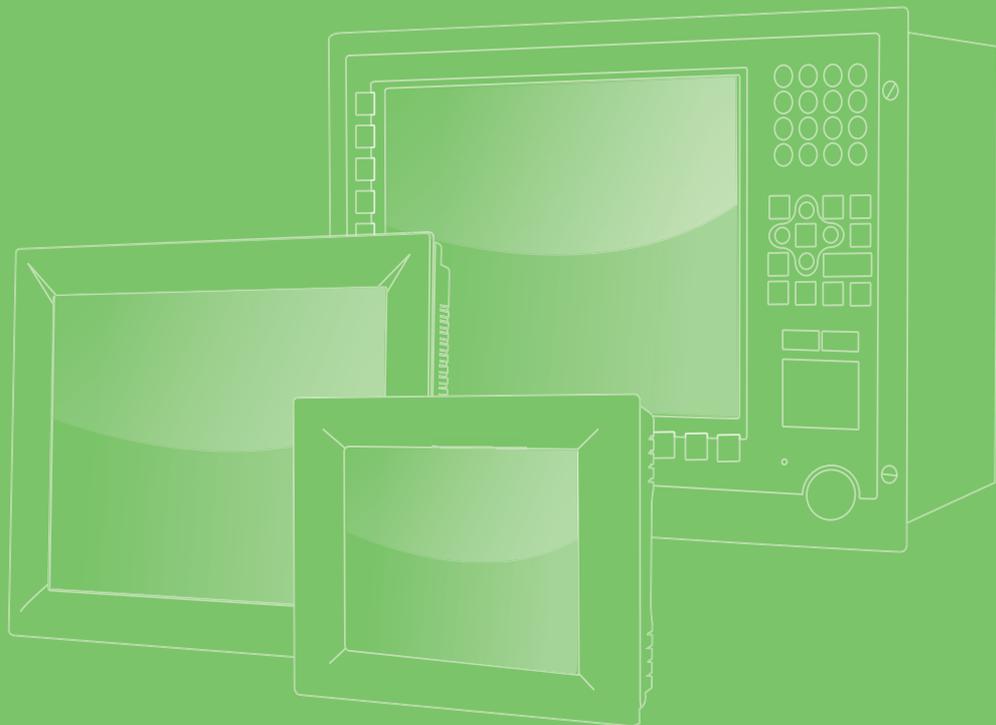


User Manual



SPC-xx81

**Stationary Multi-Touch Panel
Computer with Intel Core i
Processor**

ADVANTECH
eAutomation

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This Manual Covers the Following Models:

- SPC-1881

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each 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 which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which 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 of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

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 you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it 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 kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

Note: 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 which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at <http://support.advantech.com> where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages
3. This product is intended to be supplied by a listed power supply complying with UL60950-1; rated 24V_{DC}, 1.5A.

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it 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. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. 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 by transient overvoltage.
12. Never pour any liquid into an 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 situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's 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 GO BELOW -20° C (-4° F) OR ABOVE 60° C (140° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Caution! *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.*



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Chapter 1

General Information

1.1 Introduction

Winner of the 2013 iF product design award, the SPC-1881 series have high resolution 18.5" 16:9 widescreen PCT multi-touch displays. By embedding an Intel Core i3-4010U 1.70 GHz processor with an independent GPU, the SPC-1881 supports advanced graphical performance in more complex applications. Built-in function and home key buttons are used for intuitive UI and operating safety. The SPC-1881 also includes a Mini-PCIe slot for communication function expansion. Moreover, the SPC-1881 includes an all around waterproof design with M12 connectors. With this vertical I/O connector, cable routing can be an easy job in stationary / VESA Arm applications.

The following are the key features:

- 18.5" WXGA /21.5" Full HD TFT LED LCD display
- Intel Core i3-4010U 1.70 GHz Processor
- 16:9 wide screen with PCT multi-touch
- Built-in function and home key button used for intuitive UI
- Anti-scratch touch surface: 7H hardness
- All around IP65 with waterproof M12 connector
- Support Mini-PCIe expansion slot
- Front LED indicator to show operating status
- Fanless cooling system
- Winner of the 2013 iF product design award

1.2 Packing List

- 4 x VESA Mount Screws
- 4 x HDD Tray Screws
- 1 x SPC Driver DVD
- 1 x Registration and Warranty Card
- 1 x Simplified Chinese Manual
- 1 x China ROHS list

1.3 Specifications

1.3.1 General

- Certification: BSMI, CCC, CE, FCC Class A, UL
- Cooling System: Fanless design
- Dimensions (W x H x D): 488 x 309 x 65mm
- Enclosure: Front bezel: Die-cast Aluminium alloy
Back housing: Die-cast Aluminium alloy
- Mounting: VESA Arm
- OS Support: Microsoft® Windows WES7 32bit/64bit / Windows 7 32bit/64bit / Win EMB 8.1 Industry Pro / Windows 10 IOT Enterprise
- Weight (Net): SPC-1881WP: 8 kg (17.64 lbs)

1.3.2 System Hardware

- CPU: Intel® Core™ i3-4010U 1.70 GHz Processor
- BIOS: AMI UEFI 128 Mbit
- Chipset: Integrated Intel 8 Series Chipset
- Memory: 4GB SO-DIMM DDR3L SDRAM
- LAN: 10/100/1000Base-T x 2 (connection: M12 A-coded, 8-pin female)
- Storage: 2.5" SATA HDD bracket x 1
- I/O: RS-232 x1 (connection: M12 A-coded, 8-pin male)
USB 2.0 x1 (connection: M12 A-coded, 8-pin female)
24 V_{DC} power input (connection: M12 A-coded, 5-pin male)

1.3.3 Environment

- Humidity: 10 ~ 95% RH @ 40°C, non-condensing.
Note: Tested for 48hrs
- Ingress Protection: All around IP65
- Operating Temperature: 0 ~ 55°C (32 ~ 131°F)
- Storage Temperature: -20 ~ 60°C (-4 ~ 140°F)
- Vibration Protection With HDD: 1 Grms (5 ~ 500 Hz) (Operating, random vibration)

1.4 LCD Specifications

Display Type	WXGA LED LCD
Size (diagonal)	18.5"
Maximum Resolution	1366 x 768
Maximum Colors	16.7 M
Viewing Angle	170°/160°
Luminance (cd / m2)	300
Backlight	LED

Note! *There might be several bright or dark pixels on the LCD. This phenomenon is normal in today's LCD manufacturing.*



1.5 Touchscreen Specifications

- **Touch Type:** Projected Capacitive
- **Base Glass Construction:** Tempered glass
- **Light Transmission:** ≥88%
- **Controller:** USB Interface

1.6 Power

- **Input Voltage:** 24V_{DC} (Typical)
- **Power Consumption:**
SPC-1881WP: 35W (Typical)

1.7 I/O Ports Arrangement

The arrangement of the I/O ports is shown in Figure 1.1



Figure 1.1 SPC-1881 Rear View- I/O Port Arrangement

1.8 VESA Mounting

The SPC-1881 have been designed with support for the VESA mount standard. Refer to figure 1.2. Supports 100mm VESA dimension. Use M4 screws (Length 8mm to 10 mm).

Warning! Use suitable mounting apparatus to avoid risk of injury.

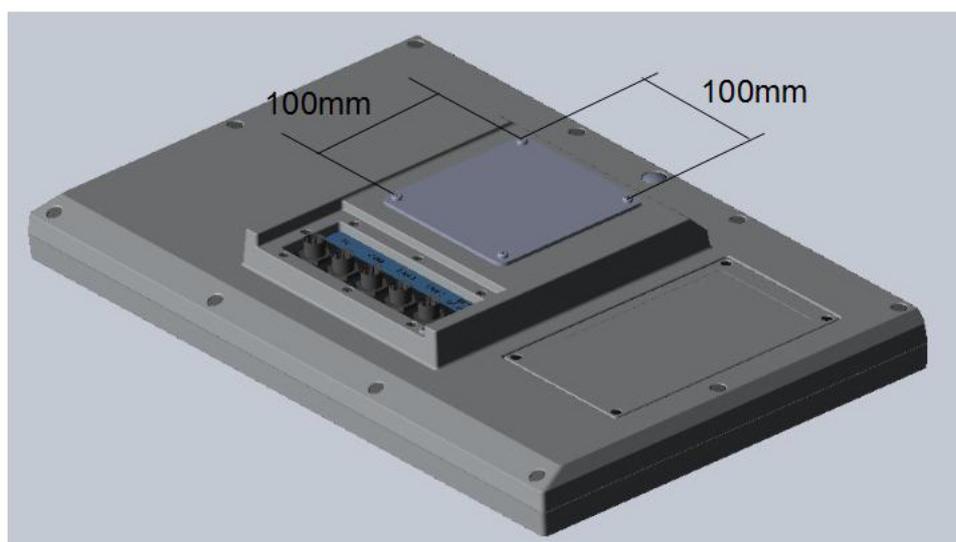


Figure 1.2 VESA Mounting

1.9 Dimensions and Cutout

SPC-1881WP

- **Weight:** 8kg
- **Dimensions (W x H x D):**
 - 488 x 309 x 65mm (19.21" x 12.17" x 2.56")

