet:** 3 x 10/100/1000BASE-T (2 x Intel® I210, 1 x Intel® I219)
- **Watchdog Timer:** EC watchdog timer; 1 ~ 255 sec (system)
- **Storage:**
  1 x M.2 (2280) SATA, 1 x 2.5" SATA SSD, and 1 x CFast (optional via iDoor)
- **I/O Ports:**
  1 x RS-232, 1 x RS-232/422/485, 2 x USB3.0, 2 x USB 2.0, 1 x audio line out, 1 x DisplayPort 1.4 out

1.2.2 O/S Support

Microsoft® Windows WES7 (32/64 bit)/Windows 7 (32/64 bit)/Windows 8.1 (64 bit)/ Windows 10 IoT Enterprise LTSB

1.2.3 Certification and Environment

Certification

- FCC Class A
- CE certified
- UL

- CCC
- BSMI
- IP66-rated front bezel

Environment

- **Operating Temperature:** -0 ~ 55 °C (32 ~ 131 °F)
- **Storage Temperature:** -20 ~ 60 °C (-4 ~ 140 °F)
- **Humidity:** 10 ~ 95% RH @ 40 °C, non-condensing
- **Vibration:** With SSD: 3 Grms (5 ~ 500 Hz) (operating, random vibration)

1.3 LCD and Touch Specifications

Category	Item	12.1"	15"	17"	18.5"	21.5"
LCD	Display Type	XGA TFT LED LCD	XGA TFT LED LCD	SXGA TFT LED LCD	HD TFT LED LCD	Full HD TFT LED LCD
	Max. Resolution	1024 x 768	1024 x 768	1280 x 1024	1366 x 768	1920 x 1080
	Max.Color	16.2 M	16.7M	16.7 M	16.7 M	16.7 M
	Luminance (cd/m²)	600	400	350	300	300
	Viewing Angle (H/V°)	160/140	160/140	160/140	170/160	178/178
	Backlight Life	50,000 hr	50,000 hr	50,000 hr	30,000 hr	50,000 hr
	Contrast Ratio	700:1	700:1	800:1	1000:1	5000:1
Touch	Type	5-wire resistive	Projected capacitive	Projected capacitive	Projected capacitive	Projected capacitive
	Light Transmission	81% ± 3%	90% ± 3%	90% ± 3%	90% ± 3%	90% ± 3%
System	Temperature Operating	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)	0 ~ 50 °C (32 ~ 131 °F)	0 ~ 55 °C (32 ~ 131 °F)
	Temperature Storage	-20 ~ 60 °C (-4 ~140 °F)	-20 ~ 60 °C (-4 ~ 140 °F)	-20 ~ 60 °C (-4 ~ 140 °F)	-20 ~ 60 °C (-4 ~ 140 °F)	-20 ~ 60 °C (-4 ~ 140 °F)
	Power Consumption	31W typical, 90W max.	32W typical, 90W max.	42W typical, 90W max.	36W typical, 90W max.	40W typical, 90W max.
	iKey built in	No	Yes	Yes	Yes	Yes

Note! *There might be several bright or dark pixels on the LCD. This phenomenon is normal in today's LCD manufacturing. The inspection criteria follow the specifications defined by the LCD vendor.*
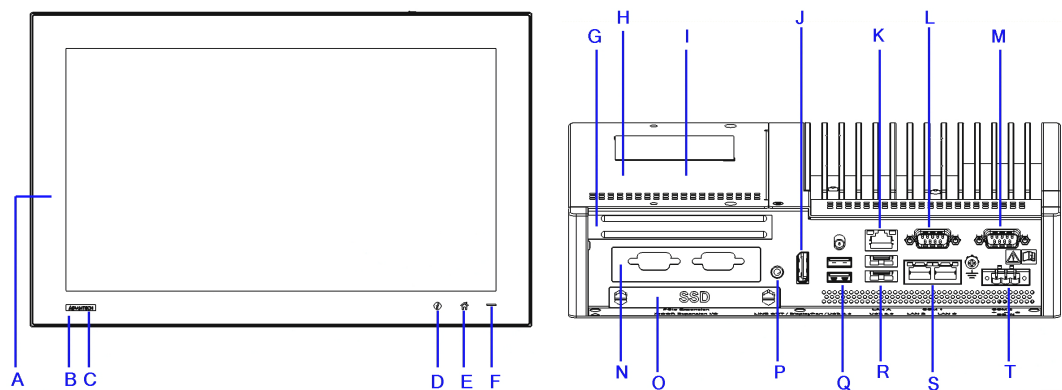
1.4 Power

- ■ **Input Voltage:** 24 V$_{DC}$ +/-20%
- ■ **Typical:**
  - – TPC-5122T: 24 V$_{DC}$ @ 3.7 Amp
  - – TPC-5152T: 24 V$_{DC}$ @ 3.7 Amp
  - – TPC-5172T: 24 V$_{DC}$ @ 3.7 Amp
  - – TPC-5182W: 24 V$_{DC}$ @ 3.7 Amp
  - – TPC-5212W: 24 V$_{DC}$ @ 3.7 Amp

1.5 I/O Port Arrangement

The arrangement of the I/O ports are as shown in Figure 1.1.

A. Wi-Fi antenna
B. NFC card reader
C. Logo
D. iKey
E. Home key
F. Power indicator

G. Half-size PCIe
H. M.2 for storage
I. 2 x mPCIe
J. DisplayPort
K. 1 x LAN I219
L. RS-232
M. RS-232/422/485

N. iDoor
O. SSD bay
P. Audio out
Q. 2 x USB 30
R. 2 x USB 2.0
S. 2x LAN I210
T. Power Input

Figure 1.1 I/O port arrangement

1.6 Panel Mounting

1. There is an adhesive waterproof gasket on the Mg front bezel. Ensure that the waterproof gasket is in place before installing the TPC system in the panel opening.
2. Install the TPC in the panel opening.
3. Retrieve the clamps and long screws from the accessory pack. Hook the clamps the holes located on the four sides of the bezel. Insert screws into every clamp and tighten them to fasten the clamp in place. These screws will push the mounting panel and secure the unit.
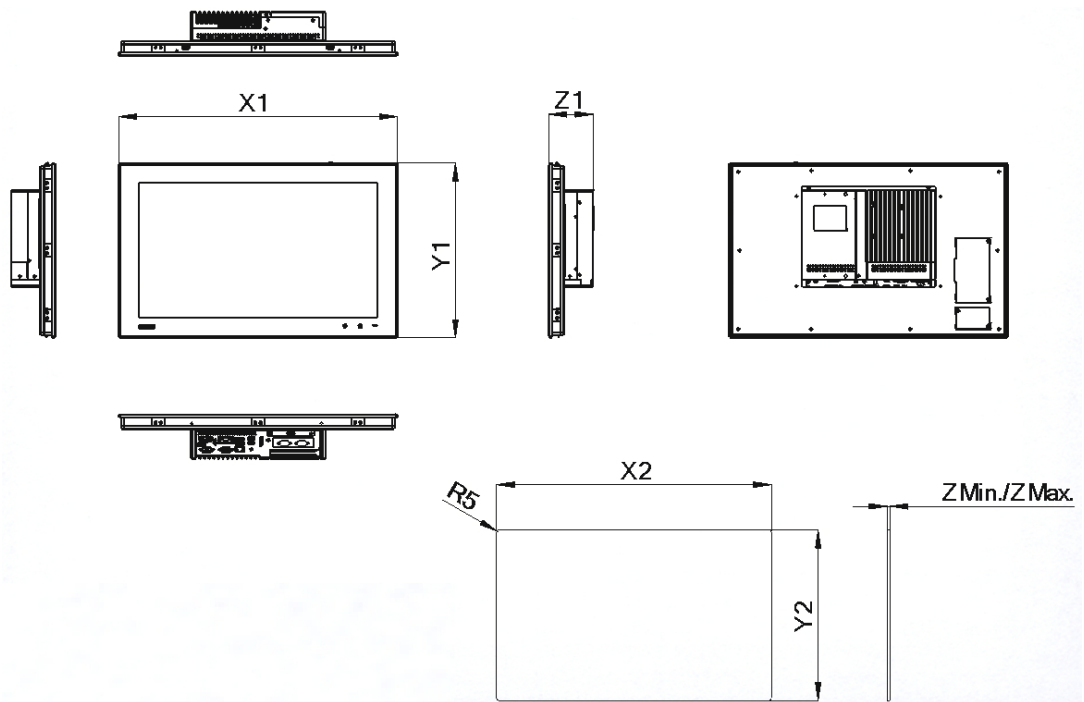4. The suggested mounting panel thickness is less than 6 mm (0.236 in).
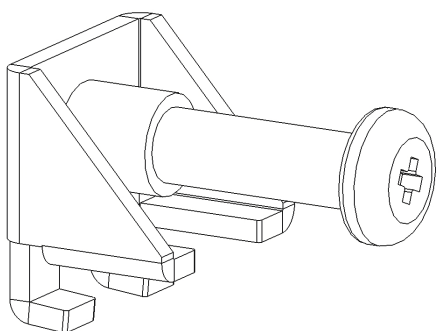
Insert the screws into each clamp and tighten them to fasten the clamp in place.
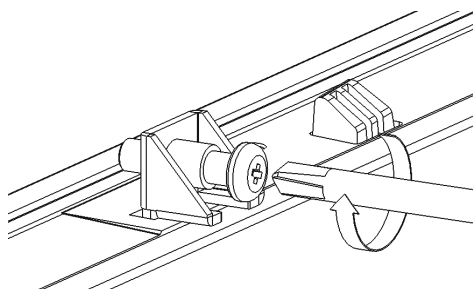
Hook the clamps into the holes and fasten the screws
Torque: 2 kgf-cm
These screws will push the mounting panel and secure the unit.

