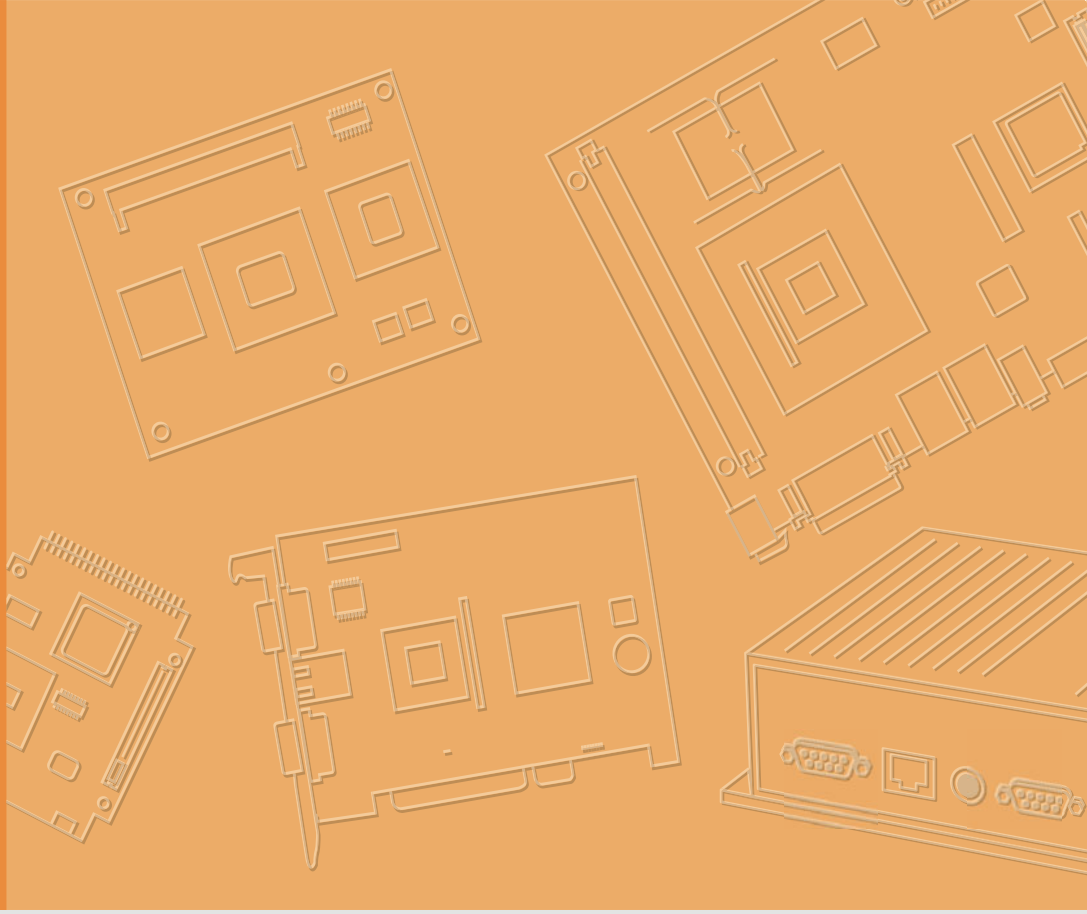

# User Manual

# PWS-440

## Computer

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*Enabling an Intelligent Planet*

# About This Manual

This manual explains how to install, operate and maintain the PWS-440 Computer.
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Advantech has many years experience in designing computers to meet severe environmental applications. These applications include those found by military as well as industrial users. The PWS-440 has been designed to comply with the relevant requirements of MIL-STD-810G, MIL-STD-461E and IP67. These include EMC, EMI, temperature, Shock, vibration, humidity, dust and water. In addition the PWS-440 has been developed to be reliable under all operational conditions that may be encountered by military services throughout the world.

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Microsoft, Windows and ActiveSync are either registered trademarks or trademarks of Microsoft Corporation.

Other product names mentioned in this manual may be trademarks or registered trademarks of their respective companies and are hereby acknowledged.

# Regulatory Compliance Statements

### FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

(2) this device must accept any interference received, including interference that may cause undesired operation.

**CAUTION!** Exposure to Radio Frequency Radiation. The radiated output power of this device is far below the FCC radio frequency exposure limits. Nevertheless, the device shall be used in such a manner that the potential for human contact during normal operation is minimized. When connecting an external antenna to the device, the antenna shall be placed in such a manner to minimize the potential for human contact during normal operation.

