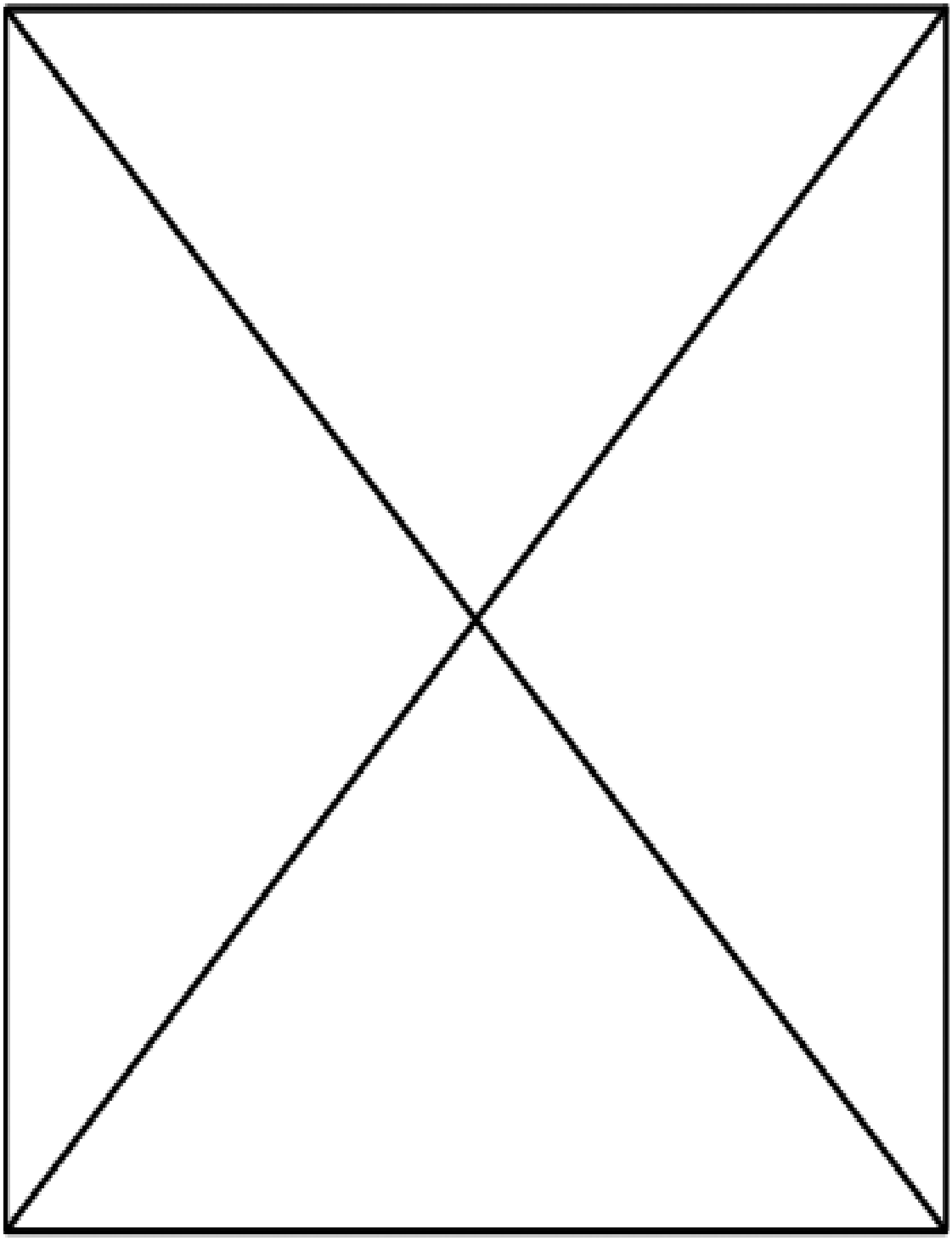
ARMOR

USER'S GUIDE | REVISION -

MODEL X7 TABLET COMPUTER

DRS TECHNOLOGIES

MODEL X7 TABLET COMPUTER



To learn more about optional ARMOR accessories, please call 1-888-872-1100

Trade Compliance Statement

Other Compliance:

- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different
  - from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two condition:

  (1) This device may not cause harmful interference, and

  (2) This device must accept any interference received, including interference that may cause undesired operation.
- For body-worn operation, this computer has been tested and meets the FCC RF exposure guidelines set forth for an uncontrolled environment when used with ARMOR supplied accessories, or accessories designed specifically for this product. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.
- This X7 tablet computer has been tested for compliance with ATEX directive 94/9/EC.
- This Class B digital apparatus complies with Canadian ICES-003, Issue 4 June 7, 2004 and RSS-210, Issue No 7 (June 2007) and No 5 (Nov 2001).
- Cet appariel numérique de la classe B est conforme à la norme NMB-003, No. 4, June 7, 2004; et CNR-210, No 7 (June 2007) et No 5 (Nov 2001).
- [In Canada], this product is restricted to indoor use due to its operation in the 5.15 to 5.25-GHz frequency range. Industry Canada requires this product to be used indoors to reduce the potential for harmful interference to co-channel mobile satellite systems.

- To prevent radio interference to the licensed service [in Canada], this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.
- Pour empêcher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit être utilisé a l'intérieur et devrait être placé loin des fenêtres afinde fournir un écran de blindage maximal. Si le matériel (ou son antenne d'émission) est installé à l'extérieur, il doit faire l'objet d'une licence.

DECLARATION OF CONFORMITY

We,

DRS Tactical Systems, Inc.
1110 West Hibiscus Blvd.
Melbourne, FL 32901, USA
Phone: 321-727-3672

Declare under sole responsibility that the product,

Model Number	**Product Name**
Armor X10	Armor M10

To which this declaration relates to is in conformity with the following standards, specifications and directives:

Standards

- **EN60950-1:2001** (Safety of Information Technology Equipment, EU)
- **UL60950-1:2003** (Safety of Information Technology Equipment, USA)
- **CSA C22.2 60950-1:2003** (Safety of Information Technology Equipment-Part 1, Canada)
- **EN 301 893: V1.3.1 (2005-03)** (Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN)
- **EN 300 328: V1.7.1** (Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems)
- **EN 301 489-1, V1.6.1 (2002-08)** (Part1; EMC for Radio Equipment and Services, Common technical requirements)
- **EN 301 489-17, V1.2.1 (2002-08)** (Part 17; EMC for Radio Equipment and Services, Specific conditions for Wideband data)
- **EN55022:2006** (Information Technology Equipment-Radio disturbance characteristics-Limits and methods of measurements)
- **EN55024:1998/A1:2001/A2:2003** (Information Technology Equipment-Generic Immunity characteristics-Limits and methods of measurements)
  - **EN 61000-3-2: 2000+A2:2005** (Limits for Harmonic Current Emissions)
  - **EN 61000-3-3:1995+A1:2001** (Limits, Limitations of Voltage Fluctuations and Harmonic Flicker)

Directives

- **DIRECTIVE 2006/95/EC** (Low Voltage Directive)
- **DIRECTIVE 2004/108/EC** (EMC Directive)
- **DIRECTIVE 2002/96/EC** (Waste of Electrical and Electronic Equipment)
- **DIRECTIVE 2002/95/EC** (Restriction of Hazardous Substances)
- **DIRECTIVE 1999/5/EC** (Radio and Telecommunications Terminal Equipment)

Lary Beaulieu, Senior Vice President
Printed Name and Title

Signature and Date

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WARNING SUMMARY

This device is a Class I, Division 2, Groups A-D, T5 product. The ARMOR X7 complies with all applicable industrial health and safety requirements. However there are certain safety considerations such as battery safety that you need to be aware of. Please read and comply with all warnings and cautions in this guide and in all other X7 documentation.

A "  **Warning!"** notice indicates a condition or action that could possibly result in injury or death to the user. A "  **Caution!"** notice indicates a condition or action that could result in loss of data or damage to equipment.

WARNING!

EXPLOSION HAZARD – DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT-RISQUE D'EXPLOSION - NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.

WARNING!

EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT-RISQUE D'EXPLOSION - AFIN D'ÉVITER TOUT RISQUE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE CHANGER LA BATTERIE.

WARNING!

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO INSTRUCTIONS IN THIS USER'S GUIDE.

ATTENTION: RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACEE PAR UN TYPE INCORRECT. JETER LES PILES USAGEES CONFORMEMENT AUX INSTRUCTIONS DANS CE GUIDE D'UTILISATEUR..

WARNING!

Do not drop or mishandle the batteries, immerse them in water, or subject them to high heat. Doing so could increase the risk of explosion or leakage, and possibly cause injury.

WARNING!

The lithium-ion batteries used in this equipment contain material that is hazardous to your health. If battery contents come in contact with the eyes, IMMEDIATELY flush the affected area with clean water for 15 minutes and have someone else summon medical attention for you. Unaffected persons should assist the affected individual in the vital first flushing of the eyes.

WARNING!

If battery material comes in contact with the skin, flush the affected area with clean water and seek immediate medical treatment.

WARNING!

Place all shipping bags and packing materials safely out of the reach of small children, especially infants and toddlers. These items may pose a choking or suffocation hazard.

WARNING!

Changes or modifications not performed by, or expressly authorized by, DRS Tactical Systems, Inc could be hazardous to your health, could cause damage to the equipment, could void your warranty, could void your authority to operate the equipment, or could result in all of the above.

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CAUTION!

Use this product only in vehicles that can supply a regulated +11 to +16 DC voltage. For vehicle battery systems outside of this range, a voltage adapter is required to prevent damage to the computer.

CAUTION!

DO NOT connect the DC power supply from a Rapid Battery Charger into the computer or docking mechanism. This power supply is 24 VDC and will cause permanent damage to the computer.

CAUTION!

DO NOT connect the computer to more than one power source at a time such as with the AC adapter connected to the computer and vehicle power connected to the docking station. Permanent damage to the X7 batteries or to the computer itself may result.

CAUTION!

When using the provided AC adapter, the maximum safe ambient operating temperature is 40°C.

CAUTION!

Use only the battery originally supplied with your ARMOR X7 or one recommended by DRS. The use of any other battery could create a hazardous condition and possibly damage your computer.

CAUTION!

Recharging the battery must only be carried out in a non-hazardous area using the supplied AC adapter. The definition of hazardous areas can be found in Standard EN 60079-10.

CAUTION!

DO NOT use this unit in classified areas unsuitable for its security ratings. NE PAS UTILISER CETTE UNITÉ EN ZONES AINSI CLASSÉES IMPROPRES À SA COTE DE SÉCURITÉ

CAUTION!

When using IEEE 802.11a wireless LAN [in Canada], this product is restricted to indoor use due to its operation in the 5.15- to 5.25-GHz frequency range. Industry Canada requires this product to be used indoors for the frequency range of 5.15 GHz to 5.25 GHz to reduce the potential for harmful interference to co-channel mobile satellite systems. High power radar is allocated as the primary user of the 5.25- to 5.35-GHz and 5.65 to 5.85-GHz bands. These radar stations can cause interference with and/or damage to this device.

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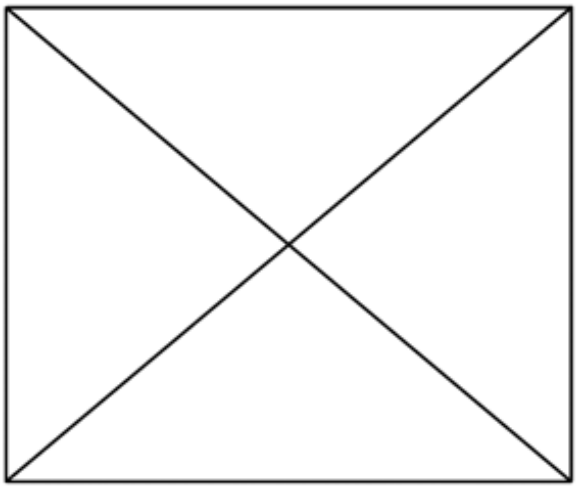
1. WELCOME AND INTRODUCTION

Thank you for purchasing the ARMOR X7 ruggedized tablet computer with Intel® Mobile technology. Your X7 is the first of a new line of durable, reliable, and easy-to-use small form factor tablet computers.

Your new X7 is equipped with a high-resolution dual-screen LCD display that is readable even in bright sunlight. In addition, you now have both a touch screen and an active pen screen at your fingertips.

The X7 batteries are hot-swappable, which means you can change them one at a time without interrupting normal computer operations and without the need for tools.

The ARMOR X7 ruggedized tablet computer can be mounted in a vehicle dock or desk docking station (shown here in a desk dock.



We take pride in providing high-quality products and superior customer service. Thank you for choosing the DRS ARMOR X7, and for your trust in the ARMOR line of products.

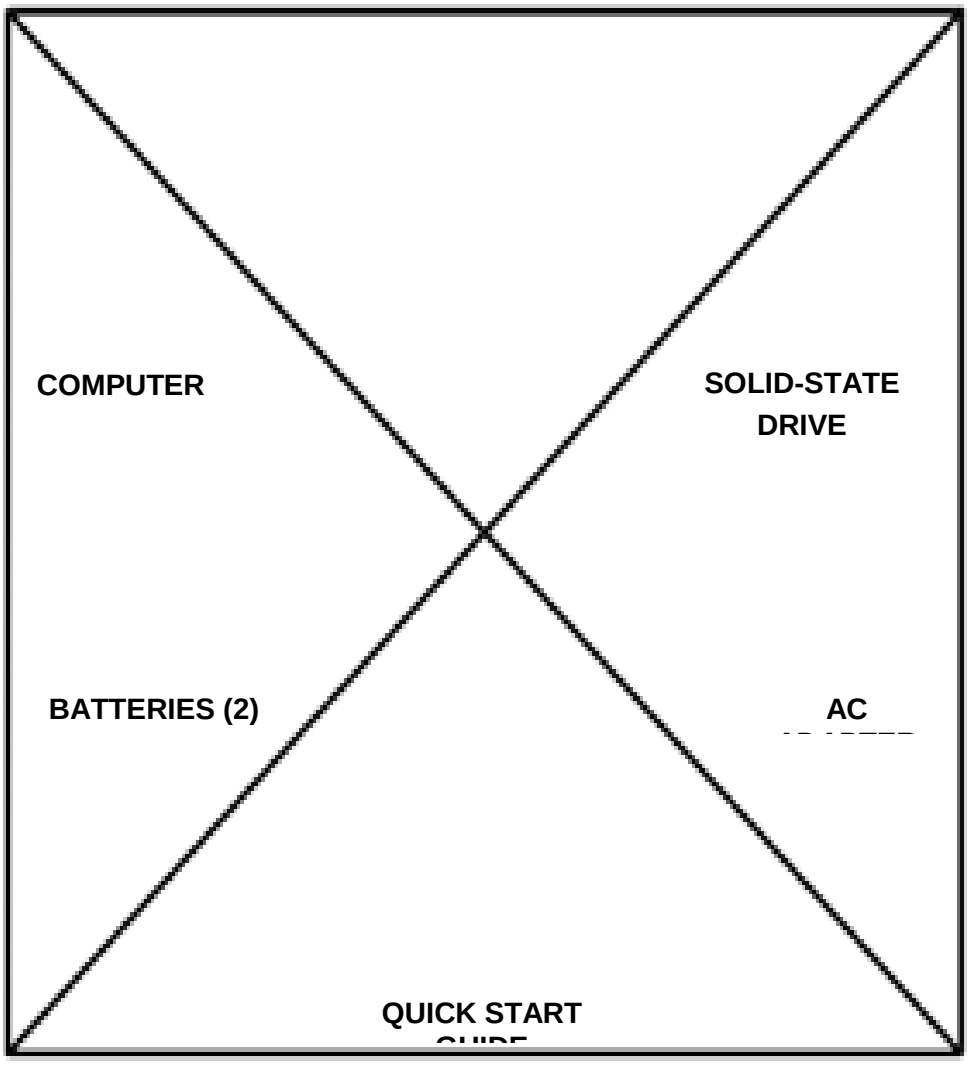
The ARMOR Team

Your ARMOR X7 Purchase

Your purchase includes the items and accessories shown below. Please confirm that all of these items are present and in good condition.

NOTE: Your solid-state drive is shipped already installed in the computer. However, if you ordered a WWAN card with your X7, a solid-state drive is not included.

Contact your ARMOR X7 computer sales representative if any item is missing or damaged.



ARMOR X7 Included Components and Accessories

About This Guide

This user's guide contains virtually all of the information required to setup and maintain your ARMOR X7 computer. However, should you need additional technical information, please visit our web site at: www.drsarmor.com, or call DRS Technical Support toll-free at 1-888-872-1100.

Viewing, Navigating, and Printing this Guide

This User's Guide is installed on your ARMOR X7 computer in PDF format. To access it, double-click on the icon on the desktop. You can click on any Figure or Table reference and on the blue underlined text (links) to navigate within the guide or to access resources on the Internet. Links to internet resources will change color after the first access to indicate the link has been recently used; links to information within the document will not change color. The latest version of Adobe PDF Reader is available for downloading free from www.adobe.com.

For best print results, use the Adobe Reader "Print "menu options.

Terminology Used in this Guide

As the result of long use and the evolution, some functions and buttons may be called by more than one name and some of these names are used interchangeably, which can lead to confusion. The following are some of the more common examples you may encounter in this manual:

Standby = Stand By = Sleep

Windows Security Key Button = SAS Button = OEM Button = Side Button

Please Help Us Maintain Top Quality Documentation

This guide was produced with the latest information available and verified for accuracy at the time of its release. However, mistakes are possible, and product updates may supersede the information in this guide. We encourage you to contact DRS Technical Support toll-free at 1-888-872-1100 with suggestions and corrections so that we can maintain the highest possible quality documentation for you and for future customers.

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2. LEARNING ABOUT YOUR ARMOR X7

The X7 is a rugged full-feature tablet PC with built-in Wi-Fi® and Bluetooth networking. Its compact size and low weight, coupled with a high-contrast display for use in bright sunlight, make it ideal for field use. The X7 is rated IP67 for protection from dust, dirt, water and other contaminating elements.

It is specifically designed to support a full 8-hour shift operating on one set of batteries. However, its hot-swap battery access means you can change the batteries without the need for tools and without interrupting normal computer operations.

Like its big brother, the X10gx, the X7 has a dual mode Touch and Pen screen supporting both finger navigation and detailed graphic positioning using a pen or stylus. Your X7 is ready for use anywhere, any time.

Processor and Operating System

The X7 contains an Intel® 1.6GHz Pineview-M single core processor with up to 2 GB of 667 MHz DDR2 memory and 512 kb of level 2 cache. Your X7 comes with either the Microsoft Windows7 Professional® or Windows 7 Ultimate® 32 bit operating system.

Data Storage

The X7 has a number of flexible solutions for data storage. It currently comes with 32 GB of mSATA solid state mass storage when configured with the Gobi WWAN radio. If the WWAN radio is not installed, the X7 is equipped with a 1.8” solid state drive of 32GB or 80GB capacity in addition to the mSATA memory

Dual Screen Display

The X7 display has both an active pen screen and a touch screen combined into one display that leverages the latest bonded LCD technologies. The pen screen allows you to navigate without touching the screen surface and provides greater accuracy in handwriting recognition plus aiding in signature capture. An active pen is provided with the X7. The touch screen allows using either a fingertip or passive stylus for navigation and input. A passive stylus is not provided.

The display defaults to touch mode until the pen screen digitizer senses the presence of an active pen within approximately 1 cm of the screen surface and activates the pen screen. When the active pen is moved away from the screen for a few seconds, the display will revert back to touch mode.

Video Graphics

The 200 MHz graphics controller is DirectX 9 compliant and supports both LVDS and VGA video standards for an internal screen resolution of 1024 x 600 pixels (WSVGA) at 32 bpp color depth.

The X7 also provides dual monitor support at the following resolutions:

- SVGA (800x600)
- WSVGA (1024 x 600)
- XGA (1024x768)
- WXGA (1280x720, 1280x800)
- SXGA (1280x1024)

Wireless

Your ARMOR X7 comes equipped with WLAN, and Bluetooth®. A WWAN radio and GPS receiver are also available as options. .

Wireless LAN

The X7 is equipped with an 802.11 a/g/n Intel® Centrino® Advanced-N 6200 PCI Express Mini card that can operate on the 2.4 and 5 GHz bands.

Bluetooth Capability

Your X7 has a built-in Class 1 Bluetooth module that allows you to connect wireless peripherals like printers and scanners or networking devices like a router or USB hub.

Optional WWAN Capability

An optional PCI-e WWAN card is available that supports the following networks:

- CDMA2000 or EVDO mobile communications at 850/1900 MHz bands
- HSPA on 850/1900/2100 MHz bands
- GSM/GPRS/EDGE on 850/900/1800/1900 MHz bands

Optional GPS Capability

The X7 can be equipped with a global positioning system (GPS) receiver. This receiver uses GPS satellites to calculate its current location and elevation. This information can then be used by installed applications.

Audio

A single internal speaker is provided, plus two sets of noise-cancelling microphones. An audio jack is provided so you can connect a set of headphones, an external speaker or an external microphone.

Batteries

Two batteries are installed, one on either side of the X7, as shown in Figure 5. The X7 batteries are high efficiency lithium-ion batteries that are “hot swappable.” That is, if you have two batteries, you can replace one battery while the tablet operates on the other battery. With this capability, you do not have to shut down the computer or interrupt your current operating session in order to replace a battery. The X7 can operate for 8 or more hours on two fully charged batteries and up to 4 hours on a single battery. Each battery has an LED “fuel gauge” that indicates the current or remaining charge.

Flexspace™

The X7 has additional usable space and a flexible interface that allows for the use of custom cards and modules. Refer to ARMOR Flexspace™ for a more detailed description of this capability.

Specifications

Operating System	Microsoft Windows7 Professional® or Windows 7 Ultimate® 32 bit
Processor	Intel® Embedded Luna Pier system architecture with Pineview-M 1.66 GHz Single Core Processor 512 KB L2 Cache 4-Channel Direct Memory Interface (DMI) ICH8M I/O controller hub Intel DX9 Graphics, 200MHz 1GB or 2GB, DDR2 667MHz SDRAM
Storage	Removable SATA 3.0 Gb/sec interface (without WWAN Module) 64GB solid state hard drive (SSHD) 1.8" removable (standard) Optional 128GB solid state hard drive (SSHD) Optional 32 GB or 40 GB mSATA drive (when unit is equipped with WWAN Module) Support for optional 8GB, 16GB and 32GB SD/SDHC card
Display & Graphics	7.0" WSVGA 1024 x 600 Transmissive sunlight-readable LCD Bonded and anti-glare, anti-reflective screen treatments LED backlighting with Automatic Light Sensor Integrated stylus holder Autosense dual mode digitizer, 2540 dots/inch (0.001mm resolution) and resistive touch glass-film-glass, 2048 dots resolution (X&Y), 0.25 mm resolution and integrated polarizer for improved viewablity Intel DX9 Graphics controller, 200MHz
Audio	Integrated enhanced piezoelectric speaker 2 element digital array microphone with dynamic noise cancelling CODEC
Keyboard	On-screen keyboard included with Windows® 7 operating system Accepts any USB keyboard using mini-USB adapter (not included)
Webcam	2.0 megapixel camera with autofocus lens

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Pointer Control	Touch screen pointer controlled by fingertip or inert stylus Pen screen pointer controlled by inductive (active) pen Virtual mouse using fingerprint sensor with special software Optional external mouse using mini-USB adapter (not included)
Interface Connections	Fixed I/O: • DC Power Jack • One Mini USB 2.0 port Docking I/O: • 10V – 30V DC power input • +5V, 2A auxiliary power output • 3x USB 2.0 • 2x 5V Ground/Open Input Devices (GPIO) • Dock detect/dock enabled discrete • GPS antenna, coaxial • WWAN antenna, coaxial Mechanical features supporting one-handed docking
Wireless	Standard: • 802.11 A/G/N 2x2 Wireless LAN connectivity (WLAN) • Bluetooth® v2.0 + EDR (Class 1) Bluetooth Optional: • Integrated GPS with SiRF III performance • Integrated WWAN Module and Antenna o North America: CDMA2000/1xEVDO Rev A: 850MHz/1900MHz bands o North America: GSM/GPRS/EDGE/UMTS/HSPA 850HMz/900MHz/1800MHz/1900MHz bands o Europe: GSM/GPRS/EDGE/UMTS/HSDPA(2100) 800MHz/900MHz/1800MHz/1900/2100 MHz bands

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Flexspace Expansion	Replacement of 2nd battery (right side battery) +5V, 1A & +3.3V, 1A power for active modules User accessible open-source interface support for 3rd party or application specific functions: 1x PCIe port SIM Card socket 4x GPIO for remote control/sense 2x USB 2.0 ports 1x RS-232 port RGB video HD Audio +5V, 1A & +3.3V, 1A power for active modules
Power	Power Input: Battery support • Twin hot-swappable 7.5V lithium polymer batteries (2-cell or 4-cell) • 2-cell capacity = 2950mAh; 4-cell capacity = 5900mAh • Battery operation: 8+ hours with two 4-cell batteries x hours with two 2-cell batteries • Battery charging time: TBS hours off, TBS hours on AC Adapter: AC 100V-240V 50/60Hz, Auto sensing/switching worldwide power supply
Security Features	Password security Support for encrypted drives TPM security chip v.1.2 Fingerprint sensor ISO 7816 Smart Card (FIPS 201) compliant
Durability Features	MIL-STD-810G certified (6' drop) IP67 certified including battery pack Injection molded plastic housing with internal magnesium frame and rubber over mold in hand grip areas

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Environmental	-20 to +50°C when hand-held or operating with vehicle dock Maximum 40°C ambient temperature when using AC adapter -40 to +70°C storage 20°C/min temperature shock (operating) +5°C to 60°C, 95% RH 20,000 feet altitude Composite wheeled vehicle vibration 30g, 11ms, half-sine operational shock IP67 IEC 60529 egress Compatibility with DRS Environmental fluids: Cat II Chemical Solvents, Cat III Cleaners and Cat IV Industrial Chemicals UV exposure ESD 22 kV air Optional: ISAFE: UL 1604 Class I, Division 2, Groups A, B, C and D; CSA C22.2 No. 213-M1987; EN60079-0, EN60079-15:2005 (ATEX)
Regulatory Certifications	TUV CSA FCC Part 15 CE Mark E-Mark C-Tick Energy Star EPEAT (Gold Level) I-SAFE/ATEX
Weight and Dimensions	3.2 lbs with two 4-cell batteries; 2.8 lbs with two 2-cell batteries 8.9” x 5.9” x 1.4” (center) 2.1” (Hand Grips) / 225 x 150 x 35 mm (center) 54 mm (Hand Grips)
Warranty	3-year limited warranty, parts & labor

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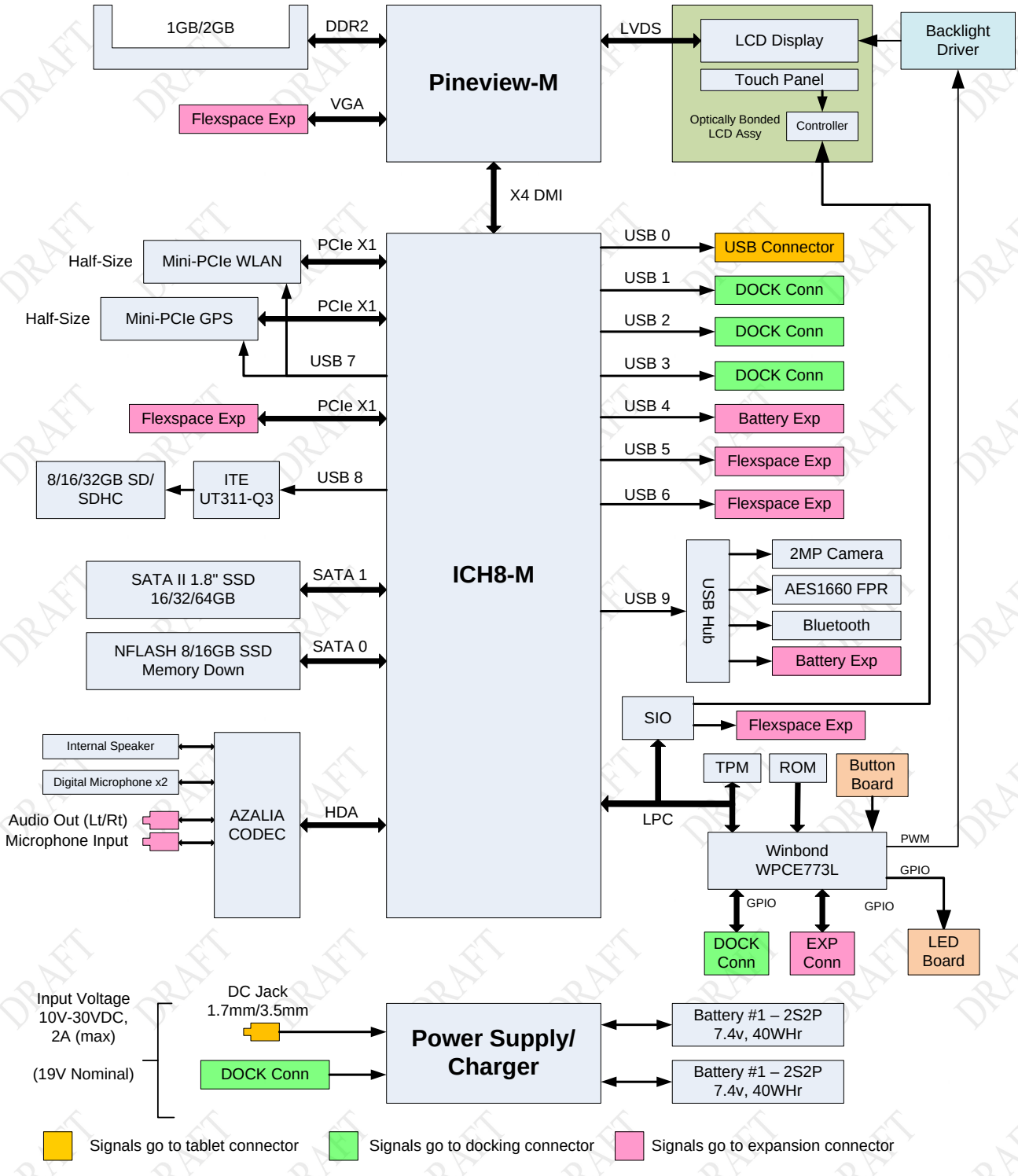

Figure 1. X7 Internal Block Diagram

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Front Panel Features

> **NOTE**
>
> ***All references to front/back, top/bottom and left/right are relative to the face-on view as shown in Figure 2 .***

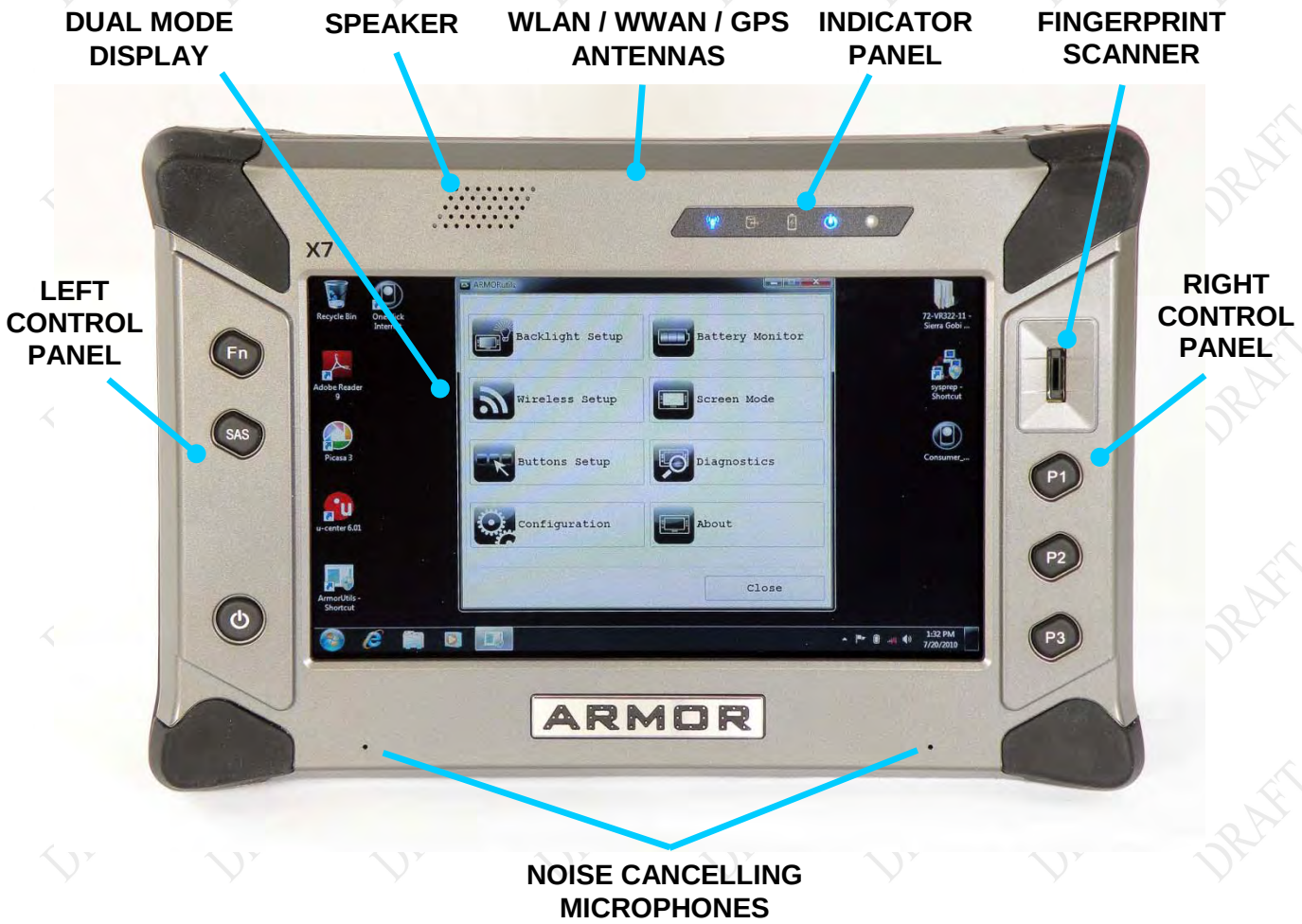

Figure 2. ARMOR X7 Key Features – Front View

Left and Right Control Panels

There are 6 momentary contact push buttons and a fingerprint scanner sensor located on two control panels on either side of the X7 display, as shown in Figure 3.

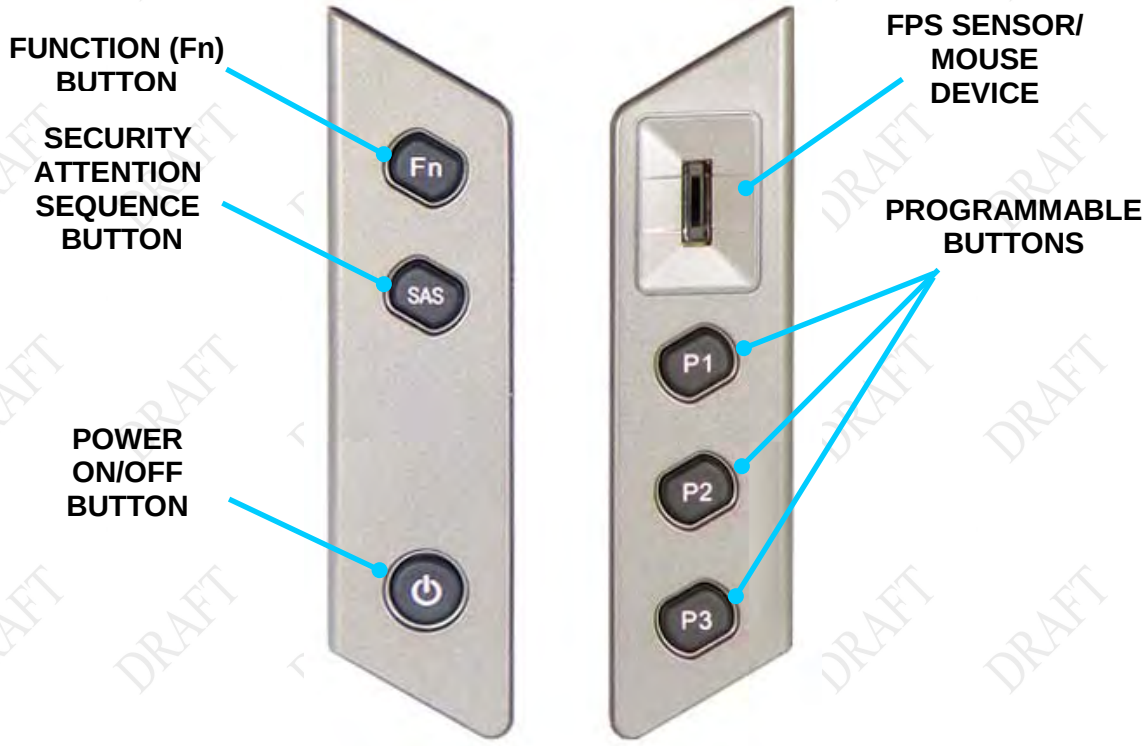

Figure 3. X7 Control Panels

Programmable Buttons (PBs) P1, P2, P3

The PBs can be used to control different functions such as increasing or decreasing brightness or changing audio volume level with just a single press. Refer to Programmable Button (PB) Settings for information on how to select available options.

Each programmable button has a built-in LED that lights for approximately 5 seconds when the button is pressed.

Fingerprint Sensor (FPS)

The fingerprint sensor is used with security software to allow you to log onto the computer or gain access to specific applications. Use of the sensor for reading fingerprints requires specialized software that is not provided with the X7.

The sensor can also be used to steer the on-screen pointer and perform some simple mouse functions. Normally, this requires third-party software that does not come with the X7. However, we have provided some introductory software that will allow you to explore this feature. Refer to Using the FPS as a Simple Mouse Device.

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Fn (Function) Button

This button is used with programmable buttons P1, P2 and P3 to activate three additional functions. Press and release the **Fn** button and then press and release **P1**, **P2** or **P3** to activate the function. Refer to the description of the Programmable Button (PB) Settings for information on how to select available options for each combination.

The Fn button also has a built-in LED that lights for approximately 5 seconds when the button is pressed.

Security Attention Sequence (SAS) Button

Pressing this button generates the SAS scan code and invokes the **CTRL-ALT-DEL** command, which opens the Windows Task Manager screen.

This button is also known as the Windows Security Key Button, the Side Button and the OEM Button.

Power Button

The **Power** button is primarily used to turn the computer on or off, but it also performs other functions when the computer is running and when the computer is in sleep or hibernate mode, as detailed in Table 1.

To turn the computer off when in normal operation, use the available Windows shutdown procedures from the desktop.

Table 1. Power Button Actions

Operating State	Power Button Action	Result
Computer powered off	Press and hold for at least 1 second and then release	Computer turns on and boots up into new Windows session.
Computer powered on and awake	Press and release	Computer goes into Sleep mode and saves your current session.
Computer in Sleep mode (powered on)	Press and release	Computer wakes up and restores your current session.
Computer in Hibernate mode (powered off)	Press and release	Computer turns on and restores your previous session.
Computer powered on	Press and hold for 5 or more seconds (emergency shutdown)	Computer shuts down immediately and does not save your session.

You can change the default action of the **Power** button through the **Power Options** settings in Windows Control Panel. Refer to Changing the Power Button Default Action .

NOTE: This change will affect only the powered-on state; the Power button still works the same when the computer is powered off or is in sleep or hibernate mode.

Indicator Panel

There are 4 LED status indicators located on the indicator panel at the upper right of the X7 display, as shown in Figure 4 (**NOTE:** The fifth object to the far right on the panel is the ambient light sensor (ALS), not an LED). The intensity of the status indicators varies as the screen brightness is varied.

The functions of these indicators are described below.

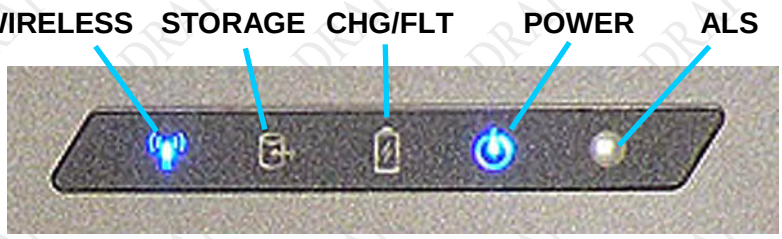

Figure 4. Indicator Panel

Wireless Activity Indicator

A blue LED that is on whenever the WLAN, WWAN or Bluetooth wireless radio is in transmit mode (GPS is receive only). The indicator will be on steady whenever your WLAN or WWAN radio is connected to a network. For Bluetooth, the indicator will only be on when data is being transmitted to a peripheral such as a printer, scanner or USB hub.