Figure 1.2 Panel mounting

1.7 System and Cutout Dimensions

	Panel Dimensions (mm)			Cutout Size (mm)		Wall Thickness (mm)	
Display Size	X1	Y1	Z1	X2	Y2	Z Min.	Z Max.
12"	311.8	238	85.6	303	229	1	6
15"	383.2	307.3	86	374.5	298.5	1	6
17"	410.4	343.4	86.8	401.3	334.8	1	6
18"	488	309	88.8	479.3	300.3	1	6
21.5"	558.4	349.8	88.8	550.3	341.8	1	6

Chapter 2

System Setup

2.1 Transport and Unpacking

When accepting a delivery, please check the packaging for visible transport damage and check the delivery for completeness by comparing it with your order form. If you notice any shipping damage or inconsistencies between the contents and your order, please inform the responsible delivery service immediately.

During transportation, the TPC system should be protected from excessive mechanical stress. If the TPC system is transported or stored without packaging, shocks, vibrations, pressure, and moisture may impact the unprotected unit. Additionally, damaged packaging indicates that ambient conditions have already had a massive impact on the device. Therefore, please use the original packaging during transportation and storage.

If the TPC system is transported in cold weather or is exposed to extreme variations in temperature, ensure that moisture (condensation) does not build up on or inside the HMI device. Moisture can result in short circuits and damage to the device. To avoid damage, store the TPC system in a dry environment and bring the system to room temperature before powering it up. If condensation occurs, a delay time of approximately 12 hours must be allowed to ensure that the system is completely dry before being switched on.

2.2 System Setup
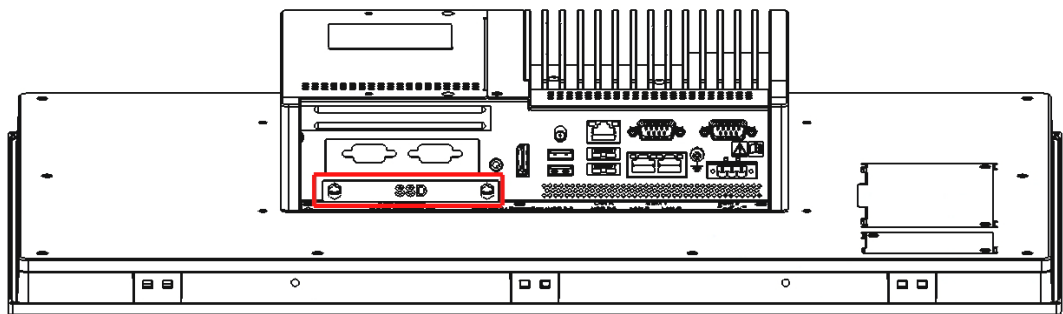
1. Remove the SSD bay using the blue hand screws.

Figure 2.1 Remove the SSD bay for SSD installation

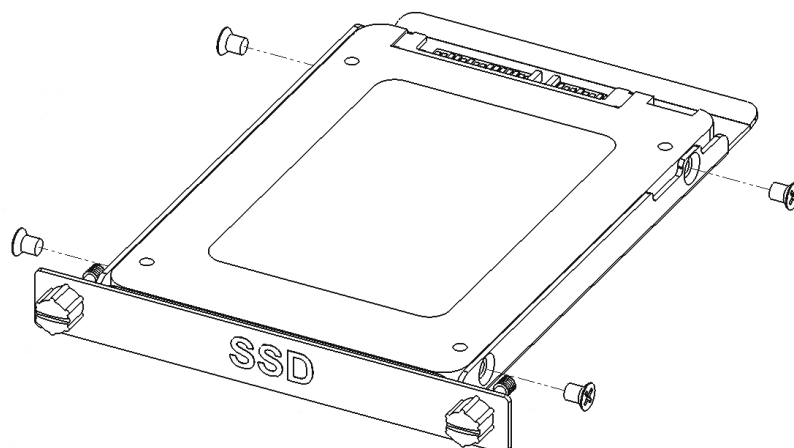2. Place the SSD into the bay and affix it in place using the screws provided in the accessory box.

Figure 2.2 Place the SSD into the bay

Warning!   *We recommend turning the system power off before adding or removing a memory card even though the CFast slot supports hot-swapping.*

Ilestsuggéré de désactiverl'alimentation du système que vousbran- chez ouretirez le carte mémoire, mêmesi la mémoire CompactFlash estremplaçable àchaud.

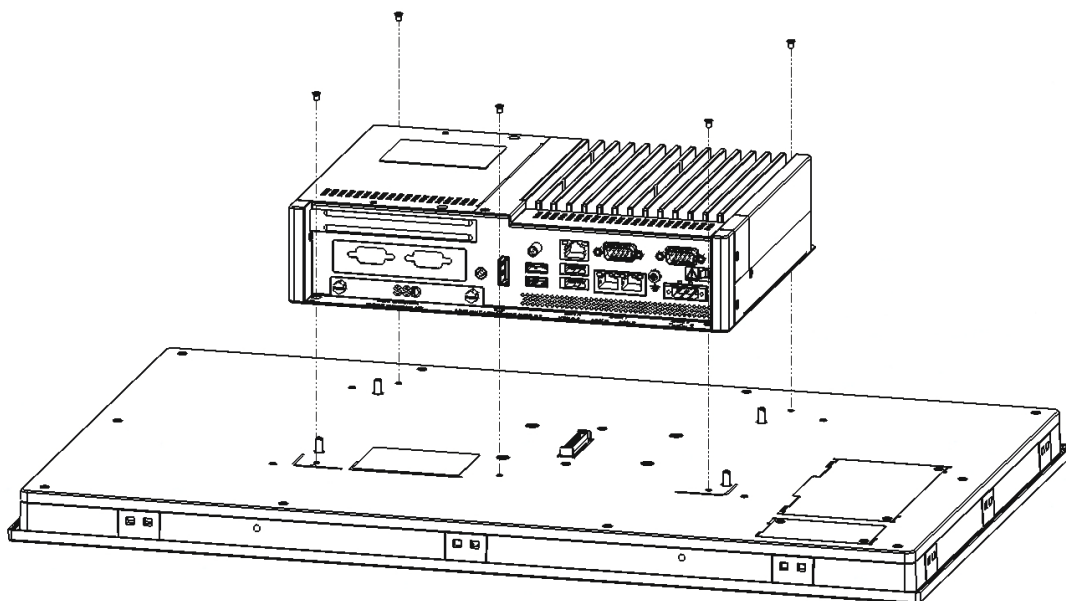3.   Attach the box module to the panel module via the board-to-board connector.

Figure 2.3 Attach the box module to the panel module

4.   Connect the power connector to 24 Vᴅᴄ power lines. The power lines can either be from a power adapter or an in-house power source.
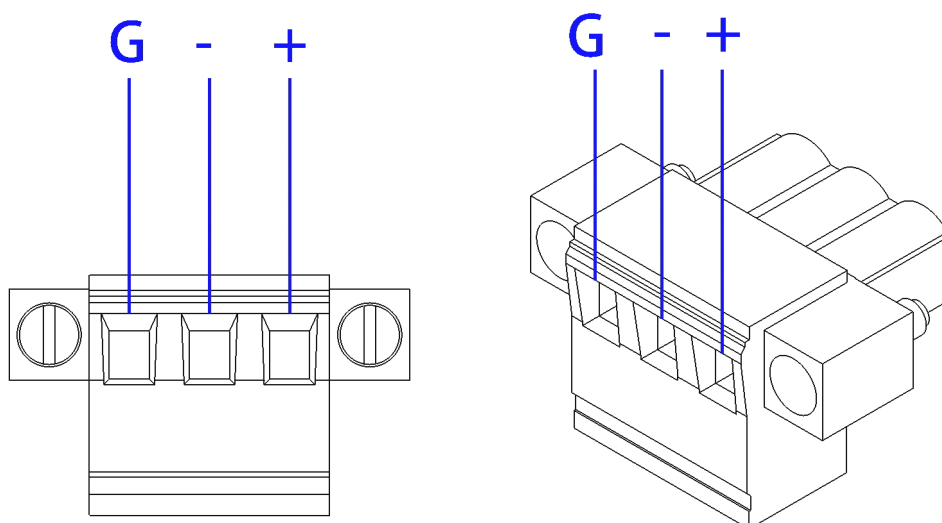

Figure 2.4 Power connector and power lines

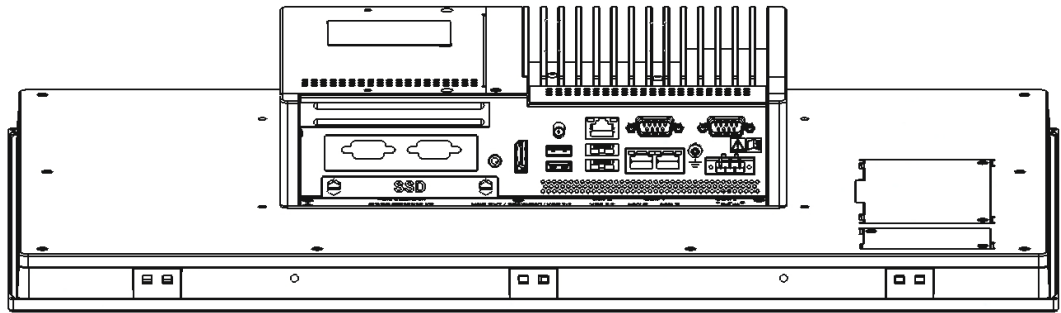5. Plug the power lines into the system's power receptor.

Figure 2.5 Power receptor and button pin assignment

6. Connect the power to the system.
7. Calibrate the touchscreen (only applicable for the 12" monitor model).

2.3 Driver Installation

2.3.1 Chipset, Graphics, ME, and LAN Driver Installation

Relevant drivers must be installed for full functionality. Install the chipset, graphics, ME, and LAN drivers individually. The drivers can be downloaded from the TPC-5000 product page of the Advantech website.

(Windows 7, Windows 8, and Windows 10 have built-in multi-touch driver support.)

2.3.2 Watchdog Driver Installation

If the Advantech watchdog driver is not pre-installed on the TPC system, users will need to install the driver.

Follow the steps outlined below to install the Advantech watchdog driver.

1. Verify that the computer meets the hardware and software requirements to run the Advantech watchdog driver.
2. If you do not already have the installer for the Advantech watchdog driver, download it from the Advantech website.
3. From the Control Panel, remove any existing installation of the Advantech watchdog driver from the computer.
4. With administrator-level privileges, run the installer for the Advantech watchdog driver.