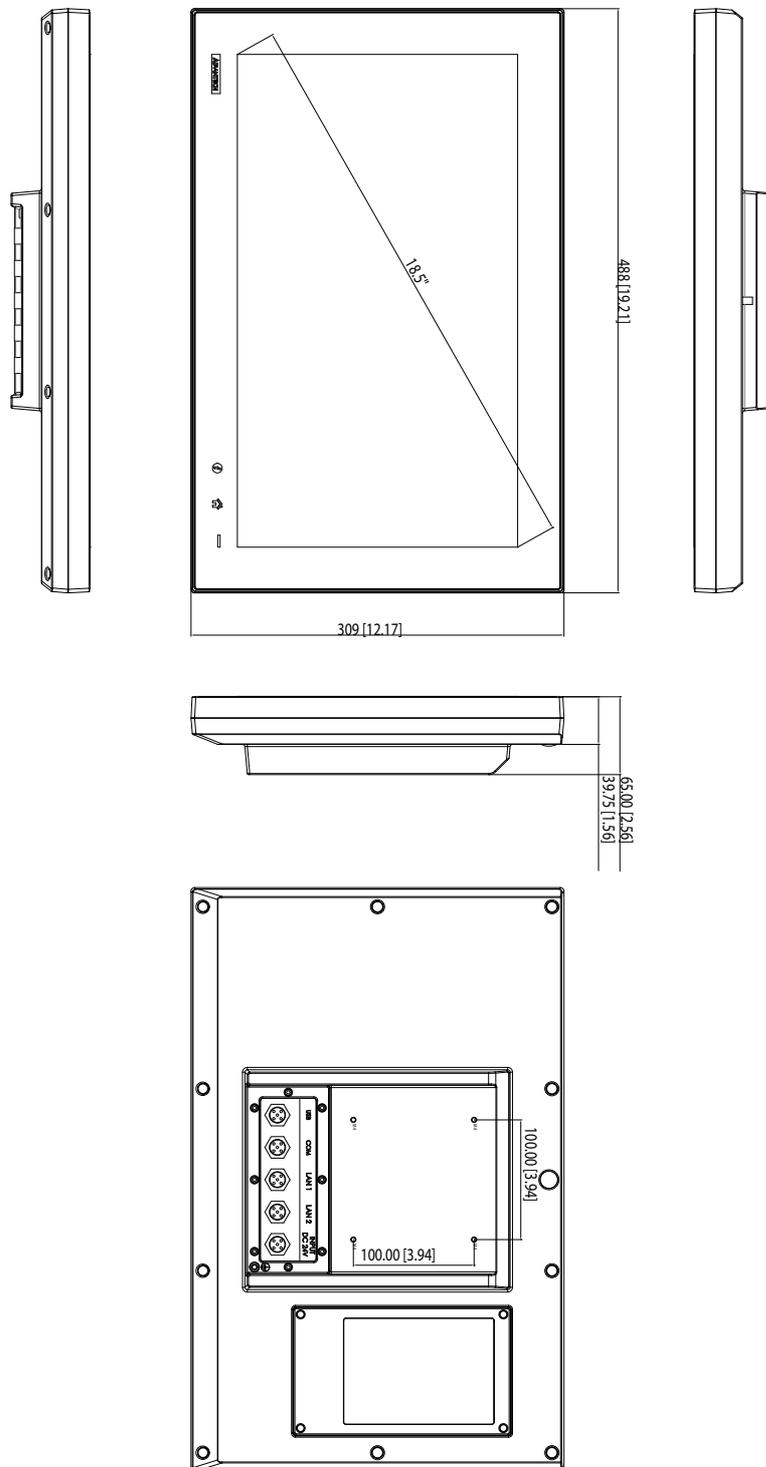


Figure 1.3 SPC-1881WP Dimensions

Chapter 2

System Setup

2.1 System Setup

You can easily get SPC started by following the below steps.

1. Unpack the SPC package. Check the packing list at the beginning of this manual to make sure all items have been included.



Figure 2.1 Unpack the Package

2. Open side cover and then install 2.5" HDD in the HDD tray which contains Windows Embedded Standard 7, Windows Embedded Standard 2009 or another operating system. Then fix the side cover with screws, after that stopper the screw hole with waterproof rubber.

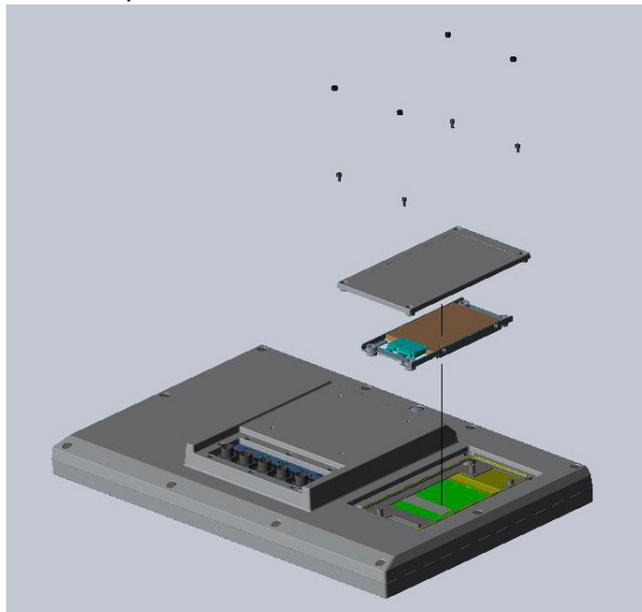


Figure 2.2 2.5" Hard Disk Drive

3. Connect the power connector with M12 connector to the 24 V_{DC} power lines. The power lines can either be of some power adapter or in-house power source.
- 4.

Power Input	Pin Number	Signal	(Male)
M12-A-5P-M Power	1	DC 24V-	
	2	DC 24V-	
	3	DC 24V+	
	4	DC24V+	
	5	F_GND	

Figure 2.3 Pin Definition of Power Connector

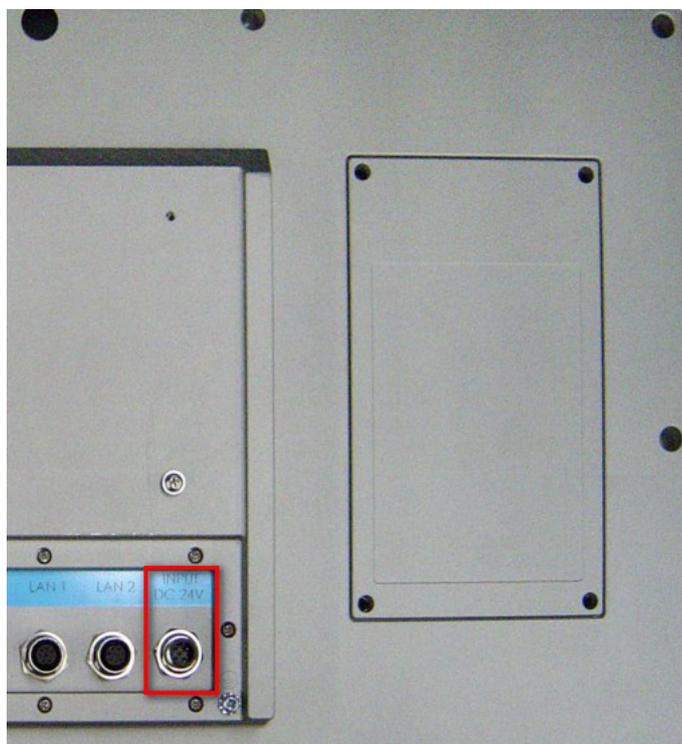


Figure 2.4 Power Receptor with M12 Connector

5. Plug the power lines into the system power receptor with M12 connector.
6. Power on the system.

2.2 Installing the Drivers

2.2.1 Installation of Touch Screen driver

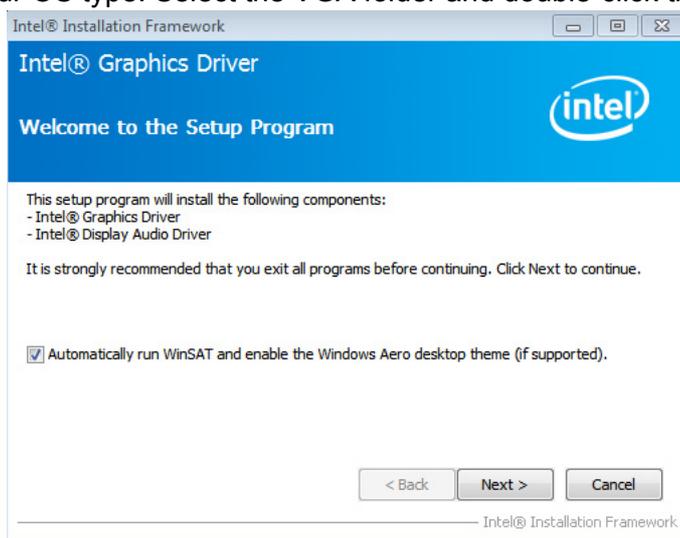
SPC-1881 will use built-in PCT touch driver of OS If operating under Windows.