Part No. XXXXXXXXXX Edition 1
Printed in Taiwan April 2013

### Federal Communications Commission Notice

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.

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 and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment to 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.

The maximum SAR value reported is 0.082 => the SAR value to be define after SAR test

### Canada-Industry Canada (IC)

The wireless radio of this device complies with RSS 210 Industry Canada.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B conforme á la norme NMB003du Canada.

### Europe-European Union Notice

Radio products with the CE alert marking comply with the R&TTE Directive (1999/5/EC) issued by the Commission of the European Community. Compliance with this directive implies conformity to the following European Norms (in brackets are the equivalent international standards).

- EN 60950-1 (IEC60950-1) - Product Safety
- EN 300 328 Technical requirement for radio equipment
- ETS 301 489 General EMC requirements for radio equipment.

Products that contain the radio transmitter are labeled with CE alert marking and may also carry the CE logo.

# Safety

Use the following safety guidelines to help protect yourself and the PWS-440.

- Do not attempt to service the PWS-440 yourself. Always follow installation instructions closely.
- Be sure that nothing rests on the AC adapter's power cable and that the cable is not located where it can be tripped over or stepped on.
- Do not cover the AC adapter with papers or other items that will reduce cooling; also, do not use the AC adapter while it is inside a carrying case.
- Use only the AC adapter, power cord, and batteries that are approved for use with this PWS-440. Use of another type of battery or AC adapter may cause risk of fire or explosion.
- If you use an extension cable with the AC adapter, ensure that the total ampere rating of the products plugged in to the extension cable does not exceed the ampere rating of the extension cable.
- When you move the PWS-440 between environments with very different temperature and/or humidity ranges, condensation may form on or within the PWS-440. To avoid damaging the PWS-440, allow sufficient time for the moisture to evaporate before using the PWS-440.
- When you disconnect a cable, pull on its connector or on its strain relief loop, not on the cable itself. As you pull out the connector, keep it evenly aligned to avoid bending any connector pins. Also, before you connect a cable make sure both connectors are correctly oriented and aligned.

### Battery Safety

- There is a risk of explosion if the battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.
- Do not dispose of batteries in a fire. They may explode. Check with local authorities for disposal instructions.

### Notices

This unit is equipped with a battery pack and backup battery. It is possible that the PDA may not power-on due to battery discharge as a result of storage.

In the above situation, insert the PDA into the cradle and connect the AC adapter. Recharge the unit for 3 hours in order to fully charge its battery. The backup battery will recharge from external power when the AC adapter is connected.

### Battery charge notice

It is important to consider the environment temperature whenever you are charging the Lithium-Ion battery pack. The process is most efficient at normal room temperature or slightly cooler. It is essential that you charge batteries within the stated range of 0°C to 50°C. charging batteries outside of the specified range could damage the batteries and shorten their charging life cycle.

### Storage and safety notice

Although charged Lithium-Ion batteries may be left unused for several months, their capacity may be depleted due to build up of internal resistance. If this happens they will require recharging prior to use. Lithium-Ion batteries may be stored at temperatures between -20°C to 50°C, however they may be depleted more rapidly at the high end of this range. It is recommended to store batteries within normal room temperature ranges.

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# Chapter 1

## Overview

# 1.1 Introduction

Thank you for purchasing the PWS-440 Computer.

The PWS-440 is an ultra rugged computer designed to military standards. The design incorporates the powerful Marvell PXA310 806MHz CPU with Microsoft Windows CE 6.0/ Embedded Handheld 6.5 operating system. The PWS-440 provides the highest performance and reliability whilst minimizing the Total Cost of Ownership (TCO). The PWS-440 incorporates a transflective LCD with touch-screen, keypad, Wifi, and Bluetooth communication capability. Currently available options include HSDPA (3.5G), and GPS.

To minimize the Total Cost of Ownership the PWS-440 is sealed to meet IP67 standards and complies with IEC 68-2-32 5 foot drop to concrete.

## 1.1.1 Features

The PWS-440 is a smart configurable handheld terminal which has been designed to meet the requirements of a wide range of applications including:

- Military & Law Enforcement
- Industrial & Manufacturing
- Emergency services and construction

PWS-440 been developed to comply with MIL-STD-461E, MIL-STD-810G and IP67 standards, the main specifications are as detailed below.