Below is an example of the Advantech watchdog driver setup. To stop the setup process at any time, click the "Cancel" button on the pop-up screen. The setup program will stop the procedure automatically.
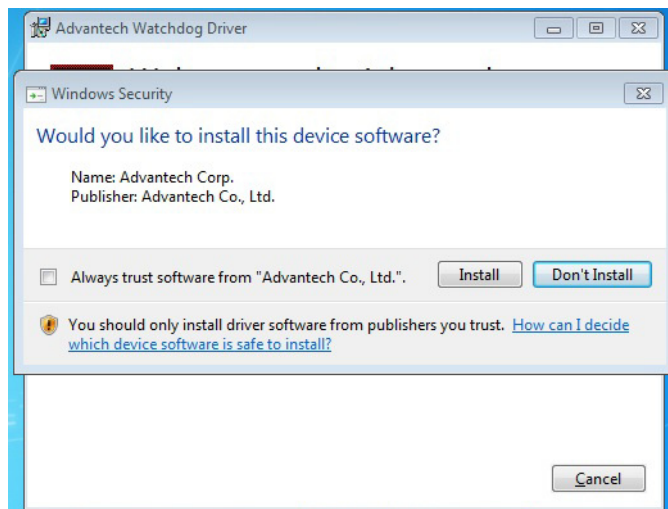
1. Open the setup program.When the setup program is running, click the "Next" button on the Advantech Watchdog Driver Setup Wizard pop-up screen.

2. Wait until the Advantech Watchdog Driver Setup Wizard has completed the installation.
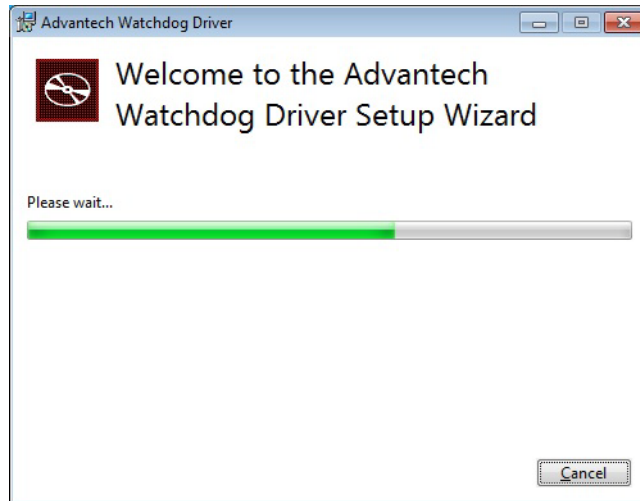
3. Click the "Install" button to continue the installation of the Advantech watchdog driver software.

4. Click the "Restart" or "Close" button on the Advantech Watchdog Driver Setup Wizard pop-up screen to complete the setup.
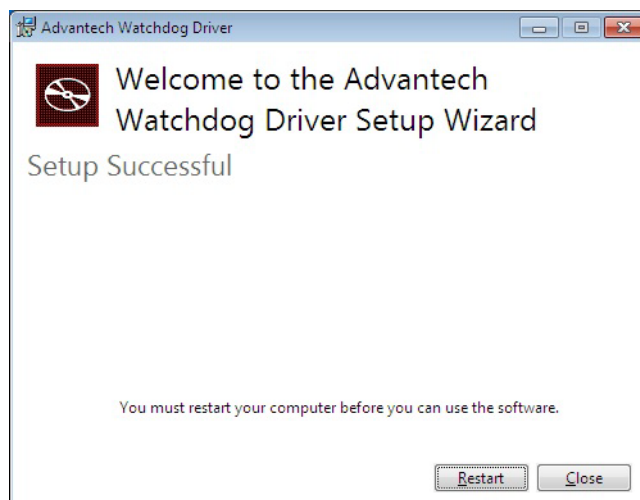
2.4 Panel Mounting

1. Position the TPC system against the panel.

2. Insert clamps into the sides of the TPC unit.

3. Secure the clamps to the panel using the screws provided in the accessory box.

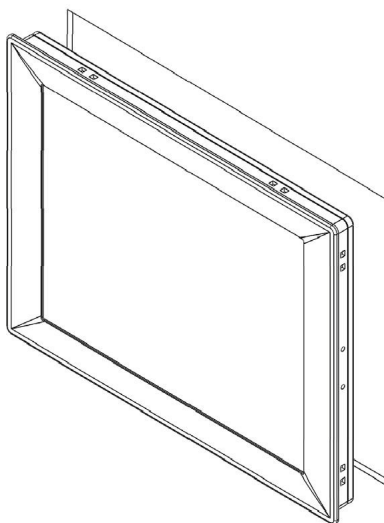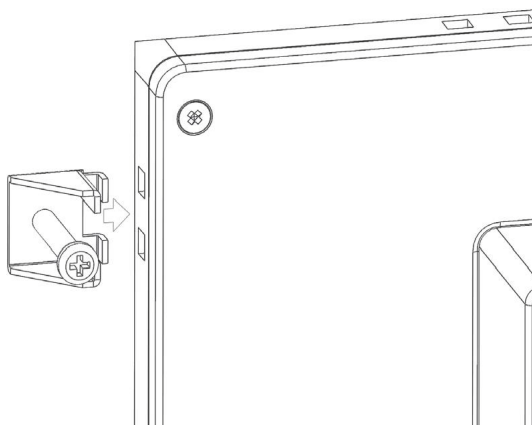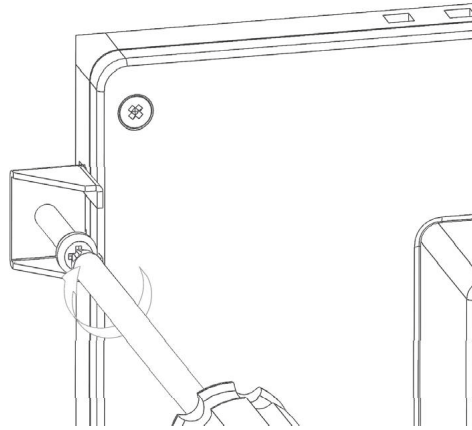## 2.5 Cabinet Installation and Earth Grounding Setup

Follow the steps outlined below to setup the TPC system. Please note that the system's grounding pin should be connected to an earth ground. This will provide the system with EMI, ESD, and surge immunity, as well as system isolation. If the TPC system is embedded in a cabinet, the TPC system's ground, the cabinet's ground, and an earth ground should be connected together.

1.   Installing the TPC system in the cabinet.
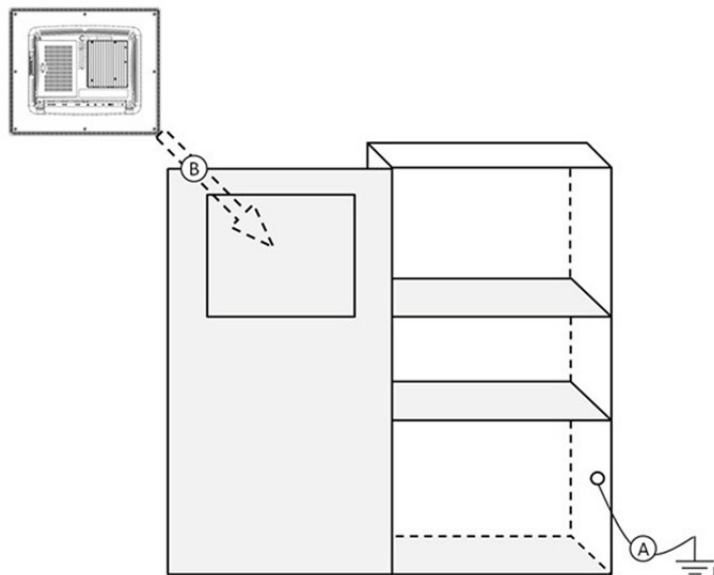
Step A: Connect the cabinet to an earth ground.

Step B: Embed a null TPC system into the cabinet without an I/O cable or power.

2.   Wiring the system.
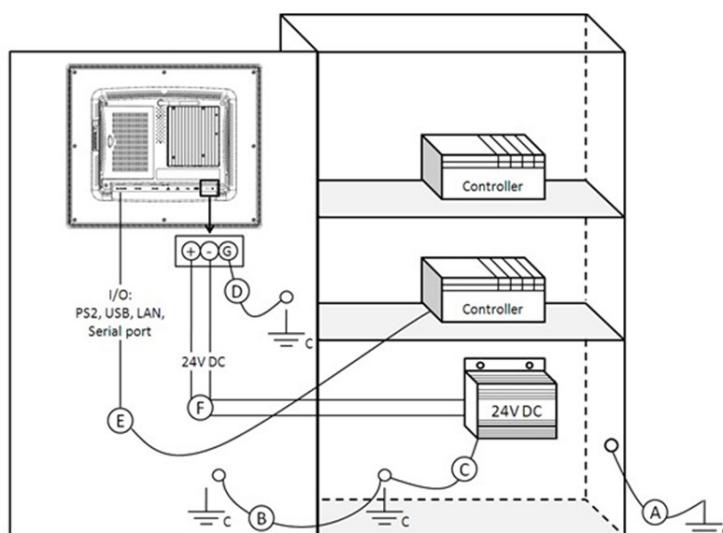
Step A: Connect the cabinet to an earth ground.

Step B: Ensure that all cabinet devices have been grounded together.

Step C: Connect the ground of the power supply to the cabinet.

Step D: Connect the ground pin of the TPC system to the cabinet.

Step E: Connect the I/O to the controller if needed.

Step F: Connect the V+ and V- of the power supply to the TPC system.

After completing Steps A to F, power should be supplied to the TPC system.

Note! *Ensure that all wires follow the installation guidelines or damage to the system may occur.*

If you need to install a device or mini PCIe card, double check the voltage of V- and the earth ground. If the voltages are not almost equal with each other, we recommend shorting V- and the earth ground with wiring.

2.6 Power/Digital Ground and Earth Ground

The purpose of power/digital grounding is to block all external interference to the chassis and prevent any possibility of a bad grounding design causing electric shocks. This is known as "Level 1 isolation", which is not implemented on consumer-grade PCs.