Note! *If you are using Windows 7 or above, the OS has a built-in driver for multi-touch so that you don't need to install the Touch Screen Driver.*

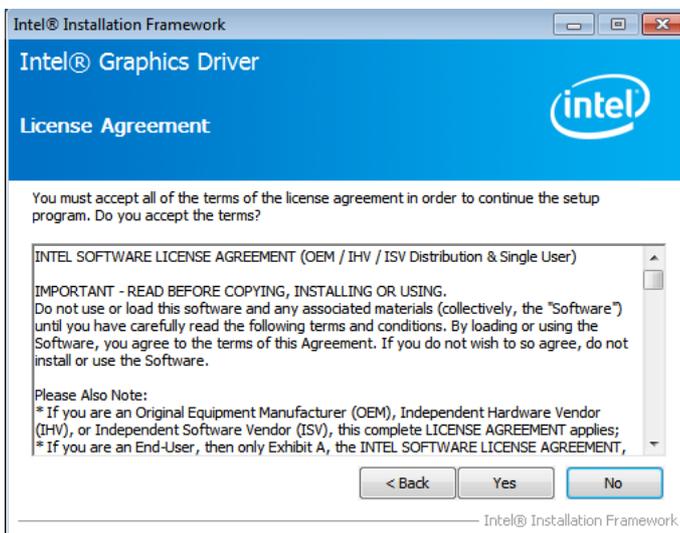


2.2.2 Installation of graphic driver

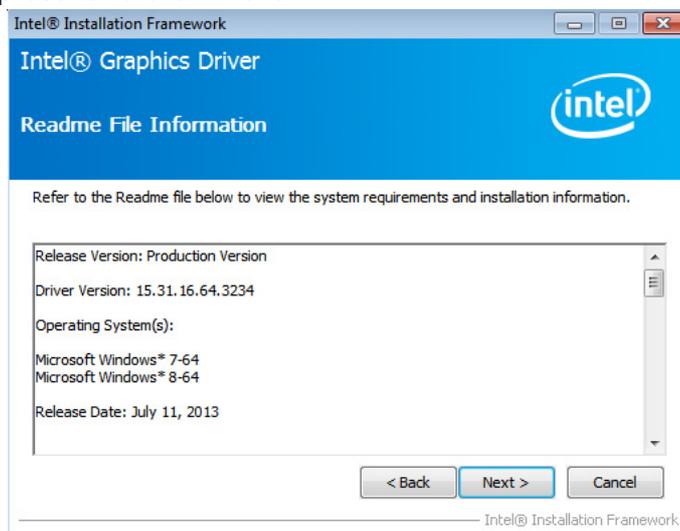
1. There is a VGA driver on the DVD, enter X:\TPC_SPC-xx81WP series then choose your OS type. Select the VGA folder and double-click the setup icon.



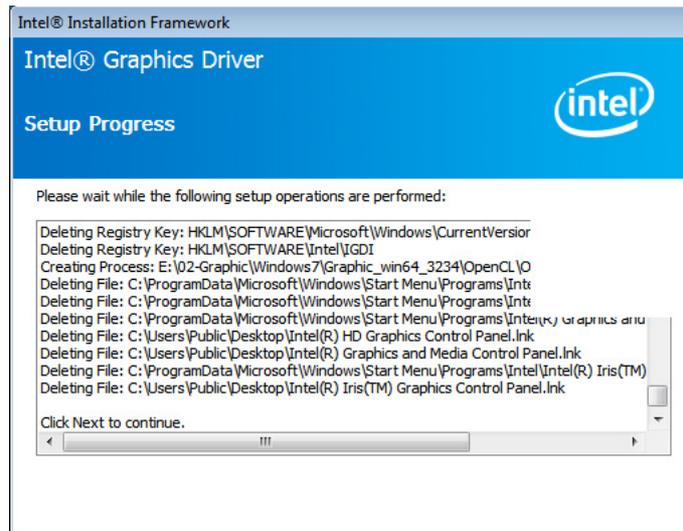
2. Click "Install"



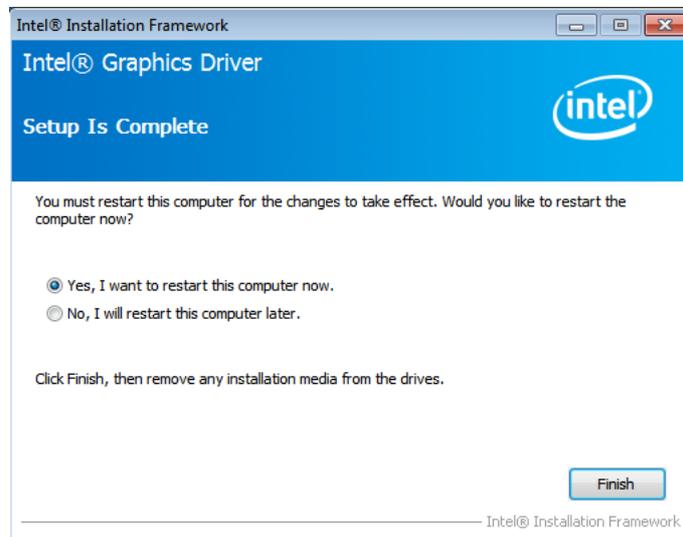
3. Select "Express" and click "Next"



4. Click **“Next”**

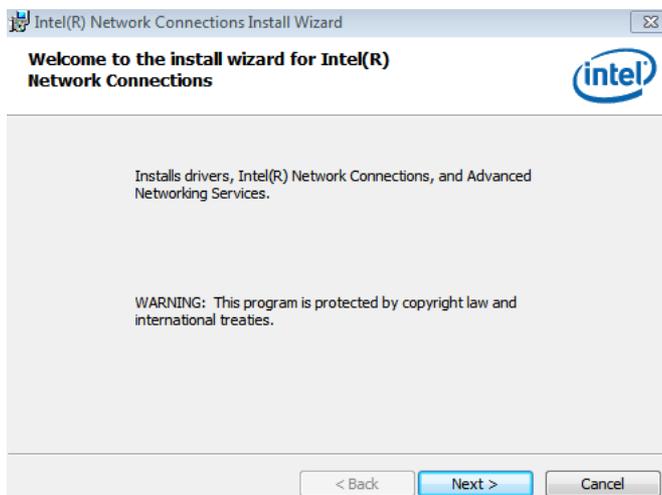


5. Click **“Finish”** to finish the installation

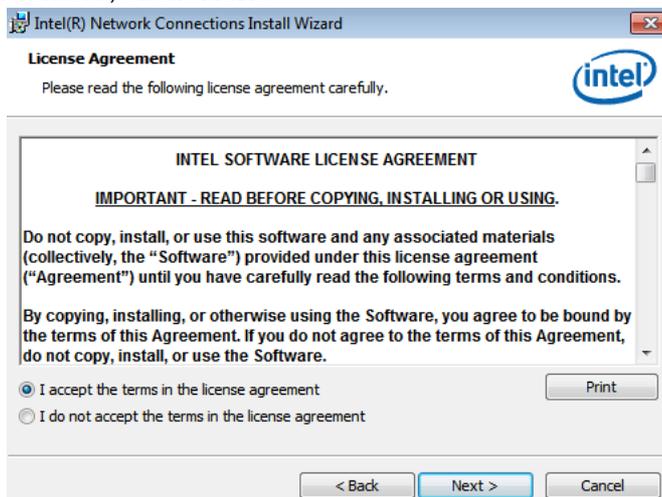


2.2.3 Installation of LAN driver

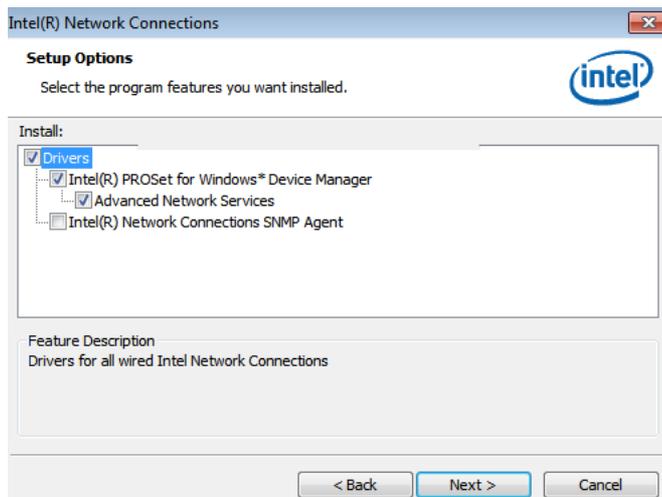
1. Enter X:\TPC_SPC-xx81WP series then choose your OS type. Select LAN folder and double click the setup icon, and then click “Next” under setup wizard window.



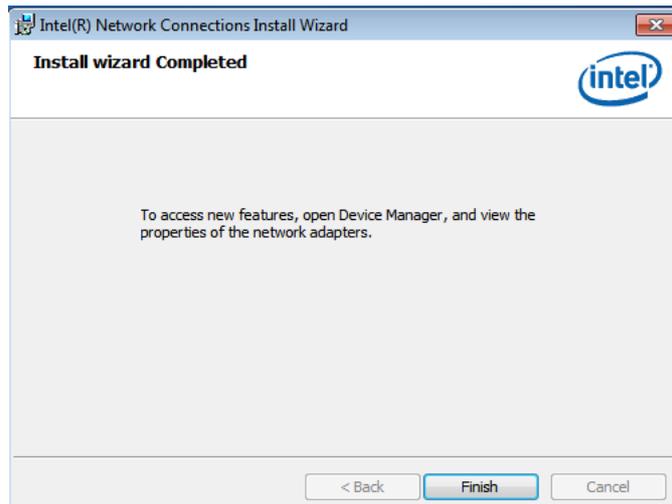
2. License Agreement, click “Next”



3. Click “Install”

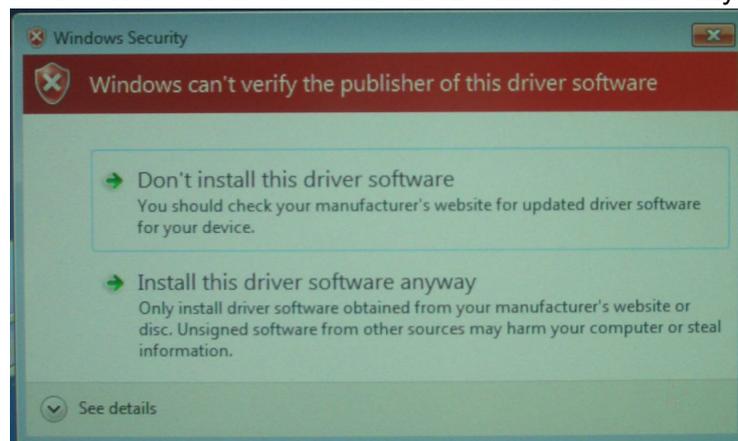


4. Click “Finish” to finish the installation



2.2.4 Installation of EC Driver

1. Select “Advantech IAG tool” folder then enter EC folder. Double click “V1.05.001”.
2. Click “Yes” and “Next” then select “Install this driver software anyway”.