**Table 1.1: PWS-440 Computer Specification**

| Items | Description |
|---|---|
| OS | Windows Embedded Handheld 6.5/ Windows CE 6.0 |
| CPU | Marvell PXA310 806 MHz |
| Memory | 256 MB SDRAM on board<br>1 GB Flash ROM on board |
| Display | 3.7” transflective TFT LCD, VGA resolution (640 x 480)/QVGA resolution (320 X 240) |
| Touch screen | 4-wire Resistive touch screen |
| Audio System | AC-97, Internal microphone and one speaker (stereo supported via earphone jack) |
| Application Buttons | One power on/suspend button<br>Navigation Key+ Function Key (4 function keys in front)<br>One HW reset key located right side door<br>One Button for backlight on/off (using power on/ suspend button) |
| Communication | 802.11b/g WLAN module built-in with integral antenna<br>Bluetooth class 2, v2.1 built-in with integral antenna<br>GPS receiver module with antenna built-in internal module (for data transmission only) |
| Status Indicator | Power LED (two color LED x1) (at right side)<br>LED on the upper side for lighting usage |

| Table 1.1: PWS-440 Computer Specification | |
|---|---|
| I/O Ports | Two USB type A connectors, USB1.1 Host (** Two USB Type A at Left Side)<br>One USB mini type B connector, USB1.1 Slave (at Right Side Door)<br>One RS-232(full) One RS-232/422/485 (OPTION)<br>One RJ-45 for 10/100M ethernet (USB type)<br>One CF slot One stereo headphone jack<br>One microphone jack<br>One DC-In connector (At the right side)<br>One MicroSD Slot |
| Main Battery | Rechargeable Li-ion smart battery, 7.4V, 1880mAh, 2S1P, 59x38x25mm |
| Power Adapter | Universal AC 90V ~ 265V, 47~63Hz input, 12V, 3.5A output. |
| Physical | 155 x 96 x 42mm, 650g |
| Environment | Operating Temperature: -20 to +60°C<br>Storage Temperature -40 to +70°C<br>Charging Temperature 0 to +50°C<br>Operating Humidity 5% ~ 95% none condensing |
| Rugged Specification | IP67 5 ft drop to concrete MIL-STD-810G MIL-STD-461E |
| Certification | CE, FCC, CCC |
| Accessories | 1. Case: standard nylon (waterproof) case with belt loop;<br>2. elastic hand strap: prevent accidental drop<br>3. Stylus with tether kit<br>4. Power: DC-Adapter<br>12 V Vehicle charger with 12 V cable (option)<br>5. Cradle: 1 x RS-232, 2 x USB (1 x Type A; 1 x TypeB), 1 x DC-in<br>6. 4-IN-1 battery charger |

### 1.1.2 Package Contents

The standard PWS-440 includes the following items:

- PWS-440 Computer
- Adapter
- Battery
- Stylus & string
- Hand strap

### 1.1.3 Optional Accessories

In addition the following optional accessories may be included:

- Cradle
- 4 IN 1 Battery Charger

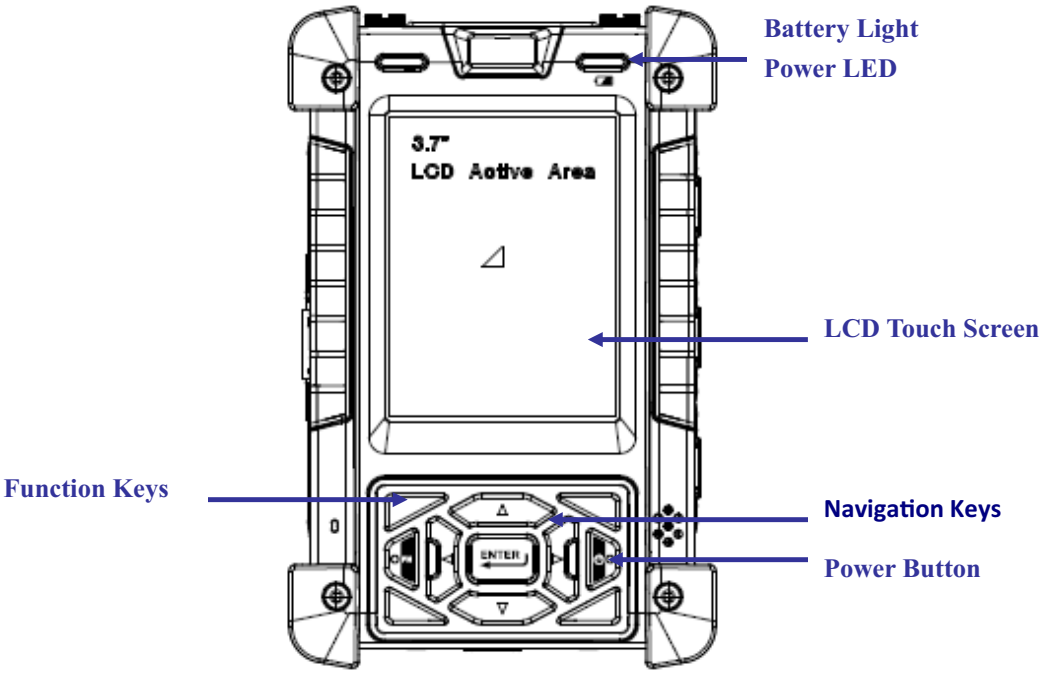
Please carefully check the delivery documents to ensure that all items are present.

In the unlikely event of a discrepancy please contact your supplier.

## 1.2 Familiarize with the PWS-440

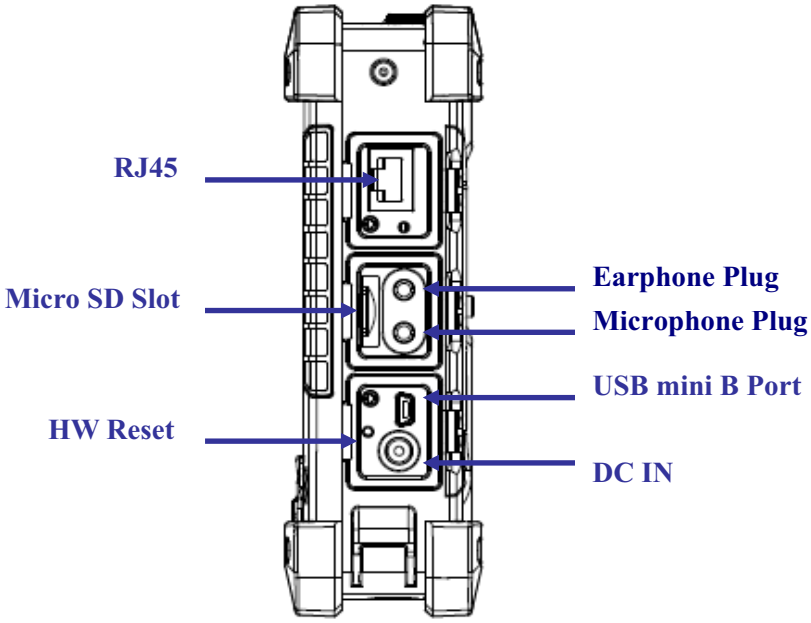
The following sections describe the main components and features of the PWS-440.

### 1.2.1 Front View



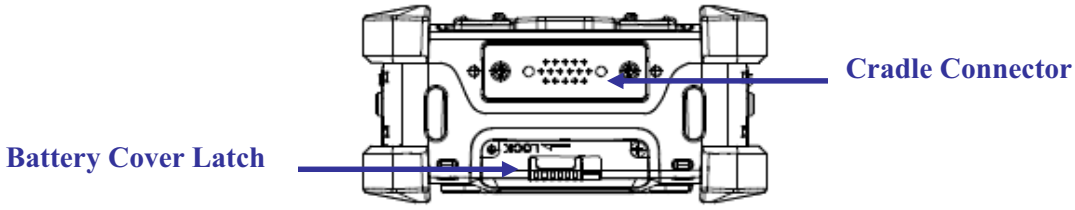

| Item | Description |
|---|---|
| LCD touch screen | Displays the applications and data stored the PWS-440. It is a touch-sensitive screen and can be operated using the stylus or finger. |
| Navigation Keys | Press these keys to navigate in the PWS-440 interface. |
| Function Keys | Programmable keypad interface for controlling the PWS-440. |
| Power button | If the device is off, press this button to turn it on. When the unit is on, press this button for 3 seconds to turn the PWS-440 off. |
| Power LED | Indicates the battery charging power status. Green -Battery is fully charged or the device is running on battery power. When LED flashes, the battery charge is at 13%. The battery should be recharged immediately. |