1. The TPC chassis and earth ground (power pin 3) are short.
2. The TPC chassis and power/digital ground are open.
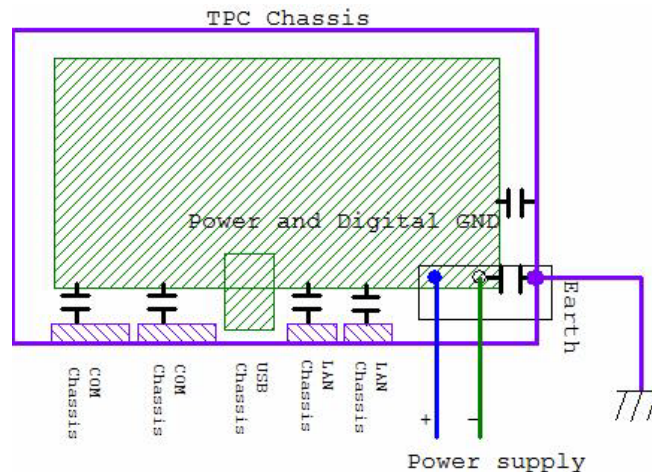
The TPC system is an industrial-grade product designed to prevent external interference and the possibility of electric shocks. To complete the isolation design, the following must be considered:

1. Because the Ethernet is isolated, a LAN connection will not impact the isolation design.
2. To resolve EMI and ESD issues, general USB devices are designed as a chassis and digital short. However, the TPC system prevents damage to USB devices. ESD and EMI solutions are designed to use the power ground as a vent path to ensure that the power ground and chassis ground do not have difference abnormalities.
3. For COM ports, because there are different COM port designs, long-distance connections cause voltage differences between the two COM port chasses.Thus, the cable shell ground must be isolated to the digital ground signal.

In practical cases, many customers may break the Level 1 isolation with a third-party device or the cable design. In such situations, we must consider making all grounds (power, digital, and earth) short and ensure that customers have a good earth ground connection.

2.7 Extension Installation

2.7.1 Remove the Rear Box

1. Remove the 2 screws on the extension door.

2. Slide the rear cover off to remove it.
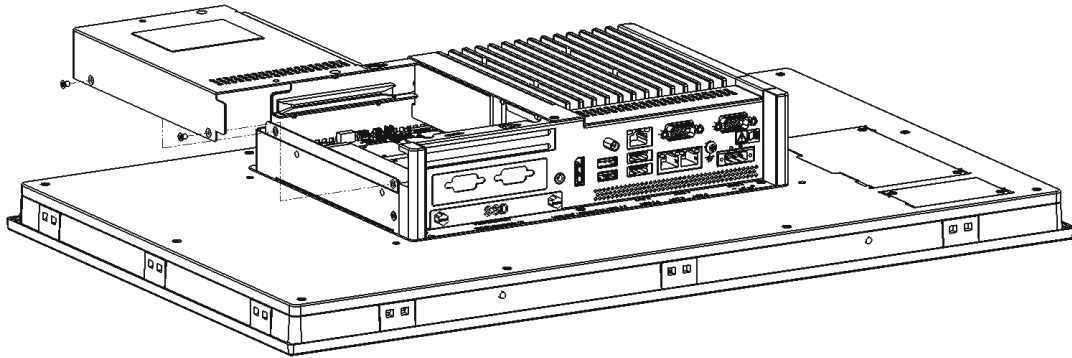
Figure 2.6 M.2 SSD installation

3. Remove the screws on the I/O bracket of the rear box module to install an iDoor module or riser card.
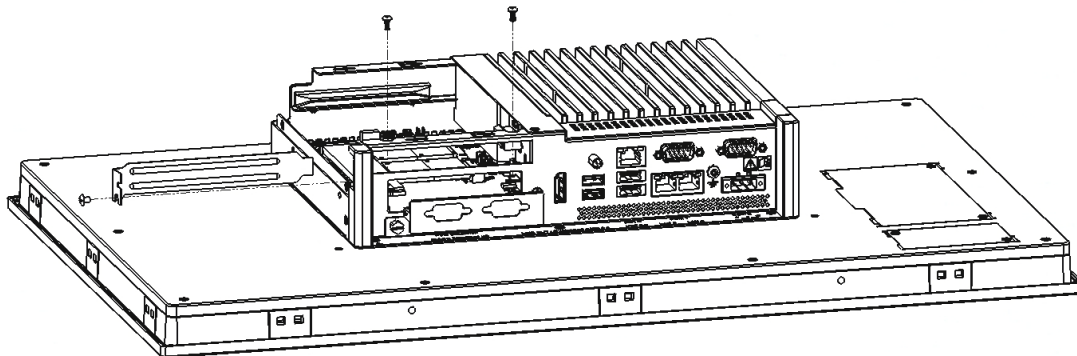
Figure 2.7 Remove the screws on the I/O bracket

2.7.2 M.2 (2280) SSD Installation

Insert the M.2 (2280) SSD and tighten the screws in the screw holes.
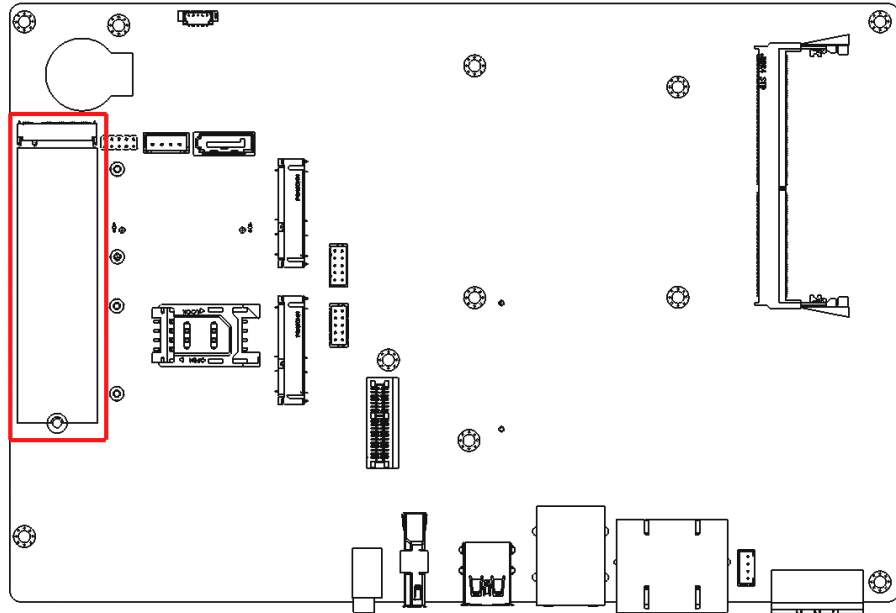
Figure 2.8 M.2 SSD installation layout

2.7.3 iDoor Installation

The iDoor module should be affixed in place using two screws that are already set in the main board. Insert the iDoor module into the slot and plug in the power and signal cables.
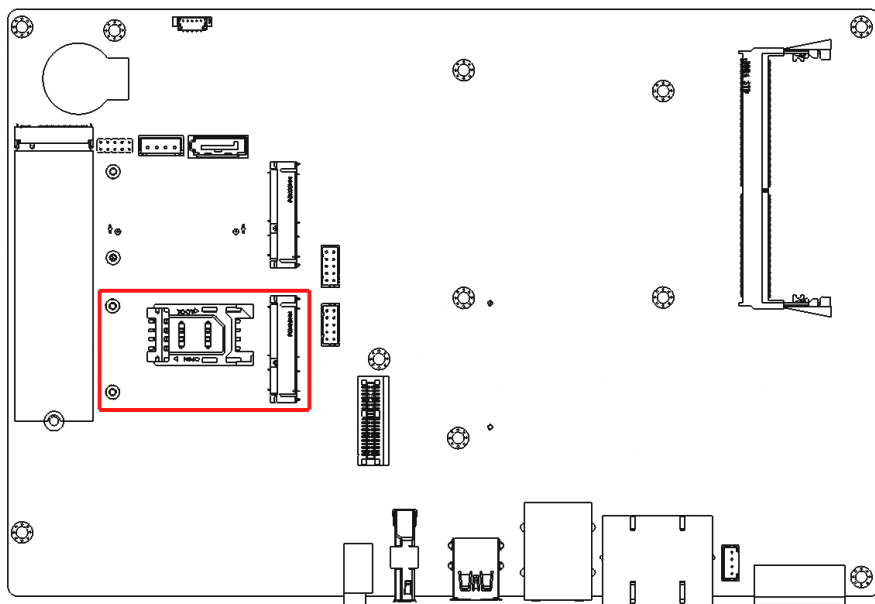
Figure 2.9 iDoor installation

2.7.4 Riser Card Installation

Riser cards should be inserted at the side of the box module through the track. After insertion, tighten the screws to affix the riser card in place.
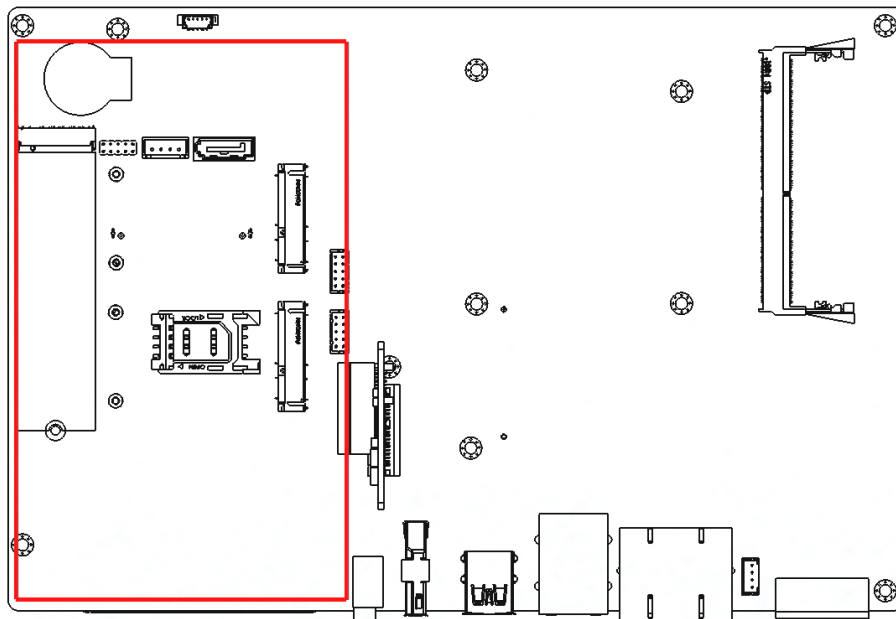
Figure 2.10 Riser card installation