3. Select finish then restart your computer.

2.2.5 Installation of EC Brightness Driver

1. Select “Advantech IAG tool” folder then enter “EC Brightness” folder. Double click “V2.02.002”.
2. Click “Yes” and “Next” then select “Install this driver software anyway”.



3. Select finish then restart your computer.

2.2.6 Installation of Lmsensor

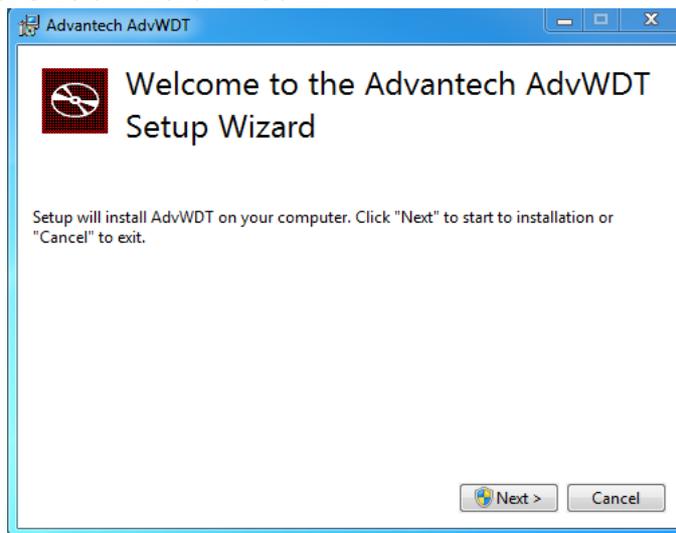
1. Select “Advantech IAG tool” folder then enter “Lmsensor” folder. “V2.02.003”.
2. Click “Yes” and “Next” then select “Install this driver software anyway”.



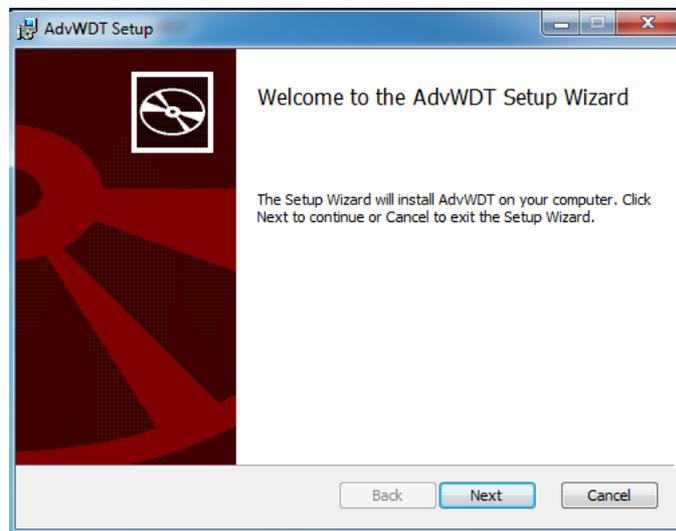
3. Select finish then restart your computer.

2.2.7 Installation of Watchdog driver

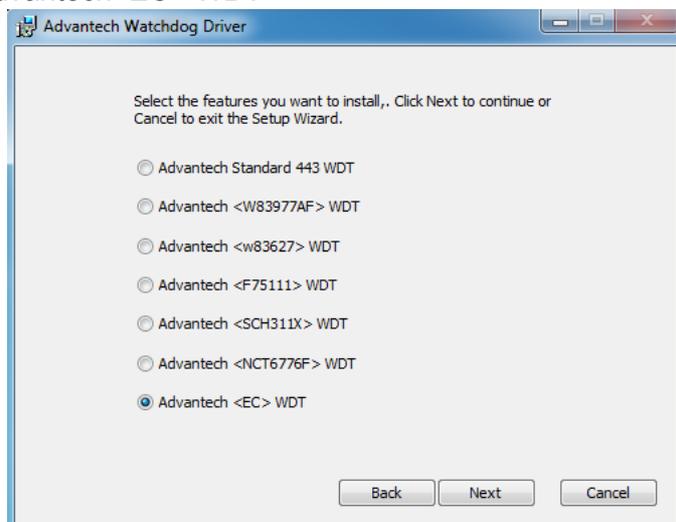
1. Enter into Watchdog folder, double click AdvWDT icon, and then click **"Next"** under InstallShield Wizard window..



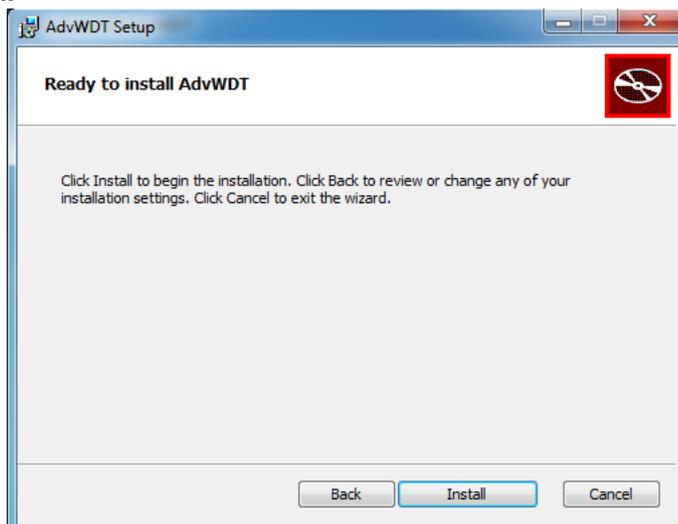
2. At the welcome screen select click **"Next"**



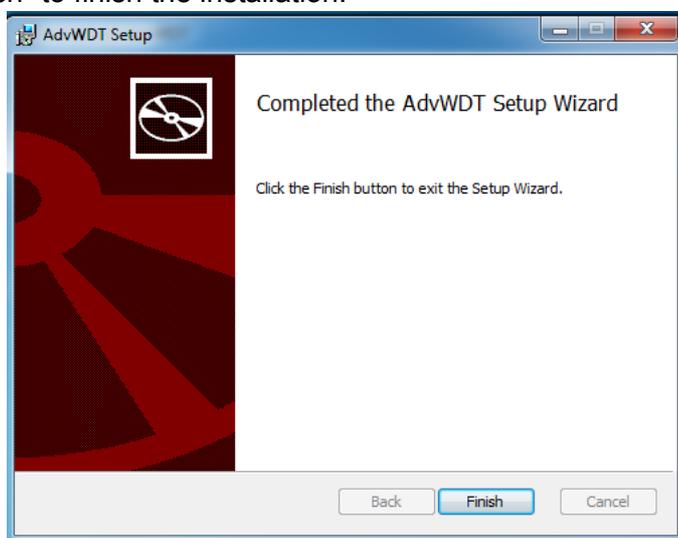
3. Select "Advantech<EC> WDT"



4. Click **“Install”**



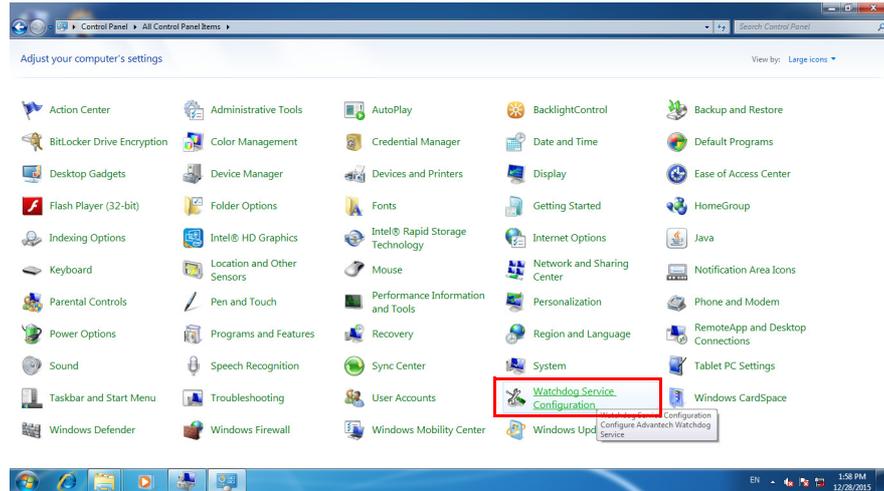
5. Click **“Finish”** to finish the installation.