### 1.2.2 Right View



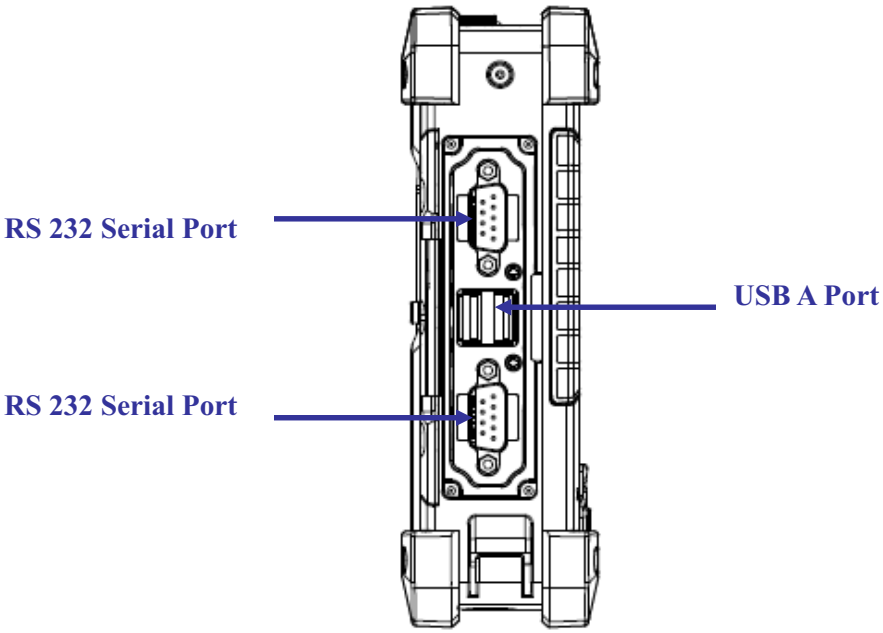

| Item | Description |
|---|---|
| RJ45 Port | Connects to the LAN. |
| Earphone Plug | Connects to audio line-out devices (earphones or headphones) for use in noisy environments. |
| Microphone Plug | Enables the recording of voice using an external microphone |
| USB mini type B port | USB mini type B port (client). |
| Micro SD Slot | Accommodates Micro Secure Digital memory cards. |
| HW Reset Switch | Press the end of the stylus into the button to reset PWS-440. |
| DC IN Jack | Connect the AC adapter to this jack to supply power to charge the PWS-440 battery. |

### 1.2.3 Bottom View



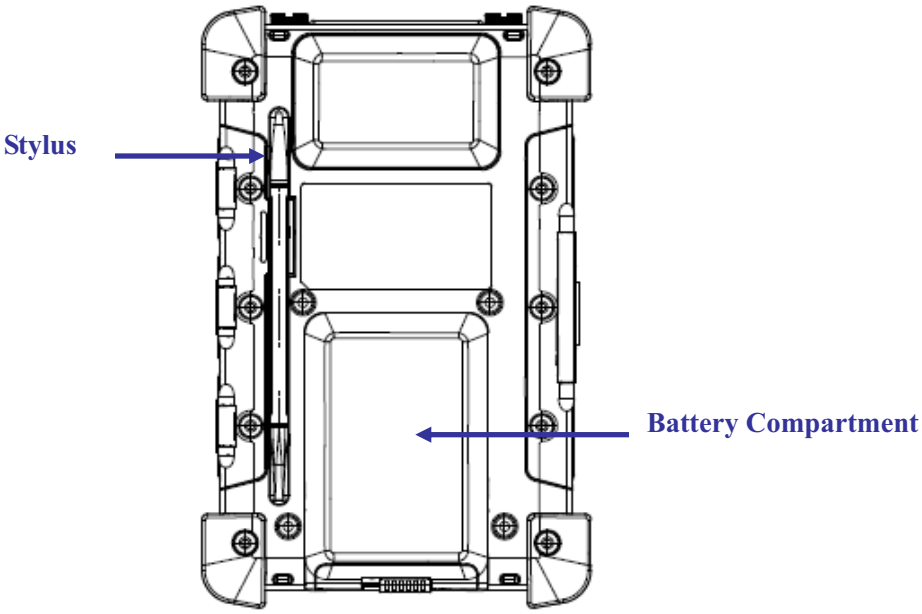

| Item | Description |
|---|---|
| Cradle connector | Connects the PWS-440 to cradle, enabling battery charging also connects RS232, USBA and USB mini B). |
| Battery Cover Latch | Unlock the latch to open the battery compartment cover to place or remove battery. |