Storage Device Activity Indicator

A blue LED that is on intermittently whenever a storage device is being accessed. Storage devices can include the 1.8 inch solid-state drive, mSATA drive or an SD memory card, or a combination of any of these (**NOTE:** The mSATA drive is an integral part of the X7 circuitry and is not physically accessible by the user).

Charging/Fault Indicator

A dual LED that can be amber or red and has the following conditions:

- Off when the computer is off.
- Off when the computer is powered by batteries only and no faults are detected.
- A steady amber color when external power is connected and the batteries are fully charged.
- Flashing at a 1/2 second rate while batteries are charging.
- Flashing at a 1 second rate when charging has stopped due to battery temperature.
- A steady red color if a power system fault occurs such as an overvoltage, undervoltage or overcurrent condition or a battery charger or battery internal failure. The red indicator will turn off when the fault condition is removed.

Power On Indicator

A blue LED that is on steady whenever power is applied to the ARMOR X7 and is off when power is shut down.

Ambient Light Sensor (ALS)

The ALS is located on the indicator panel (see Figure 4). It senses changes in surrounding light levels and adjusts the display brightness and indicator light levels accordingly. If the surrounding light level increases, the display and indicator brightness will increase proportionally; if the light level decreases, the display and indicator brightness will decrease proportionally.

Speaker

A single high-volume speaker is located on the top left of the front panel, as shown in Figure 2.

Noise Cancelling Stereo Microphones

Two noise-canceling microphones are located at the bottom of the front panel. These microphones support simultaneous analog and 4-channel digital recording.

Rear Panel Features

The rear panel of the X7 houses a built-in webcam, a cooling register, bays for two batteries and a compartment that provides access to installed radio modules, a SIM card socket, and a micro SD socket. A slot for the active pen is also built into the back panel with posts to secure the lanyard.

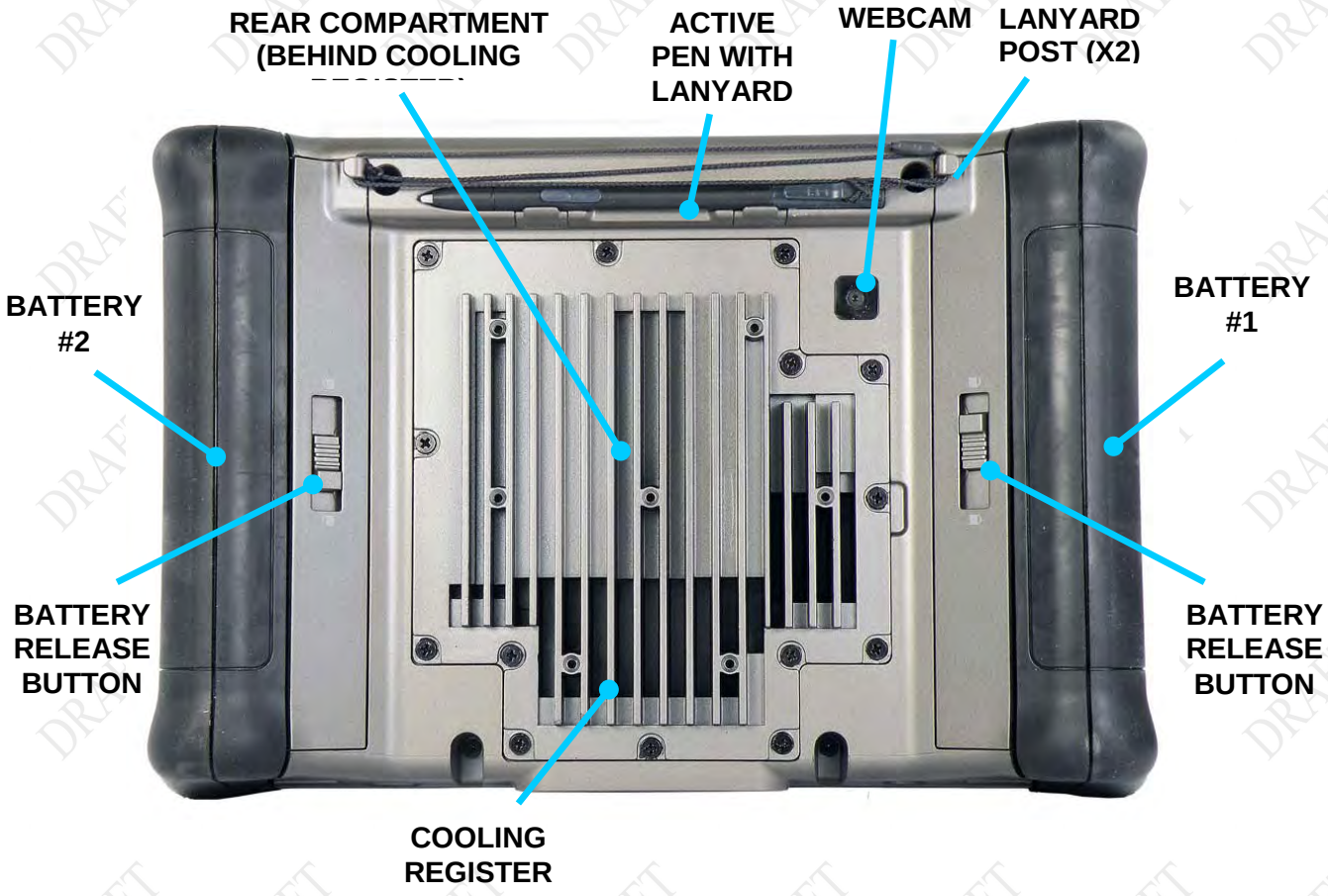

Figure 5. Key Features - Rear Panel

Cooling Register

ARMOR computers are designed to operate in dirty and moist environments under extreme temperatures. Because the tablet is sealed against contamination, the X7 incorporates passive cooling which channels the internal heat to the cooling register at the back of the unit. The register dissipates the heat evenly and feels only mildly warm to the touch.

The cooling register also acts as a cover for a sealed compartment which provides access to the solid-state drive (if installed), a SIM card socket and a micro-SD socket.

Batteries

Your X7 is shipped with two batteries that are installed in bays on either side of the X7, as shown in Figure 6. These batteries are high efficiency lithium-ion batteries that are "hot swappable." That is, if you have two batteries installed, you can replace one battery while the computer operates on the other battery. With this capability, you do not have to shut down the computer or interrupt your current operating session in order to replace a battery.

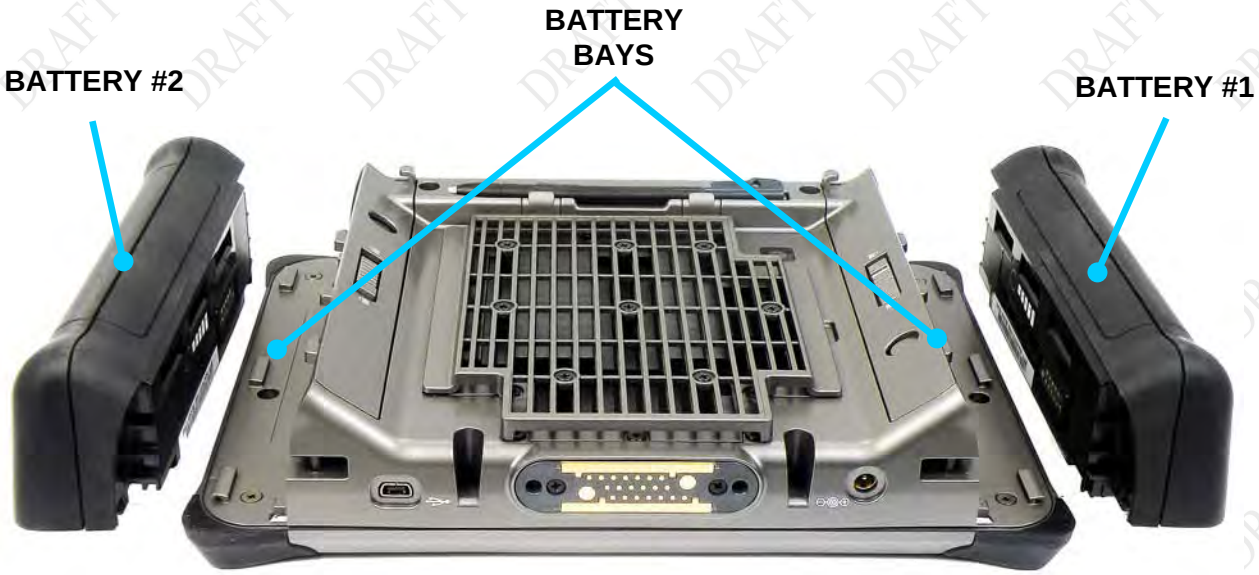

Figure 6. X7 Battery Bays

"Smart Batteries"

Your X7 batteries have built-in "smart" technology to monitor their charging functions and internal conditions. These batteries are self-calibrating and self-regulating. Should a problem occur, even a short circuit, the X7 battery will disconnect itself from the computer to prevent any damage. Since the batteries are literally the handles for the X7, you can keep a defective battery in place until you obtain a replacement.

Two Battery Capacities are Available

Depending on your purchase, your X7 came with one or two 2-cell or 4-cell batteries. The 2-cell battery has a capacity of 2850 mAh battery and the 4-cell battery has a capacity of 5900 mAh battery.

Table 33. Summary of X7 Battery Operating Times lists the operating and charging times for both types.

Webcam

Your X7 has a built-in 2 megapixel camera located on the back side of the unit (see Figure 7). The camera is equipped with an autofocus lens and can be used to capture still images or movies, or to scan barcodes. The camera saves still images in JPEG format at 1280 x 1024, 800 x 600 and 640 x 480 pixel resolutions. Movies are saved in Windows Media Video (.wmv) format.

Refer to Using the Webcam for instructions on capturing still images and video and scanning bar codes.

Figure 7. X7 Webcam

Bottom Panel Features

The bottom panel houses an AC adapter jack, a mini-USB connector and a 20-pin docking connector. The docking connector contains two RF ports to connect the X7 to external GPS and wireless antennas.

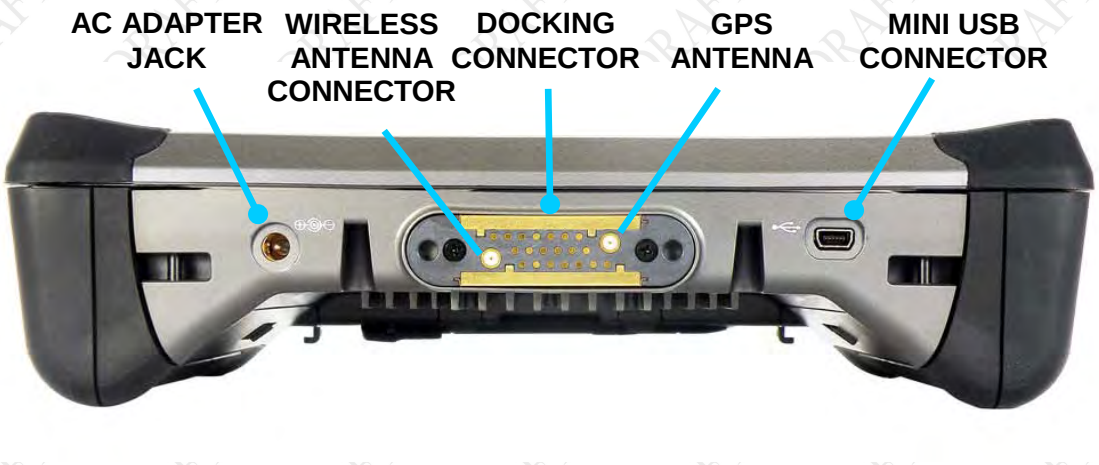

Figure 8. Key Features – Bottom Panel

Included Components, Accessories and Support

Active Pen with Tether

The pen that comes with your X7 (Figure 9) has circuitry in the tip that interacts with the digitizer assembly built into the tablet display. The digitizer detects the pen tip close to the screen and activates certain functions like steering the pointer or performing a right click action if the pen is allowed to hover for a few seconds.

The pen also has a side button that can be programmed for a number of different functions (refer to the Pen Tablet Properties Utility). It's default function is **Right-Click**. The pen is stored in the tablet's carrying handle and is secured to the handle by a flexible tether.

Figure 9. The ARMOR X7 Pen

AC Adapter and Power Cord

Included with your ARMOR X7 is a +19 VDC ± 5%, 2 amp AC power adapter, or "AC Adapter". This external DC power supply can be plugged in to any 100-240 VAC standard 3-prong outlet and is used to recharge your computer's batteries and provide power to the computer without draining the batteries. A North American power cord is standard, but a European AC power cord is also available.

Figure 10. ARMOR X7 AC Adapter

ARMOR Cloth

This microfiber cloth is specially designed to clean the display screen of dust and fingerprints. See for important information about using this cloth with the X7 display.

Figure 11. ARMOR Microfiber Cleaning Cloth

Subscriber Identity Module (SIM) Card Support

The X7 is equipped with a SIM card socket as required by GSM networks. A SIM card is a small electronic card that contains your GSM subscriber ID, billing information, and network permissions (see . The card allows you to easily transport your subscriber information to another computer or subscriber device.

You must have a SIM card installed in order to use your Gobi radio to connect to a GSM WWAN network. For instructions on installing your SIM card, see Installing the Subscriber Identity Module (SIM in the Networking section.

Secure Digital (SD) Card Reader Support

The ARMOR X7 also provides a card reader for a micro SD or SDHC card. These cards are used as removable flash memory. The micro SD card slot is located inside the rear compartment, as shown in Figure 76. The Windows operating system recognizes the card as a removable drive, just like a USB memory stick.

Trusted Platform Module (TPM) Support

The X7 supports the Infineon SLB 9635 TPM controller module. This module meets the requirements of the Trusted Computing Group (TCG) Trusted Platform Module Specification 1.2. The TPM module is connected to the low pin count (LPC) bus.

For more information on TPM capabilities with the ARMOR X7, contact DRS Tactical Systems, Inc. toll free at 1-800-872-1100.

Optional Add-ons and Accessories for Your X7

There are a number of optional add-ons and accessories that extend the capabilities of the X7 or make it easier to use.

Wireless Wide Area Network (WWAN) Radio

DRS offers the Gobi® WWAN radio for use with the X7 computer. This wireless radio allows you to surf the internet, check email and connect to a Virtual Private Network (VPN) using cell phone technology just about anywhere in the world.

GPS Radio

The U-Blox GPS receiver is available as an add-on.

Compact Keyboard

A reduced-size USB keyboard (Figure 12) is available for use with the ARMOR X7 computer. The keyboard is approximately half the size of a standard keyboard and can be connected directly to the X7 or to a desk docking station to conserve space on a table or desktop.

Figure 12. Compact Keyboard

Desk Dock

The X7 desk dock is designed to fit on your desktop without taking up a lot of space. It is made of light-weight but rugged plastic and houses connectors for 3 USB ports, 2 GPIO ports, an RS-232 serial port and 5 VDC external power. The X7 slips easily into the cradle and locks into place with the spring-loaded top clamp. Just lift up on the clamp slightly to release the tablet.

Figure 13. X7 Desk Dock

MODEL X7 TABLET COMPUTER

Vehicle Dock

The X7 dock is made of UV-resistant high-impact plastic that weighs less than 2 lbs. It is designed to be attached to any mount that accepts the Video Electronics Standards Association (VESA) 75 mm hole pattern. The dock has a latch mechanism that can withstand over 50,000 latch/unlatch cycles and the latch can be locked with a key to prevent tablet removal. The floating docking connector is field-replaceable.

The dock has connections for 3 USB ports, 2 bi-directional GPIO ports and external 5 VDC power. The tablet slips easily into the cradle and can be inserted and latched with one hand.

The X7 vehicle dock is rugged and light weight and can be adapted to just about any mounting situation from console and dashboard installation to bulkhead and cab roof installation (see Figure 15), or it can be floor mounted using a special mounting assembly.

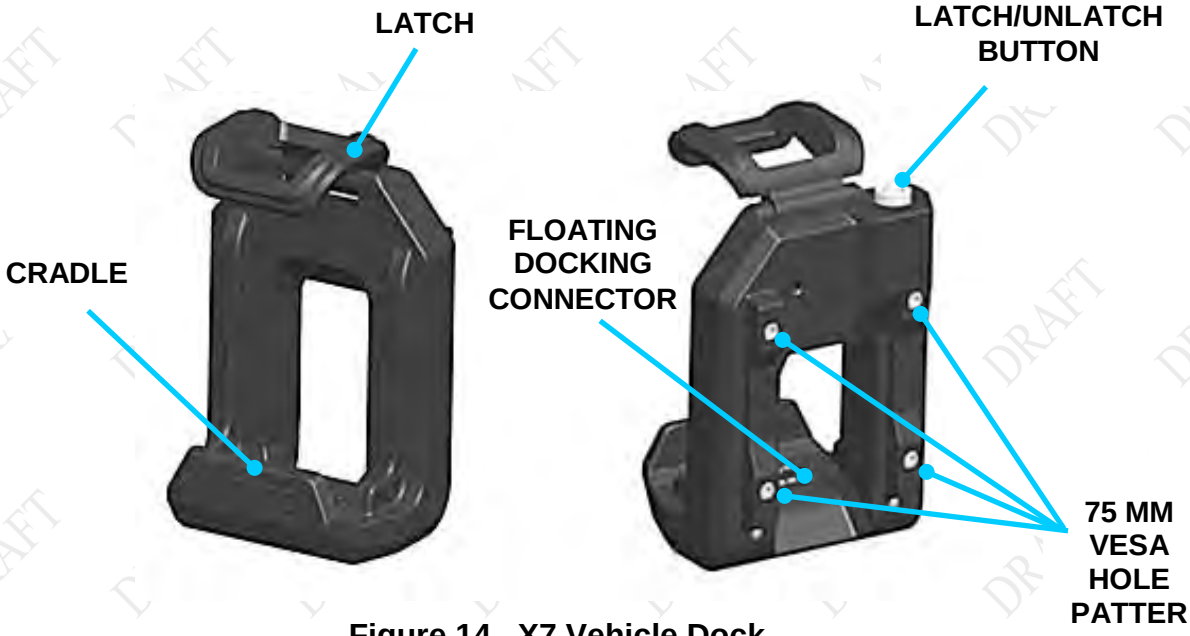

Figure 14. X7 Vehicle Dock

Figure 15. Examples of X7 Vehicle Dock Mounting Configurations

ARMOR Flexspace™ Adapter

The X7 computer provides additional space and a flexible I/O connectivity to accommodate a custom card or module such as a radio frequency ID (RFID) tag reader, contactless card reader or satellite communications module. It can also be used to provide additional interface ports.

The X7 Flexspace consists of a battery-shaped adapter that replaces the right-side battery. Figure 16 shows a conceptual model of a Flexspace adapter that provides additional interface connectors.

For more information on Flexspace capabilities with the ARMOR X7, contact DRS Tactical Systems, Inc. toll free at 1-800-872-1100.

Figure 16. ARMOR X7 Flexspace™ Adapter Concept

For information on these and any other ARMOR X7 accessories, please contact your ARMOR sales representative or call DRS Tactical Systems toll free at 1-888-872-1100.

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3. GETTING STARTED

The information in this section will help you get your X7 set up and operating. Please read all warnings, cautions and notes prior to each procedure or step.

CAUTION!

Use this product only in vehicles with a regulated voltage supply of +10 to +30 VDC. Voltages outside this range could cause unstable operation or result in permanent damage to the computer.

CAUTION!

Use only the external AC Adapter provided with your ARMOR X7 or an equivalent model approved by DRS. Attempting to use a different model power supply could result in equipment damage.

CAUTION!

DO NOT connect the computer to more than one power source at a time (such as to both an AC adapter and docking station) or permanent damage to the battery and/or computer may result.

Installing and Charging the Batteries

The first step to getting your X7 operating is to install and charge the batteries. The batteries are inserted into slots or “bays” on side of the computer as shown in Figure 17. The batteries are identical and can be installed in either bay. Follow the procedure in Table 2 to install the batteries.

CAUTION!

When using the provided AC adapter, the maximum safe ambient operating temperature is 40°C.

Figure 17. X7 Batteries Positioned for Installation

Table 2. Install the X7 Batteries

STEP	ACTION
1.	Place the flat surface of the first battery on the left side compartment tray with the locking slots facing toward the computer.
2.	Push and hold the battery latch and slide the battery toward the computer until the locking bar engages and the battery is flush against the compartment wall. Rock the battery slightly if necessary to engage the locking bar.
3.	Release the battery latch to lock the battery in place.

STEP	ACTION
4.	Perform steps 1-3 to install the second battery.
5.	Connect the AC adapter to the jack on the bottom of the X7 and plug the adapter power cord into an AC outlet.
6.	Allow the batteries to charge until the Charge/Fault indicator turns off. This could take anywhere from 2 to 4 hours depending on the level of charge when the batteries were received. You can work with your X7 while the batteries charge.

Monitoring Battery Charge Levels

You can check the current charge level of your batteries at any time by clicking on the battery icon in the system tray on the Windows desktop. This icon will have the shape of a battery when the unit is operating on batteries alone, and will have a plug next to it when external power is applied. Clicking on this icon opens a window like that shown in Figure 18.

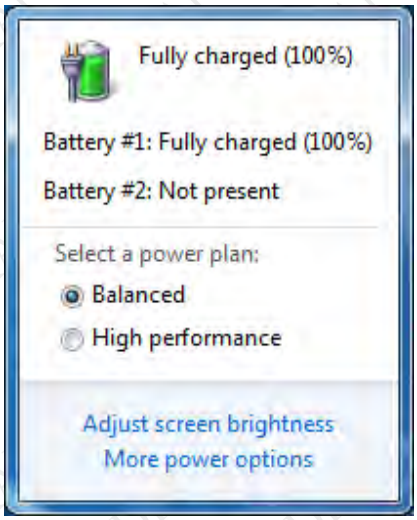

Figure 18. System Tray Battery Window

Battery "Fuel Gauges"

A multi-LED battery charge indicator, or "fuel gauge", is located on each battery pack, as shown in Figure 19. Each LED array consists of 5 LEDs and each LED represents 20% of the total charge of the battery as follows:

LED #5 - 81-100% (far right LED)
LED #4 - 61-80%
LED #3 - 41-60%
LED #2 - 21-40%
LED #1 - 01-20% (far left LED)

Activating the Fuel Gauges

The fuel gauge indicators are not visible when the battery is installed. However, when a battery is disconnected, you can press the battery button to activate the fuel gauge and check the current charge level.

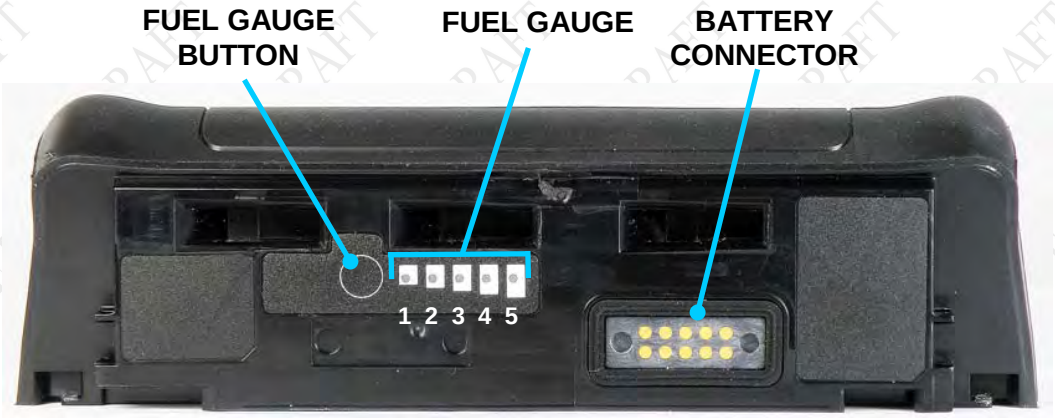

Figure 19. Battery Fuel Gauge

Turning On Your X7 for the First Time

On the left control panel, press and hold the **Power** button for at least 1 second and then release. If this is the first time the computer has been started since you received it, the Microsoft Out-of-Box Experience (OOBE) setup instructions will appear after the computer boots up. Follow these instructions to configure your Windows operating system software.

Turning the Computer On Normally

Turn the computer on by pressing the **Power** button for at least 1 second and then releasing it. The ARMOR X7 will perform self-checking routines during the start-up process. All units are configured at the factory to automatically boot to the Microsoft Windows desktop unless a custom configuration has been requested.

Putting the Computer in Sleep Mode

To put the tablet into sleep mode, press and release the **Power** button while the tablet is operating. **NOTE:** This is the default action of the Power button when you first receive your X7, but this can be changed in Windows Control Panel (see Changing the Power Button Default Action instructions).

You can also put the computer to sleep from the Windows desktop. Click on the **Start** button and click the down arrow next to the Shut Down button, then select **Sleep**.

When the computer is in sleep mode, the screen will be dark and all LED will be off except the battery status indicator. This LED will flash at a 1 sec rate to indicate the computer is in sleep mode. The computer will continue to run normally in the background and your session will be held in suspension.

Press and release the **Power** button again to wake up the computer and return to your session.

Turning the Computer Off Normally

To turn the computer off normally, select **Start → Shut down** from the Windows desktop. The computer will perform a normal shutdown.

NOTE

Do not press and release the Power button to turn off the computer. This will only put the computer into sleep mode and the screen will go dark. This could be mistaken for a power off condition while the computer is actually still running and consuming battery power.

Emergency Shutdown

If an emergency condition occurs where the computer needs to be shut down immediately, press and hold the **Power** button for more than five seconds. The computer will bypass the normal Windows shutdown sequence and turn off.

This procedure should only be used in emergencies because improperly shutting down Windows may result in the loss of data and possible corruption of the operating system.

Indicator State Summary

Table 3 lists all states for the various X7 indicator LEDs (refer to Indicator Panel for a description of each indicator).

Table 3. X7 Indicator State Summary

LED	IF THE INDICATION IS:	AND THE POWER MODE IS:	AND EXTERNAL POWER IS:	AND BATTERY IS:	THIS MEANS:
Wireless (blue)	On	On	Either		At least one radio is transmitting (GPS is receive only).
	Flashing intermittently	On	Either		The WLAN or WWAN radio is searching for a network connection or Bluetooth is transmitting data to a peripheral.
	Off	On	Either		One or more installed radios (excluding GPS) are disabled in ARMORutils. See Wireless Devices Dialog Window.
Storage Activity (blue)	Flashing intermittently	Power on	Either		Processor is accessing a storage device (SSHD, mSATA memory or micro SD card).
Charging/ Fault (amber or red)	Off	Power on	Disconnected	Installed	No power faults are detected
	Off	Power off	Connected	Installed	Batteries are not charging

LED	IF THE INDICATION IS:	AND THE POWER MODE IS:	AND EXTERNAL POWER IS:	AND BATTERY IS:	THIS MEANS:
	Flashing at 1 sec rate	Power on/off	Connected	Installed	Batteries are charging
	Flashing amber at 1/2 sec rate	Power on/off	Connected	Installed	Battery charging has stopped due to extreme battery temperature
	On steady red	Power on/off	Connected	Installed	Power system fault (overvoltage, undervoltage or overcurrent condition or battery failure). The LED will turn off when the fault condition is removed.
Power (blue)	On	On	Either		Computer is powered up.
	Flashing	Reduced	Either		Computer is in sleep mode.
	Off	Off	Either		Computer is powered off or in hibernate mode.
Fuel Gauge (blue) NOTE: press fuel gauge button to see indications	Single LED on steady	N/A	N/A	Removed	Total charge is maximum for that level (20%, 40% etc.)
	LED # 1 (far left) flashing at 1 second rate	N/A	N/A	Removed	Battery is below 10% charge level (fully depleted)
	All LEDs off	N/A	N/A	Removed	Battery is overly depleted. See What to Do for Overly-Discharged Batteries.

Activating your Wireless Radios

Refer to Section 4, Networking for instructions on activating and using your wireless radio connections.

Installing a Micro SD or SDHC Card

The micro SD/SDHC card socket is located inside the rear compartment. For instructions on how to install the card, refer to Installing a Micro SD or SDHC Card.

Configuring your Audio System

Table 4. Configuring Your Speaker

STEP	ACTION	CONDITION OR INDICATION
1.	Double-click on the orange speaker icon in the task bar tray.	The Realtek® HD Audio Manager window opens with the **Speakers** main tab (top of page) open and the **Speaker Configuration** sub-tab displayed, as shown in Figure 20
2.	Adjust your speaker/headset volumes as desired.	
3.	Select the **Sound Effects** sub-tab to select special effects.	
4.	Select the **Default Format** sub-tab to choose your default sound format.	

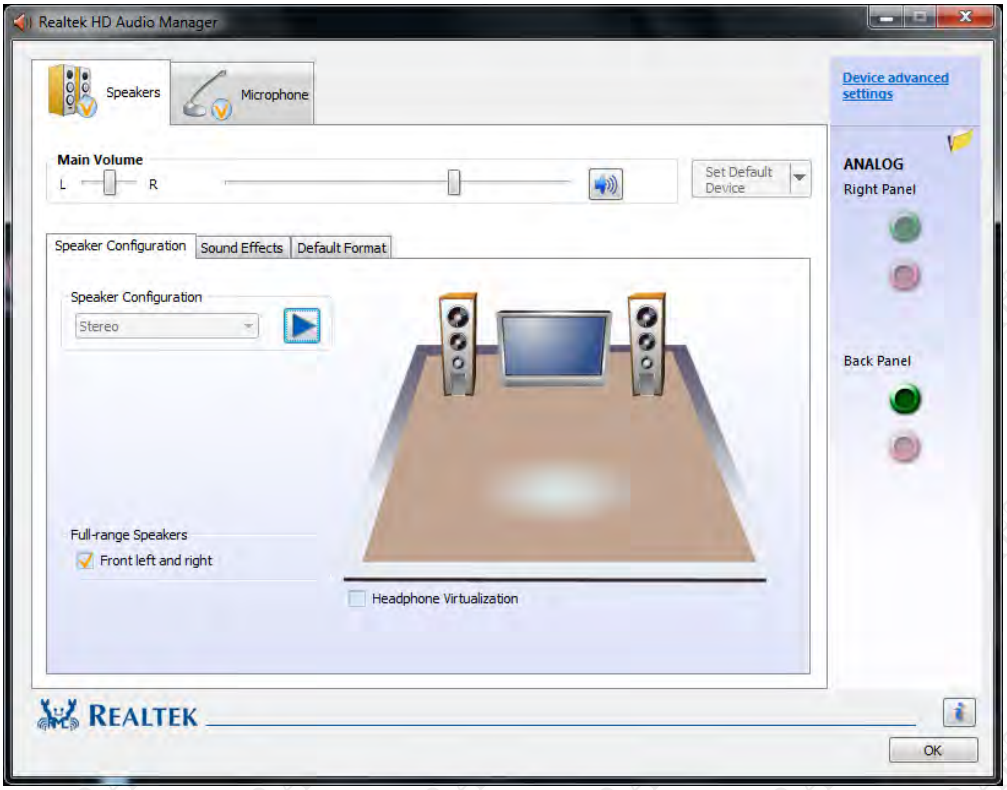

Figure 20. Realtek HD Audio Manager - Speakers Main Tab

Configuring your Microphones

Table 5. Configuring your Microphones

STEP	ACTION	CONDITION OR INDICATION
1.	Click on the **Microphone** main tab at the top of the page.	The Microphone main tab opens with the **Microphone Effects** sub-tab displayed, as shown in Figure 21.
2.	Set up and adjust your microphones.	
3.	Click on the **Default Format** sub-tab to select a default sound format for your microphones.	

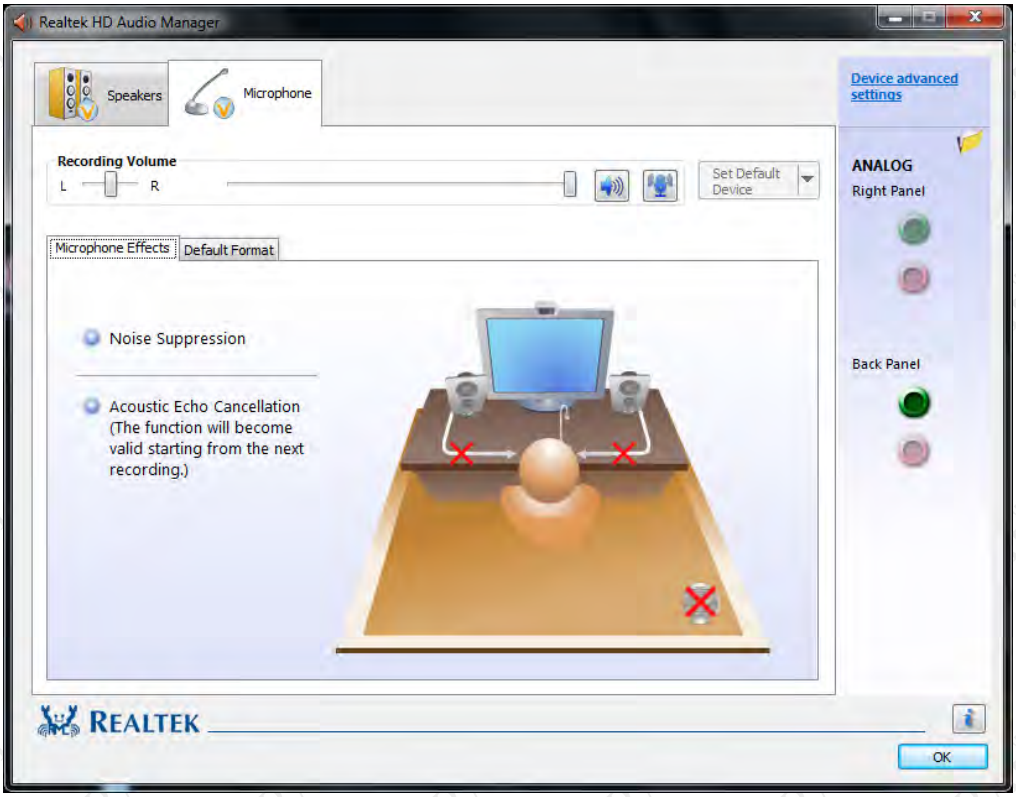

Figure 21. Microphone Main Tab

Operating the X7 Display

Adjusting the Screen Brightness

The brightness of an LCD display is controlled by adjusting the intensity of the backlight. The backlight intensity level for the X7 can be controlled manually or automatically.

Manual Brightness Adjustment

Your ARMOR X7 Tablet Computer is pre-set for manual adjustment of screen brightness (backlight level). The brightness can be adjusted manually in two ways: by repeatedly pressing P1 or P2 on the right control panel or by using the Backlight Setup dialog window in ARMORutils.

Using P1, P2 and P3

When you first receive your X7, the P1 button is programmed to increase the screen brightness in 10% steps, P2 is programmed to decrease brightness in 10% steps and P3 is programmed to toggle the screen off and on.

Press and release the **P1** button repeatedly to increase the brightness to its maximum level (100%); press the **P2** button repeatedly to decrease the brightness to its minimum level (10%). Press the **P3** button to turn the screen completely off; press it again to turn the screen back on to it's previously set level.

Using the ARMORutils Backlight Setup Page

Double-click on the ARMORutils desktop icon and select the Backlight Setup button. The Backlight Setup dialog opens as shown in Figure 22.

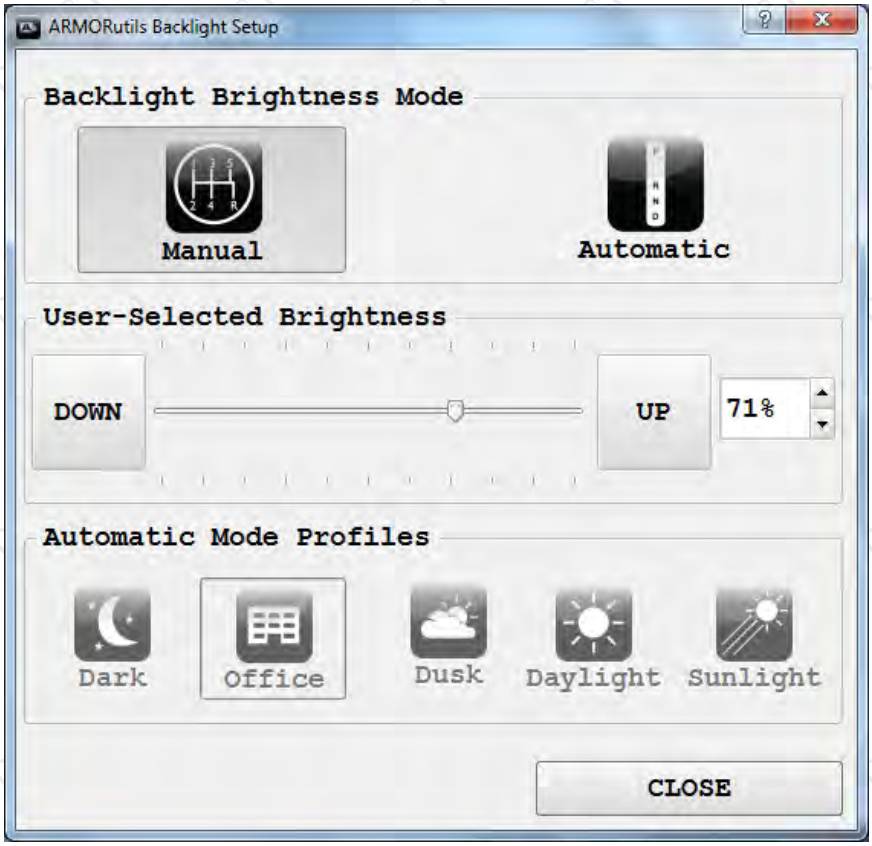

Figure 22. Armor Utilities Screen – Backlight Tab

Drag the slider or press the **UP** or **DOWN** buttons repeatedly with the pen or a fingertip to move the slider and adjust the backlight level. The % brightness is displayed in a field on the right. You can also use the up and down arrows next to this field to adjust the slider.

Automatic Adjustment

Open the **Backlight Setup** dialog in ARMORutils and click on the **Automatic** button. The backlight level will now be controlled by the ambient light sensor (ALS). If the surrounding light decreases, the brightness will *also decrease* proportionally; if the surrounding light increases, the brightness will *increase* proportionally.

NOTE

You must keep the ALS uncovered to allow proper automatic brightness adjustment.

Automatic Mode Profiles

Everyone's eyes react differently to changes in light levels and there may be times when the full range of automatic brightness adjustment is uncomfortable for you.

You can tailor the automatic brightness adjustment by selecting one of the 5 pre-configured brightness profiles. DRS has researched typical lighting environments and has created these adjustment profiles that respond more precisely to changing light levels within a particular environment.

For example, if the automatic brightness doesn't keep the display bright enough for you under surrounding lighting conditions, you can select the Dusk, Daylight or Sunlight profile to increase the brightness range proportionally. Similarly, if the normal brightness control results in light levels that are consistently too bright, you can select the Office or Dark profile to reduce the brightness range.

Working with the Pen Screen

When the pen screen is active, you can steer the pointer and perform many functions by simply hovering close to the screen without actually touching it. Other functions are initiated by pressing the tip to the screen surface to activate the tip switch or by pressing the side button switch.

Your X7 Active Pen

The pen that comes with your X7 (Figure 9) is stored in a slot on the back panel (see Figure 5) and has circuitry that interacts with the digitizer assembly built into the pen screen. The digitizer detects the pen tip close to the screen and activates certain functions like steering the pointer or performing a right click action if the pen is allowed to hover for a few seconds. Pressing the tip to the screen activates a tip switch that performs a left-click action.

Using the X7 Pen with the Pen Screen

Table 6 lists mouse-type objectives you can perform using the X7 pen with the pen screen.

NOTE

This description assumes the side button is set for the (default) right-click function.

Table 6. Pen Screen Actions.

MOUSE OBJECTIVE	PEN ACTION
Select option or tab or open submenus. Fill selection boxes. Activate buttons. Deselect highlighted objects (touch next to the object).	Tap once
Selects multiple objects.	Touch pen tip to display and drag box around objects
Highlight object or option.	Hover over object or option
Move object on the desktop.	Touch an object and move it with the pen.
Start application or open folder.	Tap twice
Highlight option, open menus (right click).	Hover tip near screen until option menu opens -or- Press side switch and touch object or option (see Pen Tablet Properties Utility for other side switch options).