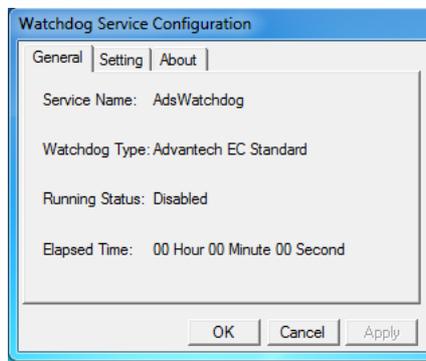
6. Select **“Restart”**



7. After installing Watchdog driver, a "Watchdog Service Configuration" icon will show in control panel.



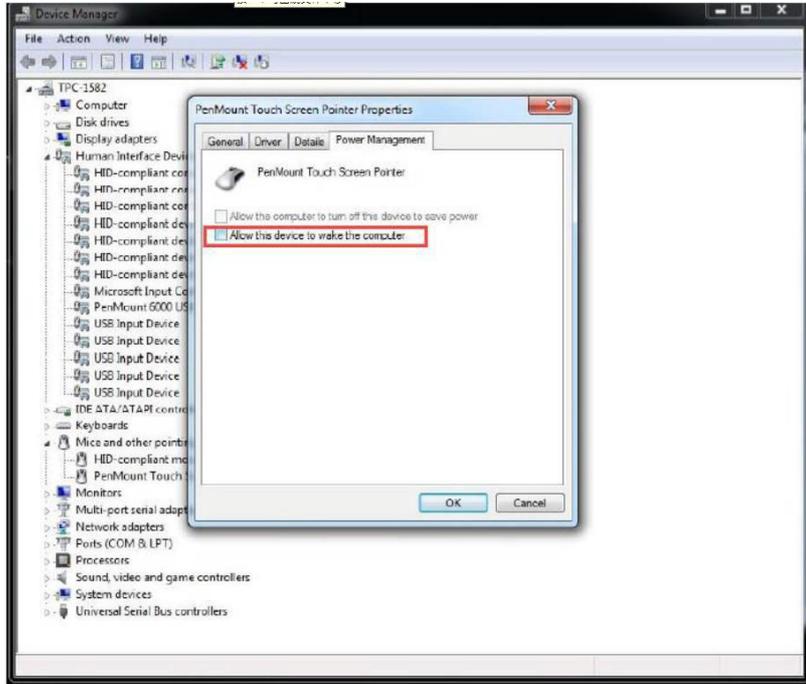
8. Double click the "Watchdog Service Configuration" icon, and you can configure the Watchdog timer function.



2.3 Wake up from Suspend Mode

Brief Solution - Step by Step:

1. Enable “allow this device to wake the computer” in device manager -> **Human interface device** -> **HID compliant consumer and control, HID compliant device**-> **power management**.
2. Double click and select power management page, then enable "Allow this device to wake the computer”.



Chapter 3

Features in Windows
Embedded

3.1 Features in Windows Embedded Platform

SPC products support the Windows Embedded platform. This section outlines the important features (EWF, FBWF and HORM), that are provided in WES7, and UWF provided in Windows Embedded 8 Standard and also in Windows 10 IoT Enterprise.

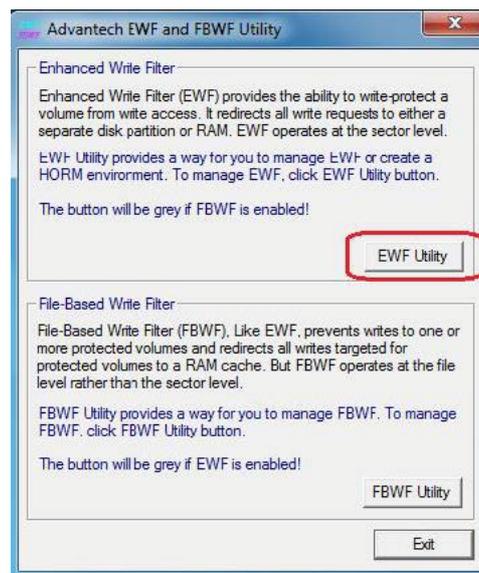
3.2 Enhanced Write Filter (EWF)

Enhanced Write Filter (EWF) and File-Based Write Filter (FBWF) redirect all writes targeted at protected volumes to a RAM or disk cache, called an overlay. The overlay stores changes made to the operating system, but is removed 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.

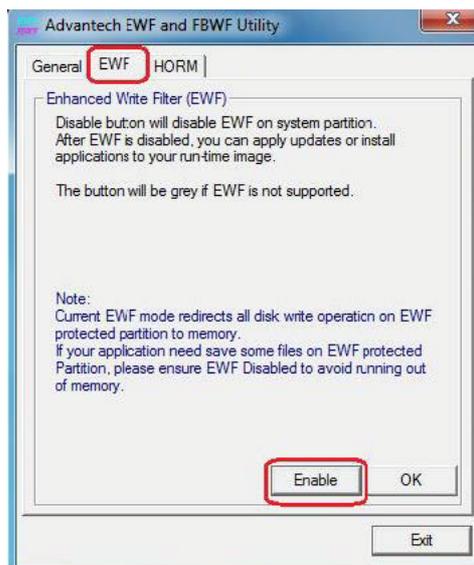
EWF works at the sector level on protected disks and allows you to commit changes so that they persist when the device is restarted. EWF is useful for thin clients that do not need to store cached information or receive frequent updates. Changes made to a system protected by EWF are stored in one or 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 provide utility to operate EWF. Refer below steps if you want to enable.

1. Click **Start Menu->All Programs->Advantech->AdvWF** and click **EWF Utility**



2. Click **EFW tab**, and click **“Enable”** button



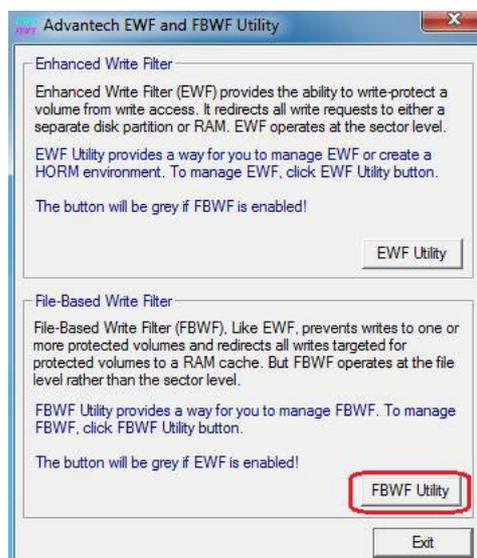
3. After the system automatically reboots , EWF is enabled

3.3 File-Based Write Filter (FBWF)

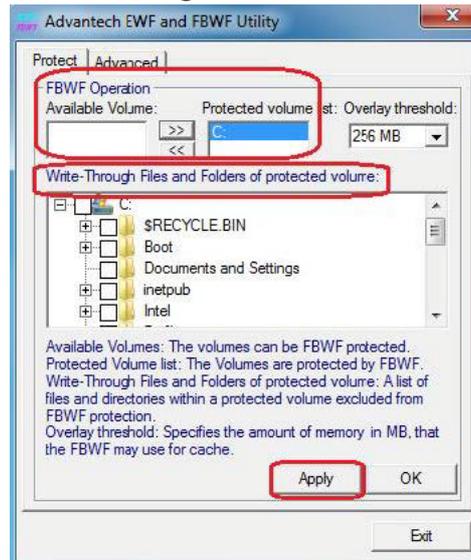
File-Based Write Filter (FBWF) works at the file level instead of the sector level on protected disks. By default, FBWF protects the whole disk, but selective write through exceptions can be granted to specific files and folders. Writes to folders with write-through exceptions will be persisted when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

Advantech provide utility to operate FBWF. Refer to the below steps if you want to enable it.

1. Click **Start Menu->All Programs->Advantech->AdvWF** and click **FBWF Utility**



2. Move volume you want to protect from “Available Volume” to “Protected Volume” and choose “Write-Through Files and Folders”

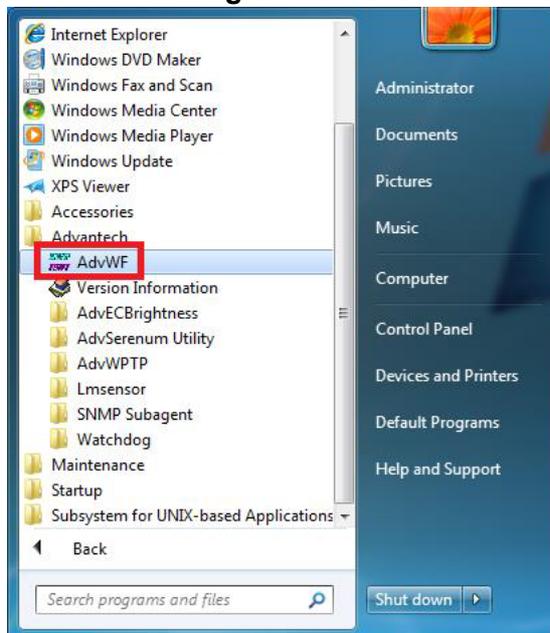


3. Click “Apply”, and the system is rebooted automatically. Then FBWF is enabled.

3.4 HORM

HORM stands for Hibernate Once Resume Many. In HORM environment, a single hibernation file is used to boot the system repeatedly. To set a HORM environment, follow the steps below.