2.7.5 SIM Card Installation via Mini PCIe

The SIM card should be inserted into the mini PCIe slot. Tighten the screw after insertion to affix the SIM card in place.
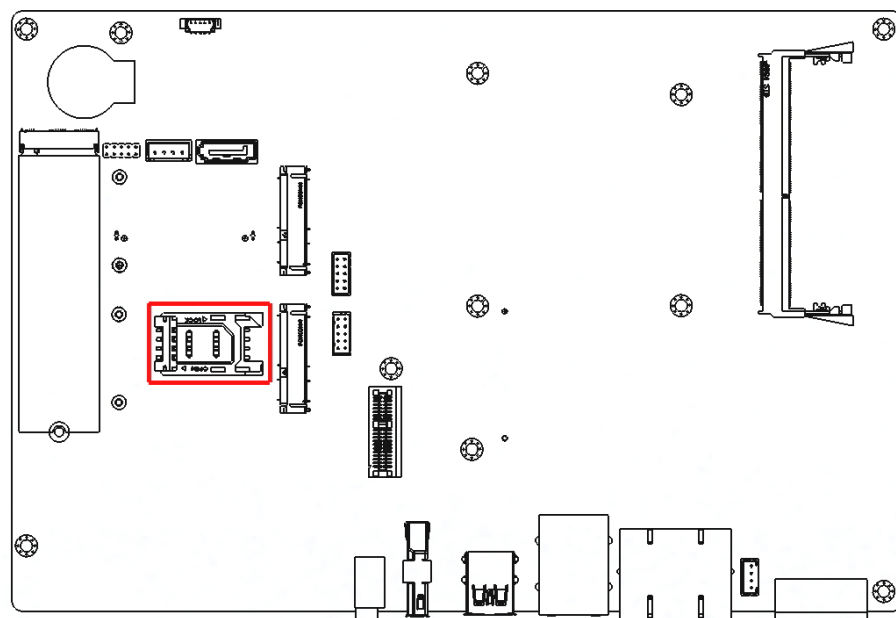
Figure 2.11 SIM card installation

2.7.6 NFC/RFID and Wi-Fi Module Installation

NFC/RFID and Wi-Fi modules should be installed on the front panel.

1. Open the bracket at the back of the front panel.
2. Insert the Wi-Fi module into the mPCIe slot, connect the antenna, and tighten the affixing screws.
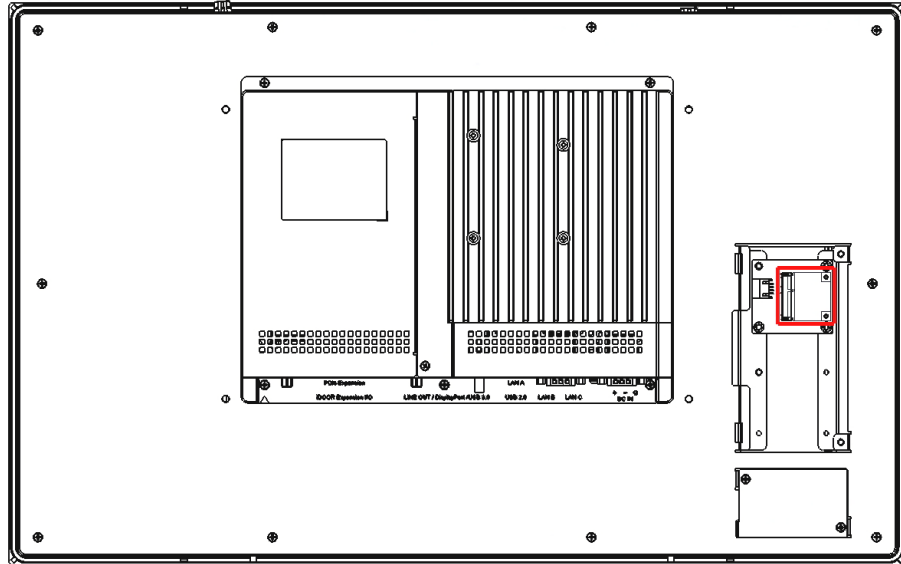
Figure 2.12 Wi-Fi module installation

3. Plug the USB cable into the NFC/RFID module and affix it in place using an adhesive.
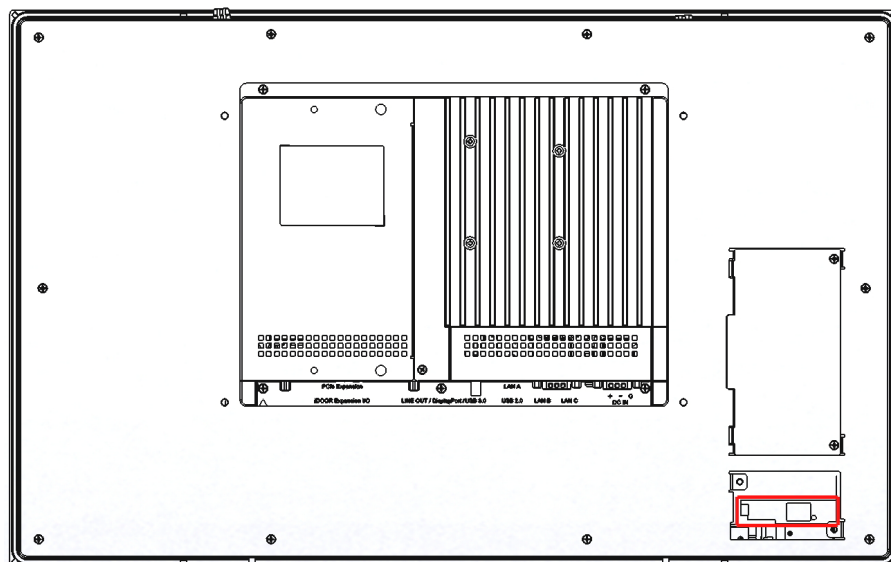
Figure 2.13 NFC/RFID module installation

Chapter 3

Features of Windows Embedded OS

3.1 Features of Windows Embedded OS

The TPC series systems support the embedded Windows OS platform. This chapter outlines the important features (EWF, FBWF, UWF, and HORM) that are provided in WES7.

3.2 Enhanced Write Filter (EWF)

Enhanced Write Filter (EWF) and File-Based Write Filter (FBWF) redirect all writes targeted at protected volumes to a RAM or disk cache, which is known as an overlay. Although the overlay stores any changes made to the operating system, it is deleted when the device is restarted, restoring the device to its original state. Note that there is no disk-based overlay support for Windows Embedded Standard 7.

EWF works at the sector level on protected disks and allows users to implement changes that persist when the device is restarted. EWF is useful for thin clients that do not need to store cached information or receive frequent updates. Changes made to a system protected by EWF are stored in one or more layers that represent snapshots in time. Applying changes to an image applies all changes made to the operating system during a specific period of time.

Advantech provides a utility to run EWF. Follow the steps outlined below to enable this function.

1. Access **Start Menu**->**All Programs**->**Advantech**-> **AdvWF** and then click **EWF Utility.**
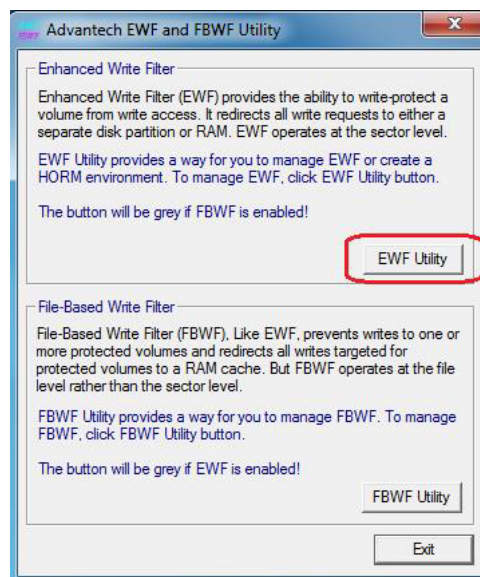
2. Access the EWF tab and click on the "Enable" button.
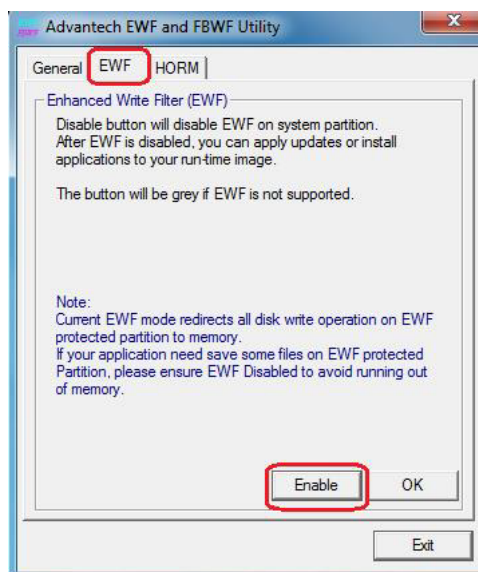
3. After the system is rebooted automatically, EWF functionality will be enabled.

3.3 File-Based Write Filter (FBWF)

File-Based Write Filter (FBWF) works at the file level instead of the sector level on protected disks. By default, FBWF protects the entire disk. However, selective write through exceptions can be granted to specific files and folders. Writes to folders with write-through exceptions will persist when the device is restarted.

Advantech provides a utility to run FBWF. Follow the steps outlined below to enable this function.