### 1.2.4 Left View



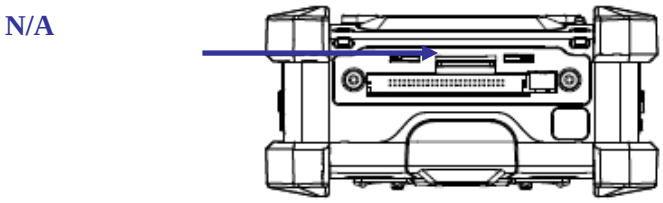

| Item | Description |
|---|---|
| RS 232 Serial Port | Connects using a mini 9 way D type connector for this port for serial communications. |
| USB type A port | Connects to USB type A port (host) to this port. |

### 1.2.5 Back View



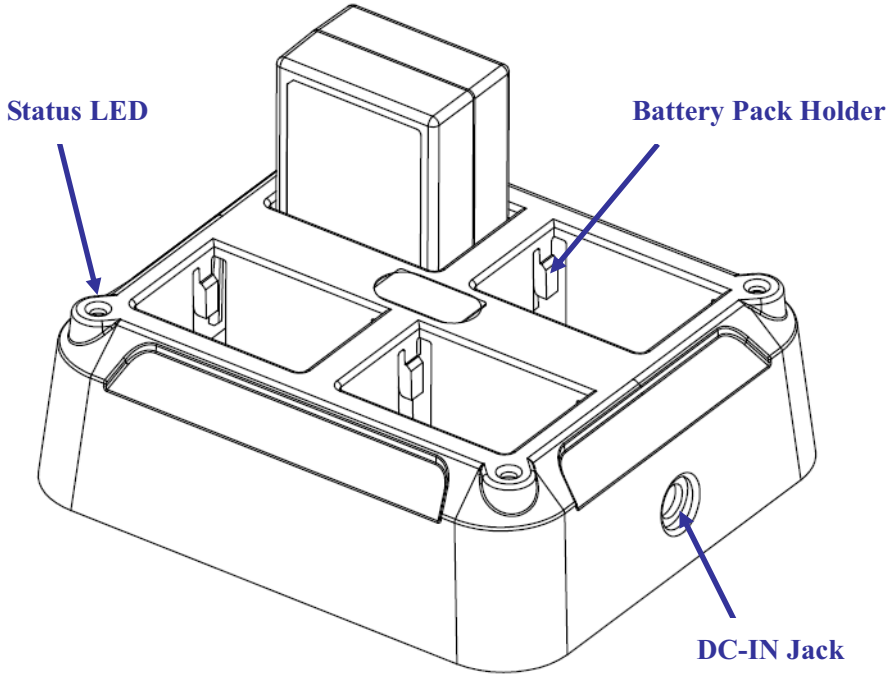

| Item | Description |
|---|---|
| Stylus | Enables you to interact with the operating system. Remove the stylus from the holder and hold and use it the same way you would a pen or pencil. For use with the touch screen. |
| Battery Compartment | Houses the removable and rechargeable battery pack. |