1. Make sure EWF is disabled. You can run OSUnLock to disable EWF.
 - a. Click **Start Menu->All Programs->Advantech->AdvWF**

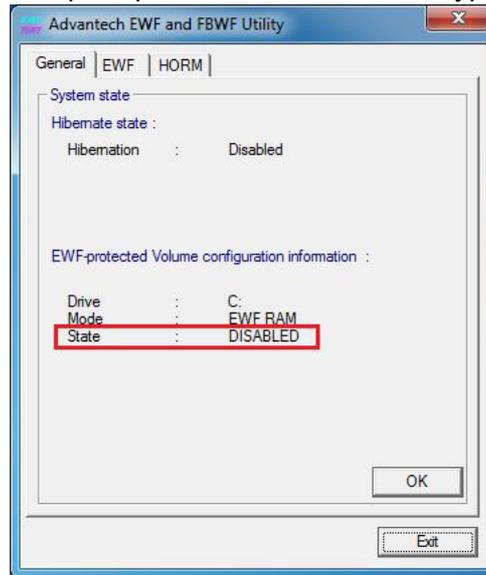


- b. Click EWF Utility and go to General page to check EWF is disabled.

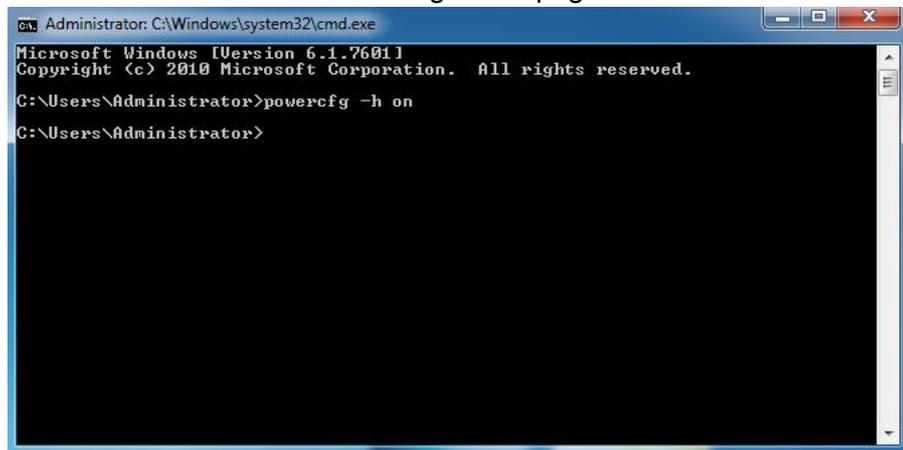


2. Enable Hibernate

a. Open command prompt as Administrator and type "powercfg -h on"

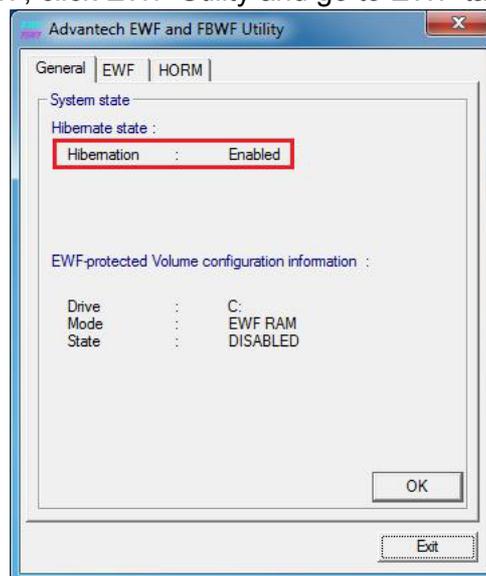


b. Check the hibernate state in general page.

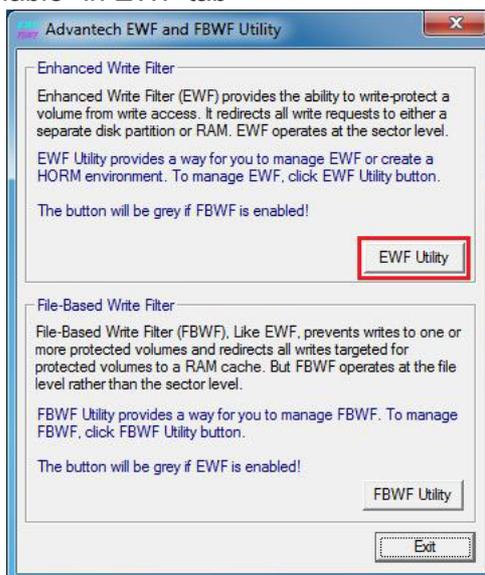


3. Enable HORM

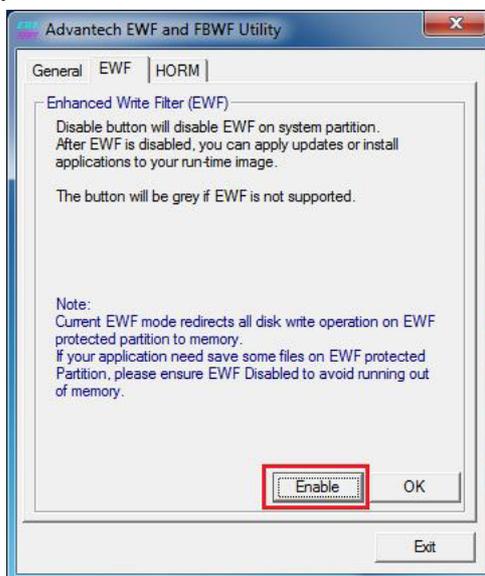
a. Open AdvWF, click EWF Utility and go to EWF tab



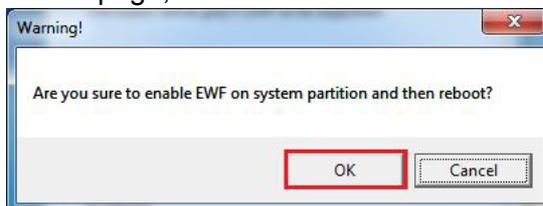
- b. Click "Enable" in EWF tab



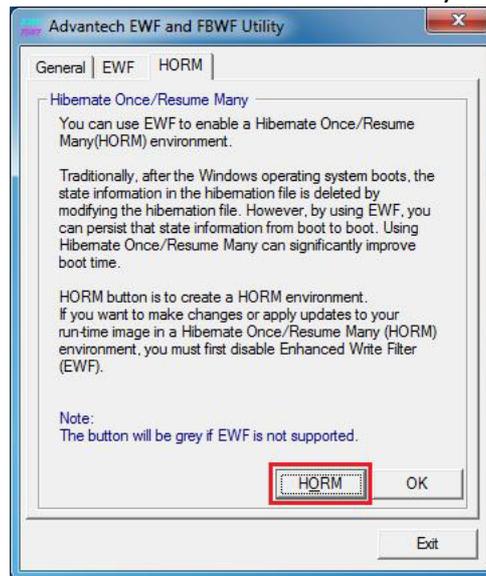
- c. Click OK and it will reboot automatically to make EWF become effective.



- d. After system is rebooted, open AdvWF and click EWF Utility
 e. Go to HORM page, and click "HORM" button



- f. Click OK and it will shutdown automatically



3.5 UWF

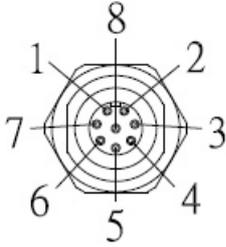
Unified Write Filter (UWF) is a sector-based write filter that you can use to protect your storage media. UWF intercepts all write attempts to a protected volume and redirects those write attempts to a virtual overlay. This improves the reliability and stability of your device and reduces the wear on write-sensitive media, such as flash memory media like solid-state drives.

You can use Hibernate Once/Resume Many (HORM) or file and registry filtering exclusions with UWF. UWF is a new feature for Windows Embedded 8 Standard, and is not available as part of Windows 8. UWF integrates the functionality previously available in Enhanced Write Filter (EWF), File-Based Write Filter (FBWF), and Registry Filter in Windows Embedded Standard 7. EWF, FBWF, and Registry Filter are also included.