Pen Screen Adjustments

You can change attributes related to use of the pen with the pen screen by selecting **Start → Control Panel → Hardware and Sound** → and clicking on one or more of the following utilities:

- Pen and Touch utility
- Pen Tablet Properties utility
- Tablet PC Settings utility

Refer to Section 5, Your ARMOR X7 Software for information about these utilities.

Pen Screen Calibration

After a period of normal usage, the screen may need to be calibrated with the pen to ensure the pen tip is aligned with the pointer over the entire screen area. Refer to Calibrating the Display.

Working with the Touch Screen

When the touch screen is active, the pressure of a stylus tip or fingertip against the screen is used to duplicate actions with a two-button mouse.

NOTE

Tapping with a stylus tip requires only light to moderate pressure. It is possible to damage the pen tip and/or the display by pounding the tip against the surface with too much force.

Working with the Touch Screen

Table 7 lists mouse-type objectives you can perform using a passive stylus (not provided) or fingertip with the touch screen.

Table 7. Stylus Actions.

MOUSE OBJECTIVE	STYLUS ACTION
Select tabs or open sub-menus. Highlight a label or option. Fill selection boxes. Activate buttons. Deselect highlighted objects or release multiple objects	Tap once Tap outside the object(s)
Start an application or open a folder.	Tap twice
Move an object on the desktop.	Press over an object, hold contact with display, drag pen and release pressure.
Open menu options.	Press over icon or option and hold contact with display without moving pen.
Select multiple objects.	Press and hold contact with display, drag box around objects.

Touch Screen Adjustments

You can change attributes related to use of a fingertip or passive stylus with the touch screen.

Select **Start → Control Panel → Hardware and Sound** → and click on the **Touch Settings** utility, **Pen and Touch** utility and the **Tablet PC Settings** utility.

Refer to **Your ARMOR X7 Software** section in the **X7 User's Guide** for an explanation of these attributes.

Touch Screen Calibration

NOTE

You will not be able to use the pen that came with your X7 to calibrate the touch screen since the calibration routine will detect the active pen tip and not allow you to proceed. Use your fingertip or a passive stylus designed for touch screens.

You will need to calibrate the touch screen using a fingertip or a passive stylus (not included with the X7) to ensure the actual touch point matches the position of the pointer. For calibration instructions, refer to Calibrating the Display.

Entering Data Using the Input Panel

The input panel is a virtual keyboard and handwriting entry tool that is located on your desktop.

The Input panel keyboard is normally hidden just off the left side of the display. The edge appears in the upper left corner when you tap near it on the screen with a fingertip, stylus or the active pen, as shown in Figure 23.

When it is visible, tap on it twice to fully open it on the desktop, as shown in Figure 24.

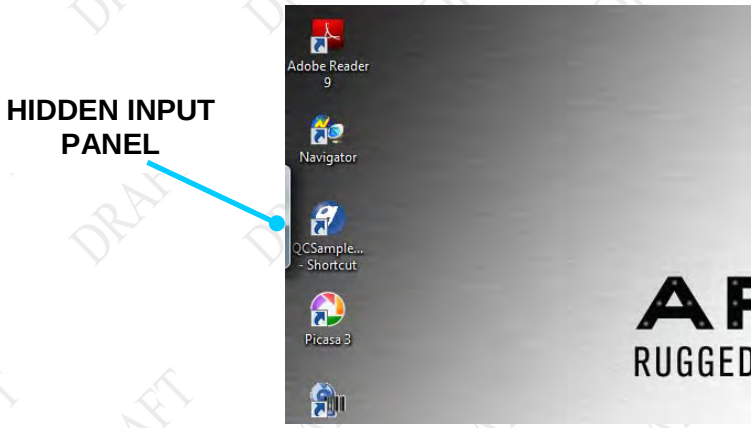

Figure 23. Location of the Input Panel

Figure 24. Input Panel Keyboard Opened on Desktop

Operating Modes

The input panel has two modes: handwriting and keyboard entry. These are selectable by the two mode icons at the upper left corner. **NOTE:** The panel will always open in the last mode used.

Click on the Tools menu for handwriting options and for information on how to set up and use Input Panel.

Editing Documents

When you tap on an open text document such as a WordPad document, a keyboard icon will appear on the screen. Tap on the icon to open the input panel.

Opening Input Panel with a Gesture

You can also use a side-to-side gesture to open the input panel. **Select Start → Control Panel → Hardware and Sound → Pen and Touch**, then highlight **Start Tablet PC Input Panel** in the Pen Actions panel and click on **Settings**.

When the Start Input Panel Gesture Settings window opens, check the **Enable start Input Panel gesture** option. Follow the instructions to test and adjust your gesture.

Using the FPS as a Simple Mouse Device

The FPS mouse function is activated as soon as you start up the computer. It places an icon in the task tray that you can used to access options and make adjustments. Follow the procedure in Table 8 to configure the FPS mouse function.

Refer to Table 9 for a list of available mouse functions using the FPS sensor.

Table 8. Configuring the FPS Mouse Function

STEP	ACTION	CONDITION OR INDICATION
1.	Right-click on the **AuthenTec icon** in the task tray.	The **TruePrint Sensor Properties** dialog window opens with the **Swipe Navigation tab** displayed, as shown in Figure 25.
2.	If not already selected, click on the **Cursor Nav** option at the top of the window.	

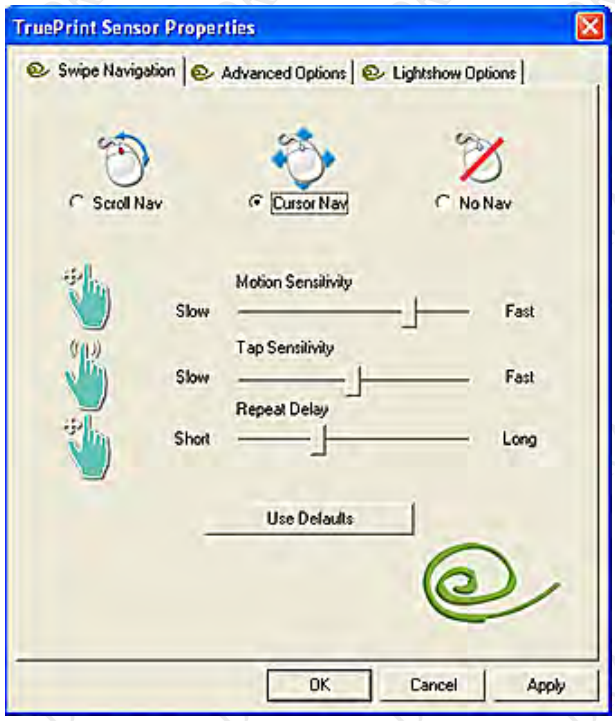

Figure 25. FPS Sensor Properties Window

STEP	ACTION	CONDITION OR INDICATION
3.	Move the **Motion Sensitivity** slider to the right to about 80% of the scale.	
4.	Click on the **Advanced Options tab** at the top of the window and change the **Orientation** to **270**°.	This aligns the mouse movement axes with finger movement over the FPS sensor.
5.	Click on the Lightshow Options tab and de-select **Enable Lightshows**.	
6.	Select **Apply** and then select **OK**.	

Table 9. FPS Mouse Actions

MOUSE OBJECTIVE	FPS SENSOR ACTION
Move pointer	Keep thumb flat on sensor and move in long swipes.
Select tabs or open sub-menus. Highlight a label or option. Fill selection boxes. Activate buttons. Deselect highlighted objects or release multiple objects	Tap once. Tap outside the object(s).
Start an application or open a folder.	Tap twice.
Move an object on the desktop.	- Function not available -
Open menu options.	Move pointer over icon or option and press thumb down on sensor for a few seconds.
Select multiple objects.	Drag pointer to create box around objects.

Operating with the ARMOR X7 Vehicle Dock

X7 RF and Non-RF Vehicle Docks

Two versions of the X7 vehicle dock are available: the RF version and the Non-RF version. The RF version has two coaxial cables attached to the docking connector to route the WWAN radio and GPS receiver antenna connections to external antennas mounted in a vehicle.

The Non-RF version does not have the coaxial cables.

Using the X7 Vehicle Dock

Place the X7 in the docking cradle and press down on the top latch until it locks. To remove the X7, press on the latch locking mechanism until the latch snaps up.

If you have the RF version of the dock, you will be able to connect your X7 tablet to external WWAN and GPS antennas, which will dramatically improve reception. These antennas are automatically switched into the tablet antenna circuits by an RF multiplexer when the tablet is docked and switched out when it is undocked.

Either one or both antennas can be enabled using the Wireless Devices dialog in ARMORutils (Figure 26). Follow the instructions in

NOTE

If you have an X7 RF dock installed but are <u>not</u> using external antennas, you must set the Dock RF Sw to "Disable" in order to use the tablet's internal antennas.

NOTE

If you have an X7 Non-RF dock installed, you must set the Dock RF Sw to "Disable" in order to use the tablet's internal antennas.

Table 10 to configure the external antennas.

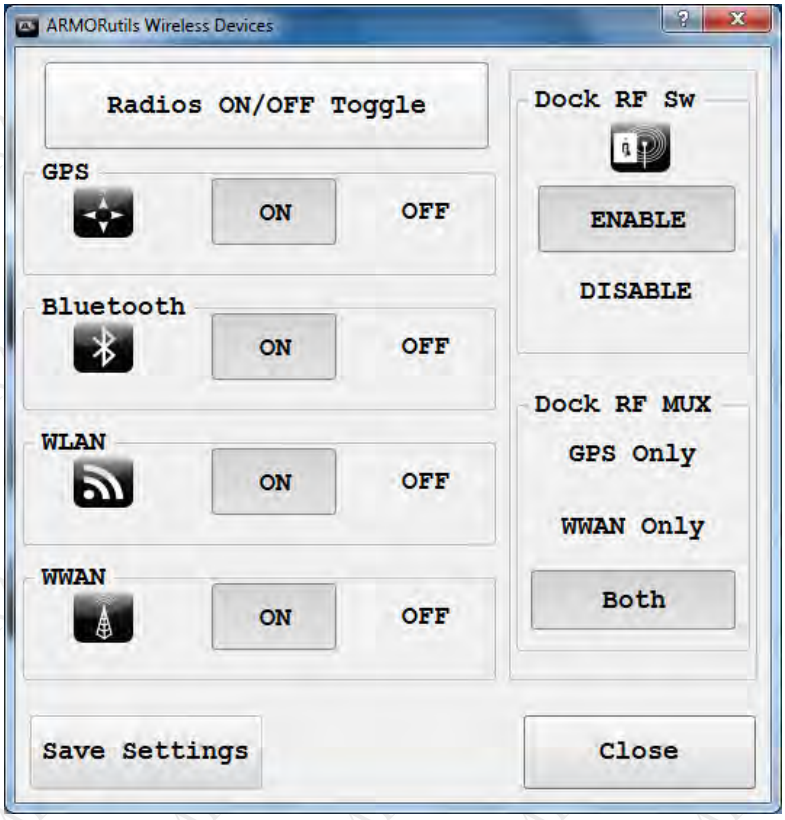

Figure 26. External Antenna Selection Options in ARMORutils

NOTE

If you have an X7 RF dock installed but are <u>not</u> using external antennas, you must set the Dock RF Sw to "Disable" in order to use the tablet's internal antennas.

NOTE

If you have an X7 Non-RF dock installed, you must set the Dock RF Sw to "Disable" in order to use the tablet's internal antennas.

Table 10. Configuring the External Antennas

STEP	ACTION	CONDITION OR INDICATION
1.	In the **Dock RF MUX** panel, select **GPS Only**, **WWAN Only** or **Both**	When the tablet is docked, only the antennas that are selected will be utilized.
2.	Press the **Docking RF Sw Enable** or **Disable** button to enable or disable the antenna configuration that is selected in the **Dock RF Mux** panel.	

Using the Webcam

Capturing Images and Video

Image and video capture is performed using the built-in webcam and image capture software. Your X7 is provided with a version of Picasa 3™ image editor to demonstrate the image capture process. Other software packages with more and varied options are available.

Follow the procedure in Table 11 to capture and save a still image or movie using this software.

NOTE

Remove the blue protective film from the webcam lens before using the camera.

Table 11. Capturing a Still Image or Video

STEP	ACTION
1.	Double-click on the **Picasa 3 icon** on the desktop to open the Picasa application window, as shown in **Error! Reference source not found.**.
2.	Click on the “Capture photos or video…” button in the options bar. A Capture dialog window will open displaying the current webcam image.
3.	To capture the image as a **still image**, click on the **camera** button below the image. Each capture will appear as a thumbnail at the bottom of the window.
4.	When finished, click on the **Done** button to access editing and correction options or to save or upload your images.
5.	To capture moving video, click on the **Record** button below the image. The capture window will change to a viewer with options to view, save and upload your captured video.
6.	To return to the main window, click on the **Back to Library** button.
7.	Refer to the Picasa Help resources for detailed instructions.

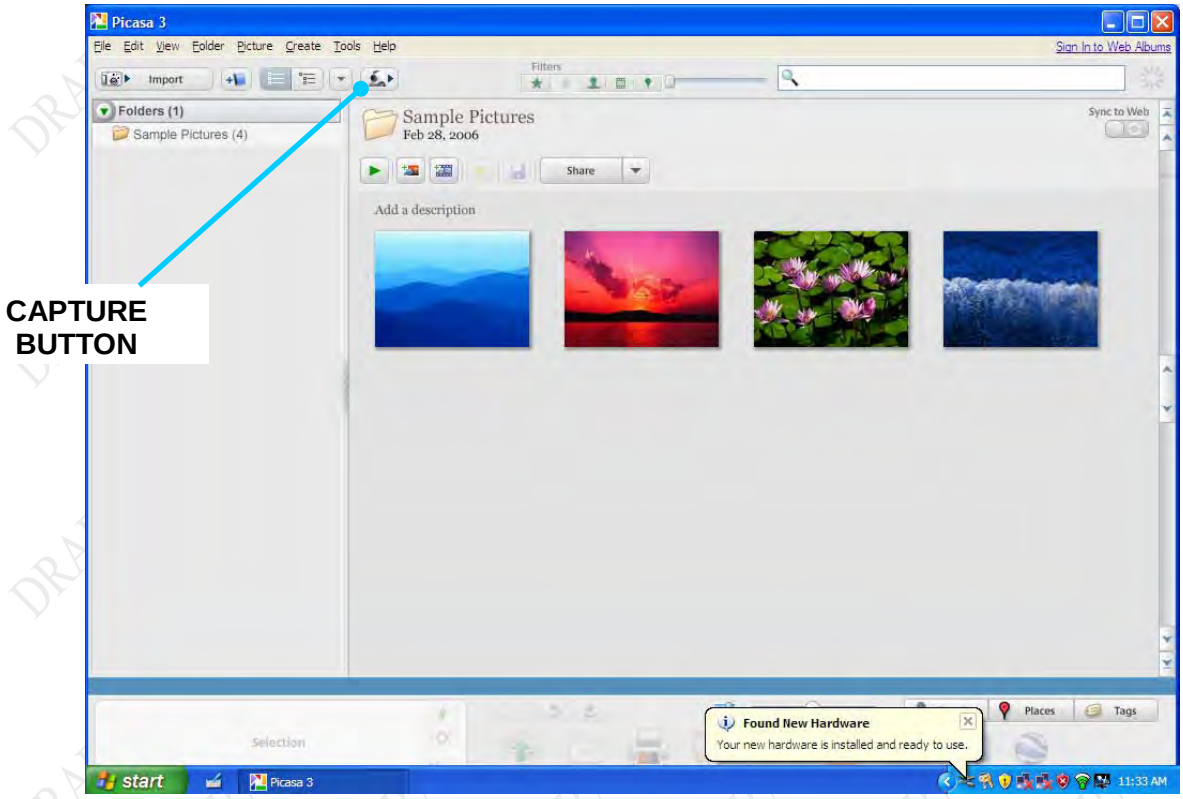

Figure 27. Picasa Application Window

Scanning a Barcode

The built-in webcam and application software of your choice allows you to scan various types of barcodes and incorporate them in to your documents. We have included two simple applications to demonstrate the barcode scanning capabilities of the X7.

NOTE

Ensure that adequate light can reach the barcode to be scanned.

Linear Barcodes Such as UPC-10, EAN-13 and ISBN

Figure 28 shows a sample of a linear barcode. Follow the procedure in **Error! Reference source not found.** to scan a linear barcode.

Figure 28. Sample Linear Barcode

Table 12. Scan UPC-10, EAN-13 and ISBN Barcodes in Windows 7

STEP	ACTION
1.	Double-click on the **Webcam Barcode Scanner** icon on the desktop to open the application window, as shown in Figure 29.
2.	Hold the barcode to be scanned 2-3" from the camera and hold it steady. A tone will announce successful barcode capture, and the barcode number will appear at the bottom of the window. The captured barcode is stored in the Windows clipboard.
3.	To use a barcode in an application, open the application, place the pointer in a field and paste.

Figure 29. Webcam Barcode Scanner® Barcode Scanner Application Window

2D Barcodes in Datamatrix or QR format

A sample 2D barcode is shown in Figure 30. Follow the procedure in **Error! Reference source not found.** to scan a 2D barcode.

Figure 30. Sample 2D Barcode

Table 13. Scan Datamatrix and QR Format Barcodes in Windows 7

STEP	ACTION
1.	Double-click on the **QuickMark** icon on the desktop to open the QuickMark® application window, as shown in Figure 31.
2.	Hold the barcode to be scanned 2-3" from the camera; an audible signal will sound upon capture and the barcode information will be displayed in the application window, as shown in Figure 32.
3.	To return to the camera mode, click door icon at the lower right corner of the window.

Figure 31. QuickMark® Barcode Scanner Application Window

Figure 32. A Captured 2D Barcode

Using the Screen Magnifier

Some text and images on a small screen can be difficult to see clearly. Your X7 has a handy application that will magnify a portion of the screen and help you see more effectively. The program is called Virtual Magnifying Glass™.

- To start the application, click on the **Virtual Magnifying Glass icon** on the desktop or select **Start > Programs > Virtual Magnifying Glass.**
- Use the Scroll wheel to increase or decrease magnification. The application will return to the last magnification when restarted.
- Left click to close the magnifier.
- To access the configuration menu, right-click on the icon in the task bar.
- A magnified example is shown in Figure 33.

Figure 33. Virtual Magnifying Glass at Work

Tips for Proper Use and Care Of Your X7

There are certain precautions you should take to ensure that your ARMOR X7 computer continues to provide you with reliable service:

- Do not subject the computer to heat by placing it on the dashboard of a vehicle with the display facing the sun.
- Do not store the computer in temperatures below -40°C or above 70°C.
- Do not pile tools or heavy objects on top of the computer.
- Avoid severe impacts, especially to the display.
- Do not try to take the computer apart. Disassembly of the unit by unauthorized personnel may void your warranty.
- Keep your screen clean and calibrated.

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4. NETWORKING

Your ARMOR X7 comes configured with two wireless network capabilities: Wi-Fi™ (wireless fidelity) and Bluetooth(r). The Wi-Fi network is primarily used for higher bandwidth connections such as Internet or a company LAN. The Bluetooth network is used for connecting wireless devices such as a wireless printer or scanner to your computer.

The X7 can also accommodate an optional WWAN radio and/or a GPS receiver. These radios are described in Optional Add-ons and Accessories for Your X7. Please contact DRS Technical Support for information about installing these options.

Managing your WI-FI Radio

Your WI-FI (WLAN) radio is already configured and operating. Refer to Table 14 for instructions on how to establish and manage your WLAN connections.

Table 14. View and Manage Network Connections

STEP	ACTION	CONDITION OR INDICATION
1.	Select **Start → Control Panel → Network and Internet → Network and Sharing Center**.	The window shown in Figure 34 opens.
2.	Click on the "**Connect to a network**" link to open the window shown in Figure 35. Click outside this window to close it.	The label "Connected" will appear beside each network you are currently connected to. Any other available networks are also listed. The green signal bars indicate the relative strength of the wireless signal. A yellow shield indicates those sites that do not have security enabled. Use caution when connecting to these sites.
3.	To connect to a network, click on the network name and select **Connect**. To disconnect from an active network, click on the name and select **Disconnect**.	
4.	For more detailed information on the options and settings for these windows, click on the **Help** icon	

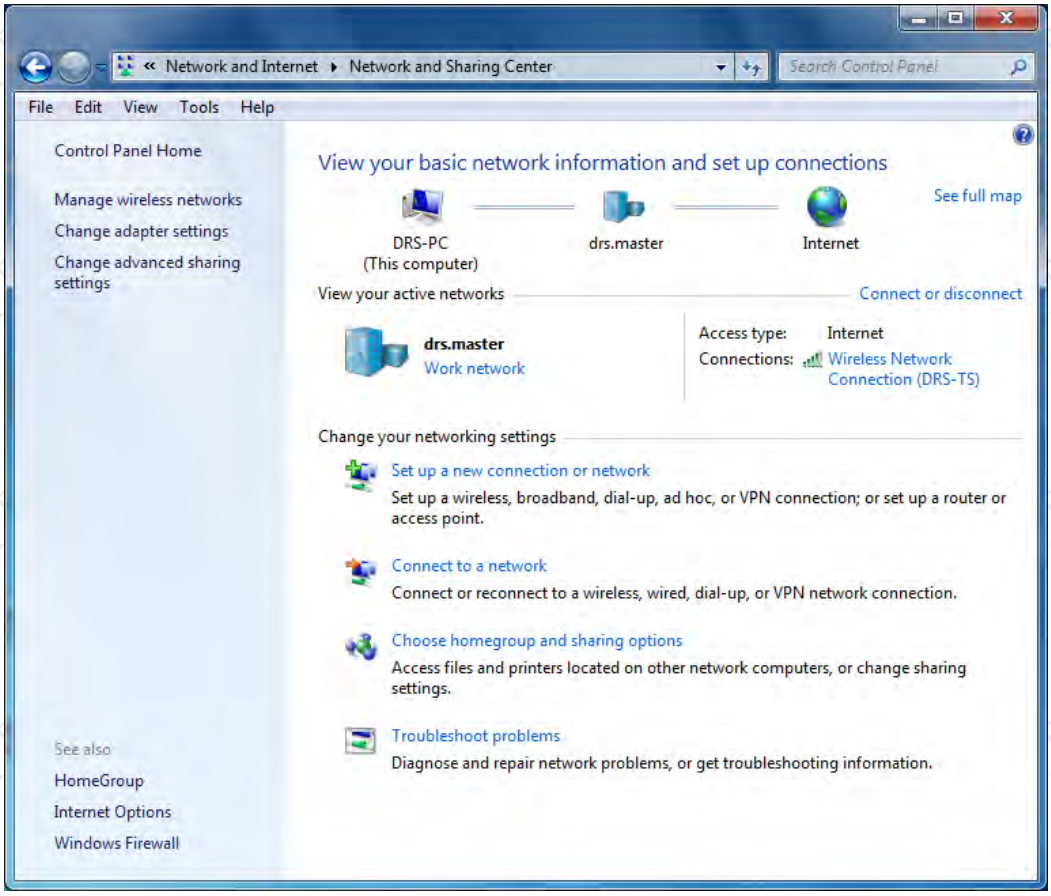


Figure 34. Windows Network and Sharing Center

Figure 35. Currently Connected and Available Wi-Fi Networks

Managing Your Bluetooth Connections

Your X7 comes equipped with Bluetooth® networking. To utilize this feature, you must "associate" this computer with your Bluetooth devices. To see what Bluetooth devices are available and to add or remove devices, follow the procedure in Table 15.

Table 15. View and Manage Bluetooth Devices

STEP	ACTION	CONDITION OR INDICATION
1.	Select **Start → Control Panel → Hardware and Sound → Devices and Printers.**	A window opens (Figure 36) showing any peripherals connected or available (including cabled devices).
2.	Right-click on the icon for your computer and select **Bluetooth settings** from the menu.	The Bluetooth Settings window opens, as shown in Figure 37.
3.	Check the "**Allow Bluetooth devices to find this computer**" option.	
4.	Check the "**Allow Bluetooth devices to connect to this computer**" option.	
5.	To add a device, click on the "**Add a device**" option in the toolbar.	
6.	To remove a device, click on the "Remove a device" option in the toolbar.	
7.	For additional information about these windows, click on the **Help** icon.	

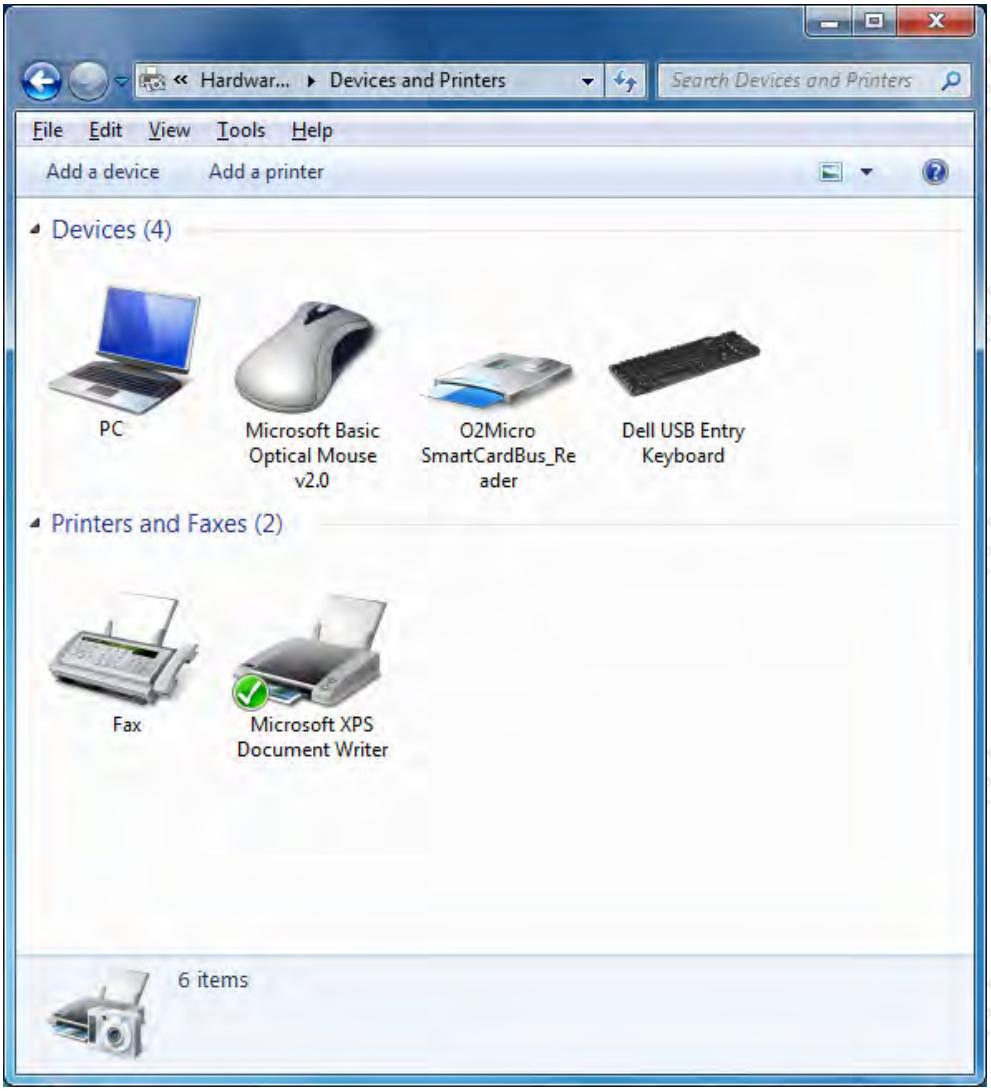


Figure 36. Devices and Printers Window

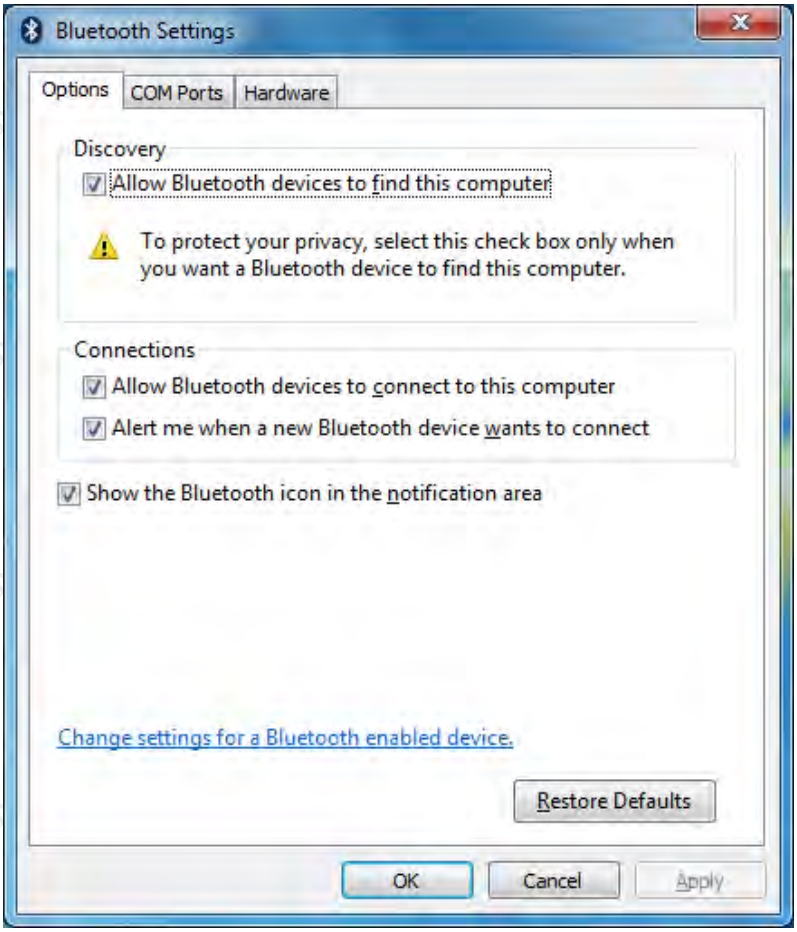


Figure 37. Bluetooth Settings Window

If you have the Optional WWAN Radio

If your WWAN network does not require a SIM, skip to

Connecting to a WWAN.

Installing the Subscriber Identity Module (SIM)

For certain networks like GSM, you must install a valid SIM before you can activate and use your WWAN radio. The SIM is obtained from your WWAN service provider and is installed in a socket located inside the rear compartment, as shown in Figure 38.

Follow the procedure in Table 16 to access the rear compartment and install the SIM.

NOTE

This procedure should only be performed by a qualified technician in a controlled environment.

CAUTION!

Circuit boards containing electrostatic discharge (ESD) sensitive devices are exposed in this compartment. Static-free handling is required to prevent possible damage to the components.

Table 16. Installing a SIM

STEP	ACTION	CONDITION OR INDICATION
1.	Power down the computer and disconnect any external power.	
2.	Remove the batteries.	
3.	Place the computer face down on a clean surface and remove the 14 Philips screws securing the cooling register (rear cover).	
4.	Carefully pry up the register at the slot provided (Figure 38) and remove.	

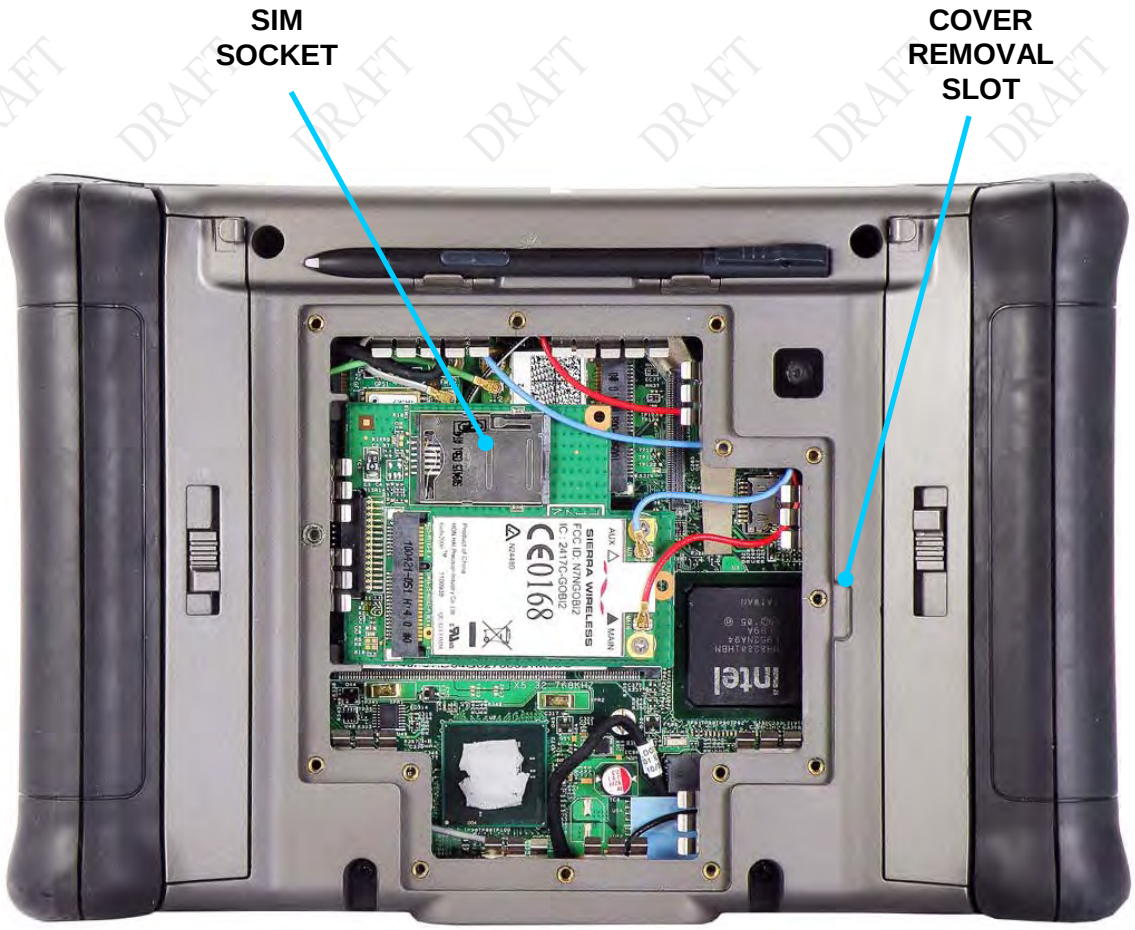
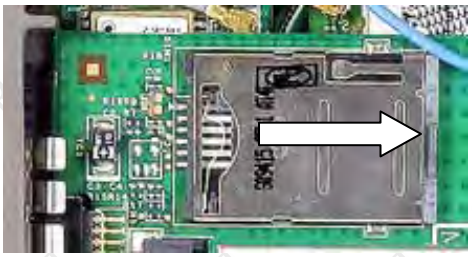
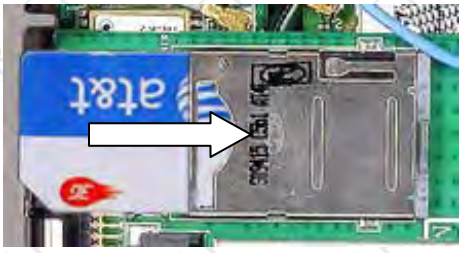
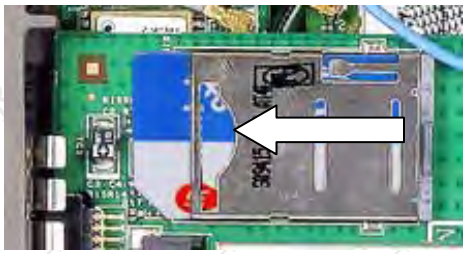


Figure 38. X7 Rear Compartment

STEP	ACTION	CONDITION OR INDICATION
5.	Place a fingertip in the notch on the left side of the SIM socket cover and slide the cover to the right until you feel an indent, then lift up.	
6.	Insert the SIM with the corner notch at the lower left.	

7.	Gently press the cover down and slide to the left to lock in place.	
8.	Reinstall the cooling register and secure with the 14 Philips screws. Be careful not to over-tighten the screws.	

Connecting to a WWAN

Once your card is installed (if required), you are ready to activate your network connection. Follow the procedure in Table 17 to connect to a WWAN.

Table 17. Connecting to a WWAN

STEP	ACTION	CONDITION OR INDICATION
1.	Click on the **OneClick Internet icon** on the desktop or Select **Start → All Programs → OneClick Internet**	The Sierra® OneClick™ Internet Connection Manager window opens, as shown in Figure 39.
2.	Select **Settings** and then click on the **General** tab.	The Settings window opens, as shown in Figure 40.
3.	Select the **Gobi NDIS Auto Connect** option.	This option automatically controls launching the connection application, connecting to the network, reconnecting if you lose contact, and roaming.
4.	If you wish to be alerted when roaming, select the Roaming Alert option.	The connection is made and a list of connection statistics is displayed in the right panel.

NDIS Notes:

- NDIS turns the WWAN radio on even before the OS starts. This is not always a desirable state, so choose NDIS only if needed.
- Because NDIS enables the Gobi WWAN hardware to connect, reconnect and roam automatically, those selections are ignored if chosen in conjunction with NDIS.
- Auto Launch is not recommended for use with NDIS – it will launch the Connection Manager application upon reboot, restarting the connection.

Click on the **Help** button on the OneClick Internet connection manager window (Figure 39) for detailed information on using the Sierra application.

Figure 39. Sierra OneClick Connection Manager Window

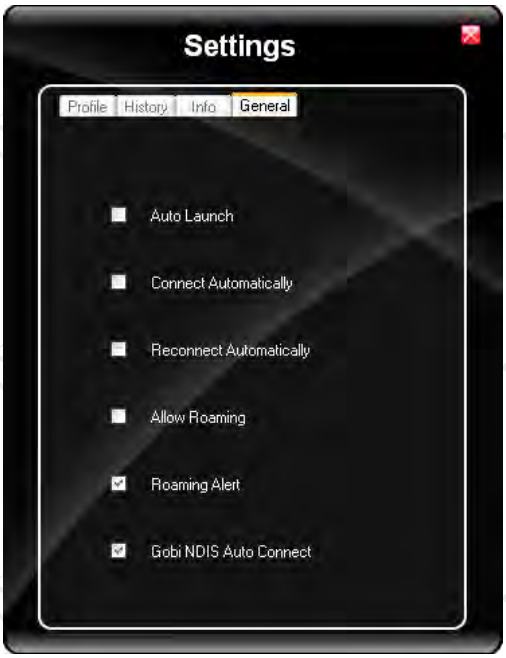


Figure 40. Settings Window

If you have the Optional GPS Receiver

The u-center GPS application is bundled with the X7 software suite but is only functional if you have the optional GPS receiver installed.

Before you can use your u-center software, you must manually obtain and enter the communications port that was assigned to the u-center by Windows. To do this, follow the procedure in Table 18.

Table 18. Configuring the u-Center com port

Step	Action	Comment
1.	From the Windows desktop, select the **Start** button and select **Control Panel → Hardware and Sound → Devices and Printers → Device Manager**	The Device Manager dialog window will open.
2.	Open the **Ports (COM & LPT)** option and record the COM port currently assigned to **u-blox 5 GPS and GALILEO Receiver.**	
3.	Close Control Panel and open the u-center application by double-clicking on the **u-center desktop icon** or selecting the **u-center option** from the **All Programs** list.	The u-center application window opens as shown in Figure 41.
4.	Select the **Receiver** menu in the application tool bar and click on the **Port** option.	
5.	Choose the COM port that you recorded from Control Panel.	Your GPS receiver will automatically begin searching for satellites.