1. Access **Start Menu**->**All Programs**->**Advantech**->**AdvWF** and the click on **FBWF Utility.**
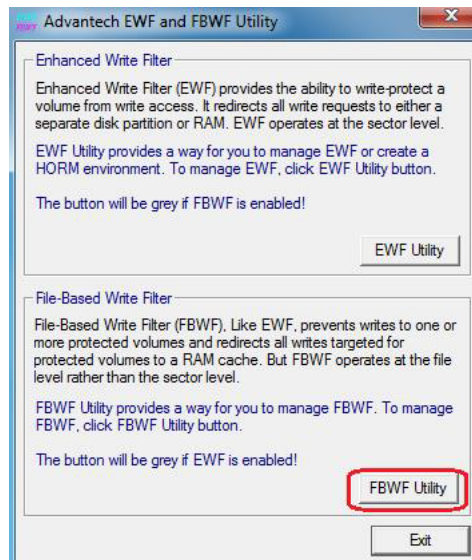
2. Move the volume you want to protect from "Available Volume" to "Protected Volume" and choose "Write-Through Files and Folders".
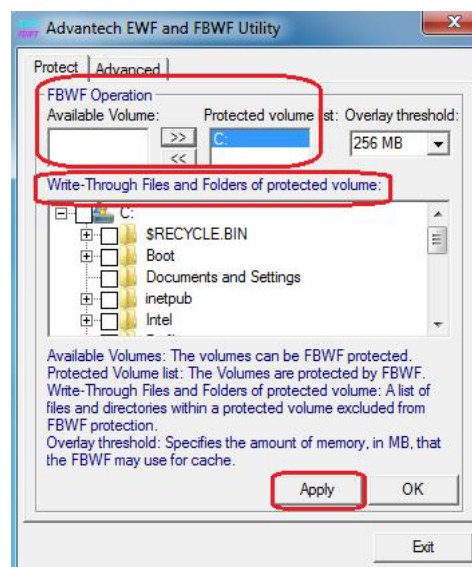
3. Click "Apply". The system will reboot automatically, after which FBWF will be enabled.

Chapter   4

Easy Installation

4.1 Easy Installation

With the easy installation design, a single person can complete the panel mount process. Simply follow the steps outlined below.

To install the TPC system into a cabinet

Step 1:

Models with a 4:3 screen ratio

1. Use the snap hooks at the top of the TPC unit to hook the system in the cabinet.
2. Release the pillars at the bottom of the TPC unit to install the system in the cabinet.
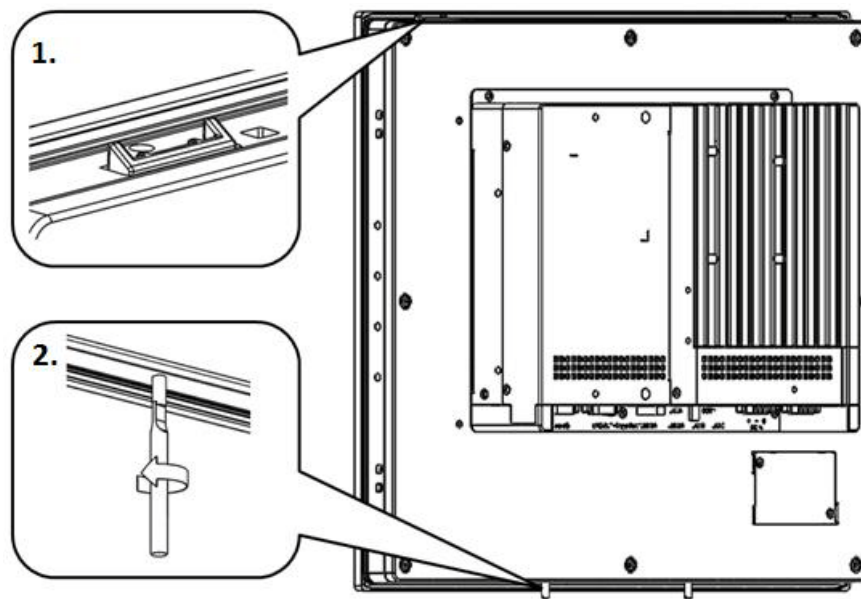
Models with a 16:9 screen ratio

1. Remove the screws and use the snap hooks to hook the TPC unit in the cabinet.
2. Release the pillars at the bottom of the TPC unit for balancing in the cabinet.
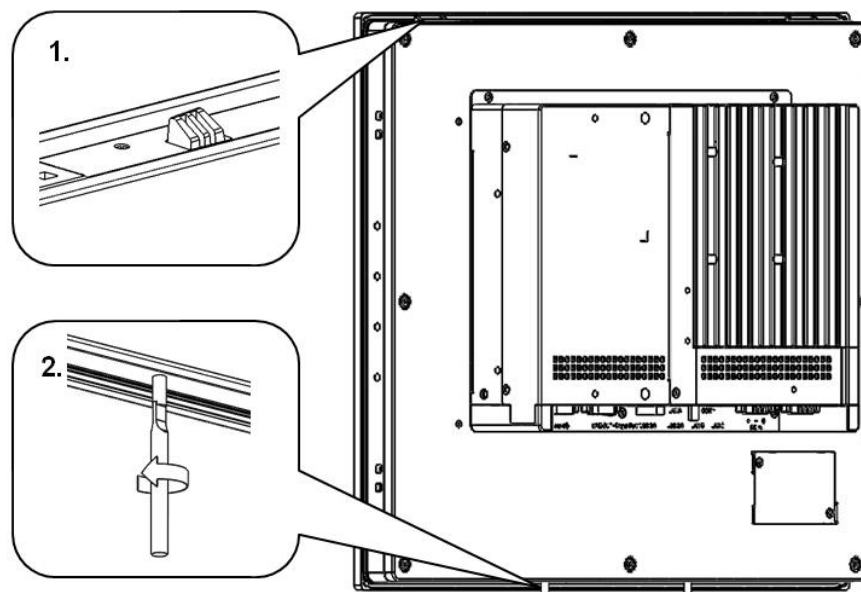
Step 2:

1. Place the TPC unit across the cabinet wall.
2. Push the upper part of the system towards the wall until the snap hooks flip back. The snap hooks will hold the machine on the wall.
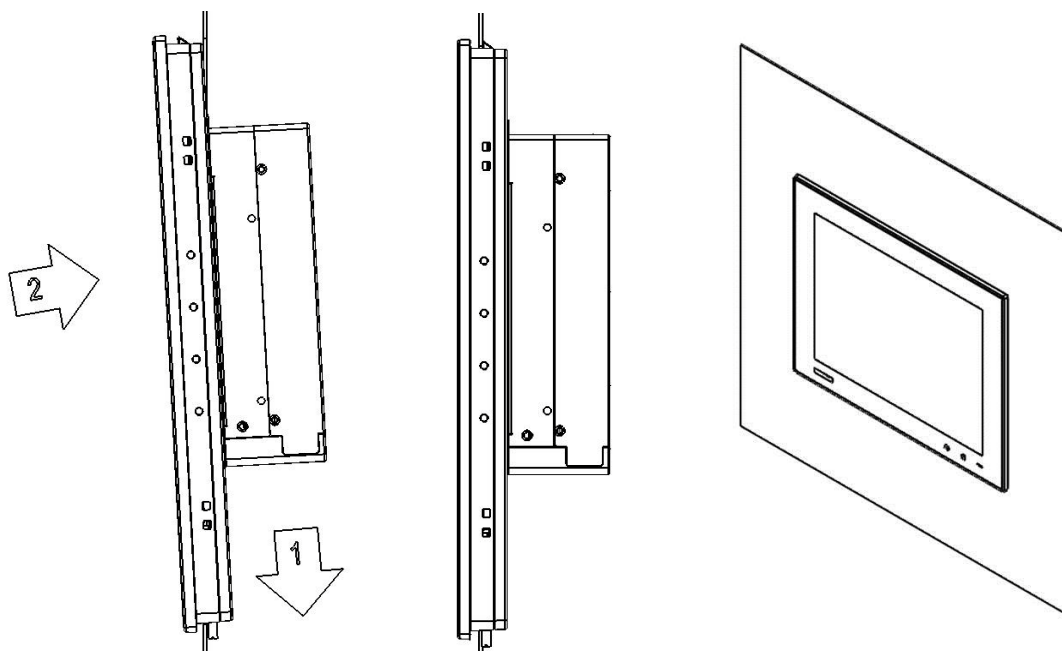
To remove the panel from a cabinet

1. For cabinets with a thickness of 2 mm or less, use a Ø≤ 4 mm stick to pull out the panel. For cabinets with a thickness of more than 2 mm, push the snap hooks to pull out the panel. Remember to hold the panel securely when pushing the snap hooks to release the panel.
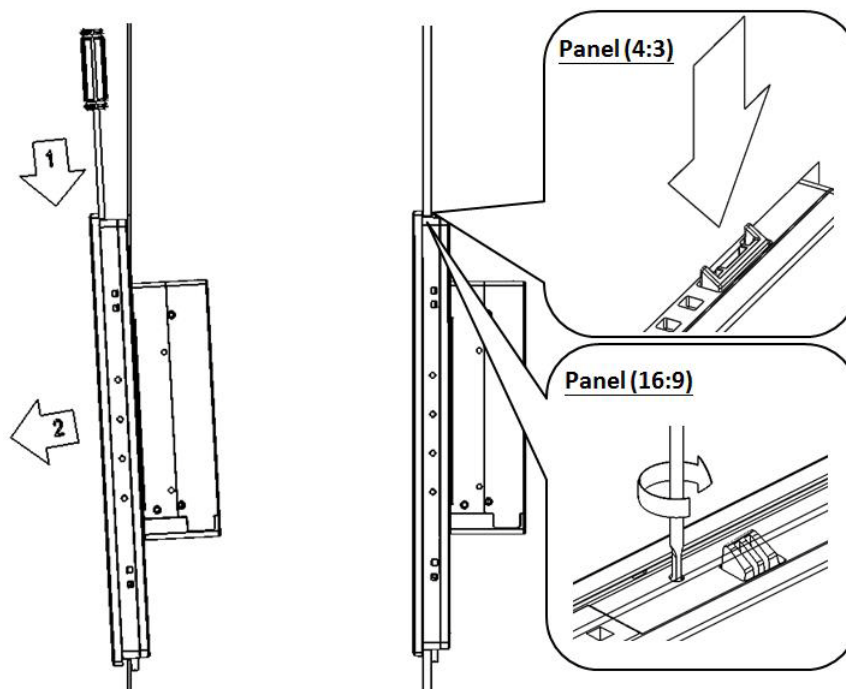
Panel (4:3)

Panel (16:9)

4.2 UI Operation

This section provides instructions for operating the HMI utility (GL_Utility), which can be downloaded from Advantech's TPC product support portal at http://support.advantech.com.