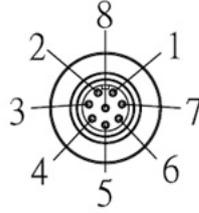
Appendix **A**

M12 connector I/O pin
definition

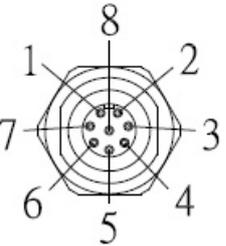
A.1 LAN1 / LAN2 pin definition with M12 connectors

LAN	Pin Number	Signal	(Female)
M12-A-8P-F LAN	1	TX_D1+	
	2	TX_D1-	
	3	RX_D2+	
	4	BI_D3+	
	5	BI_D3-	
	6	RX_D2-	
	7	BI_D4+	
	8	BI_D4-	

A.2 RS-232 pin definition with M12 connector

RS-232	Pin Number	Signal	(Male)
M12-A-8P-M RS-232	1	CD	
	2	RXD	
	3	TXD	
	4	DTR	
	5	GND	
	6	DSR	
	7	RTS	
	8	CTS	

A.3 USB pin definition with M12 connector

USB	Pin Number	Signal	(Female)
M12-A-8P-F USB	1	Vcc	
	6	D-	
	3	D+	
	5	Vss	
	8	Shielding	

A.4 Power Input pin definition with M12 connector

USB	Pin Number	Signal	(Male)
M12-A-5P-M Power	1	DC 24V-	
	2	DC 24V-	
	3	DC 24V+	
	4	DC24V+	
	5	F_GND	

Appendix **B**

UI Operating Process

B.1 UI Operating Process

This section is to introduce how to operate HMI utility(GL_Utility), you can download the utility from Advantech's product support portal of SPC-1881 at <http://support.advantech.com>. See the process below:

1. As you can find 2 function buttons in the lower right corner of front panel,



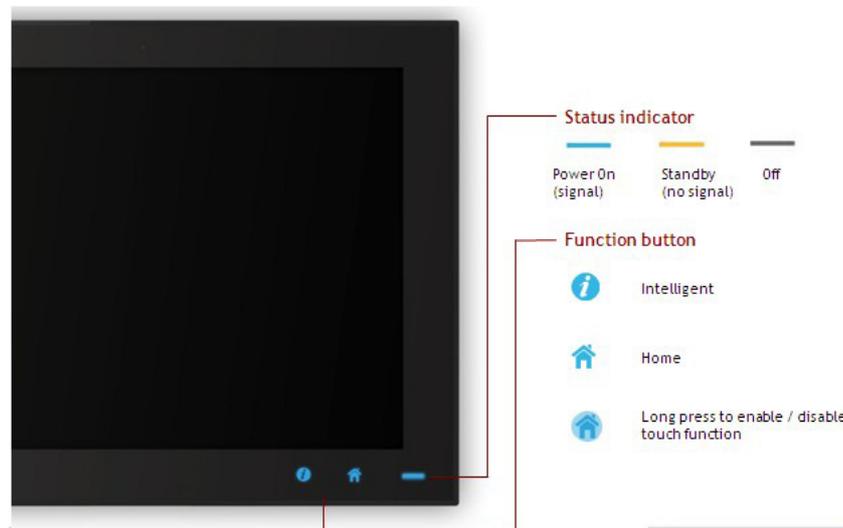
represents “intelligent” key while



represents “home” key. At the same time you can find status indicator show in following table:

Table B.1: Status indicator table

Indicator	Status
Blue	Power on
Orange	Stand by
No light	Off



2. One press Home Key->



Home – Back to desktop (default setting)



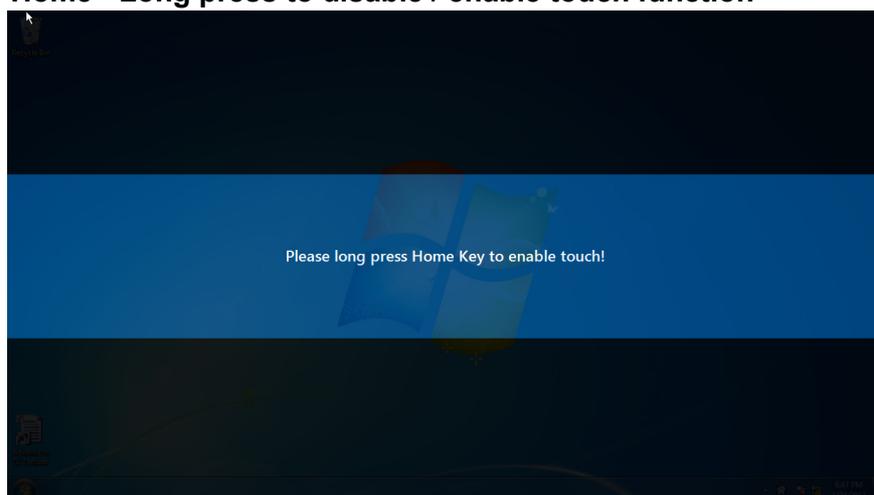
Home - Execute Home-key App (Set up in setting page)



3. Long press Home Key->

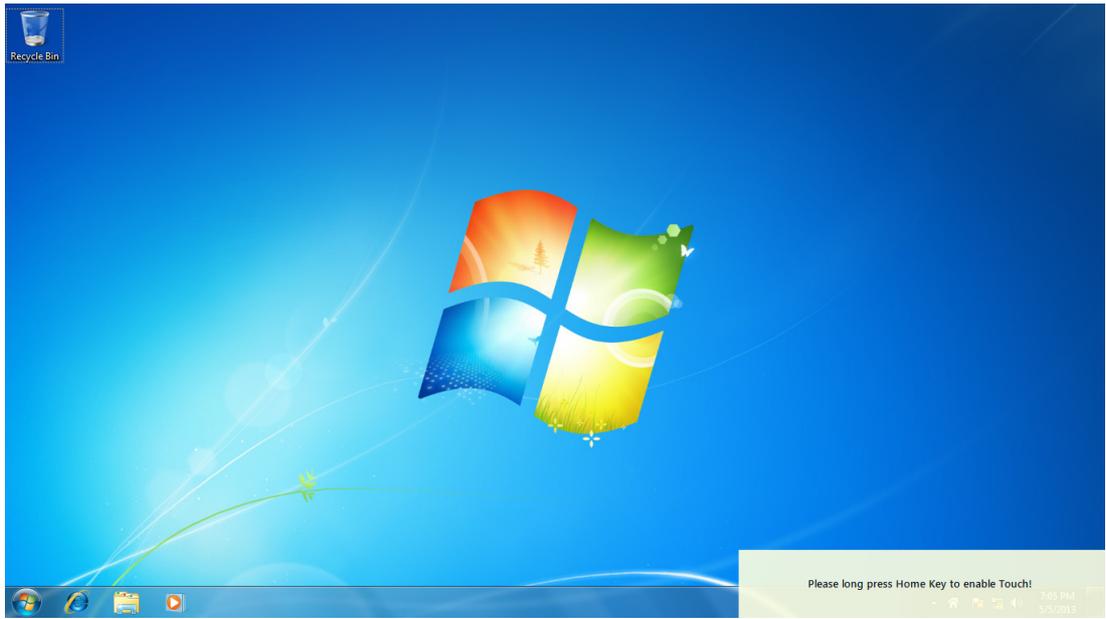


Home - Long press to disable / enable touch function

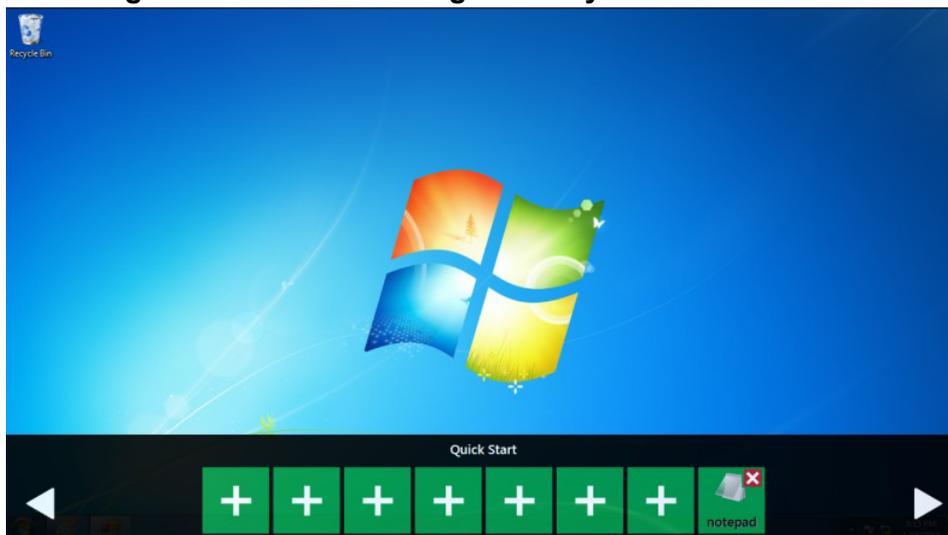


Note! *When touch function is disabled, you'll see a message up in the lower right corner of screen*