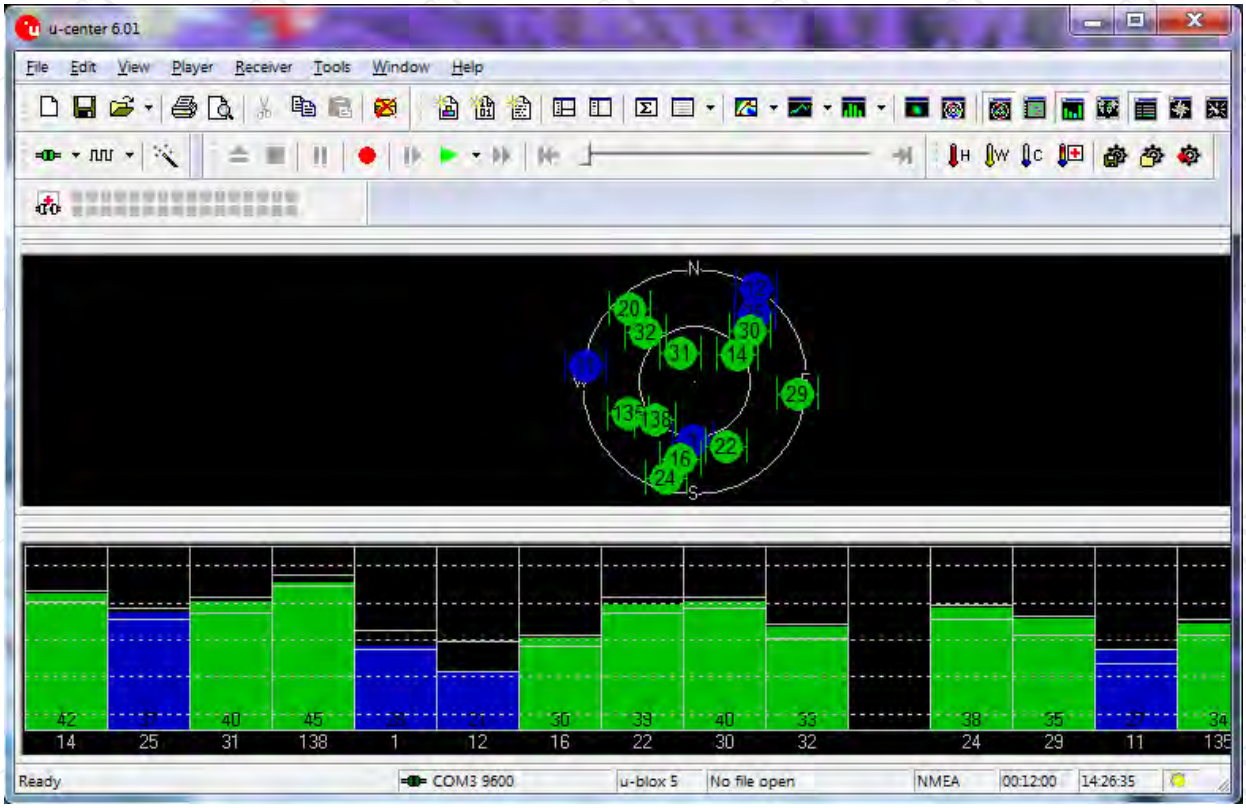


Figure 41. U-Center GPS Application Window

The diagram in the center shows the approximate positions of satellites relative to your location that are within range of the receiver. The graph at the bottom of the page shows the signal strength of each satellite. A green bar indicates acceptable signal strength; a blue bar indicates marginal reception. You must have at least four satellites with acceptable signal strength to generate reliable position data.

Click on the **Help** tab at the top of the window for guidance on accessing, interpreting and using the GPS information.

Enabling and Disabling Your Wireless Radios

You may want to turn off one or more of your radios to save power, to avoid interfering with other radio systems, or just to ensure your privacy. Or you may want to turn off all of your wireless radios at one time but keep working on your computer, as when travelling on an aircraft.

Click on the **ARMORutils icon** on the desktop and select the **Wireless Setup** option. This will open the Wireless Devices page, as shown in Figure 42.

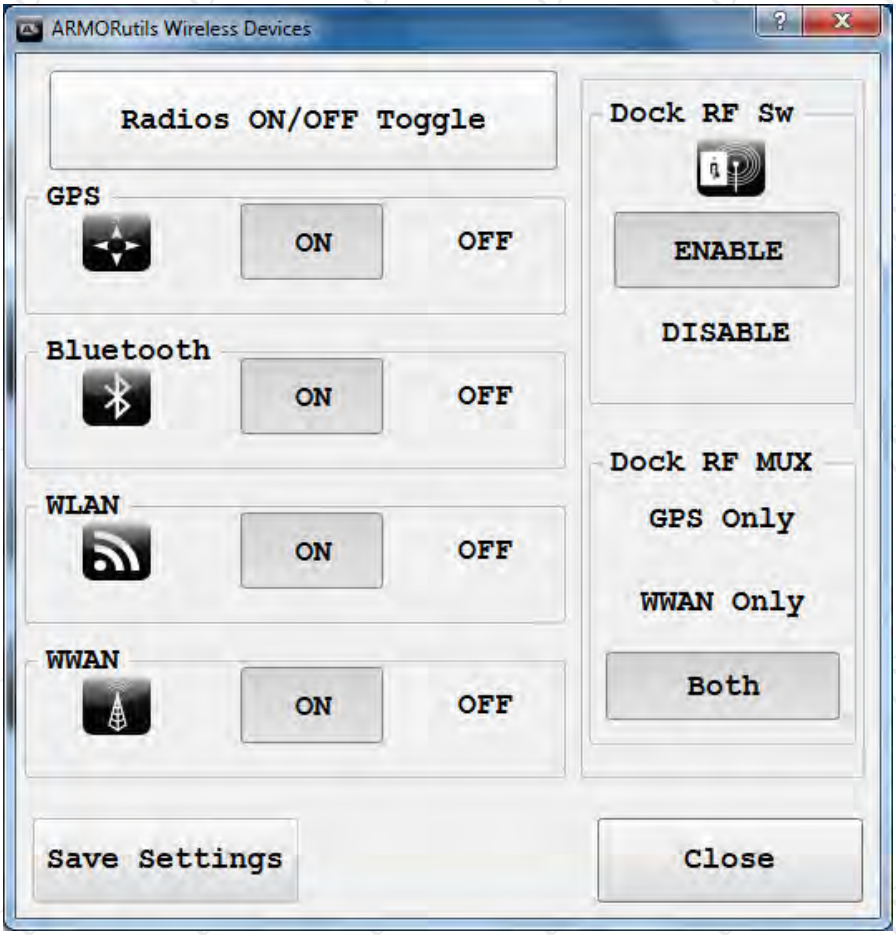


Figure 42. ARMORutils Wireless Devices Page

Click on the **ON** or **Off** button to enable or disable each individual radio that is installed, then click the **Save Settings** button to save your configuration. Click on the **Radios ON/OFF Toggle** button to turn off all enabled radios at one time. Click it again to turn them all back on.

For use of the **Dock RF Sw** and **Dock RF MUX** options, see Using the X7 Vehicle Dock.

Wireless Signal Quality

Wireless signal quality is affected by several conditions:

- Distance from a Wi-Fi access point.
- Access rights (set up through an administrator).
- Your security settings.
- Orientation of the wireless antennas.

If you are having difficulty connecting to your network, try the following steps:

1. Open the Wireless Devices page in ARMORutils and verify that the radio is enabled.
2. If your tablet is not locked in a vehicle mount, try turning the unit in various directions to improve signal quality.
3. Try to get closer to the access point.
4. Move away from obstacles such as trees and metal objects which may be between you and the Access Point.
5. Verify that the Wi-Fi access point is operating.

   If none of these actions solves the problem, contact your Network Administrator for assistance.

5. YOUR ARMOR X7 SOFTWARE

Your ARMOR X7 comes with a variety of software applications. Many of these are standard with the Windows 7 operating system, some are provided by DRS to improve your configuration and control of the computer and some may be custom software provided for add-ons and special requirements.

Table 19 lists the software bundled with your X7 purchase. The paragraphs following provide you with an overview of these software applications.

NOTE

A detailed description of each setting and option (with the exception of programs created by DRS) is beyond the scope of this manual. Please refer to the help resources provided with each software application.

Table 19. Software Included with your X7 Purchase

APPLICATION	PURPOSE
Microsoft® Windows 7 Professional™ or Windows Ultimate™ Operating System	Controls the processing, display, wireless communications and media functions of the computer.
DRS ARMORutils® (ARMOR Utilities)	Provides settings and information used to configure and maintain your X7.
Windows Pen and Touch Utility	Provides settings for interacting with the touch and pen screens.
Windows Tablet PC Settings Utility	Provides settings for calibrating the pen and touch screens and for customizing the action of the pen and fingertip.
Windows Pen Tablet Properties Utility	Provides settings and extended capabilities for the active pen, plus access to calibration routines.
Sierra Wireless® OneClick Internet Connection Manager™	Provides configuration and connection management of the optional Gobi® WWAN radio.
UBlox® u-center™ GPS application	Controls the GPS receiver and acts as the data interface for Windows applications.
Realtek® HD Audio Manager™ application	Provides sound settings and adjustments for the internal speaker and for optional external headphones.
TruePrint® Fingerprint Sensor Navigator application	Allows the fingerprint sensor to be used to steer the pointer on the desktop and perform simple mouse functions.

Picasa 3® Image Capture Application	Works with the webcam to capture still images and movies.
WebcamBarcodeScanner™	Allows the webcam to capture linear barcodes.
QuickMark™ barcode scanner	Allows the webcam to capture 2D barcodes.
Virtual Magnifying Glass™	Provides a handy screen magnifier.

Getting Started with Windows 7

Click on **Start → Getting Started** to open the Windows welcome page (Figure 43) and access a number of helpful links and resources. **NOTE:** Screen content and layout may vary depending on your version of Windows 7 and any added service packs or updates.

Figure 43. Windows 7 Welcome Page

Help for Windows

For information on using Microsoft Window's features, options, applications and utilities, refer to the Microsoft help files and documentation on the X7 computer by clicking on the **Start** button and selecting **Help and Support.**

ARMORutils Application

The ARMORutils application is provided to help you configure and manage your X7 computer. It contains settings and information about screen setup, wireless configuration, battery status and much more.

NOTE

The screen images in this section are used for reference only and may not reflect the actual configuration of your X7.

To open the ARMORutils main dialog window (Figure 44), double-click on the **ARMORutils icon** on the desktop or select **Start → All Programs → ARMORutils**.

ARMORutils Main Window

The ARMORutils main window is shown in Figure 44. Seven buttons provide access to setup and configuration or information dialog windows. Click on a button to access one of these dialog windows.

Figure 44. ARMORutils Main Window

Backlight Setup Dialog Window

The Backlight Setup dialog window allows you to adjust the screen brightness manually or automatically and to select from a series of preset profiles to automatically restrict the brightness range under specific lighting conditions.

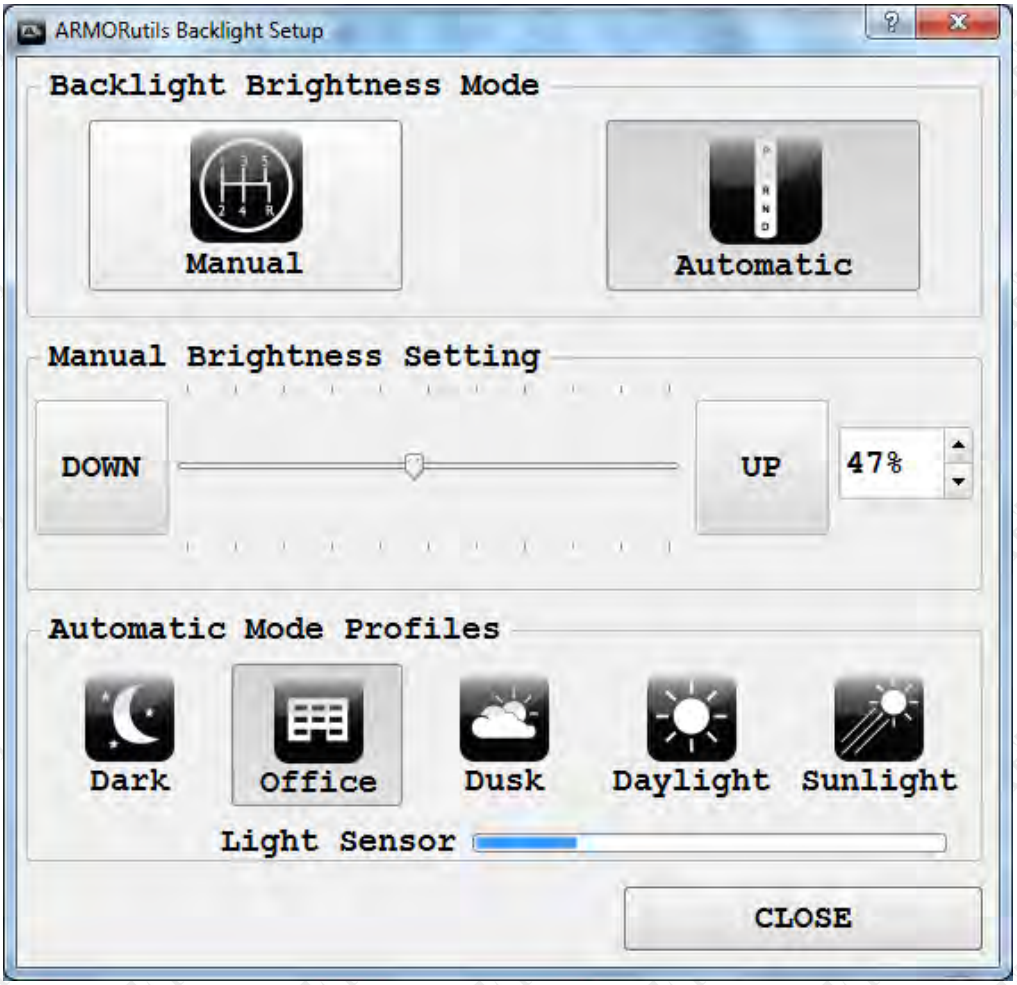


Figure 45. ARMORutils Backlight Setup Page

Manual Brightness Mode

The **Manual** button is initially activated by default. To manually adjust screen brightness, click repeatedly on the **UP** or **DOWN** buttons in the Manual Brightness Setting panel or drag the slider. The current brightness level is displayed as a percentage in the window to the right of the UP button. You can also adjust the brightness by clicking on the up and down arrows next to the percentage readout.

The manual controls change the brightness from 0% to 100% of the total available adjustment range for Manual mode. At the 0% point, the brightness low but the screen is not totally dark.

Automatic Brightness Mode

Click on the **Automatic** button to activate the automatic brightness control mode. Automatic brightness adjustment is controlled by the ambient light sensor (ALS) located on the indicator panel on the front of your X7 tablet. The ALS monitors the surrounding (ambient) light level and automatically adjusts the backlight level to maintain the same relative screen brightness. For example, if you are working in an office near a window and someone opens the blinds, the surrounding light will suddenly increase. The ALS will measure the increase in light level and automatically increase your screen and indicator brightness to compensate.

Unlike Manual mode, where you can vary the brightness across a much larger adjustment range, in Automatic mode, the total range of brightness adjustment is smaller and is determined by the selected Automatic Mode Profile.

When you first start ARMORutils, the system defaults to the Office profile. Once you select a different profile, the tablet will continue to use that profile until you select another.

Switching Between Brightness Modes

If you are in Manual mode and you click on one of the automatic profile settings, the brightness mode will switch to Automatic mode. Conversely, if you are in Automatic mode and click on the Manual mode UP or DOWN button, or one of the up/down arrows, the brightness mode will switch to Manual mode.

Automatic Mode Profiles

Everyone's eyes react differently to changes in light levels and there may be times when the full range of automatic brightness adjustment is uncomfortable for you.

You can tailor the automatic brightness adjustment by selecting one of the 5 pre-configured brightness profiles: Dark, Office, Dusk, Daylight, and Sunlight. These profiles control the range of brightness levels to values based on typical surroundings or times of day.

For example, if you typically work in an office environment but the automatic brightness doesn't make the display bright enough for you, you can select the Dusk, Daylight or Sunlight profile to increase the brightness range proportionally. Similarly, if the normal brightness control results in displays that are too bright, you can select the Office or Dark profile to reduce the brightness range.

Light Sensor Bar

The Light Sensor bar provides a visual indication that the ALS circuit is functioning correctly. Screen brightness changes in response to the changing ambient light level occur gradually to allow your eyes to adjust and may not be readily apparent, but the Light Sensor bar gives an immediate indication that the ALS is controlling the screen brightness. The Light Sensor bar will continue to operate even when the backlight mode is set to Manual.

Wireless Devices Dialog Window

The Wireless Devices page allows you to enable or disable all of the installed wireless devices in your ARMOR X7. It also provides controls for external antennas connected through an X7 vehicle dock.

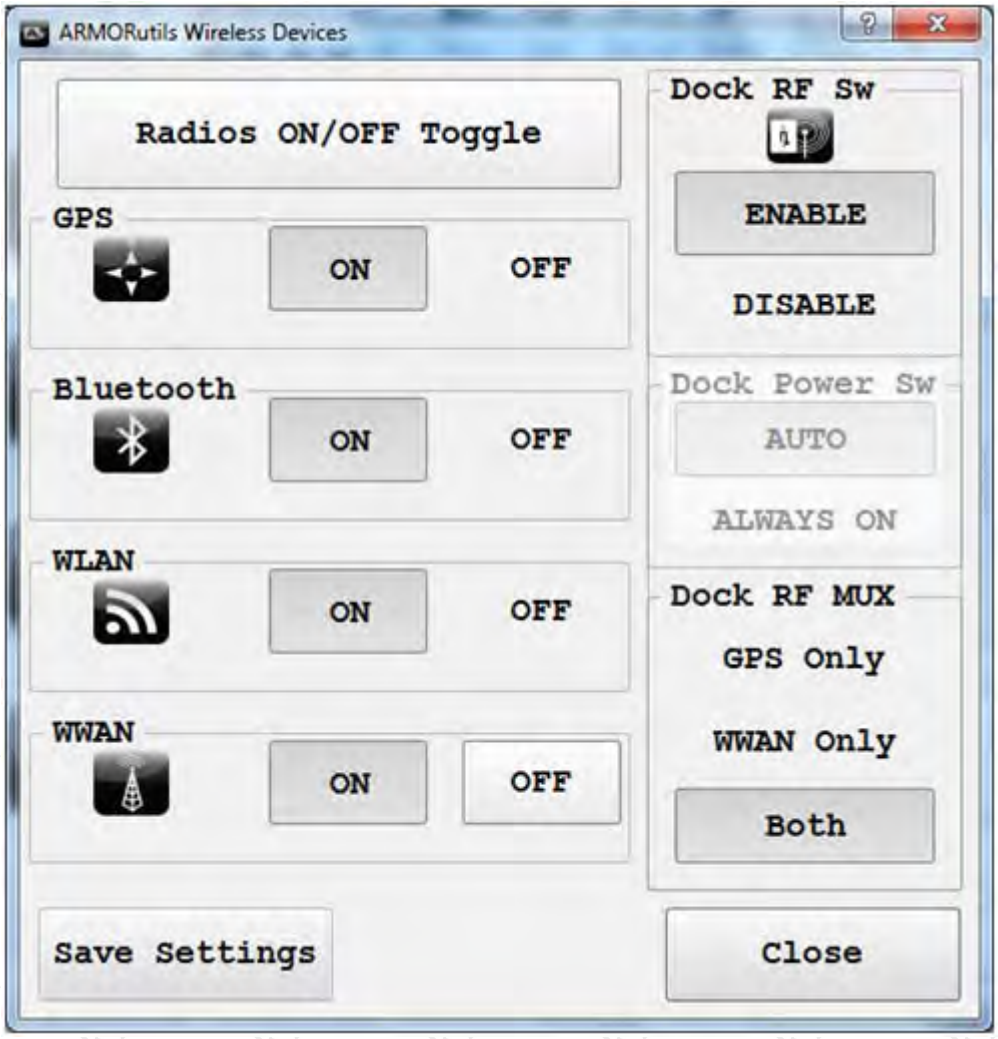


Figure 46. ARMORutils Wireless Devices Page

Radio ON/OFF Buttons

There is an **ON** and **Off** button for each radio that can be installed in the X7. When you first start your ARMOR X7, all installed radios are ON or enabled (default condition). Each radio can then be disabled by pressing its **OFF** button and re-enabled by pressing its **ON** button.

Docking RF Switch Button

There are RF docking connectors on the X7 dock for an external wireless antenna and an external GPS antenna. These connectors route external antennas (if installed) through the dock to the X7. The **Docking RF Sw** enables or disables the antenna configuration that is selected in the Dock RF Mux panel. The initial default option is “Enable”.

Dock Power Sw

This function is not used with the X7.

Dock RF MUX Options

These options allow you to select which external antennas will be used by the X7. You can select GPS only, WWAN only, or both antennas. If only one external antenna is selected, the other radio will operate on its internal antenna. The initial default option is “Both”.Save Settings Button.

Regardless of how you configure your radios and the Dock RF Switch during your session, they will return to their default settings the next time you restart the computer unless you save your settings using the **Save Settings** button.

Once you configure each radio and the RF switch to suit the way you normally use them (ON or OFF), you can press the **Save Settings** button to save the current configuration as your new default settings.

Save Settings Button

Regardless of how you configure your radios with the Radio ON/OFF buttons during your current session, they will return to their default settings the next time you restart the computer - unless you save your settings using the **Save Settings** button.

After you have configured each radio to suit the way you normally use them (ON or OFF), press the **Save Settings** button to save the current configuration as your new default settings.

Radios ON/OFF Toggle Button

Click on this button to turn off or turn on all radios currently enabled with the Radio ON/Off buttons. This is particularly handy if you’re on a commercial aircraft and you want to turn off all radios so you can continue working with the computer without interfering with the aircraft electronic systems.

When you arrive at your destination, just click on the **Radios ON/OFF Toggle** button again to turn on the radios you previously had enabled.

Programmable Buttons (PBs) Settings Dialog

The PB dialog window is shown in Figure 47. It allows you to assign two different functions for each PB (**P1, P2, P3**). The first function is activated by pressing and releasing a PB. The second function is activated by first pressing and releasing the **Fn** button and then pressing and releasing a PB (**Fn+P1, Fn+P2, Fn+P3**). This provides a total of 6 individual functions that can be activated using the PBs.

The function currently selected for each PB is shown in the field next to the button or Fn combo. **NOTE:** For ease of explanation, "PB" will refer to both a single button and a combo button setting.

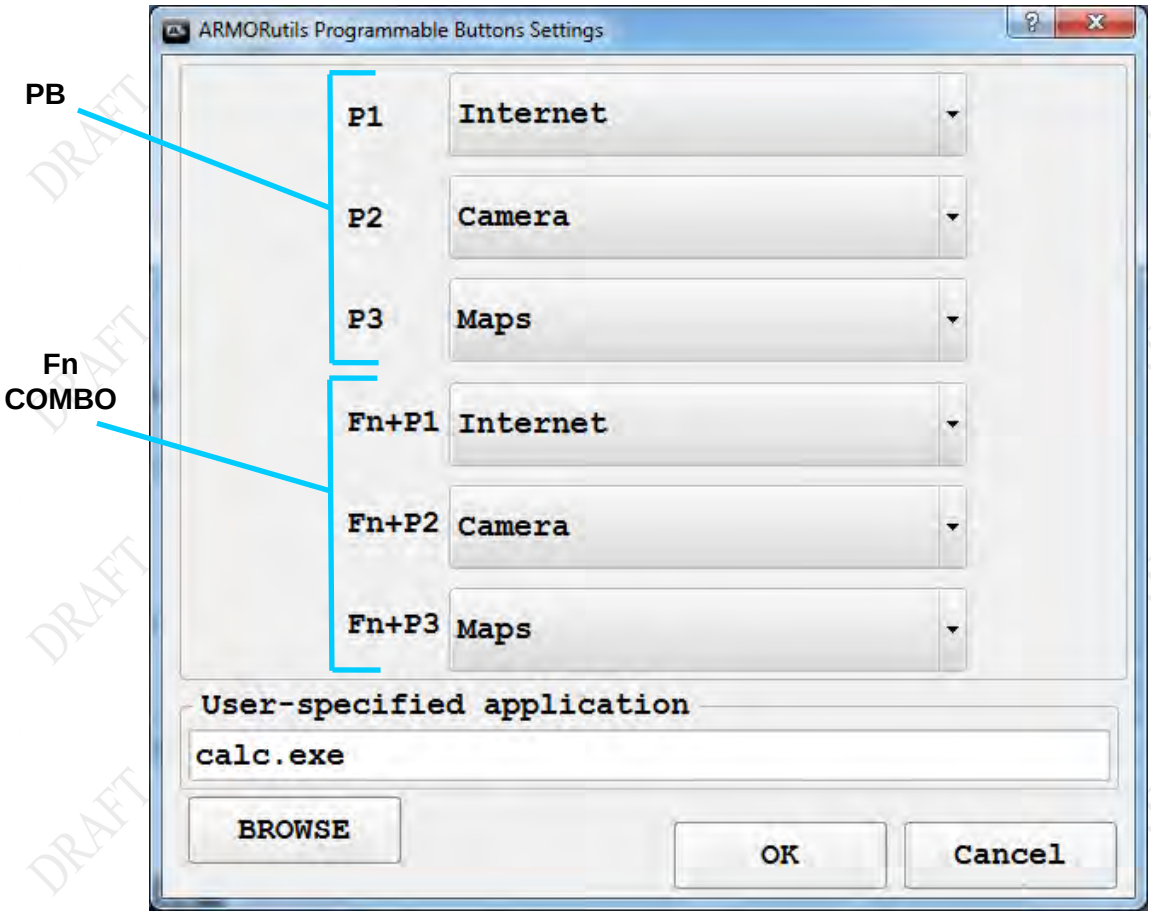


Figure 47. ARMORutils Programmable Buttons Settings Page

Selecting a Function

Click on the **menu arrow** next to the PB or PB combo and select the desired function, then click on the **OK** button to save your setting. Figure 48 shows a menu opened for the Fn +P1 combo.

Click on the menu arrow to the right of the field to access a list of available functions (function menu), as shown in Figure 48.

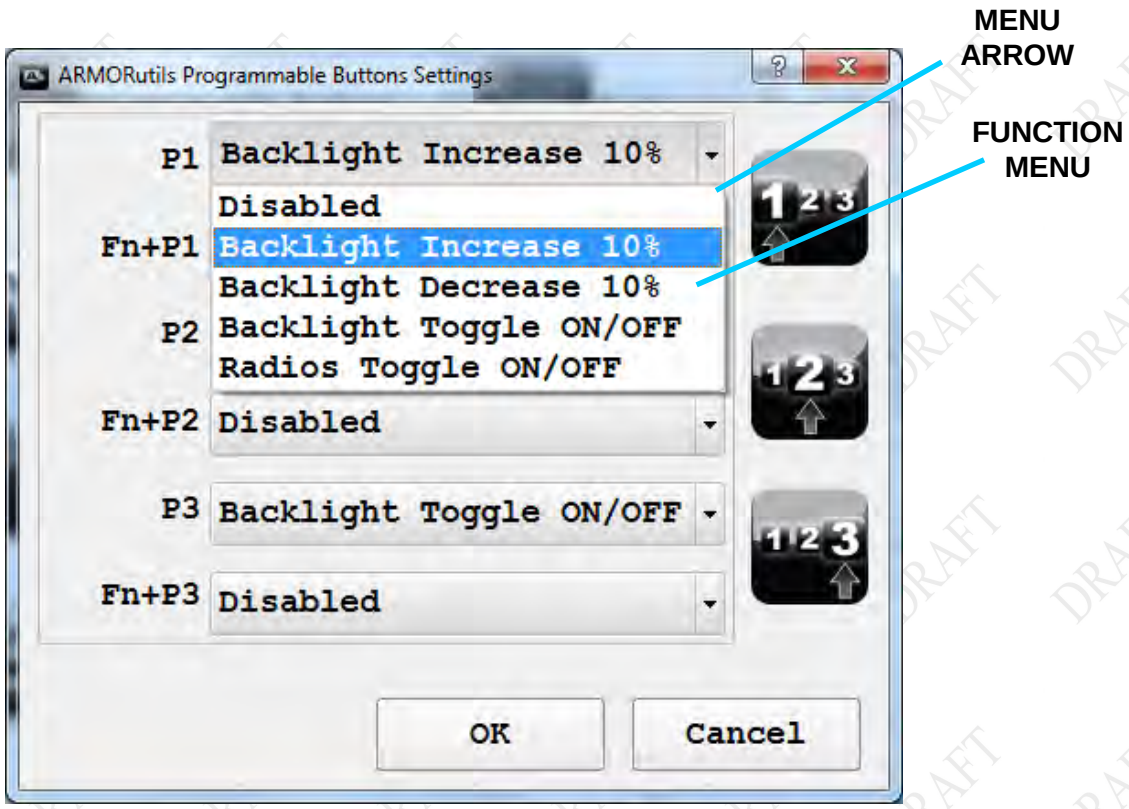


Figure 48. ARMORutils Programmable Button Settings Page Menu Options

Available Functions

The currently available programmable functions are listed below along with a brief description of their purpose (additional functions may be added in future releases of ARMORutils). You can assign any of these functions to any PB. **NOTE:** Functions that are not currently supported by the X7 will be grayed out.

1. Disabled – Disables the button.
2. Backlight Increase 10% - Increases screen and indicator brightness in steps.
3. Backlight Decrease 10% - Decreases screen and indicator brightness in steps.
4. Backlight Toggle ON/OFF – Toggles the screen on and off.
5. Radios Toggle ON/OFF – Toggles all enabled radios on and off.
6. Volume Increase – Increased sound volume in xx steps.
7. Volume Decrease – Decreases sound volume in xx steps.
8. Volume Mute – Toggles volume ON or OFF.
9. Rotate Screen 90 degrees – Rotates the screen 90 degrees clockwise with each press.
10. Video Output Cycle – Not currently supported.

11. Sleep/Hibernate – Depending on the selection in Windows control panel (see…) will place the tablet in Sleep or Hibernate mode.
12. Launch User-Specified Application – Allows you to select and launch an installed application.

Set to Default

In each function menu, there is a **Set to Default** option. Select this option to return a PB's programming to its factory default settings. The factory default settings for the X7 are:

P1 - Backlight Increase 10%
P2 - Backlight Decrease 10%
P3 - Backlight Toggle ON/OFF
Fn + P1 - Radios Toggle ON/OFF
Fn + P2 - Disabled
Fn + P3 - Disabled

Currently, you are not able to change the PB default settings. If you need to have the settings changed, please contact DRS Technical Support.

Launch User-Specified Application

Configuration Dialog Window

Installed Options

The Configuration Page provides visual confirmation of those wireless radio and display options that are installed in your X7. For those options that are installed and available, the associated icons and text will appear in dark contrast. If an option is not installed or available, the icon and text will be grayed out.

Figure 49. ARMORutils Configuration Page

System Information

Important system information is provided in the bottom panel.

Battery Monitor Dialog Window

The Battery Monitor window is shown in Figure 50. This window provides information about:

- Each battery's current charge level
- Whether or not the battery is charging or discharging
- Its estimated remaining operating time
- The estimated time to reach the next charge level
- The estimated time to reach a full charge.

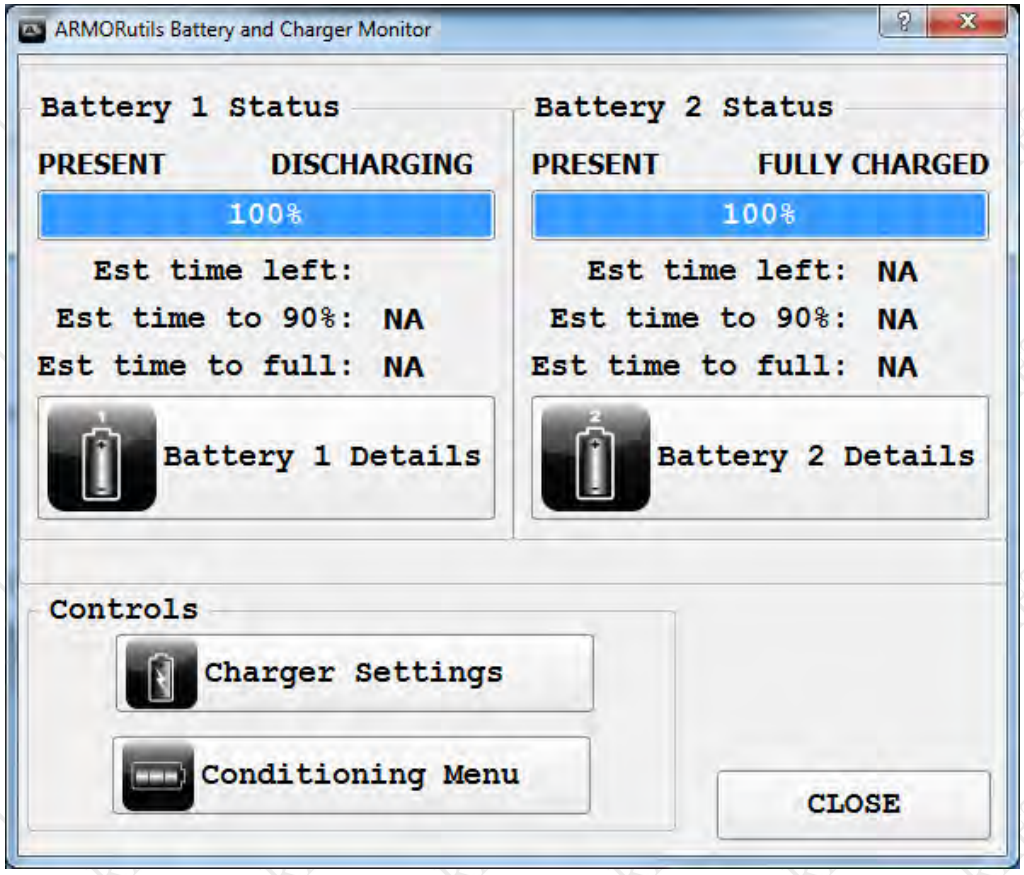


Figure 50. ARMORutils Battery Monitor Dialog

Battery 1 and 2 Information Buttons

Click on the Battery 1 Details or Battery 2 Details button (Figure 50) to open a Battery Information window (example shown in Figure 51). Readings such as percentage of charge, present capacity, remaining capacity and charge cycle count are updated in real time on this page.

If the battery needs conditioning, a message will appear at the bottom of the page indicating that a conditioning is necessary.

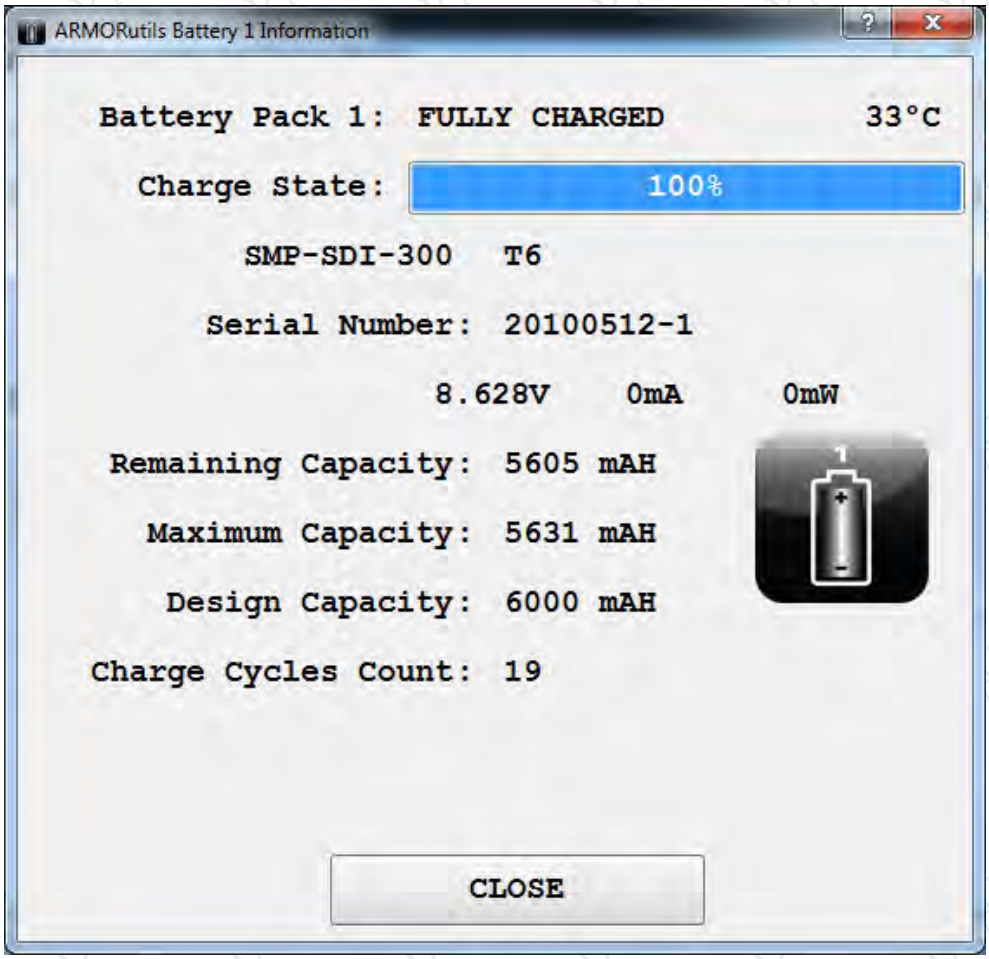


Figure 51. ARMORutils Battery Information Window

Remaining Capacity – This is the current charge level expressed in mAh instead of %.

Maximum Capacity – This is the current maximum capacity that the battery can achieve.

Design Capacity – This is the maximum capacity that the battery was designed to hold.

Charge Cycles Count – This is the total number of times the battery has been discharged below the 30% level and then been recharged to within 15% of maximum.

Charger Settings Button

Click on the **Charger Settings** button (Figure 50) to open the **Charger Control Settings** window, as shown in Figure 52.

From this window, you can decide what charging policy the system will use when two batteries are installed. Click on **Charge Both** to charge both batteries at the same time or **Charge Lowest First** to charge the battery with the lowest charge first. The default setting is "Charge both".

Click on **OK** to save the new setting. Select **CANCEL** to return to the previous setting.

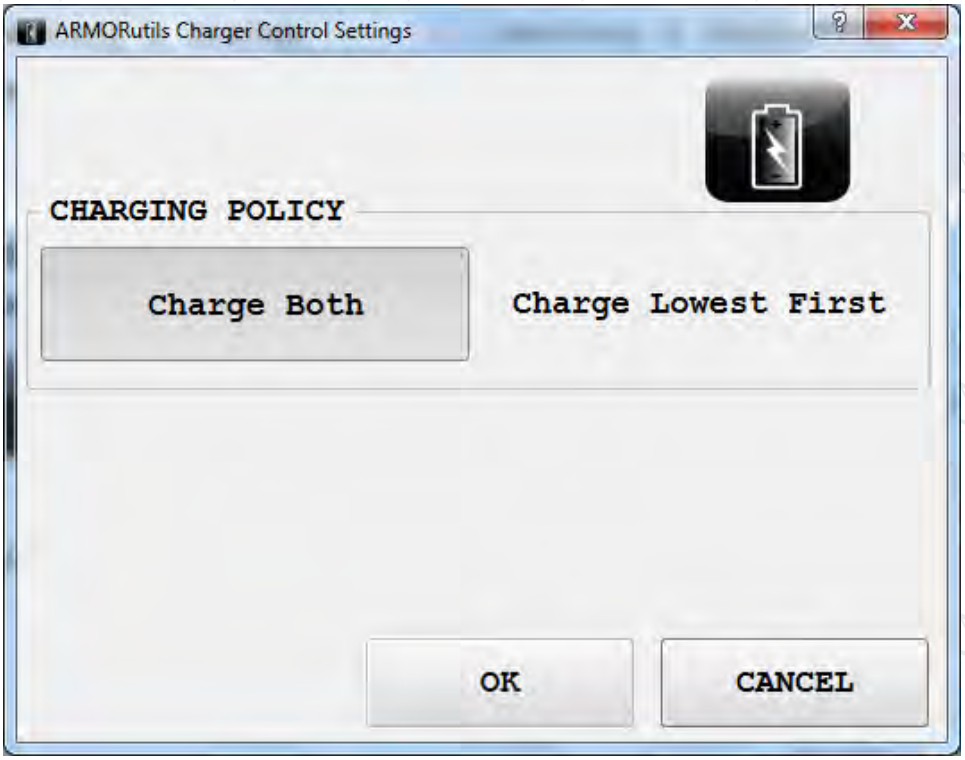


Figure 52. ARMORutils Charger Control Settings Window

.

Conditioning Menu Button

Click on the **Conditioning Menu** button (Figure 50) to open the Battery Conditioning window shown in Figure 53. This window shows the conditioning cycle information for each battery. It also allows you to select a single battery to condition, or to select both batteries.

NOTE

Conditioning should only be performed if you notice that the levels reported by Windows or ARMORutils are consistently different from battery fuel gauge readings.

The conditioning process consists of first charging the battery to a full charge, then drawing the charge down to its minimum, followed by charging the battery back to a full charge. The entire conditioning process takes about 4 hours.