### 1.2.6 Top View




| Item | Description |
|---|---|
| N/A | N/A |

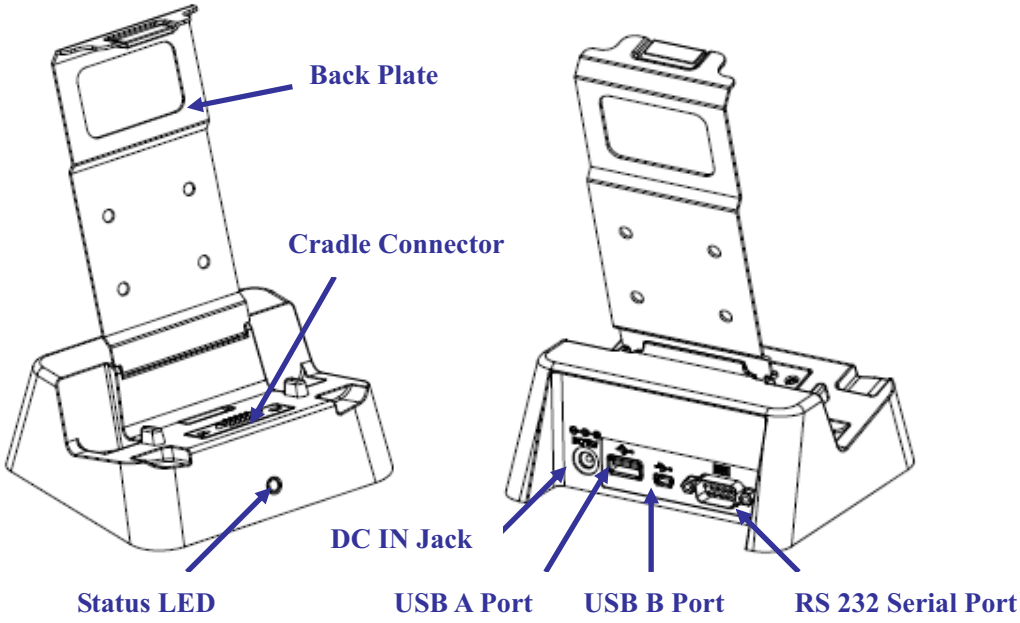
## 1.3 4-In-1 Battery Charger (Optional)




| Item | Description |
|---|---|
| Battery Pack Holder | Lock Battery pack into position for Battery charging. |
| DC IN Jack | Connect the AC adapter to this jack to supply power to the charger and charge the PWS-440 Battery. * |
| Status LED | Indicates that power and the PWS-440 battery is charging.<br>**RED light** - Battery is charging.<br>**No Light** - No battery fitted.<br>**RED light Flash once** - Power Adaptor connected, and ready for charging battery. |

***Warning!*** ** Both Battery charger adaptor and PWS-440 power adaptor are the same, but they can NOT be interchanged with other adaptor.*

## 1.4 Cradle (Optional)




| Item | Description |
|---|---|
| Back Plate | Supports the PWS-440 into charging position |
| RS 232 Serial Port | Connects a serial cable. |
| USB type A port (host) | Connects a USB type A (host) cable. |
| Cradle connector | Connects the PWS-440 to the cradle, Provides connections for RS232, USB type A and mini USB type B. |
| USB mini type B port (client) | Connects a USB mini type B (client) cable. |
| DC IN Jack | Connects the AC adapter to provide power for the cradle* |
| Status LED | Indicates that power and the PWS-440 is charged.<br>Green light - PWS-440 is charging, and connected.<br>No Light - No PWS-440 fitted for charging. |

# Chapter 2

## Getting Started

# 2.1 Getting Started

This chapter explains how to install and charge the battery, how to check the battery status, how to turn on the PWS-440, and how to calibrate the screen.

# 2.2 Connecting the PWS-440

## 2.2.1 Installing the battery

This part explains how to install the battery.

***Warning!*** *There is a risk of fire and burns if the battery pack is handled improperly. DO NOT disassemble, crush, puncture, short external contacts, or dispose the battery pack in fire or water. DO NOT attempt to open or service the battery pack.*

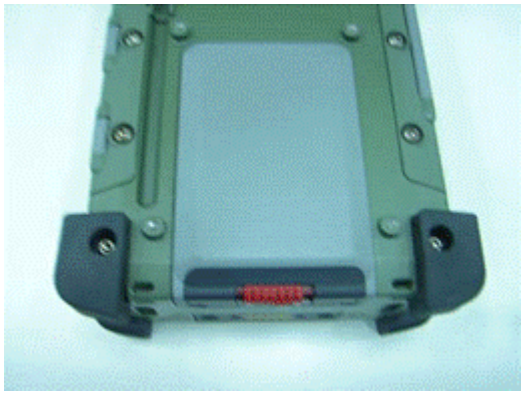
*Dispose of used batteries according to local recycling guidelines in your area. A backup battery cell is embedded into your device to prevent data loss in instances when the removable battery pack is removed or completely discharged. This backup battery cell will only support the system for a maximum of 3 minutes.*

| Status | Charging | Ready |
|---|---|---|
| Power OFF | *Amber flashing light | *Amber light |
| Power ON | *Amber flashing with Green light | *Amber light |

1. Remove the battery compartment cover.

2. Align the battery contacts with the contacts in the compartment and place the battery in the compartment as shown below.