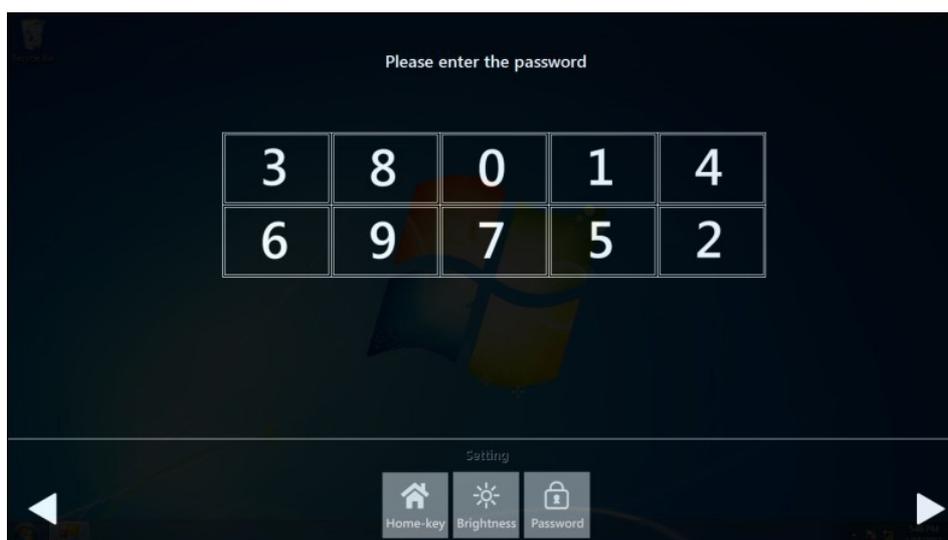




4. One press Intelligent Key->

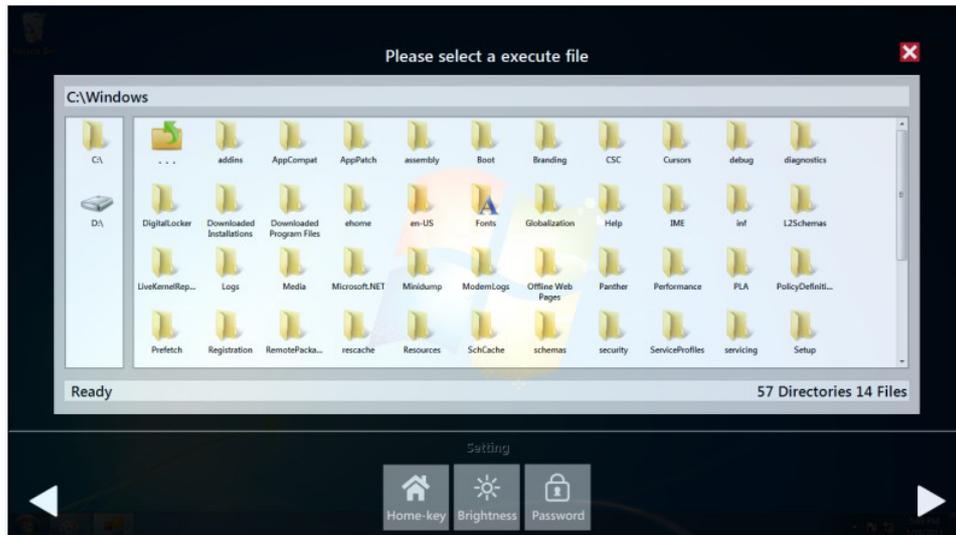
**Intelligent - Advantech Intelligent Utility****A. Quick start->**

- Press “+” to add shortcut
- Long press the icon to perform “right click” until an “X” mark appears in upper right corner to “delete”

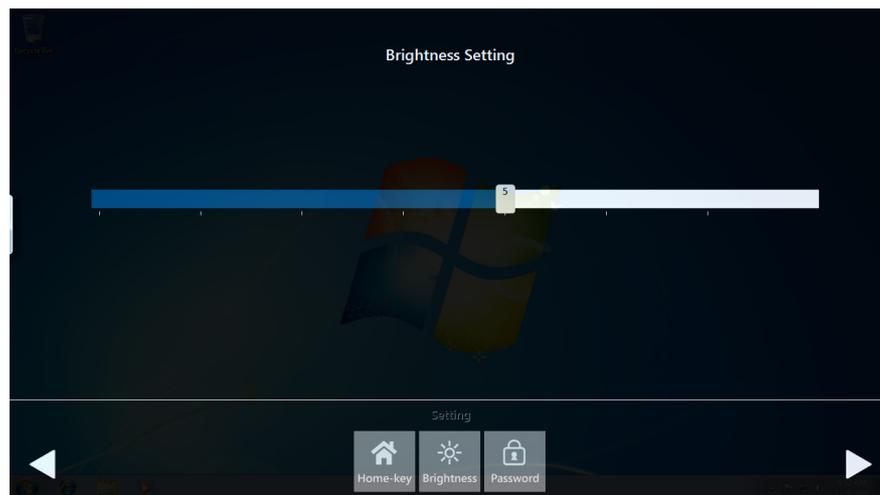


B. Setting ->

Password confirmation for authority confirmation when first log in, default password is "1234" without input order to active.



- Setting - Home-key: Select an execute file to set up as "Home-key" App, in default path is to show "desktop"

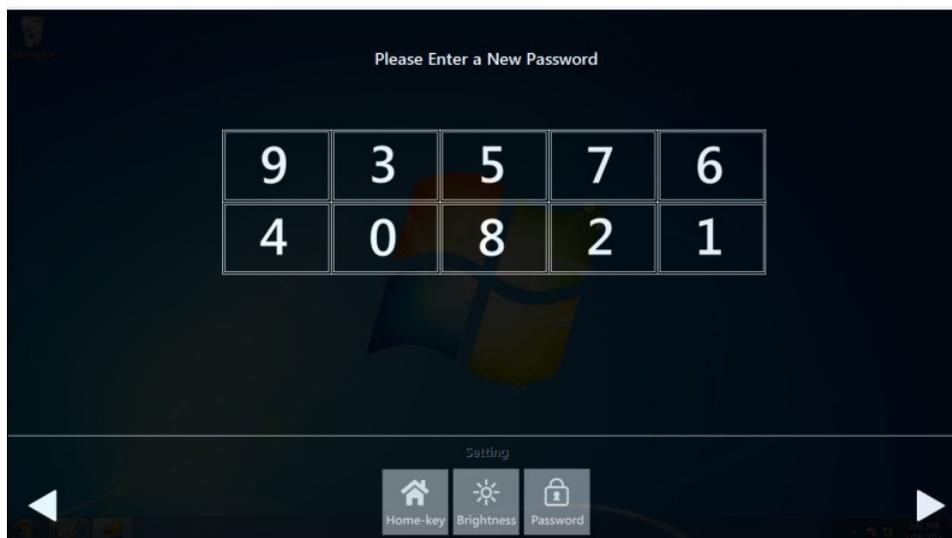
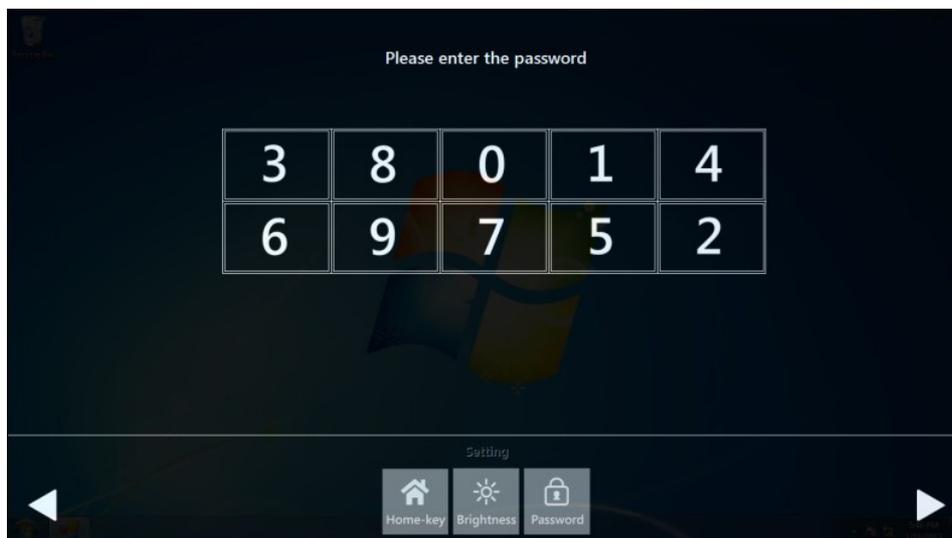


- Setting - Brightness: Brightness control from 10 to 100 percent

Note! *If you use other brightness setting tools such as iManager, remember not to adjust below 10 percent to prevent a black screen.*

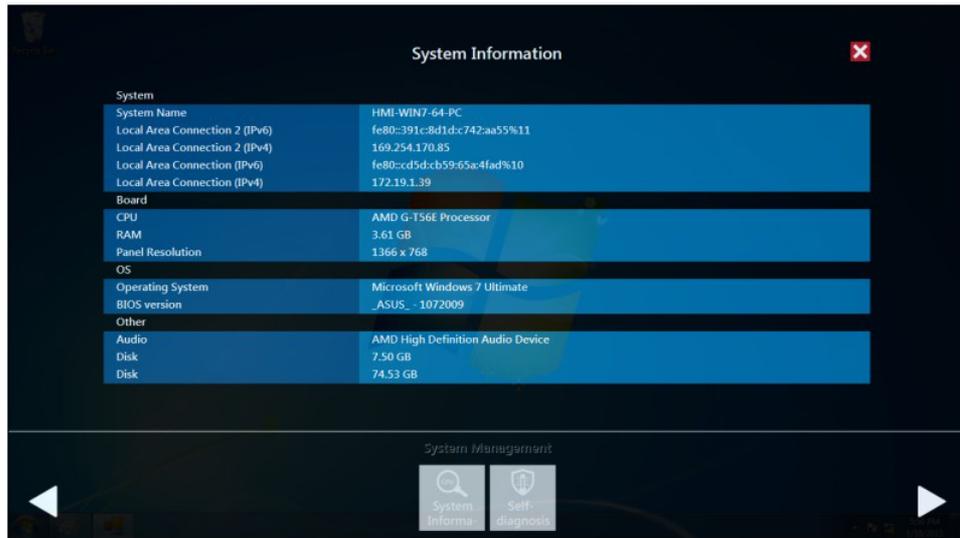


- Setting - Password: Change password function



C. System management->

– System information:



– Self Diagnosis:



Note!* SPC-1881 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 B.2: Button code definition

	One press	Long press
I key(icon) 	Ctrl+Shift+Alt+I	Ctrl+Shift+Alt+U
H Key(icon) 	Ctrl+Shift+Alt+H	Ctrl+Shift+Alt+L

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