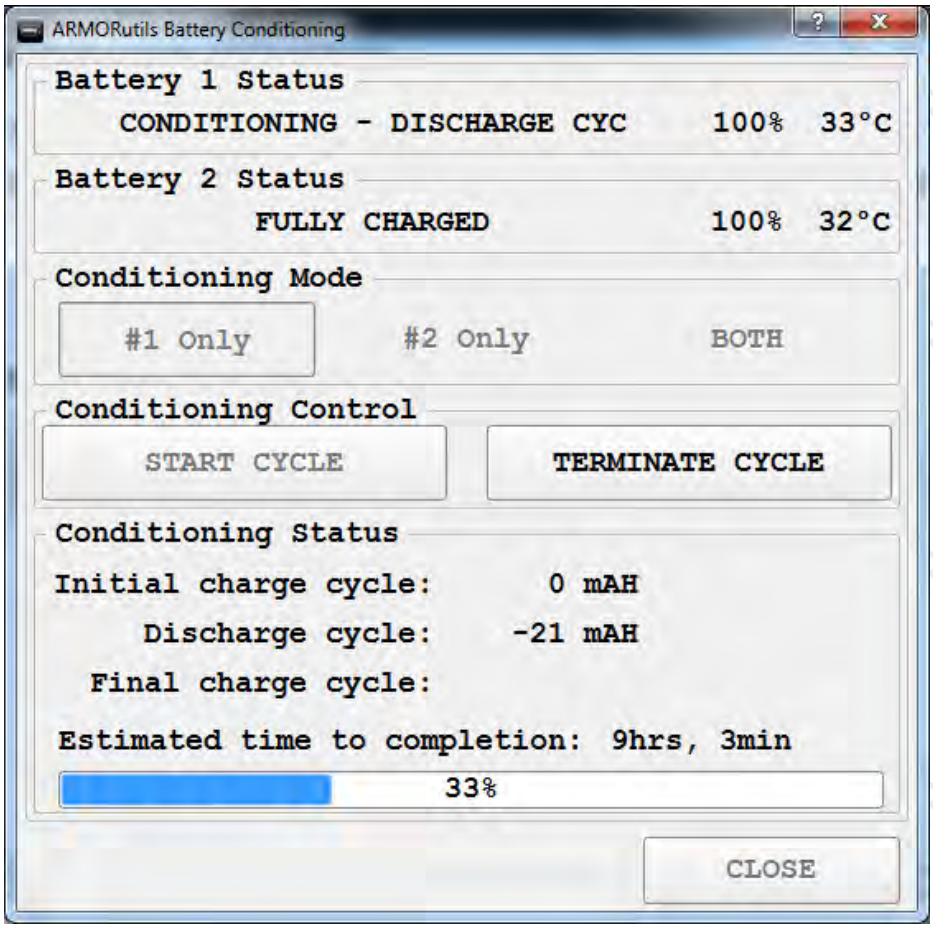


Figure 53. Battery Conditioning Dialog

Screen Mode Setup Dialog Window

The Screen Mode dialog is used to select the current display mode and to access calibration routines for both the touch and pen screens.

Figure 54. ARMORUtils Screen Setup Dialog

Screen Mode

The Screen Mode dialog allows you to select your desired display mode: Dual mode, Touch Screen Only mode or Pen Screen Only mode. The default display mode is set to **Dual Mode** with both screens enabled.

Click on the **Touch Screen Only** button to enable only the touch screen mode; click on **Pen Only** to enable only the active pen (digitizer) mode.

Calibration

You can initiate a calibration routine for each type of screen from this window. Click on either the **Calibrate Touch** or **Calibrate Pen** button and follow the on-screen instructions. If only one screen mode is enabled, the other calibration option will be grayed out.

Diagnostics Dialog Window

The Diagnostics dialog window provides internal temperature information that can be used by DRS to diagnose possible system problems. It displays three internal temperatures of the processor and one for each battery, as shown in Figure 55. These temperatures vary widely depending on the operation of the tablet and may not necessarily correlate with outside (ambient) temperatures.

If you suspect a temperature related problem, contact DRS Technical Support for assistance in troubleshooting and resolving the problem.

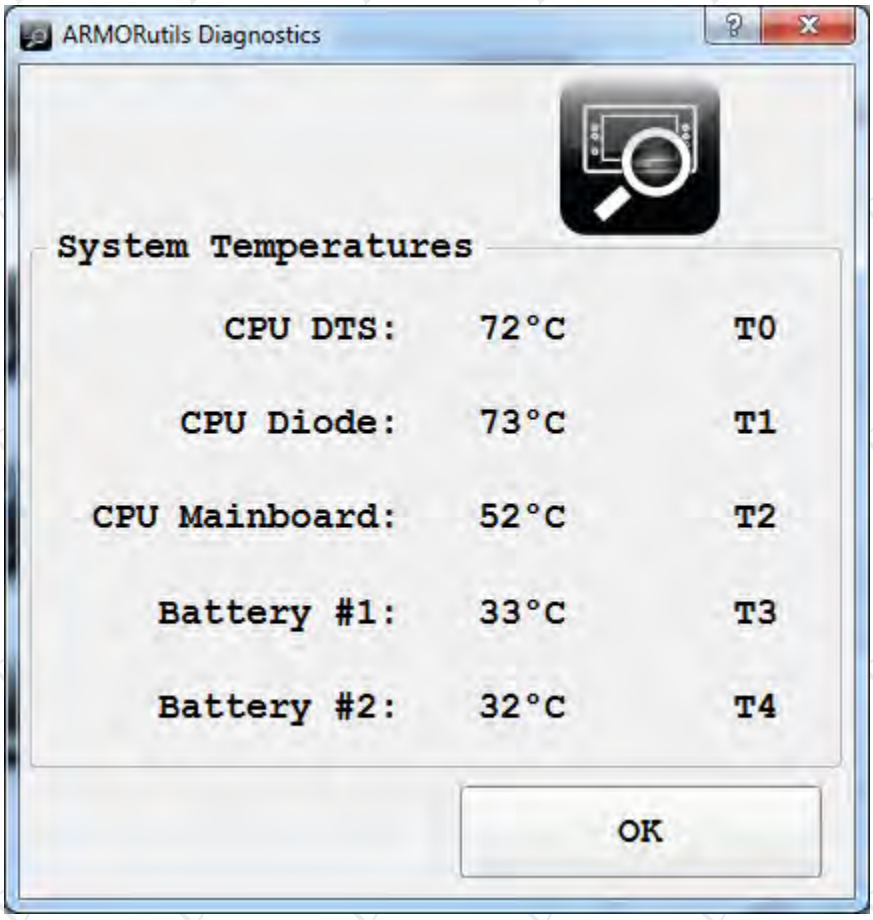


Figure 55. ARMORutils Diagnostics Dialog

ARMORutils About Window

The About window (Figure 56) displays the current version and release date of the ARMORutils software. It also provides a contact telephone number for the DRS Tactical Systems Technical Support call center and the internet address to the ARMOR website where you can log on to access support information.

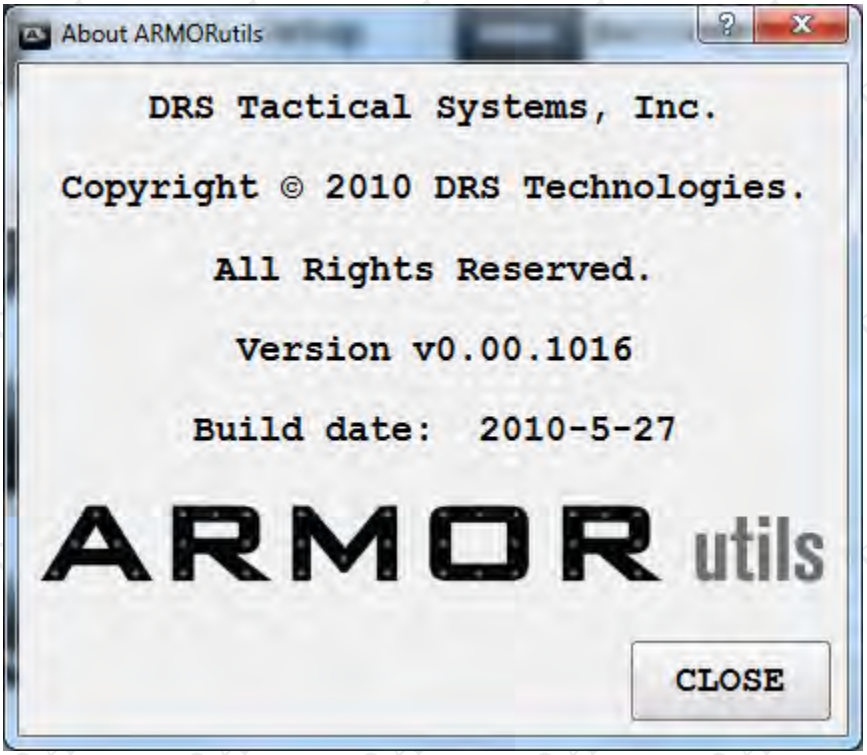


Figure 56. ARMORutils About Window

Pen and Touch Utility

The Pen and Touch utility is a Windows utility that provides settings that effect how the active pen works with the pen screen and how a fingertip or passive stylus works with the touch screen.

To open this utility, select **Start → Control Panel → Hardware and Sound → Pen and Touch**. The Pen and Touch utility opens, as shown in Figure 57.

Pen Options Tab

The Pen Options tab provides settings that are applicable to the pen screen only.

Pen Actions Panel

Highlight an action from the **Pen Actions** list and click on the **Settings** button (if active) to open a settings window, then select options or make adjustments.

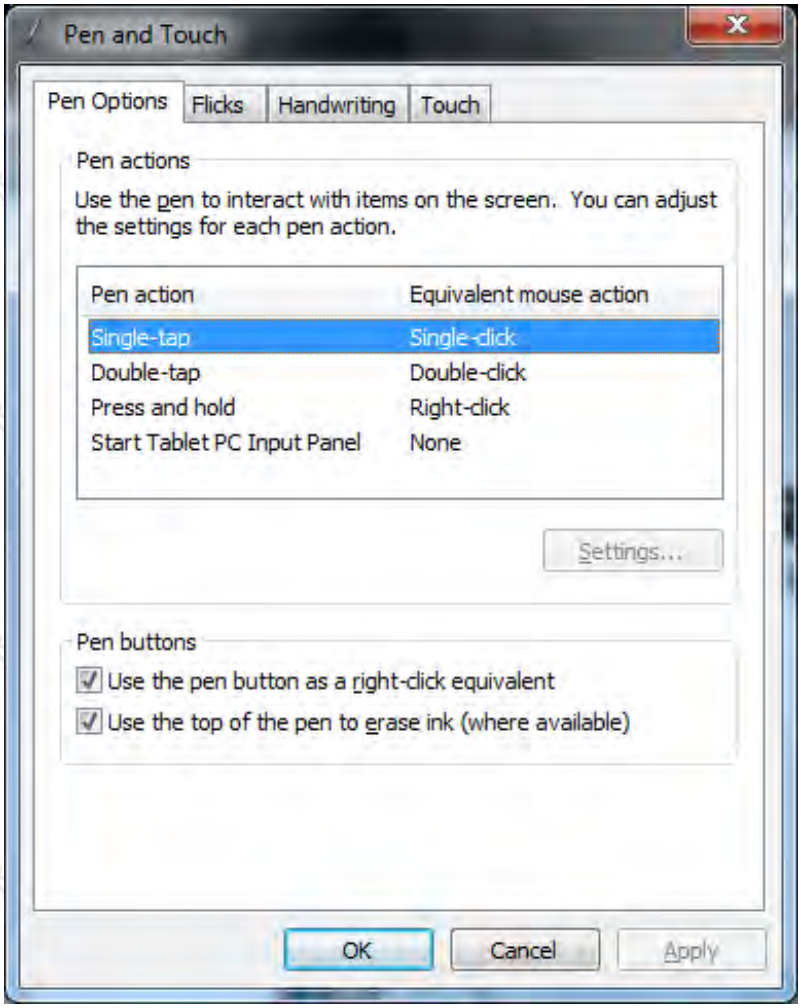


Figure 57. Pen and Touch Utility – Pen Options Tab

Pen Buttons Panel

Use the Pen button as a right-click equivalent option – This option is overridden by the pen button options in the **Pen tab** of the Pen Tablet Properties utility, regardless of whether it is checked or not.

Use the top of the pen to erase ink option – The erase function is not supported in the X7 from any utility option.

Flicks Tab

The Flicks tab provides settings that are applicable to both the pen and touch screens.

Flicks are short quick gestures either up, down, left or right that produce common actions such as scrolling through a document, dragging an object, or opening a folder. Click on the **Practice using flicks** link at the bottom of the window to access a tutorial.

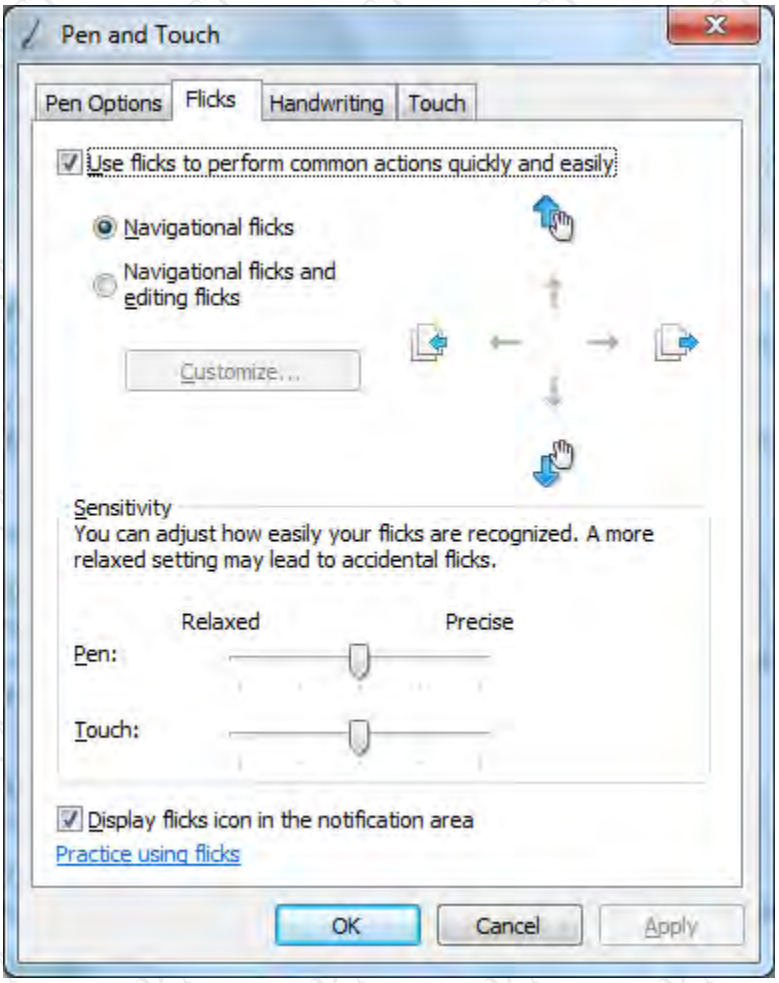


Figure 58. Pen and Touch Utility – Flicks Tab

Handwriting Tab

The Handwriting tab provides settings that are applicable to both the pen and touch screens.

The options on this tab allow you to enable or disable the automatic handwriting learning feature. Click on the "Learn about handwriting personalization link at the bottom of the window for information about automatic learning and how to train your tablet to recognize your personal handwriting style.

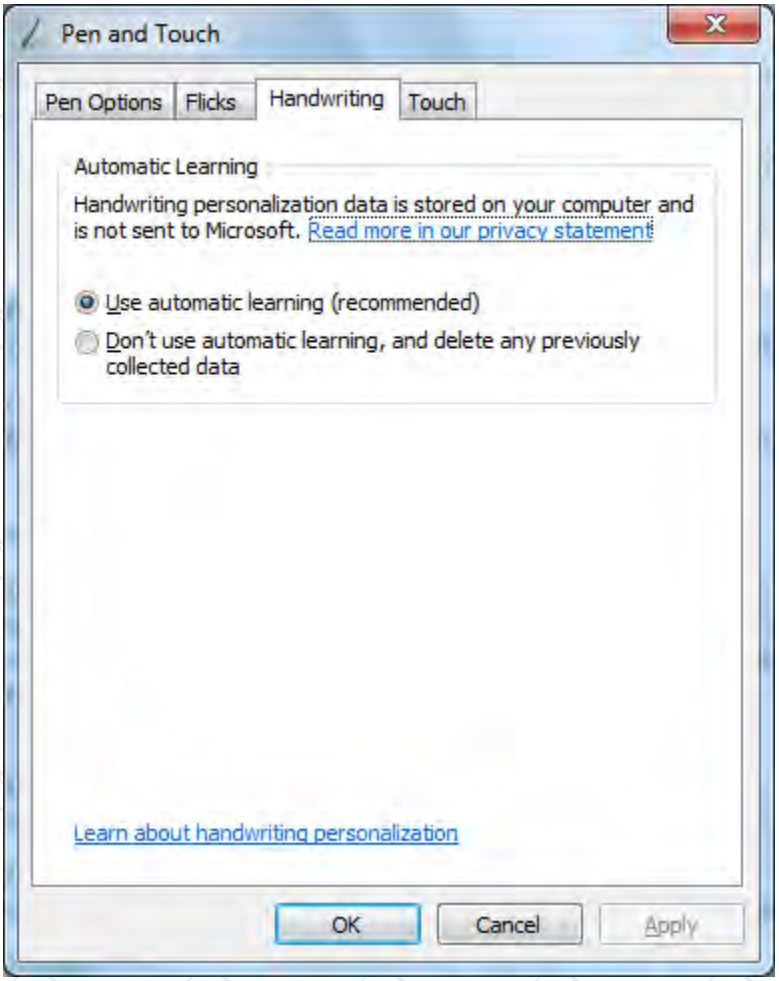


Figure 59. Pen and Touch Utility – Handwriting Tab

Touch Tab

The Touch tab provides settings that are applicable to the touch screen only. The options on this tab affect how the pen, or your finger, interacts with the touch screen.

> **NOTE**
>
> ***You must have the "Use your finger as an input device" option checked to use either your finger or the pen on the touch screen. If you are in Dual Mode, you can still use the active pen, but the touch screen will be disabled.***

Check the **"Use your finger as an input device"** option to use either the pen or your finger with the touch screen.

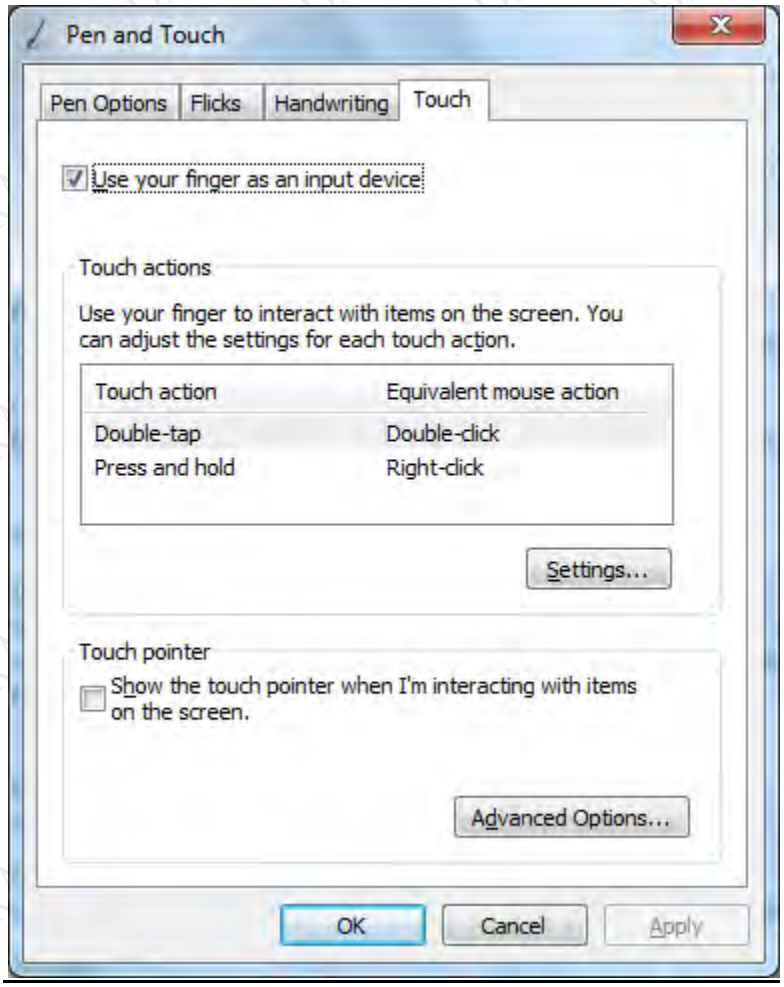


Figure 60. Pen and Touch Utility – Touch Tab

Touch Actions

Highlight a touch action and click on the **Settings** button to open an adjustment window.

Touch Pointer

Select this option to place a pointer at the touch point. A virtual mouse image will also appear next to the pointer, as shown in Figure 61 . You can then click on the left or right mouse button to produce the appropriate mouse action.

Click on the **Advanced Options** button to open a window where you can adjust the touch pointer position, appearance and behavior.

Figure 61. Touch Tab Virtual Mouse Pointer

Tablet PC Settings Utility

Display Tab

Configure

This function is not used with the X7. Use the ARMORutils **Screen Mode** dialog to select Pen or Touch screen mode.

Display Options

The X7 does not support a second display so there is only one option.

Calibrate Button

Click on the **Calibrate** button and select **Pen input** or **Touch input** to calibrate a screen.

Reset Button

This button is used in conjunction with the Calibrate button (refer to Calibrating the Display)

Go to Orientation

This option is not supported by the X7.

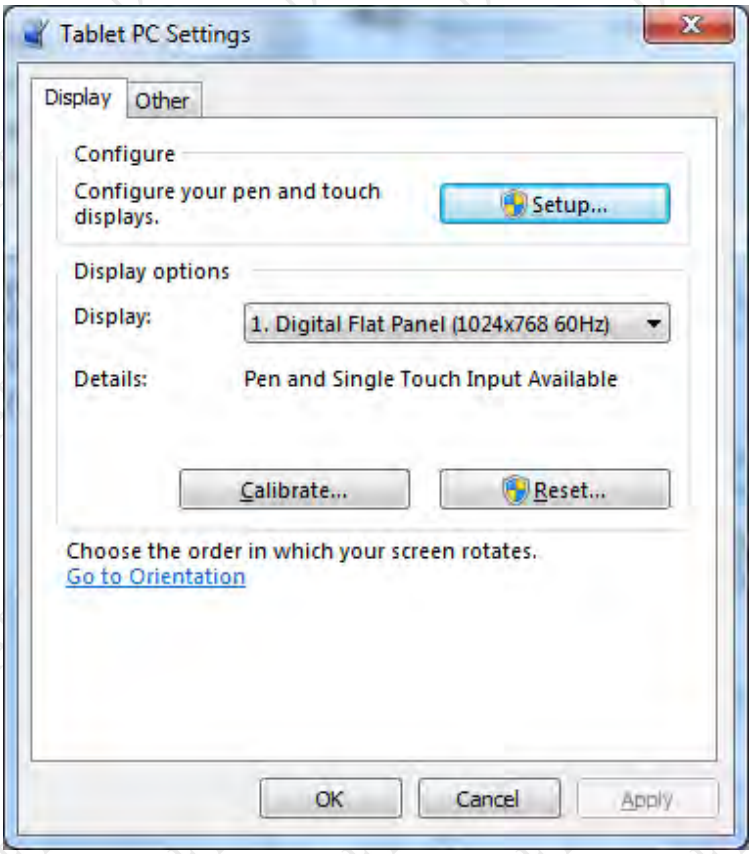


Figure 62. Tablet PC Settings – Display Tab

Other Tab

This tab allows you to change where an on-screen menu appear when you activate the pen or touch displays so that your hand does not block your view of the menu. For example, if you are left-handed, check the **Left-handed** option to have the menus appear to the right of the pointer.

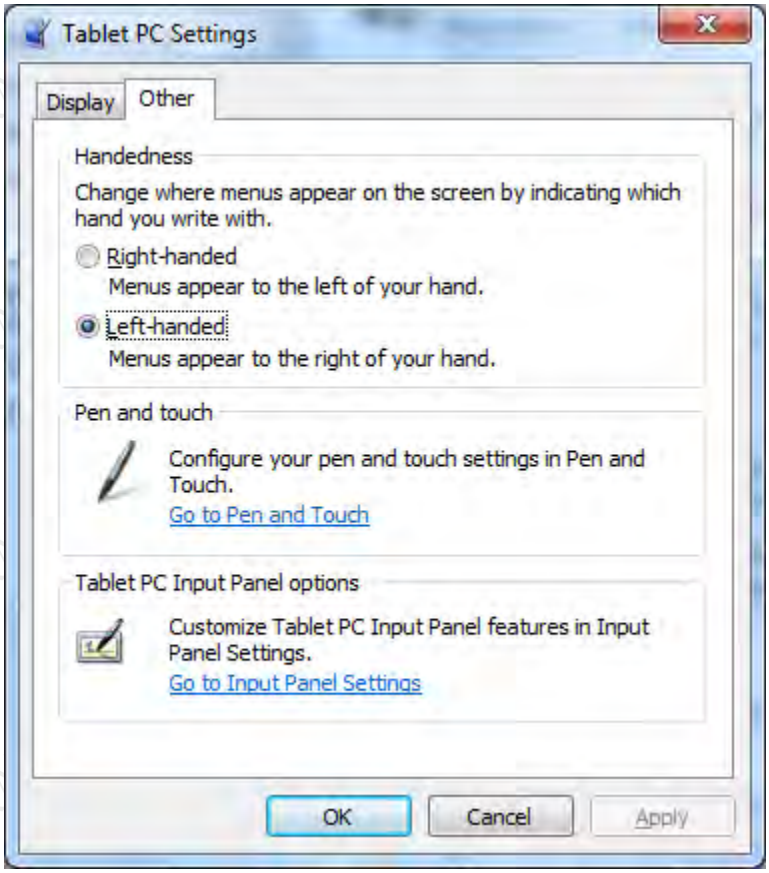


Figure 63. Tablet PC Settings Utility – Other Tab

Pen Tablet Properties Utility

The following paragraphs briefly describe the purpose and actions of the Pen Tablet Properties utility. To open the Pen Tablet Properties window, select **Start → Control Panel → Hardware and Sound** and click on the **Pen Tablet Properties** icon to open the Pen Tablet Properties window shown in Figure 64.

Pen Tab

The Pen tab is displayed by default when the Pen Tablet Properties window opens (Figure 64). The pen pictured in the tab is a WACOM™ pen that is normally used in advanced drawing tablets. Its functionality far exceeds what is required for your X7 tablet. Consequently, we have provided a simpler active pen.

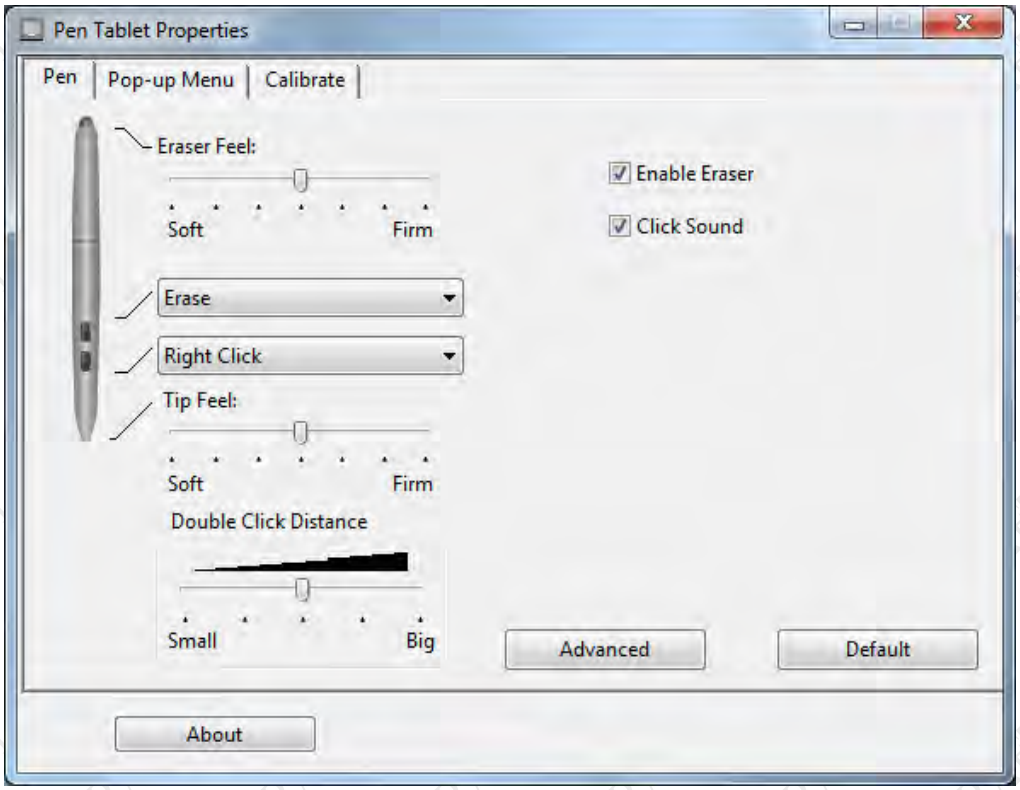


Figure 64. WACOM Pen Tablet Properties Window – Pen Tab

NOTE

The pen that comes with your ARMOR X7 has only one side button and no eraser function.

Supported Options

Figure 65 and Figure 66 highlight those functions and options that are supported by your ARMOR X7 active pen.

> **NOTE**
>
> ***Options not supported by the X7 pen are grayed out in Figure 65 and Figure 66 for illustration purposes only. They are not grayed out on the actual application screen image.***

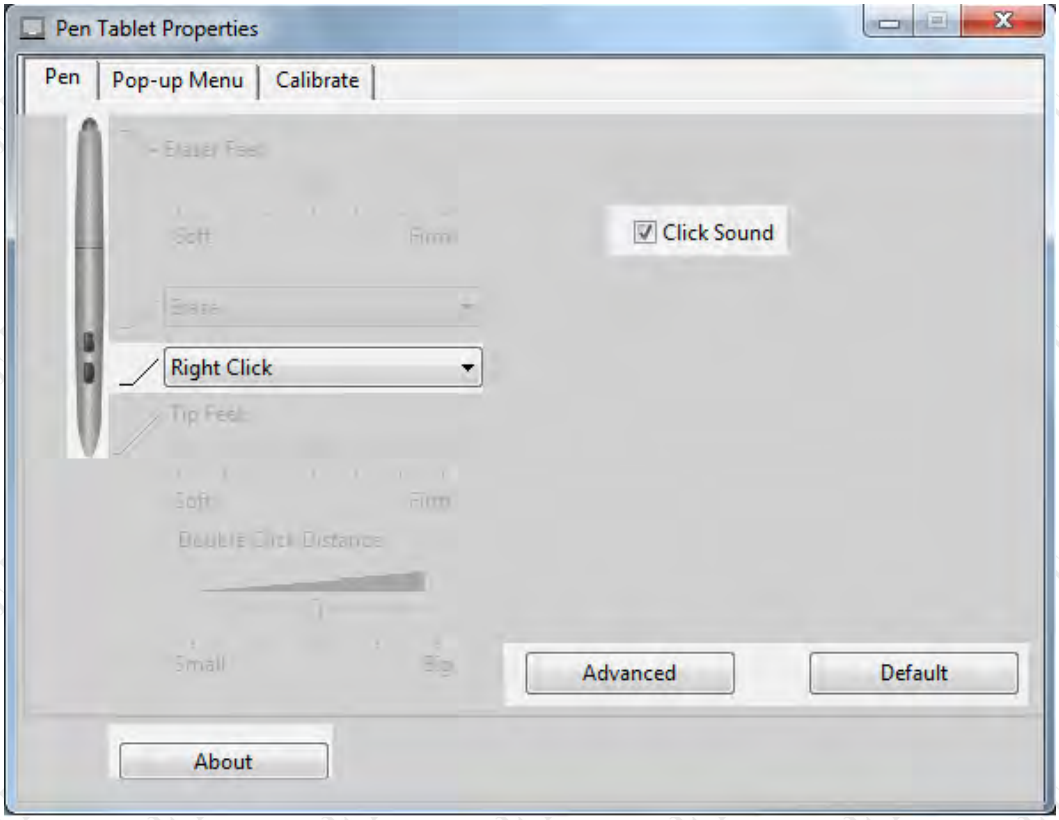


Figure 65. Settings and Options Supported by the ARMOR X7 Active Pen

Click Sound

Check the **Click Sound** option to enable a clicking sound when you perform an action with the pen.

Eraser

The X7 does not support the Erase function.

Side Button Menu Options

The side button can be set to perform different functions that are selected from the pull down menu shown in Figure 66. The default function is “Right Click”.

Only the lower button menu is used with the X7 pen. Refer to Explanation of Side Button Options in the **Appendix** for a description of each menu option.

NOTE

Some side switch settings may work differently in some software applications.

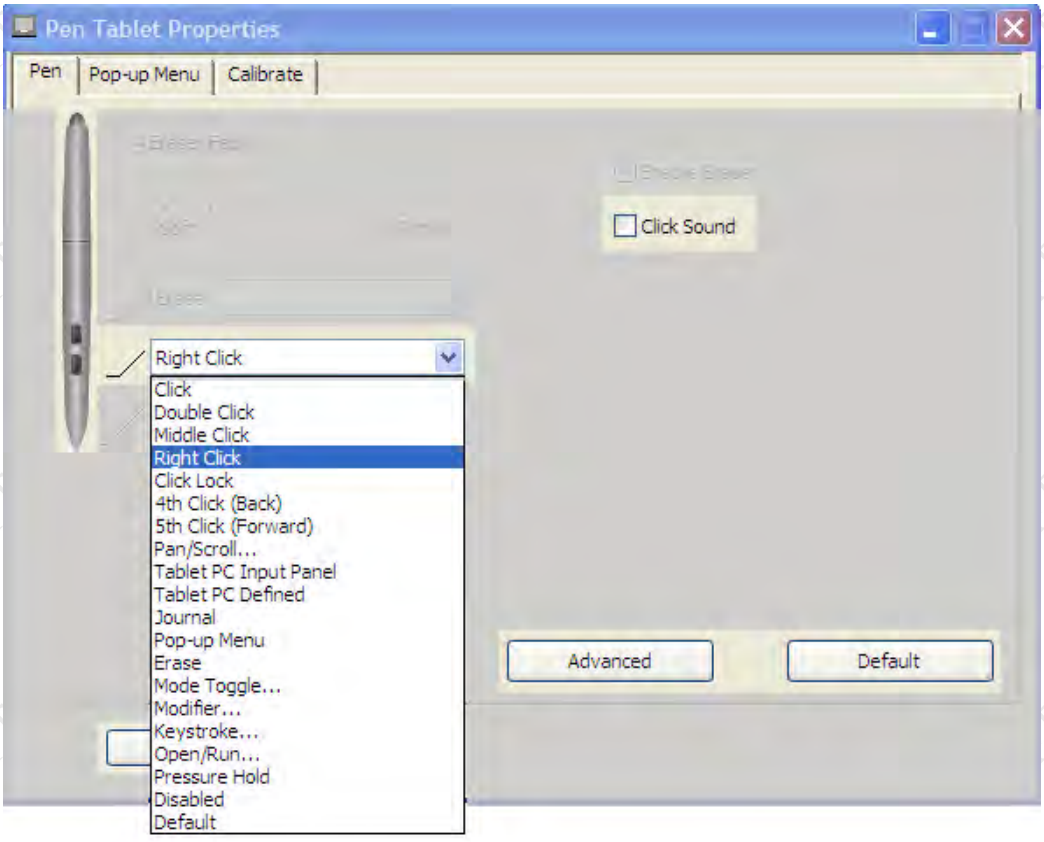


Figure 66. Side Button Menu Options

Default Button

Click on the **Default** button to return the **Pen tab** settings to their default values.

Advanced Button

Click on the **Advanced** button to open the Advanced Settings window, as shown in Figure 67. The two options in this window allow you to set the way the side switch will be used to perform a right click action. **Click & Tap** is the default action.

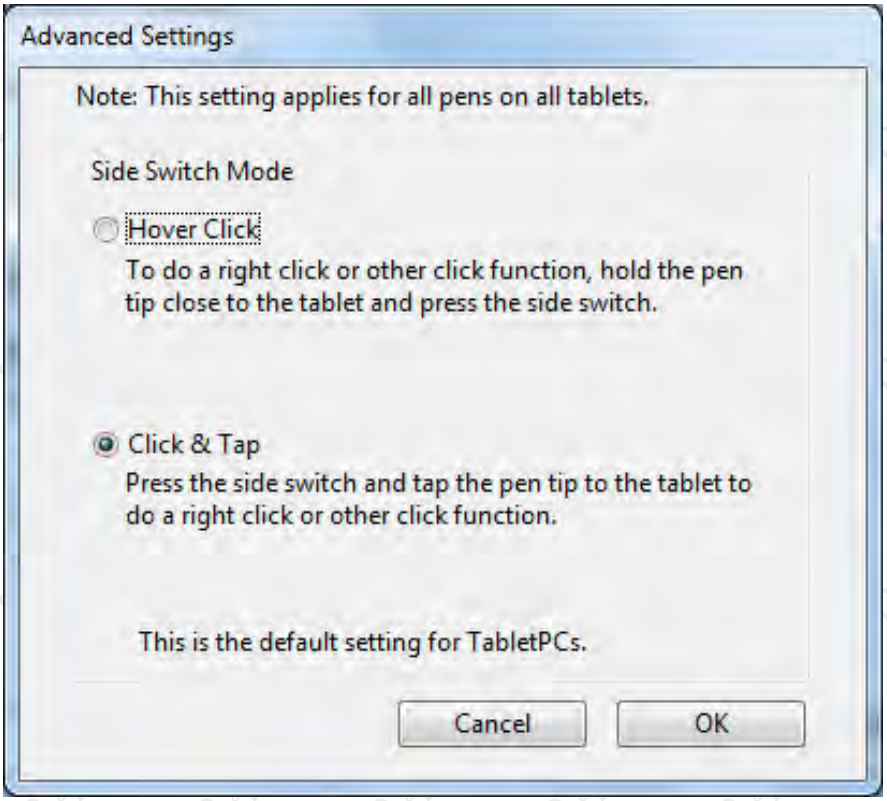


Figure 67. Pen Tablet Properties - Advanced Settings Window

Pop-up Menu Tab

The Pop-up Menu tab is shown in Figure 68. This tab allows you to add additional functionality to the side button. These functions will be displayed in a pop-up menu when the side button is pressed while in an application or working on the desktop. If only one function has been selected, only that function will be available.

NOTE

To use the functions set in the pop-up menu, you must select the "Pop-up Menu" option from the side button menu in the Pen tab.

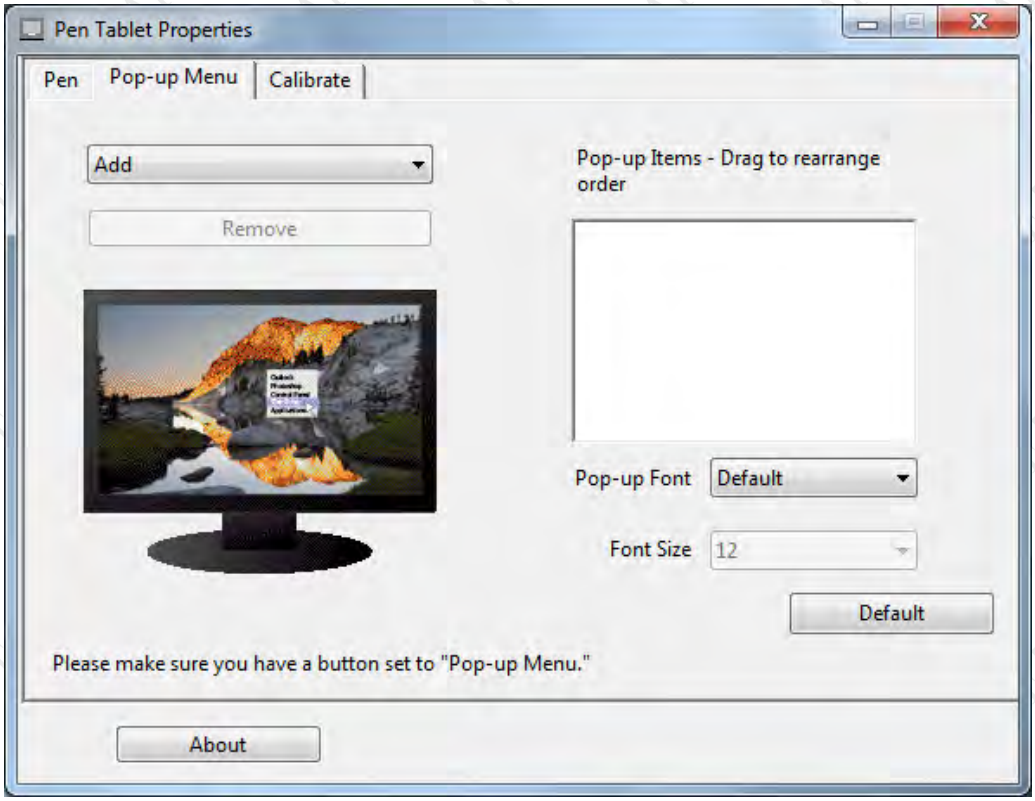


Figure 68. Pen Tablet Properties – Pop-up Menu Tab

Click on the down arrow in the **Add** field to open a list of available functions then select and configure the desired function. Those functions that are selected will appear in the **Pop-up Items** panel to the right of the **Add** field. Click on the **Remove** button to delete a function.