1. Located at the lower right corner of the front panel are two function buttons – the iKey and the home key. The ![info icon] icon represents the iKey, while ![home icon] represents the home key.

Table 4.1: Status Indicator Table	
Indicator	**Status**
Green	Power on
Orange	Standby
No light	Off
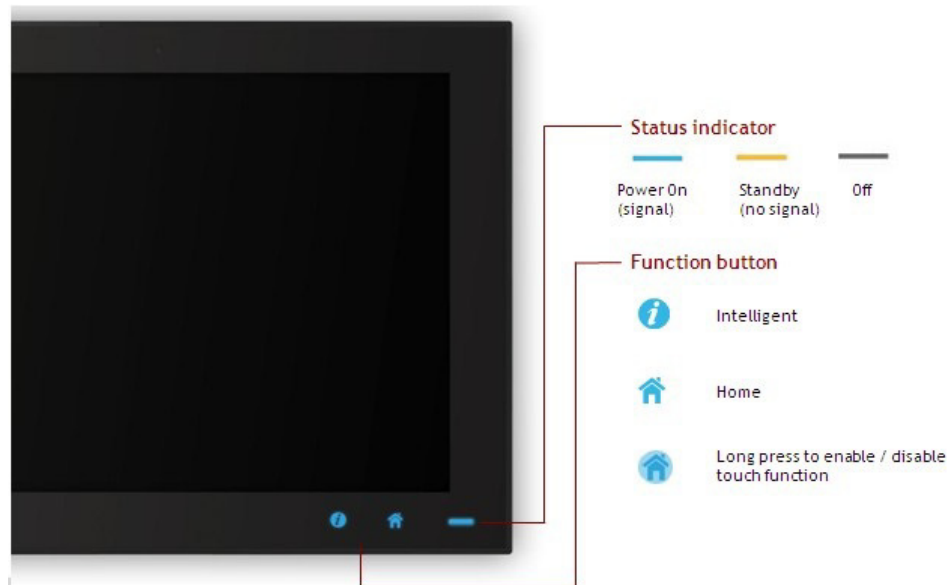
2.   Single press of the home key->

   Home – Back to desktop (default setting)

   Home - Execute home-key app (setup via the settings page)

3.   Long press of the home key->

   Home - Long press to disable/enable touch function
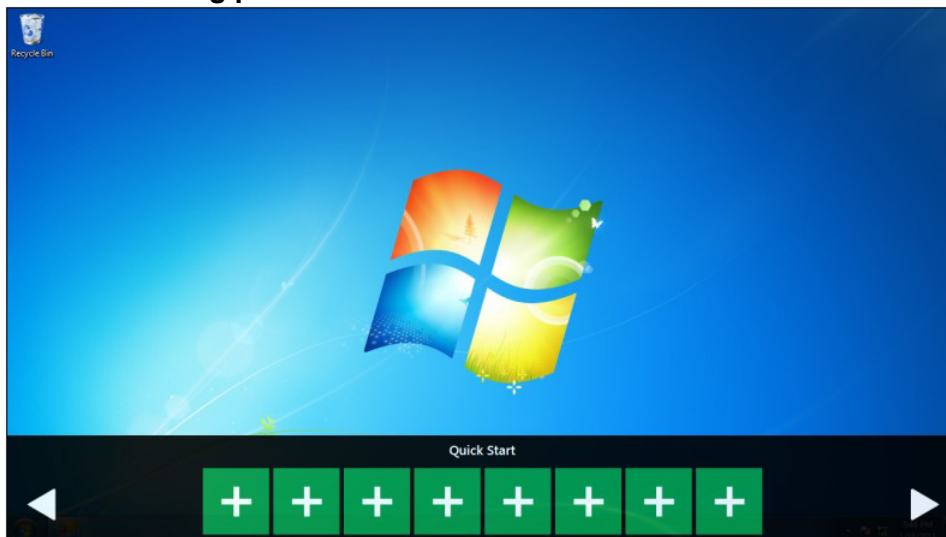
4. Single press of the iKey ->

GLToolbar Utility
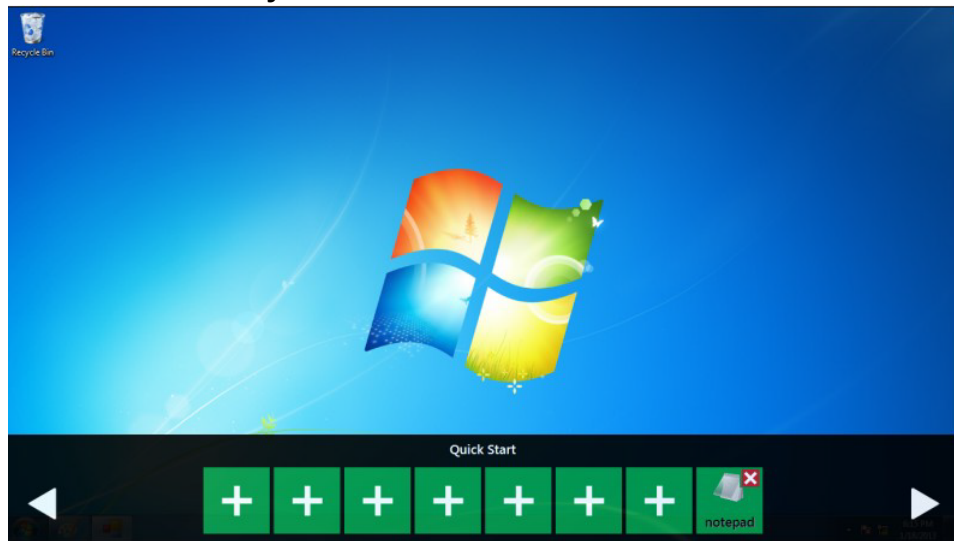
A. Quick start->
– Press "+" to add a shortcut
– Long press the iKey to perform a "right click" until an "X" mark appears in upper right corner to "delete"
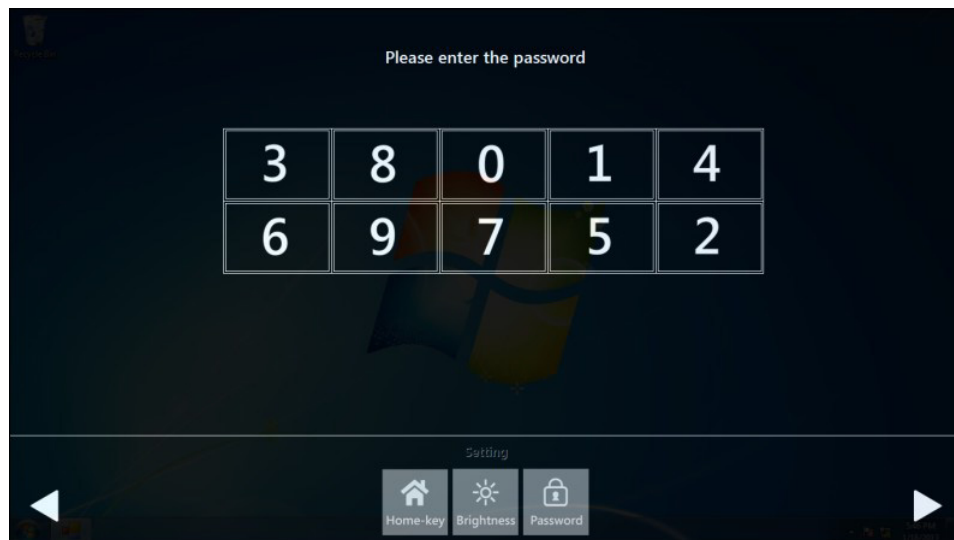
B. Setting ->