When you are using the pen in an application or on the desktop and you press the side button, a small menu is displayed with the options you have configured.

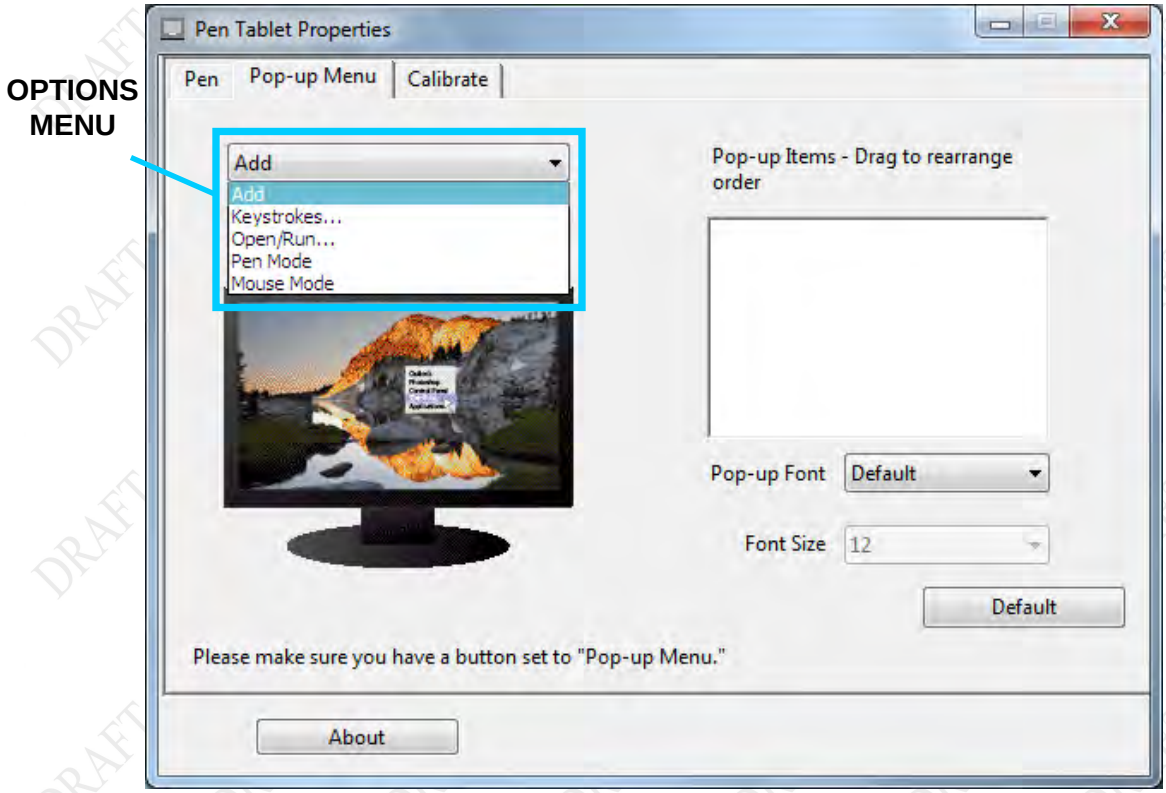


Figure 69. Pop-up Menu Add Options

Calibrate Tab

The Calibrate tab is shown in Figure 70. Click on the **Calibrate** button to access the screen calibration routine. Follow the on-screen instructions.

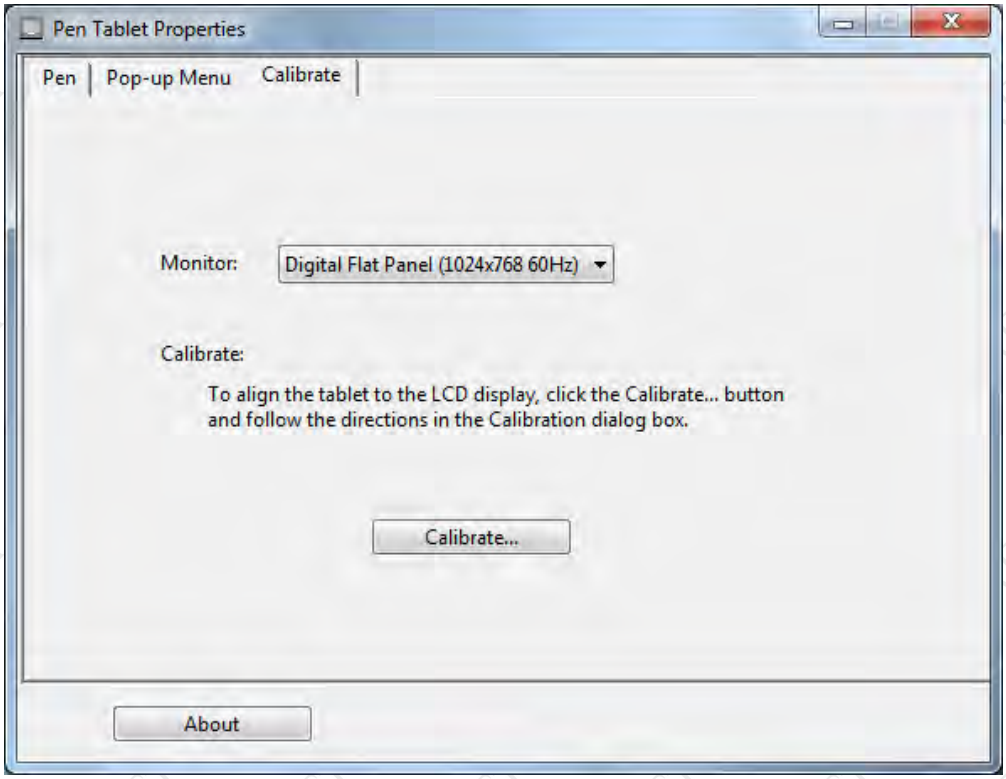
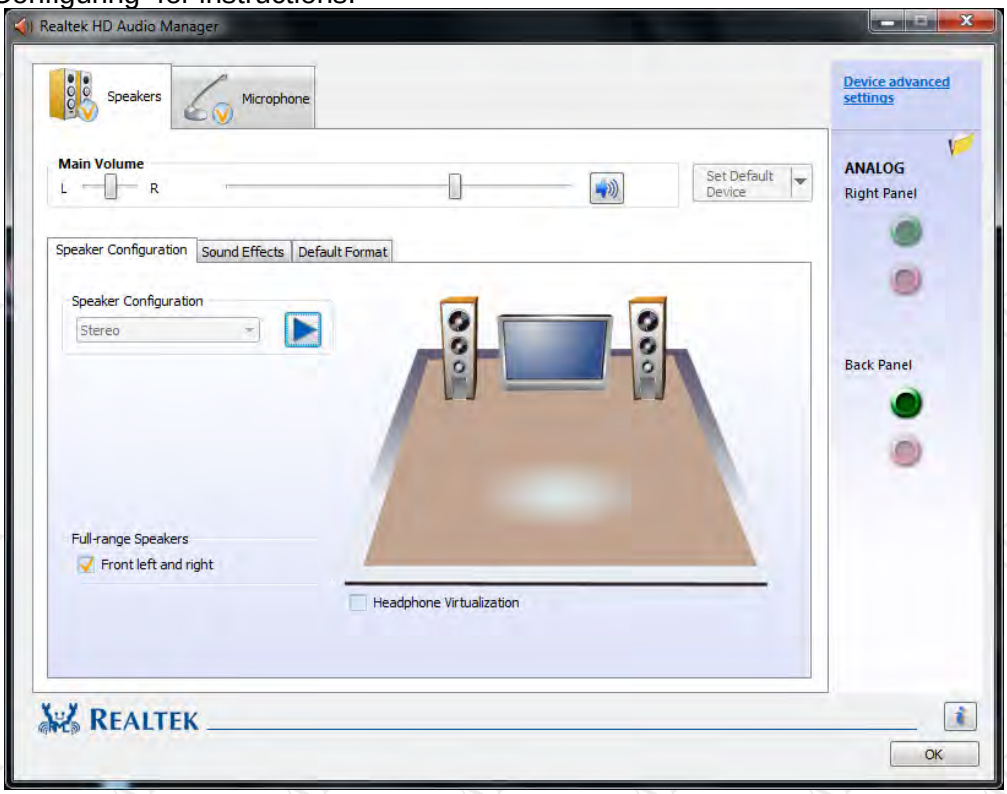


Figure 70. Pen Tablet Properties Window – Calibrate Tab

Realteck® HD Audio Manager Application

This application allows you to configure your speakers, adjust headset audio and microphone levels and create sound effects.

Refer to Configuring for instructions.



Picasa 3®

Picasa 3 is an image capture program that allows you to use the webcam for taking still pictures and movies and for capturing barcodes. Refer to Capturing Images and Video for instructions on how to use this application.

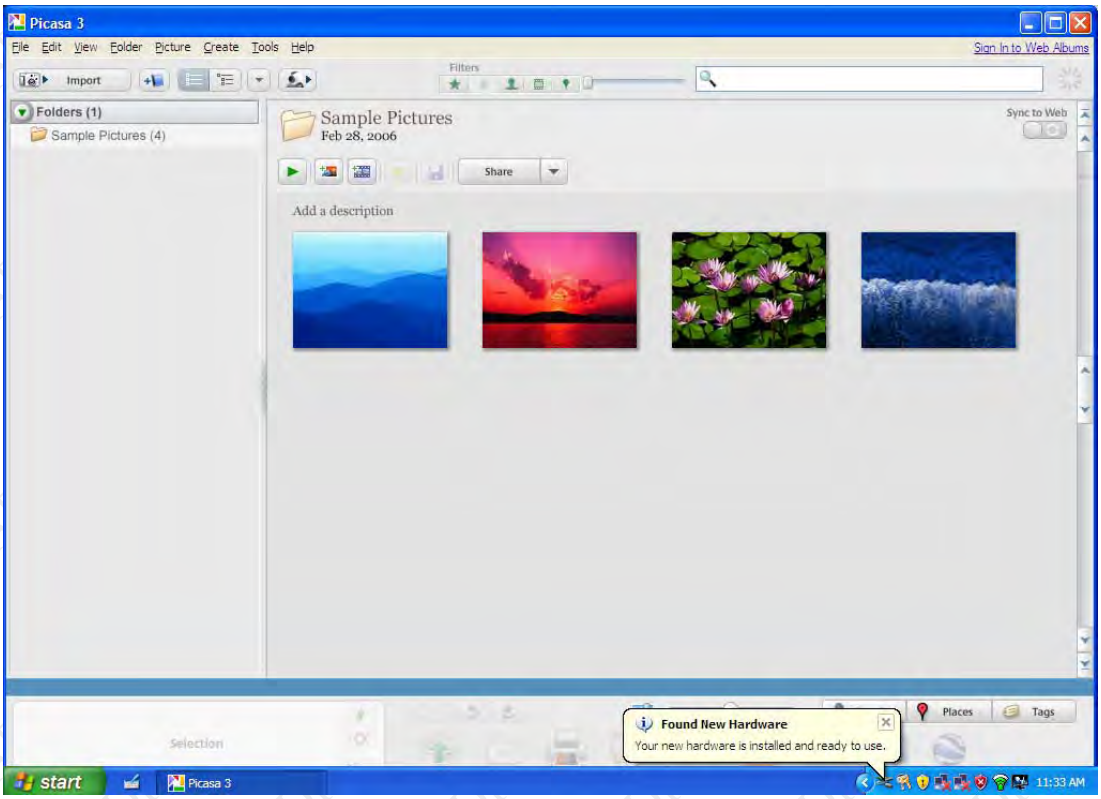


Figure 71. Picasa 3 Image Capture Application

Virtual Magnifying Glass™

This handy utility allows you to magnify portions of the screen that are too small to see clearly. It projects a virtual magnifying glass over a portion of the screen, as shown in Figure 72. Refer to Using the Screen Magnifier for instructions on how activate and use this application.

Figure 72. Virtual Magnifying Glass Application

6. TROUBLESHOOTING

This section addresses only those problems that can be corrected by replacing a removable component such as a hard drive or battery, by replacing or reseating an external cable, or by changing a configuration setting. Any other failure will require the tablet be returned to DRS Tactical Systems.

For each problem that occurs with your ARMOR X7 computer, there are specific steps that will isolate the problem to a failed component or to a configuration option that may be set incorrectly. In many cases, a single action step will isolate or correct the problem. In others, a troubleshooting flowchart with multiple actions may be needed.

Determining the Problem

Table 20 lists some possible symptoms pointing to problems with your ARMOR X7. It then provides actions to correct a problem. In some cases, you will be directed to a troubleshooting flow chart to further isolate the problem.

Use the Symptom and Problem Area columns to identify the problem you are having, then follow any directions in the Action column or go to the indicated troubleshooting flowchart to begin troubleshooting.

Table 20. ARMOR X7 Trouble Symptoms

SYMPTOM	PROBLEM AREA	ACTION	FLOWCHART
Tapping with the pen or stylus does not select or activate an option, or the pointer does not align with stylus or pen point.	Display (touch or pen screen)	1. Follow the instructions in **Error! Reference source not found.** or **Error! Reference source not found.** to calibrate the screen. Repeat up to 5 times if necessary. 2. If screen still does not calibrate correctly, send tablet in for repair.	
Backlight goes on and off.	Display	1. Default the BIOS. 2. If not fixed, flash H8. 3. If not fixed, send tablet in for repair.	

SYMPTOM	PROBLEM AREA	ACTION	FLOWCHART
Pen does not right-click when held against the screen.	Display	1. Select **Start → Control Panel → Hardware and Sound → Pen and Touch**. 2. Highlight the **Press and hold** option in the Pen Actions panel and click on **Settings**. 3. Ensure the **Enable press and hold for right clicking** option is checked. 4. If problem is not fixed, replace pen.	
Pen does not right click when side button is pressed (default setting).	Display	1. Select **Start → Control Panel → Hardware and Sound → Pen Tablet Properties**. 2. Verify/change setting to Right Click in bottom side button menu.	
Pen not working in center of display.	Display	Send tablet in for repair.	
Pen opens and closes folders and programs without touching screen.	Display	Send tablet in for repair.	
Tablet will not recognize a battery.	Battery		**TS-04**
Battery will not hold a charge.	Battery	Perform the procedure in What to Do for Overly-Discharged Batteries .	

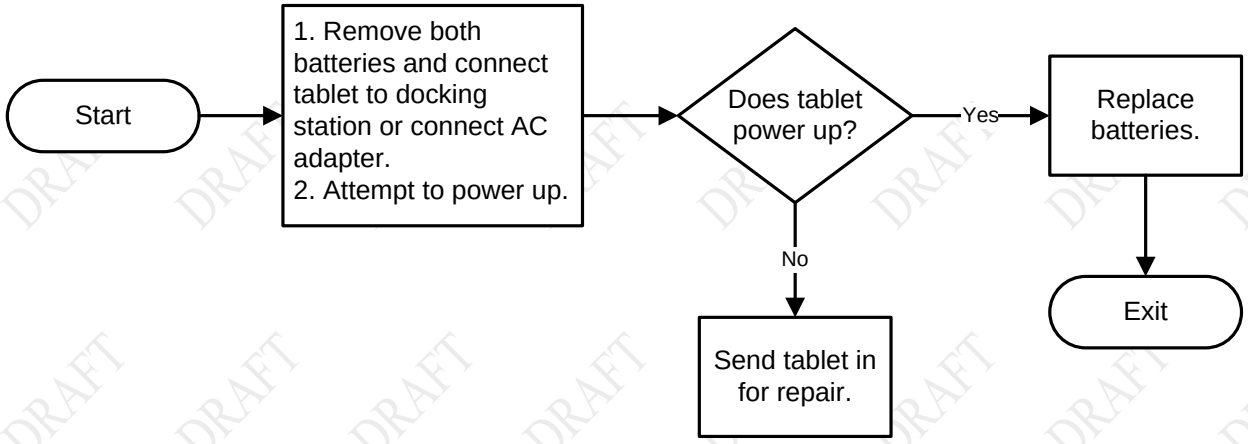
MODEL X7 TABLET COMPUTER

SYMPTOM	PROBLEM AREA	ACTION	FLOWCHART
Charging/Fault LED (indicator panel) is on steady red.	Power System or Battery	The red LED will turn off when the fault condition is removed. Try removing external power (if connected). If the fault occurs on batteries only, connect external power and remove each battery one at a time. If the fault persists, return the tablet for repair.	
Tablet will not power up.	Power System or Battery		TS-01
Tablet is locked up.	Run		TS-05
Screen rolls, flashes, and then tablet freezes up.	Run	1. Remove both batteries and connect AC adapter. 2. Reboot the tablet. 3. If tablet works normally, reinstall one battery at a time and reboot until problem reoccurs. 4. Replace one or both batteries as applicable.	
Tablet shuts down on its own.	Run	1. **Start → Control Panel → Power Options** and check if the computer has a shut down setting to save power. 2. If no shut down option is enabled, return tablet for repair.	
Tablet will not start boot process. Power ok.	Boot Up		TS-02
Tablet will not boot into Windows.	Boot Up		TS-03
Cannot connect to a wireless network.	Wireless		TS-06

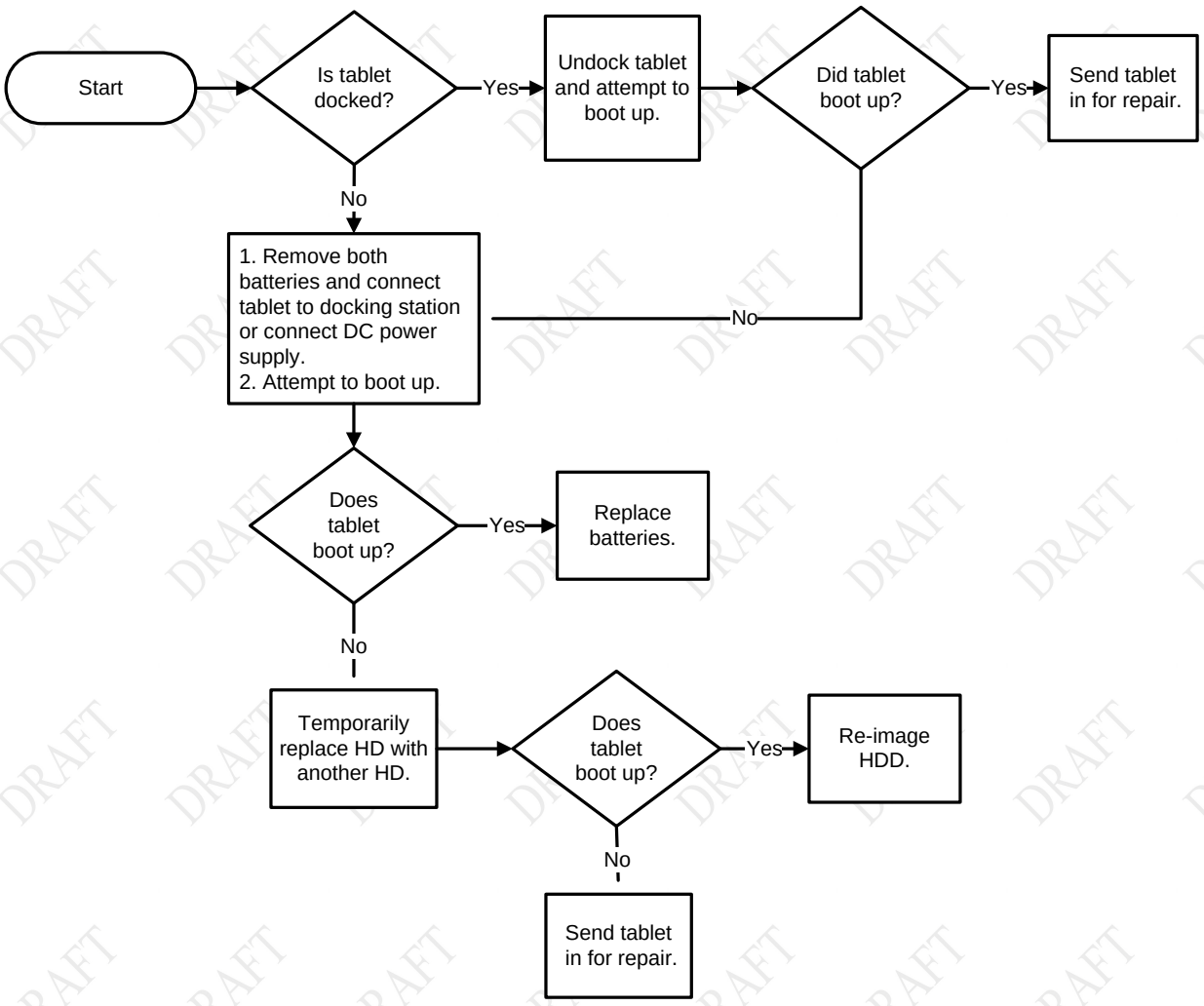
SYMPTOM	PROBLEM AREA	ACTION	FLOWCHART
USB port not working.	USB	Reset the BIOS by performing the procedure in Returning the BIOS to its Default Settings.	

Troubleshooting Flowcharts

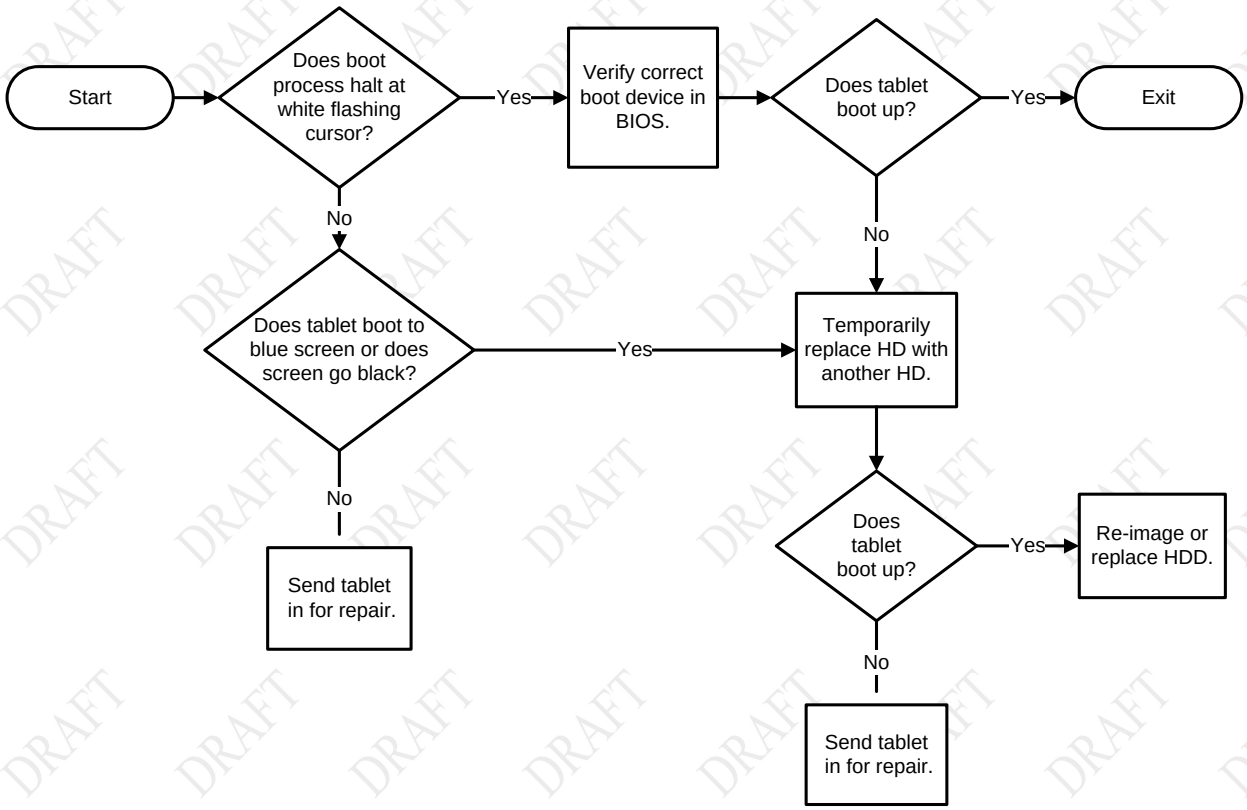
TS-01 Tablet will not power up



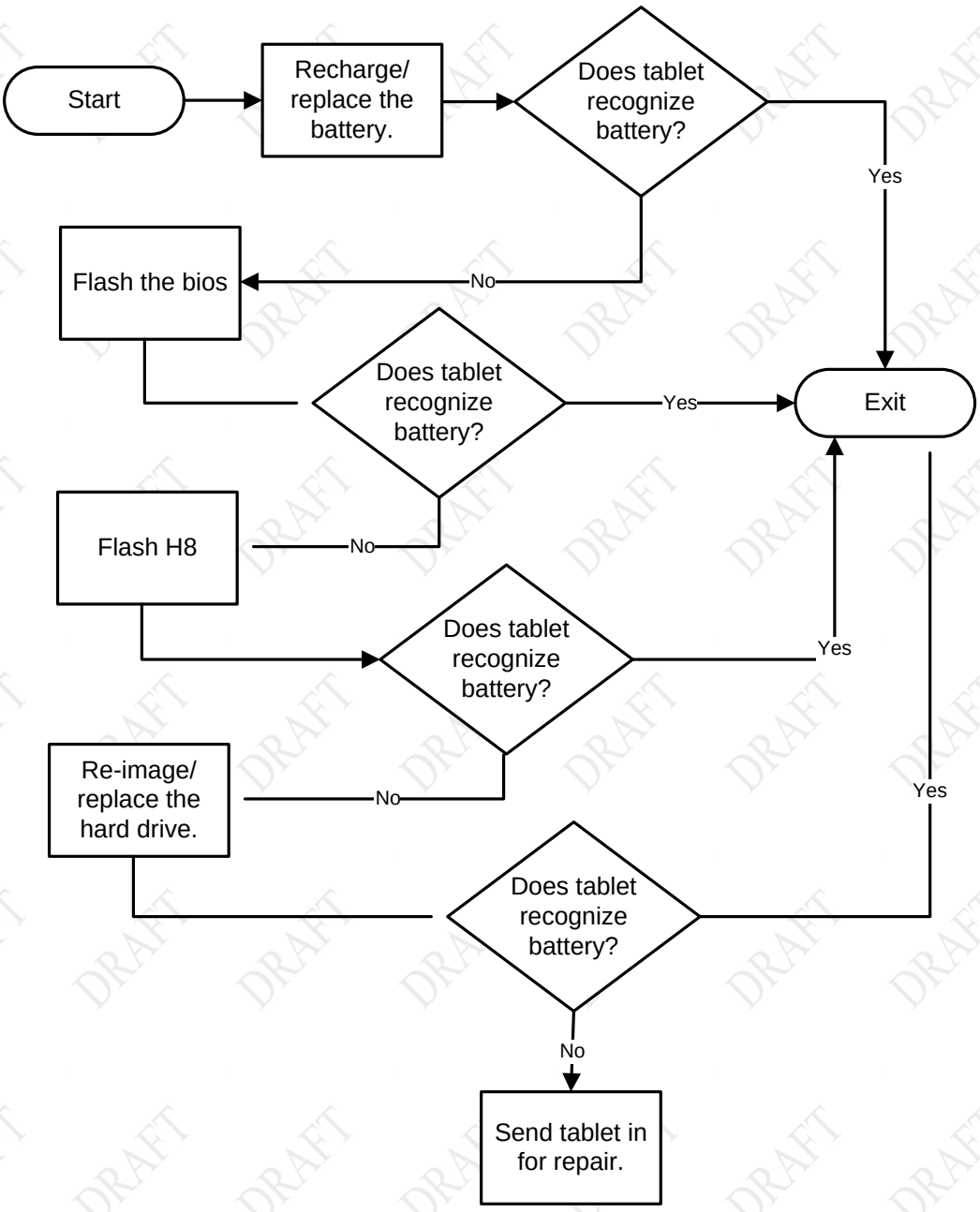
TS-02 Tablet will not start boot process. Power is ok



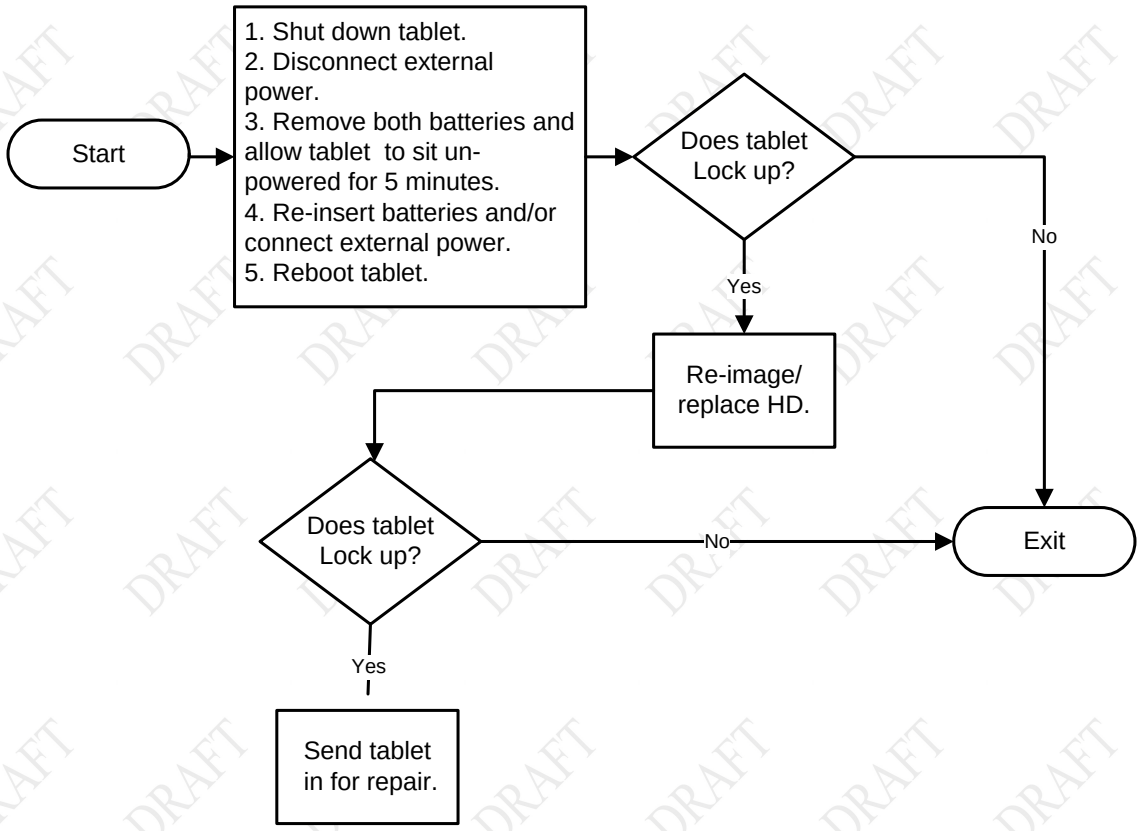
TS-03 Tablet will not boot into Windows



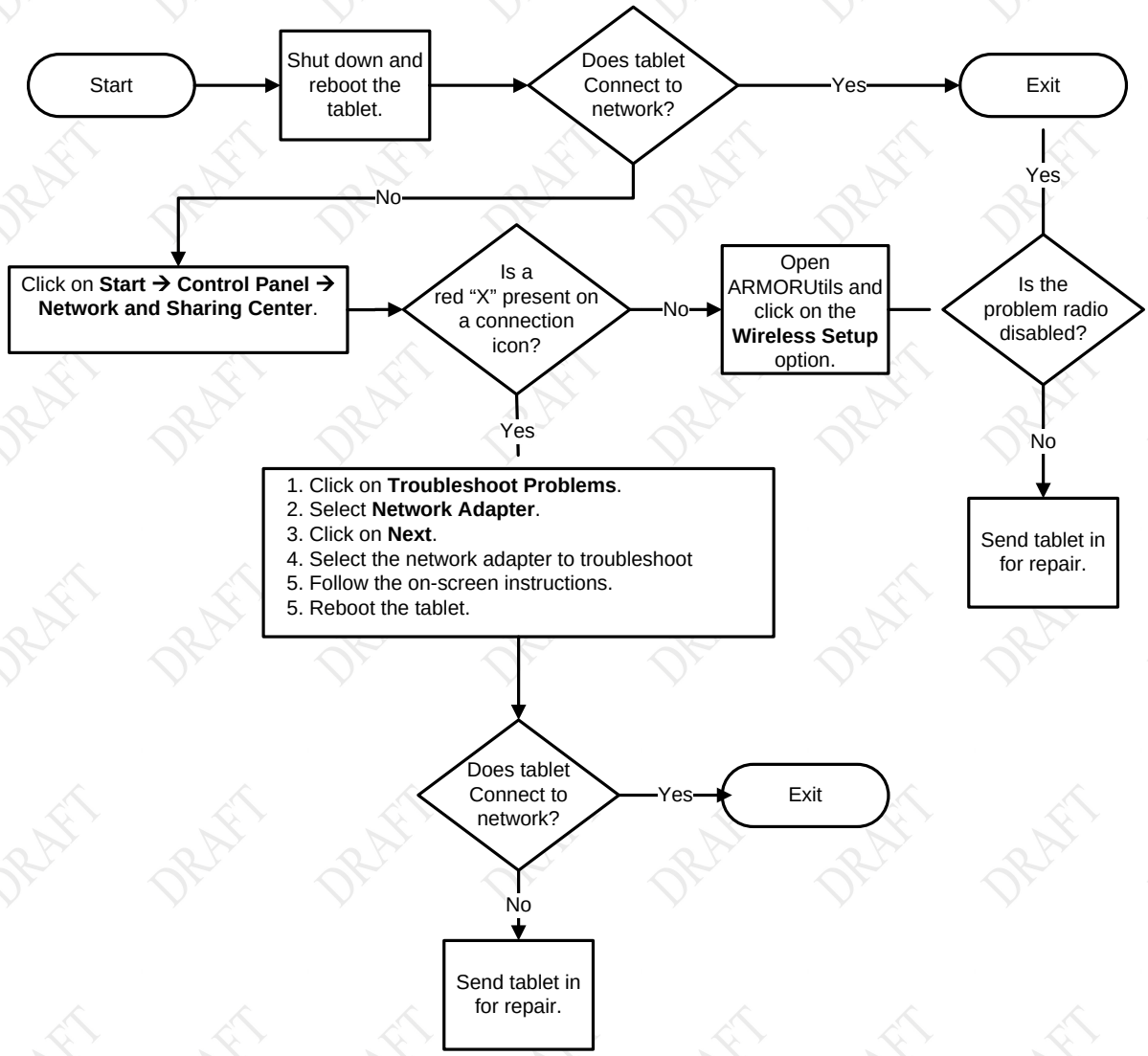
TS-04 Tablet will not recognize a battery



TS-05 Tablet is locked up



TS-06 Cannot connect to wireless network



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7. MAINTAINING YOUR ARMOR X7

Removing and Replacing the Solid State Drive

The solid state drive is located in the rear compartment in the back of the computer, as shown in Figure 73. Follow the procedure in Table 21 to remove and replace the drive.

CAUTION!

Do not remove the rear compartment cover while the unit is powered up as internal voltages will be exposed to possible short circuit.

CAUTION!

Circuit boards containing electrostatic discharge (ESD) sensitive devices are exposed in this compartment. Static-free handling is required to prevent possible damage to the components.

NOTE

The solid state drive should only be removed or installed by a qualified technician in a controlled environment.

MODEL X7 TABLET COMPUTER

Figure 73. X7 Solid State Drive Location

Table 21. Remove and Replace the Solid State Drive

STEP	ACTION
1.	Power down the computer and disconnect any external power.
2.	Place the computer face down on a clean surface and remove 14 Philips screws from the cooling register/cover then remove the cover.
3.	Lift up on the drive and carefully disconnect it from the computer.
4.	Insert the replacement drive.
5.	Replace the back cover and secure with the 14 Philips screws.
6.	Torque each screw to 2.8 kg-cm (2.4 in-lb).

Removing and Replacing the Batteries

Refer to Table 22 and Figure 74 to remove and replace a battery.

CAUTION!

Only one battery at a time can be removed and replaced during operation without causing system shutdown and possible loss of data. Connect external power first before removing both batteries.

Table 22. Remove and Replace a Battery

STEP	ACTION
1.	Push in on the battery button and slide the battery release to unlock the battery. Lift the battery away from the computer case.
2.	To install a battery, place the flat surface of the battery on the battery bay with the locking slots facing toward the battery latch.
3.	Slide the battery toward the computer until the locking bar engages and the battery is flush against the compartment wall. Press firmly until the battery locks in place.
4.	Ensure the battery latch returns to the locked position, as shown in Figure 74.

MODEL X7 TABLET COMPUTER

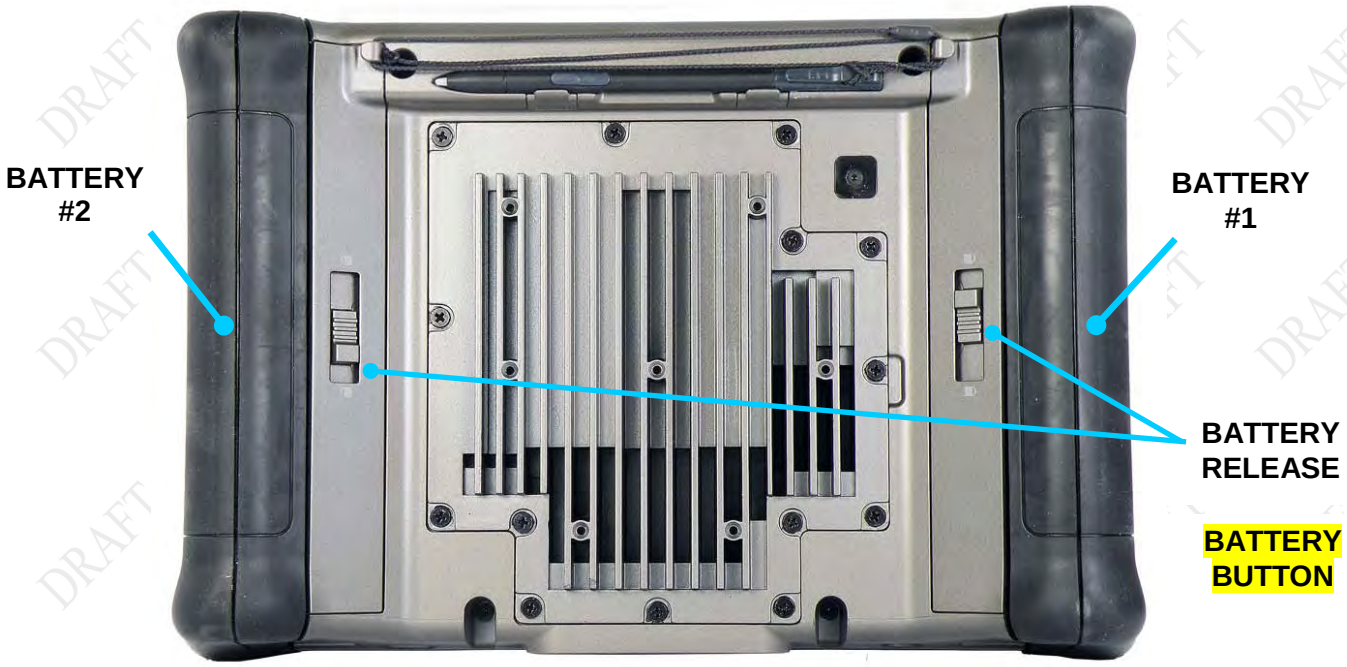


Figure 74. X7 Battery Pack Locations

Installing a SIM Card

Before you can activate and use your WWAN radio, a valid SIM card from your network service provider needs to be installed. The SIM card is installed in a socket located inside the rear compartment, as shown in Figure 75.

Follow the procedure in Table 23 to access the rear compartment and install the SIM Card.

NOTE

This procedure should only be performed by a qualified technician in a controlled environment.

CAUTION!

Circuit boards containing electrostatic discharge (ESD) sensitive devices are exposed in this compartment. Static-free handling is required to prevent possible damage to the components.

Table 23. Installing a SIM Card

STEP	ACTION	CONDITION OR INDICATION
1.	Power down the computer and disconnect any external power.	
2.	Remove the batteries.	
3.	Place the computer face down on a clean surface and remove the 8 Philips screws securing the plastic cooling register shield.	
4.	Remove the 14 Philips screws securing the cooling register.	
5.	Carefully pry up the register at the slot provided (Figure 75) and remove.	

MODEL X7 TABLET COMPUTER

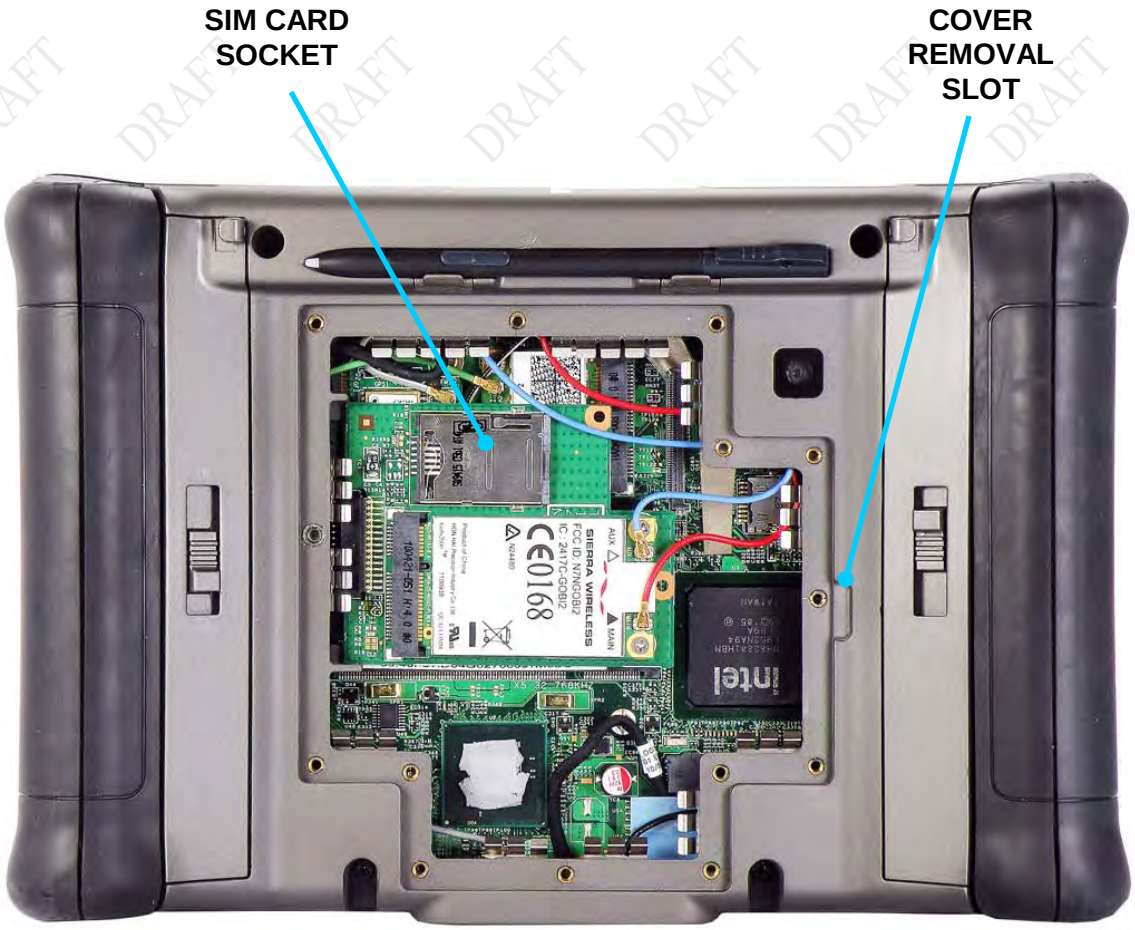
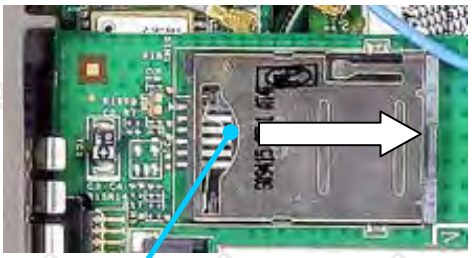
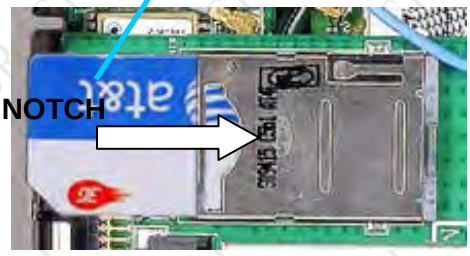
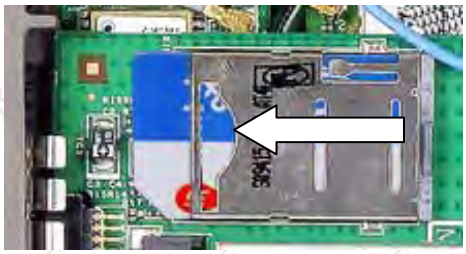


Figure 75. X7 Rear Compartment

STEP	ACTION	CONDITION OR INDICATION
6.	Place a fingertip in the notch on the left side of the SIM socket cover and slide the cover to the right until you feel an indent, then lift up.	
7.	Insert the SIM card with the corner notch at the lower left.	

8.	Gently press the cover down and slide to the left to lock in place.	
9.	Reinstall the cooling register and secure with the 14 Philips screws.	
10.	Torque each screw to 2.8 kg-cm (2.4 in-lb).	

Installing a Micro SD or SDHC Card

The micro SD card socket is located inside the rear compartment, as shown in Figure 76. Follow the procedure in Table 24 to install the card.

CAUTION!

Do not remove the rear compartment cover while the unit is powered up as internal voltages are exposed to possible short circuit.

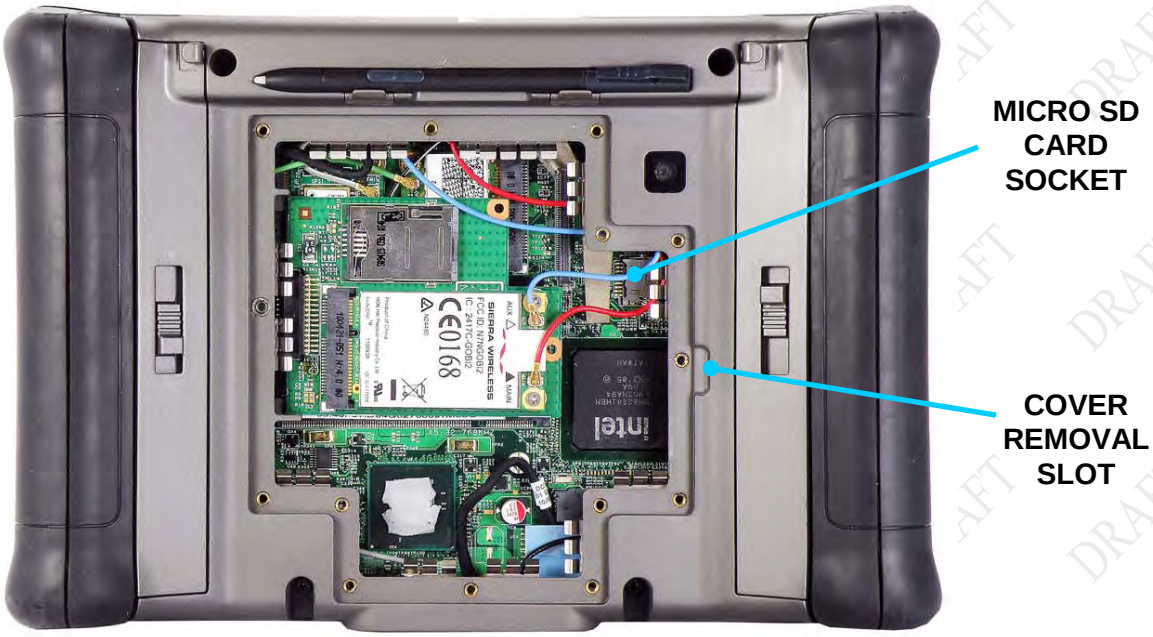


Figure 76. Micro SD Card Socket

Table 24. Installing the SC Card

STEP	ACTION	CONDITION OR INDICATION
1.	Power down the computer and disconnect any external power.	
2.	Remove the batteries.	
3.	Place the computer face down on a clean surface and remove the 14 Philips screws securing the cooling register.	

MODEL X7 TABLET COMPUTER

STEP	ACTION	CONDITION OR INDICATION
4.	Carefully pry up the cooling register/cover at the slot provided (Figure 76) and remove.	
5.	Carefully lift the socket cover and insert the SD card all the way into the cover.	
6.	Press the card down until it locks in place.	
7.	Replace the cooling register/cover and secure with 14 Philips screws.	
8.	Reinstall the batteries and re-connect external power if desired.	

Changing the BIOS Settings

Follow the procedure in Table 25 to access the BIOS setup utility and verify settings or make changes. You can use the active pen (not a stylus or fingertip) to navigate the setup screens and select options, or you can connect an external keyboard to one of the USB ports.

Contact DRS Technical Support if you have any questions about the BIOS settings for your ARMOR X7.

CAUTION!

Incorrectly setting the BIOS options could cause the X7 to become unstable or render it completely inoperable. Move carefully through the menus and use caution when making changes. Read the description of each change in the right-hand column before making any adjustments.

NOTE

If you make permanent changes as a result of an upgrade or addition of new equipment, be sure to keep a record of the changes. Table 26 provides a handy place to record these changes. Always record the previous value in case you have to return to that value.

Table 25. Access the BIOS Setup Utility.

STEP	ACTION
1.	You can use the active pen to navigate in the BIOS setup screens or you can attach a USB keyboard to the USB port on the right side of the computer.
2.	Start the computer and as soon as the DRS logo appears, tap on the screen until you hear a beep. A small options menu will be displayed.
3.	Select **Launch System Setup** to open the Setup Utility main screen.
4.	Use the **LEFT** and **RIGHT ARROW** keys to highlight the desired menu page (listed at the top of the screen) and press **ENTER** to select the menu.
5.	Use the **UP** and **DOWN ARROW** keys to scroll through the page settings and to highlight a particular setting or sub-option.

6.	Select **ENTER** to access the sub-options under a highlighted option. Press **ESC** to return to the previous option or menu.
7.	Use the **F5** and **F6** keys to cycle through the available options and highlight the desired value to change.
8.	Select **ESC** to exit the option.
9.	Use the **arrow keys** to move to the next option.
10.	When all changes have been made, select **F10** to exit and save your changes or select **ESC** to exit without saving any changes. The computer will resume booting.

Table 26. Record Bios Changes Here

SETTING	PREVIOUS VALUE	NEW VALUE	DATE CHANGED

Returning the BIOS to its Default Settings

When your X10gx was shipped to you, the BIOS settings were set to a "default" state for your particular configuration. Follow the procedure in Table 27 to return the BIOS to it's default state.

NOTE

Defaulting the BIOS will change the brightness control to the "Automatic" adjustment mode. To change the adjustment to manual, open the Backlight Setup in ARMORutils and select Manual mode.

Table 27. Return the BIOS to Its Default State

STEP	ACTION	CONDITION OR INDICATION
1.	Access the BIOS Setup Utility (see **Error! Reference source not found.** for instructions).	
2.	Press **F9** to load the default BIOS configuration.	
3.	Press **F10** to save your changes and exit.	

Changing the Power Button Default Action

Follow the procedure in Table 28 to change the default actions of the Power button.

Table 28. Changing the Power Button Default Actions

STEP	ACTION	CONDITION OR INDICATION
1.	Select **Start → Control Panel → Hardware & Sound → Power Options**	The Power Options dialog window is displayed.
2.	From the left panel, select **Choose what the power buttons do**.	The Systems Settings window opens as shown in Figure 77.
	NOTE ***The X10gx does not have a Sleep button so ignore the bottom set of options.***	
3.	Click on the pull-down menus in the **On battery** and **Plugged in** columns and select the desired action.	The pull-down menu options are shown in Figure 77.
4.	Click on the **Save Changes** button at the bottom of the window.	

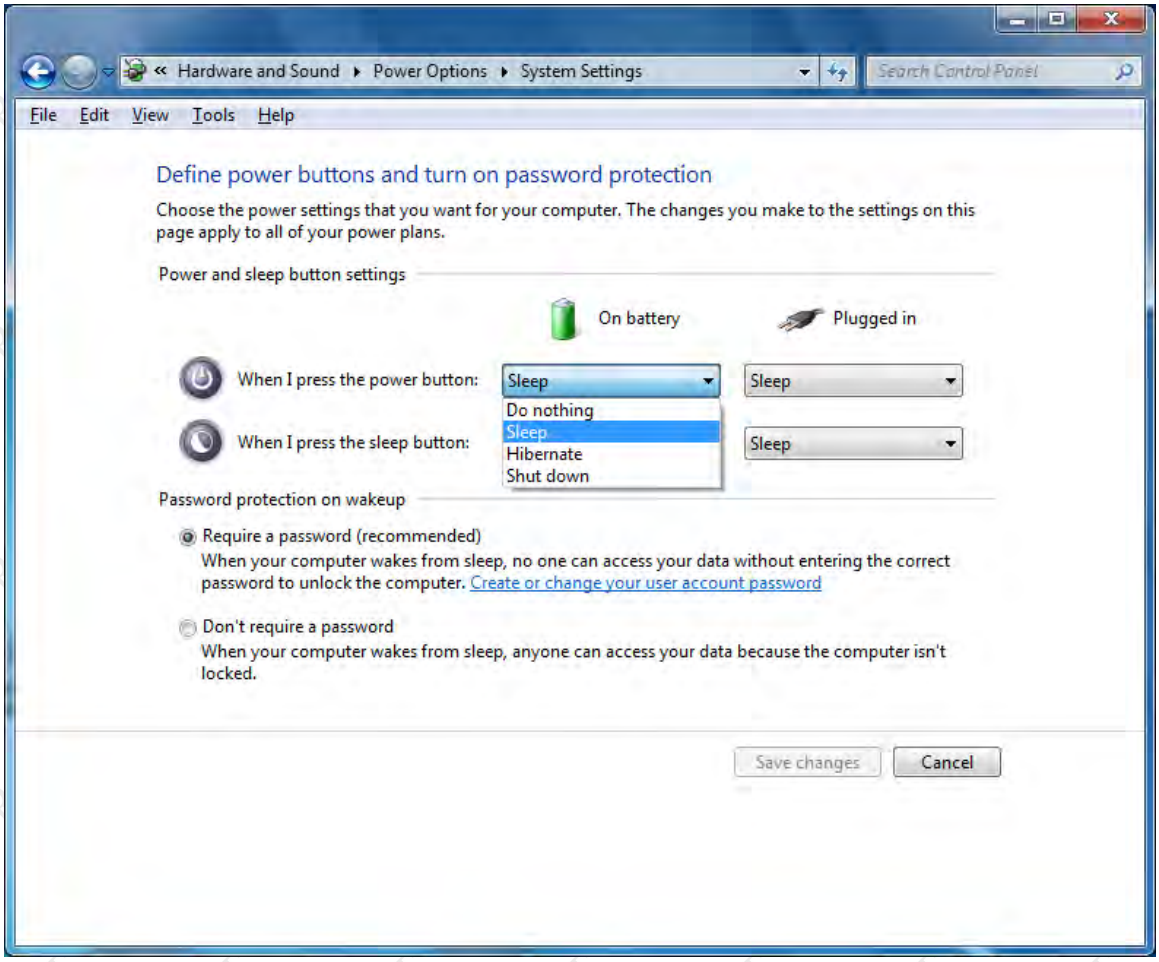


Figure 77. Power Button Settings Options

Caring For the Display Screen

The following tips will help you keep your display clean and healthy:

CAUTION!

Use only canned compressed air to clean your screen. Do not use an air compressor. Damage to the screen surface could result.

CAUTION!

<u>Do not</u> attempt to remove stuck particles with a fingernail or other hard object as this can permanently damage the touch screen surface.

- Do not use an abrasive or metallic pointer on the screen surface as this may damage the screen. Use the pen included with your X7, a passive stylus designed for touch screens (not included) or your fingertip.
- Use a plastic cleaner such as Plexus™ to clean the pen tip.
- Be careful not to let sand or grit stay on the screen as this can scratch the surface when wiped with a cloth. Clean the display surface first with canned dry compressed air (do not exceed 60psi pressure) or a soft bristle brush.
- Use the special ARMOR cloth that came with your X10gx to wipe away dust and fingerprints.
- For stubborn residue, clean the surface with plain water or water with a few drops of dish soap added and pat dry with a clean paper towel or cloth, then use the special ARMOR cloth that came with your tablet to remove any remaining residue.
- Use a cotton swab with plain water, soapy water, alcohol or glass cleaner to gently remove particles stuck to the surface.

Monitoring the Health of Your ARMOR X7

If you are experiencing problems and suspect that they are temperature related, you can monitor the internal temperature of the X7 by clicking on **Start → All Programs → ARMORutils** or double-clicking on the ARMORutils icon on the desktop to open the ARMORutils Diagnostics dialog window (see Figure 78). The window displays the following internal temperatures of the X7 tablet:

- CPU core temperature (DTS and Diode)
- CPU Main Board temperature
- Battery #1 temperature
- Battery #2 temperature

The CPU temperatures vary widely depending on the operation of the tablet and may not necessarily correlate with outside (ambient) temperatures.

If you suspect a temperature related problem, please contact **Error! Reference source not found.** for assistance in troubleshooting and resolving the problem.

NOTE

The indicated temperatures for the CPU and mainboard can indicate up to 35°C higher than the ambient temperature of the tablet.

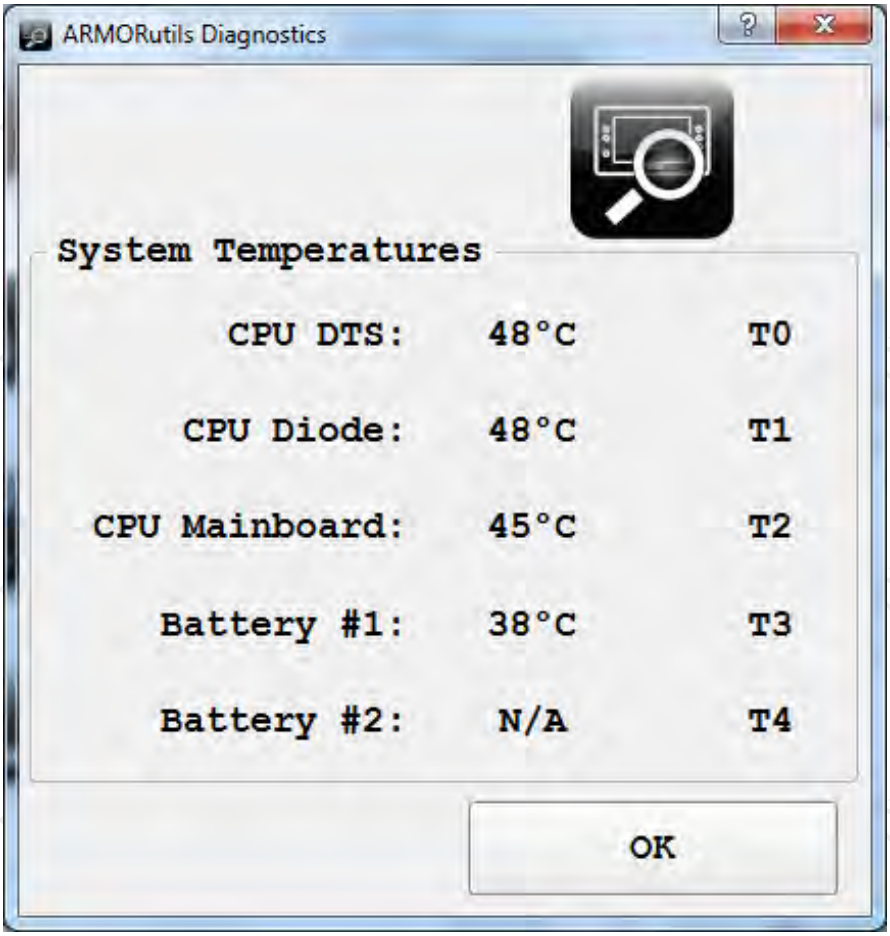


Figure 78. ARMORutils Diagnostics Dialog Window

Generating a Log of Temperature Variations

If a problem is occurring over time, you can record system temperature variations over time by creating a temperature variation log file. Follow the procedure in Table 29 to set up the log file.

Table 29. Generate a Temperature Variation Log

STEP	ACTION	CONDITION OR INDICATION
1.	Select **START** → **All PROGRAMS** → **ARMORutils** and select the **Diagnostics** page.	The page opens as shown in Figure 78.
2.	Click on the **Event Recording** button.	The Event Recording window opens as shown in Figure 79.
3.	Enter a name for the log file in the **File Name** field.	The name should be in the format **xxxxx.txt**
4.	In the **Path** field, enter the path to the folder where you want the log file to reside or click on the **Set Path** button and select the folder.	
5.	Select **START TEMPERATURE LOG** to begin generating a record of temperature changes over time.	
6.	Select the **STOP TEMPERATURE LOG** option to stop recording temperatures.	A sample log file is shown in Figure 80.

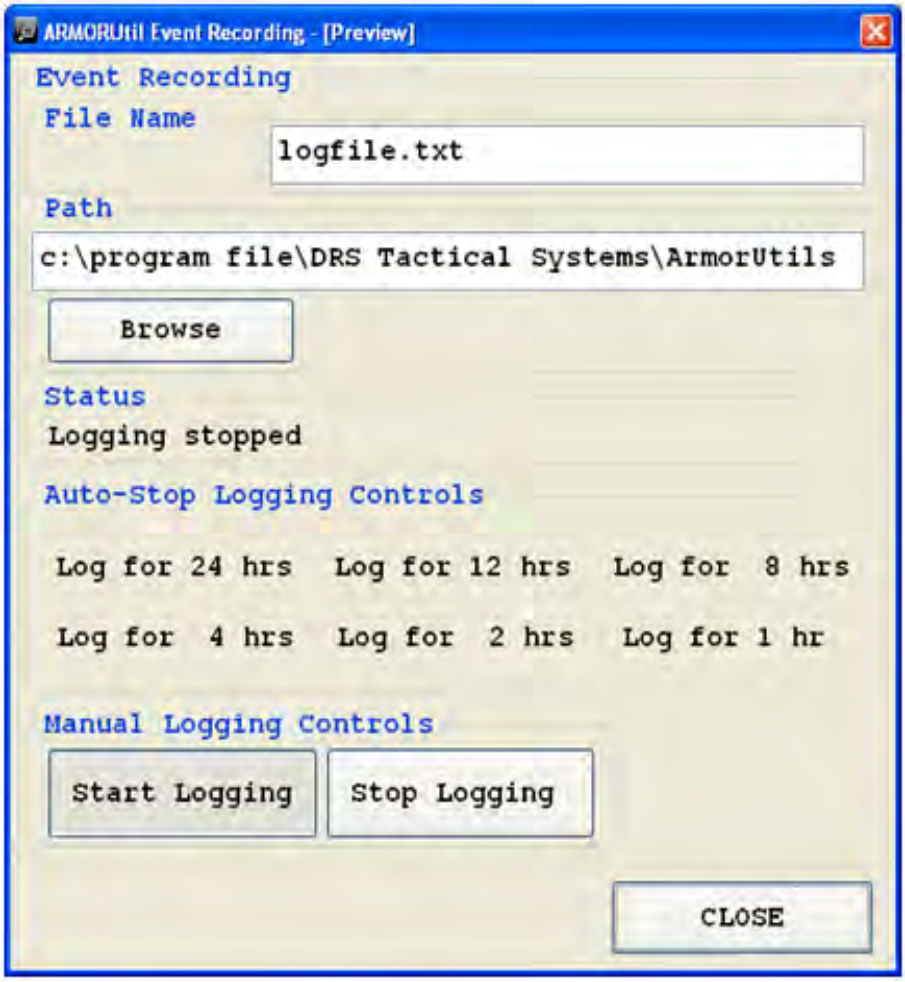


Figure 79. ARMORutils Event Recording Window

[Update image to Win 7]

Log file opened for write/append.

TIME	CPU DTS TEMP	CPU DIODE TEMP	CPU Mainboard TEMP	BAT1 TEMP	BAT2 TEMP
1/7/2010 2:42:00 AM	47°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:06 AM	48°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:12 AM	47°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:18 AM	47°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:24 AM	47°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:30 AM	48°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:36 AM	47°C	47°C	44°C	36°C	36°C
1/7/2010 2:42:42 AM	47°C	46°C	44°C	36°C	36°C
1/7/2010 2:42:48 AM	47°C	46°C	44°C	36°C	36°C
1/7/2010 2:42:54 AM	49°C	46°C	45°C	36°C	36°C
1/7/2010 2:43:00 AM	47°C	46°C	45°C	36°C	36°C
1/7/2010 2:43:06 AM	47°C	46°C	45°C	37°C	36°C
1/7/2010 2:43:12 AM	48°C	47°C	44°C	37°C	37°C
1/7/2010 2:43:18 AM	48°C	47°C	44°C	37°C	37°C
1/7/2010 2:43:24 AM	48°C	47°C	44°C	36°C	36°C
1/7/2010 2:43:30 AM	49°C	48°C	44°C	36°C	36°C
1/7/2010 2:43:36 AM	49°C	48°C	44°C	36°C	36°C
1/7/2010 2:43:42 AM	49°C	49°C	44°C	36°C	36°C
1/7/2010 2:43:48 AM	48°C	49°C	44°C	36°C	36°C
1/7/2010 2:43:54 AM	48°C	48°C	44°C	36°C	36°C
1/7/2010 2:44:00 AM	48°C	48°C	44°C	36°C	36°C
1/7/2010 2:43:06 AM	48°C	48°C	44°C	36°C	36°C

Log file closed.

Figure 80. Sample Temperature Log File

[“Core X” column headers do not correspond to Diagnostics dialog window titles (T0, T1, T2….)

“System Temp” column header is “Core T2” in the Diagnostics dialog window titles]

8. DISPLAY MANAGEMENT

Adjusting the Brightness

The brightness of an LCD display is controlled by adjusting the intensity of the backlight. The backlight level for the X7 can be controlled manually or automatically.

Manual Brightness Adjustment

Your ARMOR X7 computer is pre-set for manual adjustment of screen brightness. The backlight level can be adjusted manually in two ways: by pressing a button sequence on the control panel or by adjusting the slider in the Backlight Setup dialog window of ARMORutils.

Using a Button Sequence

Press the **Fn** button once (do not hold) and then repeatedly press the **P1** button. The brightness will increase in steps until it reaches 100%, then will start over at minimum brightness.

Using the ARMORutils Backlight Setup Dialog

Double-click on the ARMORutils desktop icon and select the **Backlight Setup** button. The Backlight Setup dialog opens as shown in **Error! Reference source not found.**.

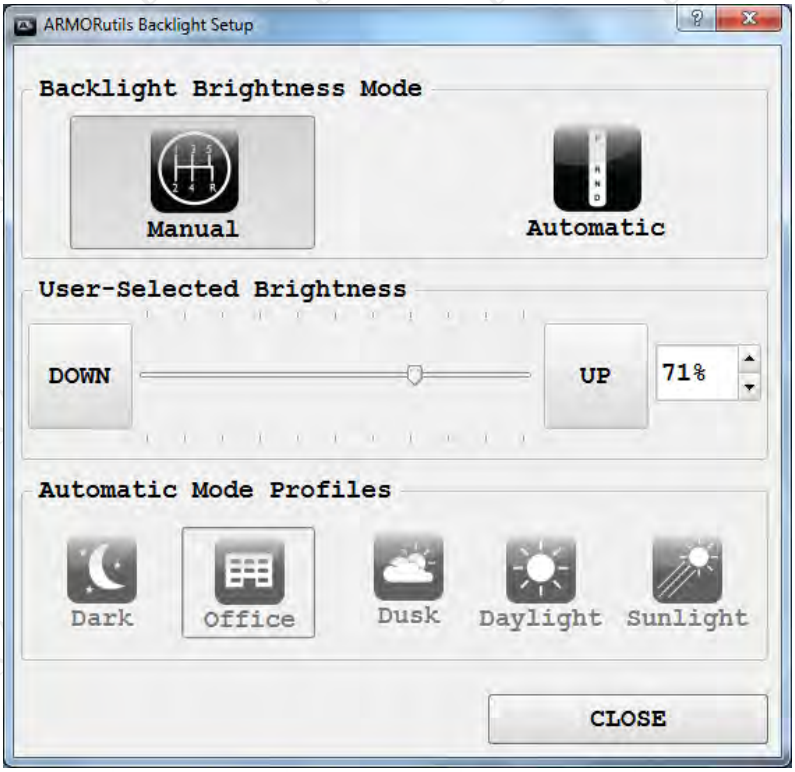


Figure 81. Armor Utilities Screen – Backlight Tab

Press the **UP** or **DOWN** buttons repeatedly with the pen or a fingertip to move the slider and adjust the backlight level. The % brightness is displayed in a field on the right. You can also use the stylus with the up and down arrows next to this field to adjust the slider.

Automatic Adjustment

Open the **Backlight Setup** dialog in ARMORutils and click on the **Automatic** button. The backlight level will now be controlled by the light sensor. If the surrounding light decreases, the brightness will also decreases proportionally; if the surrounding light increases, the brightness will increase.

NOTE

You must keep the light sensor uncovered to allow proper automatic brightness adjustment.

Automatic Mode Profiles

Select one of the profiles that best controls the range of backlight levels to suit your work environment.

Calibrating the Display

You can access both touch screen and pen screen calibration routines using **ARMORutils** or using the **Tablet PC Settings** utility in **Control Panel**.

Using ARMORutils

Open ARMORutils and click on the **Screen Settings** button.

Using the Tablet PC Settings Utility in Control Panel

Table 30. Calibrate the Display Using the Tablet PC Settings Utility

STEP	ACTION	CONDITION OR INDICATION
1.	Select **Start → Control Panel → Hardware and Sound → Tablet PC Settings**.	The Tablet PC Settings dialog window opens, as shown in Figure 82.

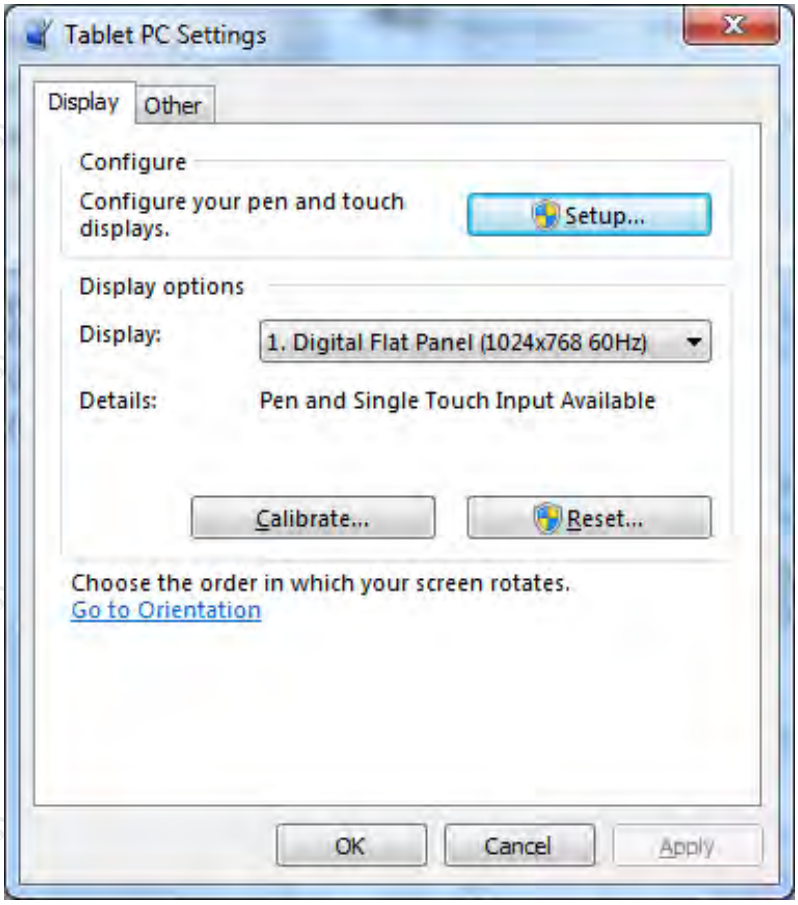
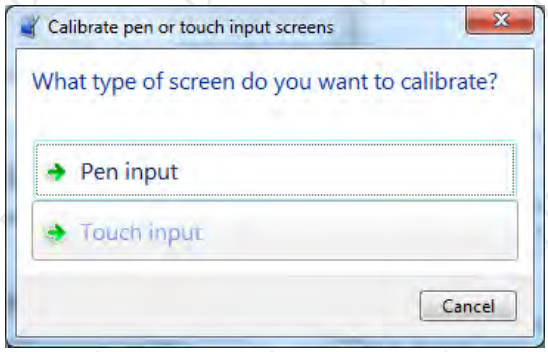
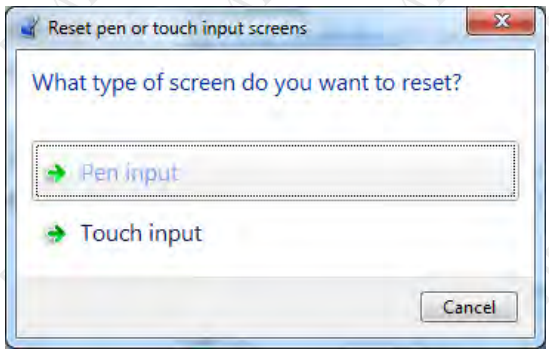
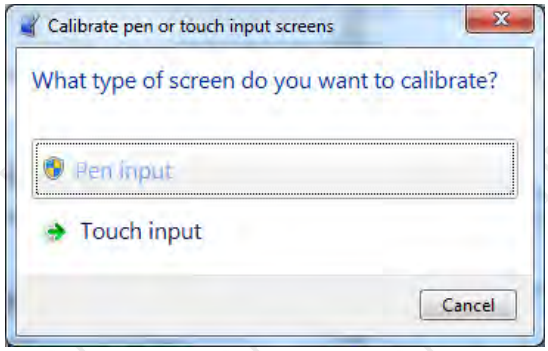


Figure 82. Tablet PC Settings Window

2.	If you are <u>not</u> having problems with screen calibration and want to do a quick 4-point calibration, click on the **Calibrate** button. Otherwise, go to Step 4.	The **Calibrate Pen or Touch Input Screens** window opens, as shown below: 
3.	Choose the type of screen to calibrate and follow the on-screen instructions.	**NOTE** ***If you do not have an external keyboard connected, you can invoke the ESC command using the Input Panel virtual keyboard. Hover with the pen or tap on the screen in the upper left corner near the left edge. The keyboard will appear.***
4.	If you are having screen calibration problems or want to do a precision 16-point calibration, click on the **Reset** button	The **Reset Pen or Touch Input Screens** window opens, as shown below: 
5.	Select the screen calibration you want to reset.	The current screen calibration points are reset to their default values and the selection screen closes.

6.	Click on **Calibrate** and select the screen you want to calibrate.	**NOTE** ***A shield symbol next to the screen type (shown below next to Pen input) indicates the calibration data has been reset and is not calibrated; a green arrow indicates that the screen is calibrated.*** 
7.	Follow the on-screen instructions.	

Rotating the Screen (Touch or Pen)

Your ARMOR X7 supports the Windows function of rotating the screen between Landscape and Portrait layout mode. In landscape mode (default orientation), the long axis of the screen is along the top and bottom of the display. In portrait mode, you turn the computer 90° and the long axis of the screen is along the left and right sides of the display.

There are three ways to rotate the screen:

- By using the Intel Graphics options via the desktop or icon tray
- By using the Intel Graphics and Media Control panel
- By using a hot key combination with an external keyboard

NOTE

If you lose calibration when rotating the screen and cannot use the pen to return to the default orientation, attach an external keyboard and press Ctrl+Alt+Up Arrow. This will return the display to the default landscape orientation.

Using the Intel Graphics Options

Right click anywhere on the desktop or click on the Intel Graphics icon in the icon tray (you may have to show hidden icons) and select **Graphics Options → Rotation**. Then select one of the four rotation angles as shown in Figure 83. **NOTE:** The "Normal" position is the default landscape orientation as shown in **Error! Reference source not found.**.

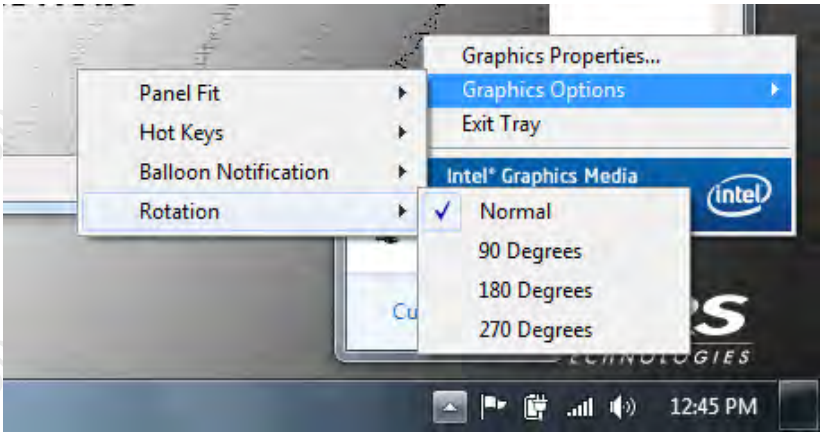


Figure 83. Intel Graphics Screen Rotation Options (from icon tray)

You can rotate the screen clockwise in four 90 degree steps, alternating between portrait and landscape orientation, or you can rotate it 180° or 270°.

Using the Intel Graphics and Media Control Panel

Right-click anywhere on the desktop or click on the Intel Graphics icon in the icon tray and select **Graphics Properties** to open the Intel Graphics and Media Control Panel, as shown in Figure 84. Select the rotation angle and click **OK**.

Figure 84. Intel Graphics and Media Control Panel

Using a Keyboard "Hot Key" Combination

Open the Intel Graphics and Media Control Panel and select **Options and Support → Hot Key Manager**. A list of pre-assigned (default) hot key combinations is displayed in the right panel, as shown in Figure 85. You can use these default combinations or specify a combination of your own.

To use a hot key combination, connect a USB keyboard and enter the combination.

Figure 85. Intel Graphics Panel Hot Key Manager

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9. BATTERY MANAGEMENT

The Lithium Ion batteries used in your ARMOR X7 computer offer the best technology available today. These 'Smart Batteries' provide ARMOR X7 users with the greatest power density and the most accurate "fuel gauge" possible. To achieve the best possible performance from your batteries, we recommend using and maintaining the batteries in accordance with the instructions provided in this section.

WARNING!

Do not drop or mishandle the batteries, immerse them in water, or subject them to high heat. Doing so could increase the risk of explosion or leakage, and possibly cause injury.

WARNING!

The lithium-ion batteries used in this equipment contain material that is hazardous to your health. If battery contents come in contact with the eyes, IMMEDIATELY flush the affected area with clean water for 15 minutes and have someone else summon medical attention for you. Unaffected persons should assist the affected individual in the vital first flushing of the eyes.

WARNING!

If battery material comes in contact with the skin, flush the affected area with clean water and seek immediate medical treatment.

Safety and Handling Considerations for Your Batteries

Please use the following safety rules when handling and using lithium-Ion batteries.

- Do not expose the batteries to very high temperatures such as an open flame.
- Do not short circuit the battery contacts or reverse their polarity.
- Do not let children play with the batteries.
- Do not crush, dent or allow any deformation of the batteries.
- Do not disassemble or open the batteries or try to alter or bypass the internal safety circuits.
- Avoid exposing the batteries to wet or extremely humid conditions.
- Avoid exposing the batteries to electrostatic discharge.
- Avoid dropping the batteries.
- Do not use in, or connect the batteries to, any other devices.
- Do not allow batteries to remain discharged for more than 1 week

When to Charge a Battery

Initial Use and Newly Received Batteries

Due to current regulations regarding shipment of lithium Ion batteries, your X7 batteries are shipped to you in a partially charged condition, typically with a maximum charge of 30%-50%. DRS recommends that you fully charge your batteries before using the computer on batteries alone.