– A password is required for authorization confirmation upon initial login. The default password is "1234" without an input order to activate.
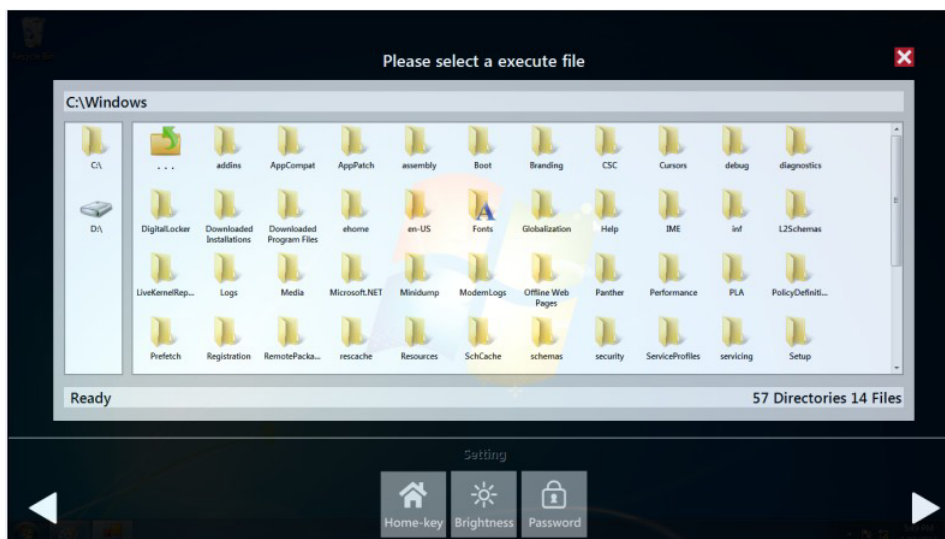
– Setting - Home key: Select an executable file to set as the home key app. The default path destination is desktop
– Setting - Brightness: Brightness control from 1 to 8
– Setting - Password: Change password function
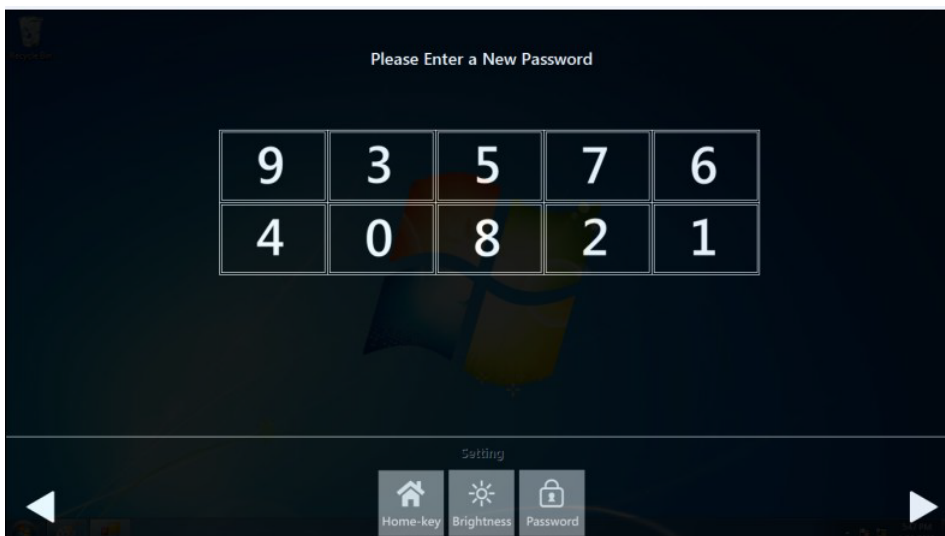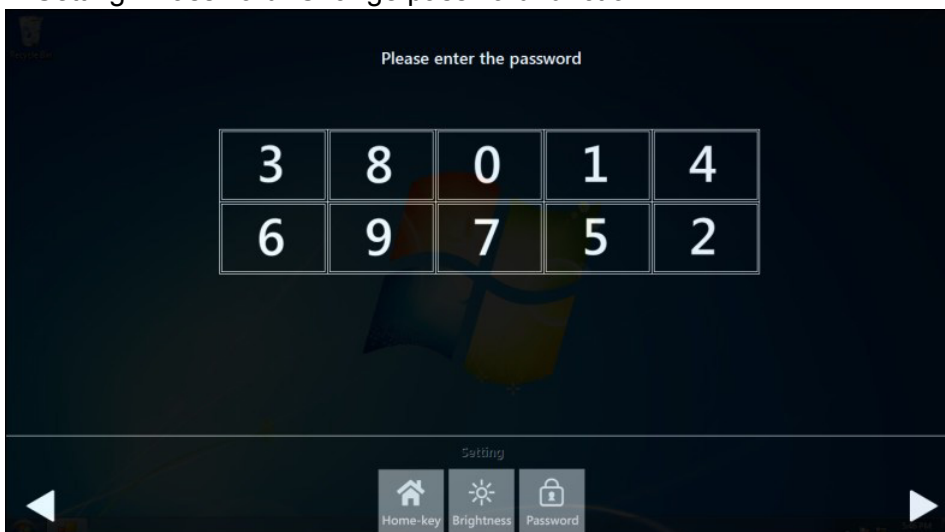
C. System management->

– System information
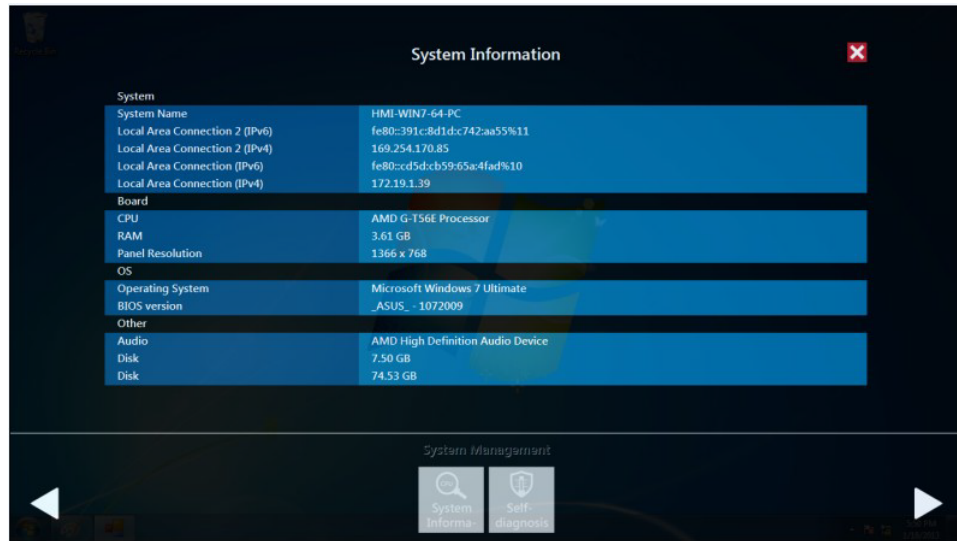
– Self diagnosis

Note!* *TPC-5000 series also provides open button code as following definition for customer's configuration to their Apps/SW applications. The codes are defined from general keyboard input.*

Table 4.2: Button Code Definition		
	Single Press	**Long Press**
iKey (icon)		
	Ctrl+Shift+Alt+I	Ctrl+Shift+Alt+U
Home Key (icon)		
	Ctrl+Shift+Alt+H	Ctrl+Shift+Alt+L

4.3 COM1: RS-232

Pin Definition
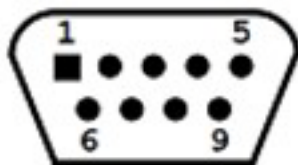
COM1

Pin	Signal
1	DCD
2	RX
3	TX
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

4.4 COM2: RS-422/485

The COM2 serial ports on the TPC series systems can be adjusted via the BIOS menu and set to RS-422 or RS-485 mode. This port is designed with automatic data flow control capabilities. In other words, the TPC series systems can automatically detect the data flow direction at this port when two-wire RS-485 communication is activated.

Pin Definition
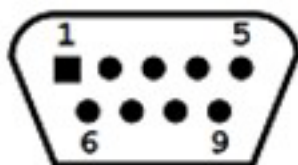
COM 2

Pin	Signal	
	RS-422	RS-485
1	TX-	D-
2	TX+	D+
3	Rx+	–
4	Rx-	–
5	GND	GND
6	–	–
7	–	–
8	–	–
9	–	–

4.5 RS-422/ 485 Mode Setting via BIOS

1. Restart the system and press the "Delete" key to enter the BIOS setup utility.

```
             Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Main Advanced  Chipset  Security  Boot  Save & Exit

      BIOS Information                                              ▲ Choose the system default
      BIOS Vendor                       American Megatrends           language
      Core Version                      5.0.1.1   0.32 x64
      Compliancy                        UEFI 2.4.0; PI 1.3
      Project Version                   EAMB 5510000U060X013
      Build Date and Time               03/28/2017 13:16:43
      Access Level                      Administrator

      Processor Information
      Name                              SkyLake
      Brand String                      Intel(R) Core(TM)
                                        i3-6100U CPU @ 2.30GHz
      Frequency                         2200 MHz
      Processor ID                      406E3                      →←: Select Screen
      Stepping                          D0/K0                      ↑↓: Select Item
      Number of Processors              2Core(s) / 4Thread(s)      Enter: Select
      Microcode Revision                88                         +/-: Change Opt.
      GT Info                           GT2                        F1: General Help
                                                                   F2: Previous Values
      IGFX VBIOS Version                1034                       F3: Optimized Defaults
      Memory RC Version                 1.9.0.0                    F4: Save & Exit
      Total Memory                      16384 MB                   ESC: Exit
      Memory Frequency                  2133 MHz

      PCH Information                                              ▼

             Version 2.18.1256. Copyright (C) 2017 American Megatrends, Inc.
```

2. Access the "Advanced" tab and select "IT8768E Super IO Configuration".

```
             Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
      Main Advanced  Chipset  Security  Boot  Save & Exit

      Setup Item Hidden                 [Disabled]                 ▲ System Super IO Chip
    ▶ Trusted Computing                                              Parameters.
    ▶ ACPI Settings
    ▶ Intel ICC
    ▶ AMT Configuration
    ▶ OverClocking Performance Menu
    ▶ PCH-FW Configuration
    ▶ SMART Settings
    ▶ IT8768E Super IO Configuration
    ▶ Embeded Controller Configuration
    ▶ Intel(R) Bios Guard Technology
    ▶ S5 RTC Wake Settings
    ▶ Serial Port Console Redirection
    ▶ CPU Configuration                                           →←: Select Screen
    ▶ Intel TXT Information                                       ↑↓: Select Item
    ▶ Platform Misc Configuration                                 Enter: Select
    ▶ SATA Configuration                                          +/-: Change Opt.
    ▶ Thermal Configuration                                       F1: General Help
    ▶ Acoustic Management Configuration                           F2: Previous Values
    ▶ PCI Subsystem Settings                                      F3: Optimized Defaults
    ▶ Network Stack Configuration                                 F4: Save & Exit
    ▶ CSM Configuration                                           ESC: Exit
    ▶ NVMe Configuration
    ▶ Switchable Graphics
    ▶ USB Configuration                                           ▼

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```

3. Select the "Serial Port 2 Configuration (COM2)" option to configure the RS-422/ 485 mode.

```
                Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

 IT8768E Super IO Configuration                              Set Parameters of Serial Port
                                                             2 (COMB)
 Super IO Chip                        IT8768E
▶ Serial Port 1 Configuration
▶ Serial Port 2 Configuration



                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



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```

4. Select the "RS-422/485 mode" option.

```
                Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
        Advanced

 Serial Port 2 Configuration                                 RS422/RS485 mode
                                                             RS232 mode.
 Serial Port                          [Enabled]
 Device Settings                      IO=2F8h; IRQ=3;

 Change Settings                      [Auto]

 COM2 Uart mode setting               [RS232 mode]


                    ┌─── COM2 Uart mode setting ───┐
                    │ RS232 mode                    │
                    │ RS422/RS485 mode              │
                    └───────────────────────────────┘       ←: Select Screen
                                                             ↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



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```

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