If you do not plan to use your computer immediately, be aware that the batteries will discharge as much as 4% in 24 hours if left in the computer with the power turned off. For this reason, we recommend that computers with the batteries left in that will not be used for an extended period of time be connected to external power, either using the AC adapter provided with your computer, or an external battery charger or through a vehicle power supply.

CAUTION!

X7 batteries should not be left installed in a computer that is connected to external power and left in a high-temperature environment, such as in a hot vehicle cab, for more than 30 minutes at a time. Prolonged exposure to high heat with external power applied can cause loss of capacity and reduced battery life.

Removed Batteries

To check the remaining charge of a battery that is disconnected from the computer, press the fuel gauge button to activate the fuel gauge (see Figure 19). The lowest indicator will flash when the battery is at 10% charge or below. Because batteries will continue to self-discharge slightly even when disconnected, DRS recommends you recharge your batteries as soon as possible after they reach the 10% level (LED #1 flashing).

Installed Batteries

When an installed battery's charge drops below 10%, a warning message, similar to the one in Figure 86 will appear on the screen. At this point, the battery is in a **depleted** charge state (between 10% and 3%). If the total charge drops below 5%, the computer will enter the hibernate state, where your Windows session is automatically saved to the hard drive and the computer is shut down to save power.

NOTE

It is possible that high current demand on the batteries could cause the remaining charge to drop too rapidly for the hibernate process to take place, resulting in the computer shutting down unexpectedly.

To avoid having your computer enter the hibernate mode or possibly shut down suddenly with the loss of your current session, you should connect external power to recharge your batteries as soon as you see the warning message, or replace them immediately with fresh batteries..

Depleted Batteries

A battery is considered **depleted** when its charge falls below 10%. If left in a computer even with power off, a battery will still discharge 3-4% over a 24 hour period. If a battery's charge is allowed to drop below the 3% level (**fully depleted**), an internal safety circuit could activate and render the battery un-rechargeable. Remove a depleted battery as soon as possible or connect external power to recharge it.

A lithium battery that is not installed in the X7 will self discharge at the rate of about 0.3% per day or 3% every 10 days (faster in higher temperature conditions). A depleted battery that is removed is therefore in danger of becoming fully depleted after about 23 days.

To protect the life of your batteries, DRS recommends you wait no longer than 10 days to recharge a depleted battery.

CAUTION!

Batteries that are allowed to discharge below the 3% charge level may not be recoverable and may have to be discarded.

How to Charge Your Batteries

Using the X7 Computer

The X7 batteries automatically begin charging when installed in the computer and external power is applied.

To recharge the batteries using the computer, plug the circular connector of the AC adapter into the DC input jack on the left side of the ARMOR X7, or into the PWR connector on a desk dock unit. If your X7 is installed in a vehicle dock, the batteries will charge whenever vehicle battery power is available.

Don't be alarmed if batteries feel warm to the touch during the charging process.

Using the Optional X7 External Battery Charger

The X7 external battery charger will charge a single battery in about 2.5 hours, or two batteries in about 4.5 hours. For instructions on using the external battery charger, see Appendix B, Using the X7 External Battery Charger

Charging Times

The charging time for one or two fully depleted battery (10% charge or less) will depend primarily on the following:

- power demands on the system (screen brightness setting, wireless and GPS radio activity, utility and software applications currently running, etc.)
- temperature extremes
- number of batteries (1 or 2)
- total capacity of each battery

Two types of batteries are available for the X7: a 2-cell type with 2850 mAh capacity and a 4-cell type with 5900 mAh capacity. Table 31 lists typical charging times for each battery type.

Table 31. X7 Battery Charging Times

Number of Batteries	2-Cell Battery P/N xxxx-xxxxx-xxxx	4-Cell Battery P/N xxxx-xxxxx-xxxx
2	x hours	8+ hours
1	x hours	x hours

NOTE

If the internal battery temperature exceeds 45°C during charging, the computer will suspend the charging cycle until the temperature drops back into the normal operating range.

NOTE

The charging cycle is not linear and the last 20% of charge takes proportionally longer to complete than the first 80% of charge time.

Selecting How to Charge Your Batteries

If you have two batteries installed, you can select if both will charge at the same time (simultaneous mode) or if the battery with the lowest charge will charge first (sequential mode). The default mode is simultaneous.

In simultaneous mode, both batteries will charge at the same time regardless of individual battery charge level.

If you choose sequential mode, the battery with the lowest charge will be charged to 80%, followed by the next lowest battery. Once both are at 80%, the first charged battery will be charged to 100%, followed by the second charged battery.

Follow the procedure in Table 32 to select if your batteries will charge simultaneously or sequentially.

Table 32. Select How to Charge the Batteries

STEP	ACTION	CONDITION OR INDICATION
1.	Connect external power.	

STEP	ACTION	CONDITION OR INDICATION
2.	Double-click on the **ARMORutils** icon on the desktop and select the **Battery Monitor** dialog page from the Main screen.	The Battery Monitor dialog page opens.
3.	Click on the **Charger Settings** button.	The Charger Control Settings window opens.
	NOTE ***If total system current exceeds 4 amps while charging two batteries, the charger will switch to sequential battery charging.***	
4.	Select **Charge Both** (simultaneous) or **Charge Lowest First** (sequential).	

Temperature Can Affect Charging Times

DRS has included temperature sensors in the battery circuit to protect the cells when a high or low temperature condition occurs. Recharging a battery under extreme temperature conditions can force the charger to suspend charging until the temperature returns to a safe level. This can occur if the internal temperature of the battery falls below -10°C (14°F) or exceeds 45°C (113°F).

How to Tell When Batteries Have Finished Charging

While the batteries are charging, the fuel gauge LEDs will light to indicate the current level of charge and the amber battery status LED will be on steady. When the batteries are fully charged, all five fuel gauge LEDs will be on steady and the battery status LED will be off.

Battery Operating Times

The length of time your X7 can operate on batteries alone before needing a recharge is primarily determined by the following:

- screen brightness (backlight) setting
- wireless and GPS radio activity
- utility and software applications that are currently running
- temperature extremes
- number of batteries (1 or 2)
- battery capacity (2-cell vs. 4-cell)

Just like people, no two batteries have the same operating characteristics. Table 33 lists typical operating times for one or two new, fully-charged 2-cell and 4-cell batteries.

Table 33. X7 Battery Operating Times

Number of Batteries	2-Cell Battery P/N 0300-50842-0001	4-Cell Battery P/N 0300-50842-0000
2	x hours	8+ hours
1	x hours	x hours

Operating under Low Battery Conditions

Low Battery Level Alarm

Your ARMOR X7 is designed to operate even when the battery is depleted (<10% charge). When the total charge drops below 10% (low battery level), a low battery alert message will be displayed, as shown in Figure 86. At this point, DRS recommends you connect external power to recharge the batteries or replace one or both batteries with fresh batteries.

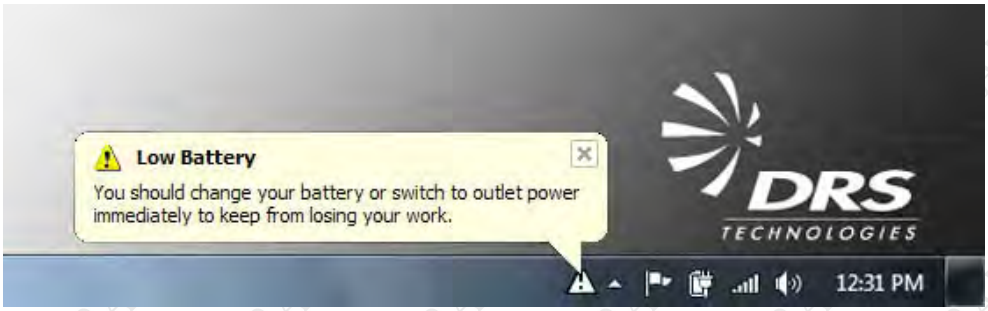


Figure 86. Low Battery Alert Message

Reserve Battery Level Alarm

When the remaining charge reaches 7% (reserve battery level), another message will be displayed stating that you are operating on reserve power. At this point, you need to save your work and then connect external power, replace the batteries or shut down the computer.

Critical Battery Level Alarm

When the remaining charge reaches 5% (critical battery level), the battery icon in the task tray will indicate a critical battery level and Windows will automatically place your computer into hibernation mode. Hibernation is a low-power mode that first saves your current session to storage and then performs an orderly shutdown. To resume your session where you left off, press the **Power** button to restart the computer.

CAUTION!

If the total battery charge drops to 3% or lower while the computer is operating, the computer will shut down abruptly with the loss of any work in progress. Normally, the automatic shutdown at the 5% point will prevent this happening, but heavy demands on the batteries may cause the battery charge to drop too quickly for the computer to react and perform a safe shutdown.

What to Do if You Get a Low Battery Alert

DRS recommends you do one of the following immediately should you get a low battery alert:

- Connect external power and begin recharging the batteries
- Replace one or both of the batteries with a fully charged battery.
- Save your work and perform a normal system shutdown.

Avoiding Overly-Discharging Your Batteries

The following suggestions will help avoid an overly-discharged condition.

- Do not store the X7 for long periods with the batteries installed. Even when the unit is powered off, the tablet still draws a small amount of power from the batteries.
- Do not store X7 batteries in a fully depleted condition for long periods of time. The X7 batteries will further self-discharge over time at a rate of about 10% a month or 3% every 10 days. The batteries should be recharged to 40% of full charge every 3-4 months of storage.

What to Do for Overly-Discharged Batteries

The Armor Tablet X7 has an internal Level 2 smart battery charger. One of the features of this charger is that it will attempt to recover a battery that has been too deeply discharged (3% or less). This is done by applying a trickle current of 80 milliamps for about 3 minutes. This process normally injects enough energy into the battery to allow normal re-charging to occur. If the recovery process is successful, the 20% LED will begin flashing or be on steady. Allow the battery to charge normally.

If this recovery process does not work (20% LED will not light), perform the procedure in Table 34.

Table 34. Recover an Overly-discharged Battery.

STEP	ACTION
1.	Remove both batteries.
2.	Wait 5 seconds.
3.	Reinstall both batteries.
4.	Repeat steps 1-4 up to a maximum of five times.
5.	If the batteries still fail to start re-charging, they will have to be replaced.

Battery Capacity and Charge

A battery's "capacity" is it's ability to deliver a specified amount of energy in the form of electrical current to the system over a one-hour period, measured in milliamps per hour or mAh. A battery's "charge" is the percentage of this capacity that has been restored to the battery. A fully charged battery is one that can supply 100% of its current maximum capacity.

Capacity gradually decreases over time due to chemical aging, temperature extremes and usage. Once a battery's maximum capacity (see Battery 1 and 2 Information Buttons) drops below 80% of its designed rating, it is considered to be at the end of it's life and is normally replaced. For example, a 5900 mAh hour battery should be replaced when it's Maximum Capacity drops below approximately 4720 mAh.

While some batteries may still be usable below the minimum capacity level, the risk for battery failure and/or unexpected shutdown increases dramatically.

CAUTION!

Permanent battery capacity loss is greatest at elevated temperatures with the batteries fully charged. Do not leave batteries installed in your X7 in high temperature surroundings with external power connected for days or weeks at a time. Remove the batteries and store them in a cool place.

Discharge/Recharge Cycles

Lithium ion batteries do not need to be deeply discharged periodically to maintain capacity like certain other types of rechargeable batteries. In fact, deep discharges have a negative effect on a lithium ion battery's capacity and operating life.

Each time a lithium ion battery is deeply discharged (< 30%) and then recharged (either during normal operation or conditioning), the system records the event as a "cycle." Each of these deep discharge/recharge cycles has a small cumulative effect on the overall capacity and life of the battery and, on average, after approximately 300-400 cycles at nominal room temperature, the battery is a candidate for replacement (sooner if used primarily in high temperatures).

The accumulated cycles are recorded in the **Charge Cycles Count** field of each Battery Information window in ARMORutils (see Figure 51).

Battery Conditioning

Battery conditioning is only recommended if you notice that the levels reported by Windows or ARMORutils are consistently different from battery fuel gauge readings, as conditioning adds to the charge cycle count.

Battery conditioning is a 3-step process consisting of an initial full charge, followed by a full discharge and finally followed by a full recharge. Each step is displayed in the Conditioning Status panel of the ARMORutils Battery Conditioning window (see Figure 87).

Follow the procedure in Table 35 to condition a battery.

NOTE

You must have external power connected to condition a battery.

NOTE

The conditioning process can take 3-5 hours to complete. Ensure that external power remains connected for the duration of the conditioning period.

NOTE

If the internal battery temperature exceeds 45°C during conditioning, the charging circuit will suspend the conditioning cycle until the temperature drops back into the normal operating range.

Table 35. Conditioning a Battery

STEP	ACTION	CONDITION OR INDICATION
1.	Connect external power to the X7, either with the included AC adapter or through a docking station.	
2.	Select **Start** → **ARMORutils** → **Battery Monitor** and click on the **Conditioning Menu** button.	The Battery Conditioning window opens, as shown in Figure 87. **NOTE:** The current conditioning mode shown is from a previous conditioning cycle. It is not determined by whether only one or both batteries are present. **NOTE:** The term "Ready" means the battery is in a waiting state. It's next state may be charging or discharging.

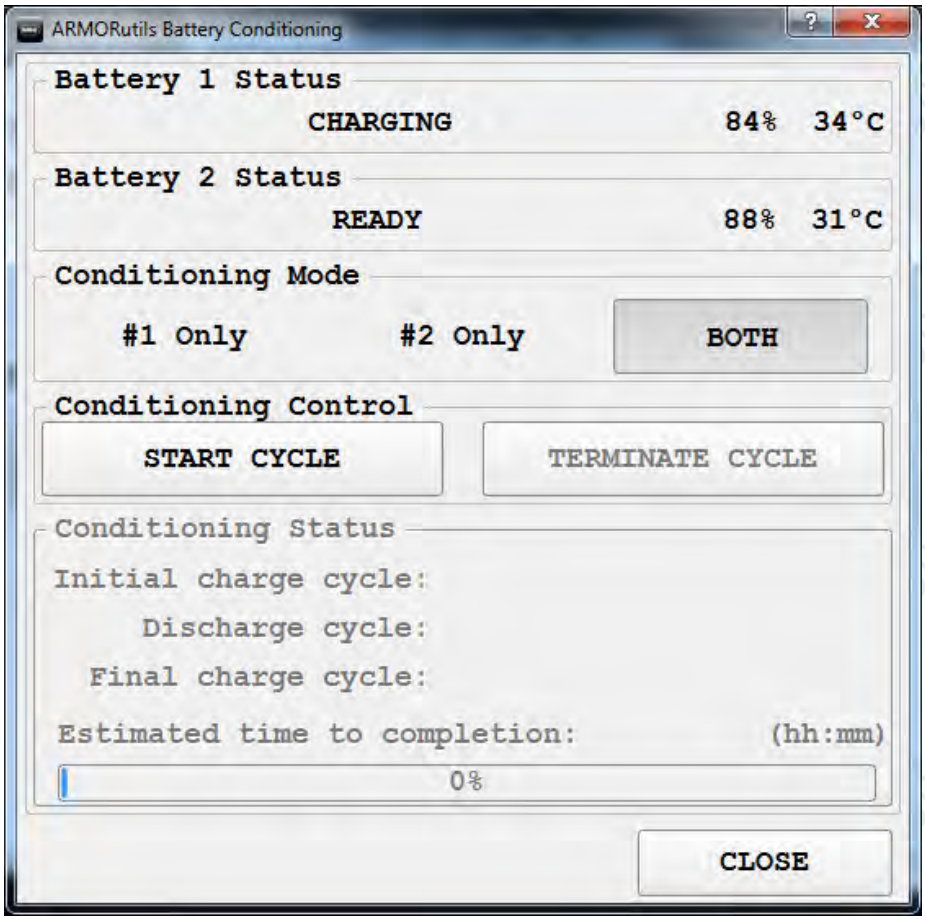


Figure 87. ARMORutils Battery Conditioning Window

3.	Select **#1 Only**, **#2 Only** or **Both**	**NOTE:** If only one battery is installed, selecting that battery will cause the **START CYCLE** option to appear in dark text; if you select the missing battery or BOTH, the START CYCLE option will appear in grayed out text.
4.	Select **START CYCLE.**	An alert window will appear as shown in Figure 88. **NOTE:** To reduce internal heating during the conditioning cycle, DRS recommends you turn down the backlight level (brightness) as much as practical. **NOTE:** If the internal battery temperature exceeds 45°C. the computer will abort the conditioning process.
5.	Click on **Yes** to proceed or **No** to cancel the conditioning.	The first charge cycle will begin. The following table lists the approximate charge times for both the 2-cell and 4-cell battery.
6.	To terminate the conditioning process at any time, click on **Terminate Cycle**.	

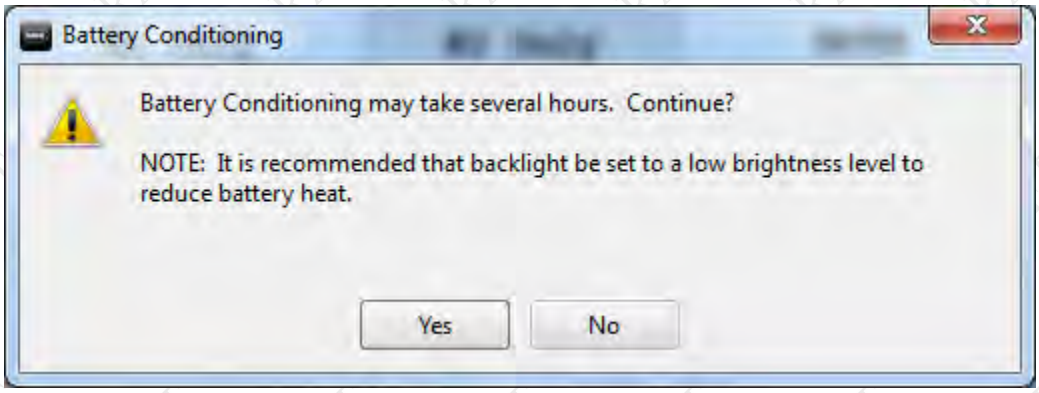


Figure 88. Battery Conditioning Start Alert Message

How to Optimize Battery Operating Time

The total operating time for your ARMOR X7 is greater than 8 hours with two batteries installed and up to 4 hours with a single battery. However, this is dependent on a variety of factors including temperature, backlight setting and computer usage.

You can help ensure the maximum performance of your batteries by optimizing your computer's power management features. For some suggested ways to do this, select **Start → Control Panel → Hardware and Sound** and click on the **Power Options** icon.

There are two power plan options: **Balanced, High Performance** and **Power Saver**. DRS recommends that you use the **Balanced** plan until you are more familiar with the usage demands on your tablet.

How to Monitor Battery Usage

You can monitor the charge level of each battery in two ways:

1) by clicking on the **Battery/Plug** icon in the task bar to open a desktop battery monitor window similar to the one shown in Figure 89. The battery icon changes to a battery with plug icon when external power is connected.

2) by selecting the **Battery Monitor** option on **ARMORutils Main Page** to open the **Battery Monitor** dialog window.

The Desktop Battery Monitor Window

Click on the Battery/Plug icon in the Windows task tray to open the desktop battery monitor window, (see examples in Figure 89). The example on the left shows the battery symbol and remaining charge when the X7 is operating on battery power alone. The example on the right shows the battery symbol and remaining charge when external power is connected and the battery is charging.

The total charge remaining or available for two batteries is determined by the following formula: Batt #1 % + Batt #2 % / 2 .

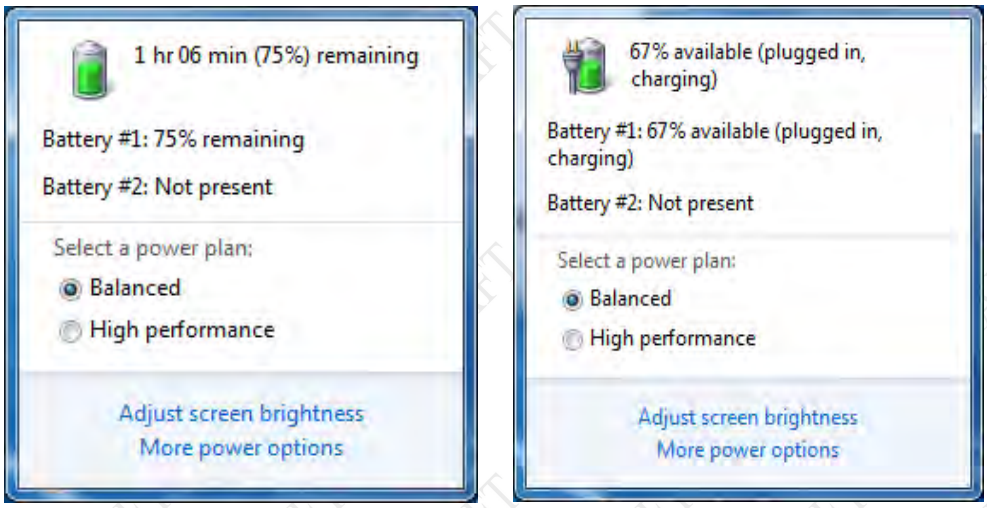


Figure 89. Windows Battery Monitor Examples

NOTE

You must restart the window to see any recent changes, such as that resulting from removing a battery or plugging in external power.

The ARMORutils Battery Monitor Dialog Window

Double-click on the **ARMORutils icon** on the desktop and select the **Battery Monitor** button to open the Battery Monitor dialog window, as shown in Figure 90. Refer to Battery Monitor Dialog Window for a description of this page.

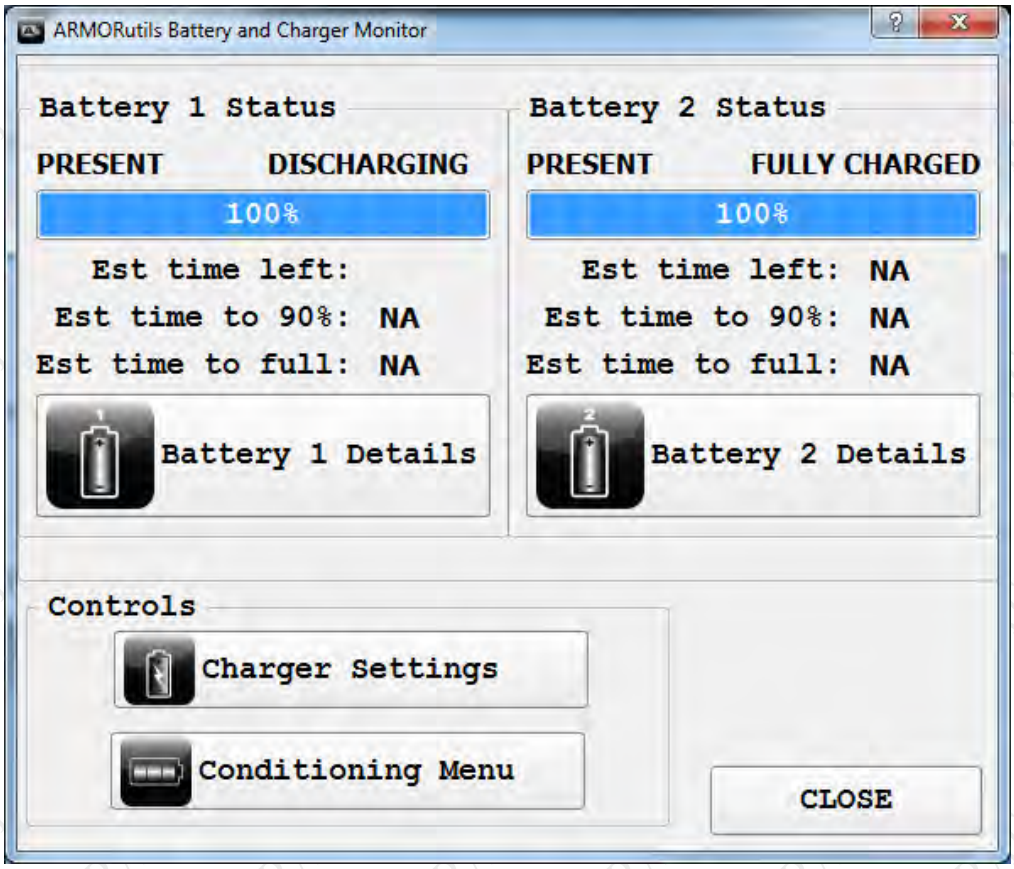


Figure 90. ARMORutils Battery Monitor Page

When to Replace a Battery

Battery life is affected by the age of the battery, its operating temperature and the number of discharge/charge cycles that it goes through over time. Industry surveys report that “average daily use” (8 hours or less at nominal room temperature) equates to approximately 300-400 cycles per year. Batteries operating at this level of usage that are properly cared for can last as long as two years or even longer. However, if the batteries are in constant use (24/7), subjected to frequent temperature extremes or are subjected to complete discharging frequently they will deteriorate more rapidly. Under these conditions, DRS recommends at least an annual replacement.

To determine the age of the battery, check the lot number on the battery label (see Figure 91). This number is the date (mm/yy) the battery was shipped from DRS.

Figure 91. ARMOR X7 Battery Label Example

Battery Warranty

Your X7 battery is warranted against all defects in material and workmanship for a period of 1 year from shipment from DRS.

Because of the many variables associated with usage and aging, DRS is not responsible for battery capacity performance except as affected by factory defects or workmanship in the battery.

Where to Purchase Replacement Batteries

Your ARMOR X7 uses long lasting Lithium Ion batteries that are custom made for DRS Tactical Systems, Inc. If you need to purchase replacement batteries, notify your sales representative, authorized reseller or contact DRS Technical Support.

Do not substitute any other batteries. Substituting batteries could damage the X7 and may void your computer warranty.

How to Store Batteries When Not in Use

The following storage tips will help you optimize the capacity and performance of your batteries.

Short-Term Storage

- If your X7 will not be in use for 7-30 days, it is recommended that the batteries first be charged and then removed from the computer for short-term storage.
- Batteries can be stored at temperatures of 32ºF to 95ºF (0ºC to 35ºC) and a humidity of 45-85%
- When possible, store them in a cool dry place at room temperature (25°C/77°F) or below.
- Do not leave batteries in direct sunlight or in any other unusually hot location. A battery will deteriorate more quickly if stored in high temperatures such as a vehicle in the hot sun.
- Protect the battery contacts from accidentally touching other battery contacts or any metal objects to prevent a short circuit and possible arcing or explosion.

Long-Term Storage

- If your X7 will not be in use for 30 days or longer, the batteries should be placed in long-term storage.
- Prepare the batteries for storage by placing them in the computer with external power disconnected and allow the charge to drop to 40%.
- LiION batteries self discharge at the rate of about 10% per month. While in long-term storage, you should recharge the batteries every 3-4 months to a charge level of 40%.
- To check a battery's remaining charge, insert it in the X7, power up the unit and select the **Battery Monitor** button from the ARMORutils main window.

Battery Tips for Best Performance

- Recharge a battery within 24 hours of a full discharge. Batteries remaining in a fully discharged state longer than 24 hours may deteriorate more quickly.
- Battery charging should be done at temperatures between 32°F (0°C) to 95°F (35°C), but preferably at room temperature. The battery could deteriorate more quickly when charged at high temperatures.
- When operating your ARMOR X7 on external power for extended periods of time (1 week or longer), it's best to remove the batteries and store them in a cool place until needed.
- If batteries are removed for longer than 30 days, refer to How to Store Batteries When Not in Use.
- If possible, allow a battery to warm or cool to the temperature of your surroundings before installing it in the tablet.

Disposing Of Your Batteries

Disposal

You can dispose of your X10gx batteries in a normal waste receptacle. However, they contain recyclable materials that can be extracted and used again. Please see the section on recycling below.

WARNING!

Disposed lithium-ion batteries that are not fully discharged contain active salts that can result in an explosion if suddenly exposed to moisture or water in the environment. To prevent possible injury to someone finding the battery, please ensure it is fully discharged before disposing in a domestic or commercial garbage receptacle.

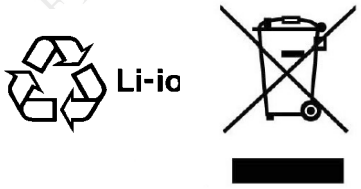
Recycling

Lithium-ion batteries are fully recyclable and should not be simply thrown away. Please help protect our environment by turning in your defective batteries to an authorized recycler, or sending them back to DRS.

DRS Tactical Systems supports recycling of batteries and will take back your batteries using a Returned Material Authorization (RMA) form. Please contact the DRS Technical Support center toll-free at 1-888-872-1100 for more information.

Follow these precautions when handling or returning used batteries:

- Insulate the battery contacts with tape.
- Do not disassemble the batteries.
- Package the batteries so that they cannot move around or make contact with each other.



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10. DRS TECHNICAL SUPPORT

Before You Contact Us

Please have your local technical personnel check for network or custom software problems before contacting DRS Technical Support with a problem.

How to Obtain Warranty Service

Before proceeding, please read the **Error! Reference source not found.**.

Notice: DRS reserves the right to charge a No Fault Found (NFF) fee for any unit returned for repair that is found to be fully operational.

1. Immediately notify DRS.

Inform DRS of your problem at one of the numbers below, or notify an authorized DRS Reseller.

In North America, call:	(888) 872-1100 or (321) 309-0599 – 24 hrs, 7 days a week
In the UK, call:	44-(0)-1252-730716
In Europe, call:	49-2246-915-99-77

2. Obtain a Return Merchandise Authorization (RMA) Number.

If it is determined that your product needs to be returned for replacement or repair, a customer service representative will give you an RMA number. The RMA number is required to return any product to DRS, regardless of the reason for the return.

3. If you want to use our online RMA service, please ask for a Username and Password.

To access our online RMA service:

1) Go to www.drsarmor.com.
2) Click on the **Support** tab and select **Online RMA**.
3) At the login screen, enter your Username and Password.
4) Click on **Send**.
5) Fill out the online form.
6) Print a copy of the form for your records.
7) Select **Send.**

4. Include the Following Required Information with Your Product(s):

- Company name, address and telephone number.
- RMA number received from DRS (if applicable).
- Serial number of the product.
- Date of purchase.

- Your ship-to address and any special shipping requirements.
- A detailed description of the problem.

5. Prepare your Products for Shipment.

- Back up any important data on the X7 storage media (solid-state drive, mSATA drive, SD card).
- Use the original shipping container if possible to return your product.
- Remove the batteries and package them separately.
- If the original container is not available, wrap each item securely with bubble wrap or suitable cushioning material.
- Enclose a copy of the RMA form.
- Enclose a description of the problem and any special notes for the repair technician.

6. Ship Your Product(s).

Ship your products to one of the addresses listed below:

NOTE

Transportation and insurance costs must be prepaid. DRS is not responsible for loss or damage which may occur in transit.

NOTE

Before you ship any product(s) to DRS, be sure to back up the data on the X7 storage media. Remove any confidential, proprietary or personal information and any removable media such as floppy disks, CDs or PC Cards. DRS is not responsible for any lost confidential, proprietary or personal information, removable media or for corrupted data.

In North America, ship to:

DRS Tactical Systems, Inc.
1110 West Hibiscus Boulevard
Melbourne, Florida 32901 USA
ATTN: Service

In Europe, ship to:

DRS Tactical Systems, LTD.
The Trading Estate
Farnham Surrey, GU9 9NN UK
ATTN: Brian Perkins

or: **International – Markus Breuch**
Rathausstr. 10
53797 Lohmar, Germany
ATTN: Silke Zaigler

Once your product(s) are repaired or replaced under the terms specified in the warranty, DRS will return your product(s), with shipping pre-paid, to the address included with your RMA.

If You Need Further Information

Please call us, fax us, email us, or visit our website.

Call us:
In North America, call: (888) 872-1100 or (321) 309-0599
In the UK, call: 44-(0)-1252-730716
In Europe, call: 49-2246-915-99-77

Fax us:
In North America: 321-725-0496
In the UK, fax: 44-(0)-1252-730522
In Germany, fax: 49-2246-915-99-78

Email us:

For Support:
In North America or UK: support@drs-ts.com
In Europe: sales@drsarmor.eu

For Sales and Information
In North America or UK: Sales@drsarmor.com
In Europe, email: Sales@drsarmor.eu

Or Visit our website at:
www.drsarmor.com
For translation in German, click on "**Deutsch**" at the top of the page.

Warranty Information

DRS TACTICAL SYSTEMS, INC.
LIMITED WARRANTY – HARDWARE
ARMOR PRODUCTS

General Information

DRS Tactical Systems, Inc. ("DRS") warrants for the duration of this warranty that the DRS ARMOR product(s) ("Product(s)") produced by DRS will be free from defects in material and workmanship under normal use and service, subject to the terms and conditions set forth herein. This warranty applies to the Products only and excludes, but is not limited to, all other products and accessories supplied and/or distributed but not manufactured by DRS.

This warranty extends only to the original purchaser of Products from DRS or a DRS Authorized Reseller ("Original Purchaser"). It is not transferable to anyone who subsequently purchases or obtains the Products from the Original Purchaser.

Length of Warranty

The warranty is valid for a period of three (3) years from the original date of the packing slip from DRS and/or an Authorized Reseller. During this period, DRS will, at its option and expense, either repair or replace with new or reconditioned (of equal or better quality) parts of any of the Products which prove to be defective, provided that such Products are returned in accordance with the terms of this warranty. All exchanged parts and Products replaced under this warranty will become the property of DRS. If repair or replacement is not feasible, DRS will, at its option, refund the purchase price of the Product(s) on a three year straight line depreciation basis. Any replacement part or Product will be warranted for the remainder of the original warranty period or ninety (90) days, whichever is longer.

Terms and Conditions

This warranty covers defects in materials and workmanship in the Products, as follows:

Term	3 years standard
Technical Assistance	Yes
Shipping Costs	Shipping costs of a Product to DRS are not included as part of this Warranty. Shipping costs of a Product to the Original Purchaser after a warranty repair is included as part of this warranty. If after receipt of a Product for repair under this warranty, it is later determined to be a non-warranted repair, all shipping costs are to be paid by the Original Purchaser.

This warranty does not cover:

- Non-DRS ARMOR products (accessories) under the original manufacturer's warranty including, but not limited to, the carrying case, PCMCIA cards, etc. Non-DRS ARMOR branded products are not covered under an extended warranty period.
- Software, including the operating system and software added to the DRS ARMOR hardware products through our factory-integration system, third-party software, or the reloading of software;
- Scratches or abrasions to the Product's LCD screen/display, and abusive wear of the LCD screens;
- Consumables and High Wear Items. Batteries, Keyboards, Touch Pad, Touch Screen, AC Adaptor, and liquid crystal display (LCD) are covered under the Limited Warranty for one (1) year.
- Problems that result from external causes such as accident, fire, floods, or acts of God; abuse; misuse; or problems with electrical power; servicing not authorized by DRS; failure to follow the Product instructions or failure to perform preventative maintenance; problems caused by using accessories, parts, or components not supplied by DRS; improper installation (to include the absence of surge protection in vehicle installations), testing, operation, use or handling of the Product; or unauthorized alteration of Products
- Products with missing or altered service tags or serial numbers.
- Products for which DRS has not received payment.
- DRS is not responsible for and shall not be liable for transportation and insurance charges incurred in or damages resulting from transporting the Products, Accessories and/or Replacement Products to DRS for warranty service.
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Additional Information

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Acronyms

ACRONYM	DEFINITION
AC	alternating current
BIOS	basic input/output system
CD-ROM	compact disk – read only memory
CDMA	code division multiple access
CPU	central processing unit
DC	direct current
DVD	digital video disk
EDGE	enhanced data rates for GSM evolution
EVDO	evolution data only/evolution data optimized
GB	gigabytes
GPRS	general packet radio service
GPS	global positioning system
GSM	global system for mobile communications
HSDPA	high-speed downlink packet access
I/O	Input/Output
LCD	liquid-crystal display
LED	light-emitting diode
OEM	original equipment manufacturer
PC	personal computer
PCMCIA	personal computer memory card international association
RAM	random access memory
SAS	security attention sequence
SD	secure digital
SIM	subscriber identity module
SmBus	system management bus
SODIMM	small outline dual in-line memory module
SSD	solid-state drive
SVGA	super VGA (maximum of 800 x600 pixels)
TFT	thin-film transistor
USB	universal serial bus
VAC	volts AC
VDC	volts DC
VGA	video graphics array
WLAN	wireless local area network
WWAN	wireless wide area network
XGA	extended VGA (1024 x 768 pixels)

Glossary

TERM	DEFINITION
ambient temperature	The temperature of the air surrounding an object
depleted battery	A lithium-ion battery that has discharged to a level between 10% and 3% of charge, as indicated by a flashing 10% LED on the Battery Gauge.
fully charged battery	A lithium-ion battery that has reached 100% of charge as indicated by a steady 100% LED on the Battery Gauge.
fully depleted battery	A lithium-ion battery that has discharged to a level of 3 % or below.
fully discharged battery	Same as depleted.
flexspace	A special compartment with a flexible communications interface for custom circuit cards or modules.
storage device	Any removable or fixed storage device (SSD, mSATA, SD card, etc.) that the processing system can use for temporary or permanent data storage.

Appendix A

Explanation of Pen Side Button Options

4th Click (Back)	Duplicates a 4th mouse button click – usually the Back command in browser application.
5th Click (Forward)	Duplicates a 5th mouse button click – usually the Forward command in browser application.
Click	Duplicates a left mouse button click.
Click Lock	Duplicates holding an object with the left mouse button; good for dragging objects or selecting text or groups of objects. Press button to grab, press to release.
Default	Sets the switch function to Right Click
Disabled	Disables the side switch.
Double Click	Generates a double-click action with a single press of the side switch.
Erase	Enables the pen tip to act like an eraser in handwriting applications and in some paint and imaging editing programs.
Journal	Opens Microsoft Journal™ (only with versions of Windows that include Microsoft Journal).
Keystroke…	Enables you to define special keystrokes. This function can also be made available using the Pop-up Menu option (must be defined in the Pop-up Menu tab of the Pen Computer Properties dialog.
Middle Click	Duplicates pressing the middle scroll button on a mouse.
Mode Toggle…	Toggles between Pen and Mouse mode if pre-configured in the Pop-Up Menu tab of the Pen Computer Properties dialog (see Windows Control Panel).
Modifier…	Enables you to duplicate a shift, ctrl, alt or click function.
Open/Run…	Opens or runs a pre-selected application. This function can also be made available using the Pop-up Menu option.
Pan/Scroll…	Enables you to use the pen like a hand to move a document or image in any direction within an active window.
Pop-up Menu	Makes available selections enabled in the Pop-up Menu tab of the Pen Computer Properties dialog (see Windows Control Panel).
Pressure Hold	Primarily used with painting programs to maintain the pressure of a brush stroke.
Right Click	Duplicates a right mouse button click.
Computer PC Defined	Uses the pen settings defined in the Pen Options tab of the Pen and Touch dialog window.
Computer PC Input Panel	Opens the Computer PC input panel (only with versions of Windows that support Computer PC).

Appendix B

Using the X7 External Battery Charger

The X7 battery charger can recharge a single battery in 2.5 hours and two batteries in less than 6 hours. You can remove or insert a battery at any time in the charge cycle without causing damage to the charging circuits or to the battery.

Table 36. Charging a Battery

Step	Action	Comment
1.	Hold the battery with its connector pointing down and the rounded edge of the battery facing away from the charger, as shown in Figure 92.	
2.	Insert the battery into the bay and gently press down to engage the locking latches. Rock the battery slightly to ensure the battery is locked in place.	The battery button will snap into place when the latch is engaged. The charging will begin immediately, as indicated by the steady yellow charge indicator. When charging is complete, the yellow LED will turn off and the green (fully charged) LED will turn on.
3.	To remove the battery, press on the spring-loaded battery release button and lift the battery from the charging bay.	

Figure 92. Inserting a Battery

Charger LED Status Indications

There are two status indicators for each battery bay. Table 37 lists the possible indicator conditions and their meanings.

Table 37. Status Indicator Conditions

Status Indicator	Condition
Fully Charged Battery LED (green)	On steady with external power applied and battery fully charged (>95%).
	Off with external power disconnected or battery charge <95%.
Charging LED (yellow)	On steady with external power applied and battery charging.
	Flashing 1 sec on/1 sec off with external power applied and battery temperature above or below maximum limits.
	Flashing 1 sec on/1 sec off with external power applied, temperature in limits, and other battery charging (serial charging).
Fault LED (red)	On steady when fault in power system is detected (over voltage, under voltage, excessive current, charger circuit failure or battery circuit failure).
	Off when fault is corrected.

RECORD OF CHANGES

Rev	ECO #	Description Of Change
-		Initial Release.

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