3. Replace the battery compartment cover, and lock the battery latch.



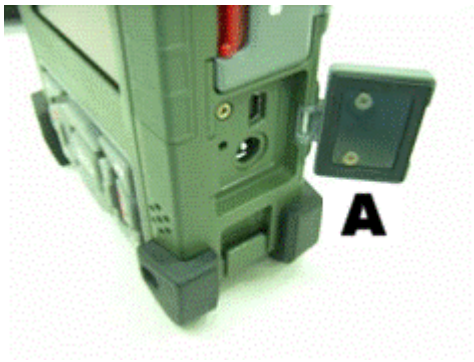
## 2.2.2 Charging the Battery

Before using the PWS-440 for the first time it will need charging for about 3 hours. The PWS-440 can be charged using the power adaptor or the Cradle.

***Note!*** *When the battery power is below 10%, the PWS-440 will enter suspend mode.*

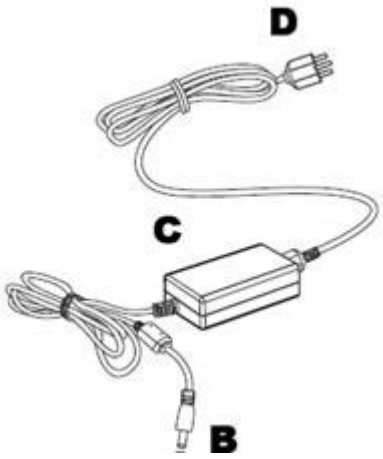
### 2.2.3 Charging the Battery with the Adapter Charger

1. Open the side door on the right bottom of the PWS-440.




2. Plug the adapter charger (B) into the side door (A).

3. Plug the power cord into the AC adapter (C).
4. Plug the AC adapter (D) into an electrical outlet.

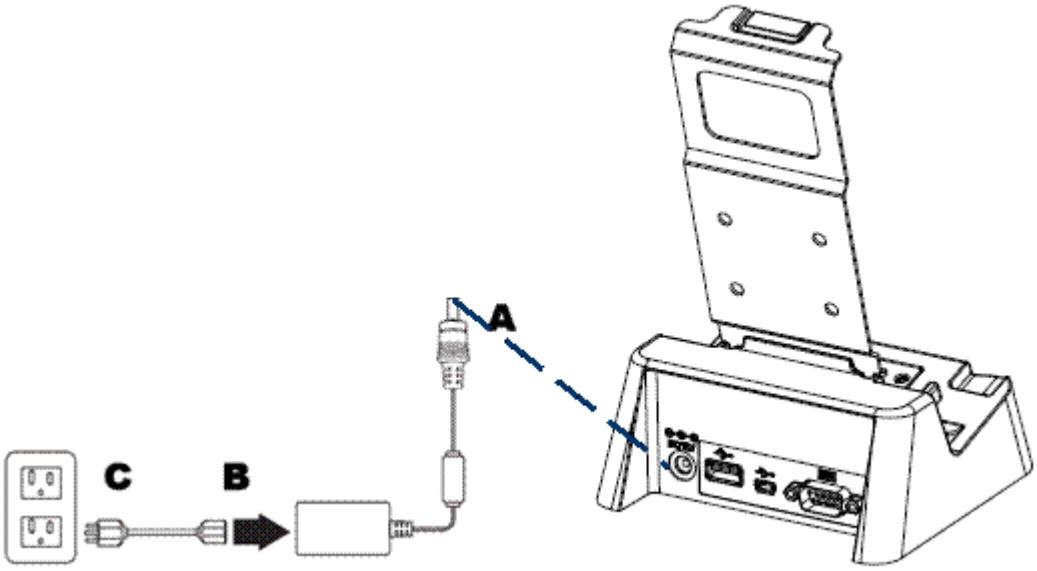


### 2.2.4 Charging the Battery with the Cradle

1. Slide the PWS-440 into the cradle until it clicks into place.

2. Plug the AC adapter cable into the power connector on the cradle (A).

3. Plug the power cable connector into the AC adapter (B), Plug the AC adapter into an electrical outlet (C).



## 2.3 Powering up for the First Time

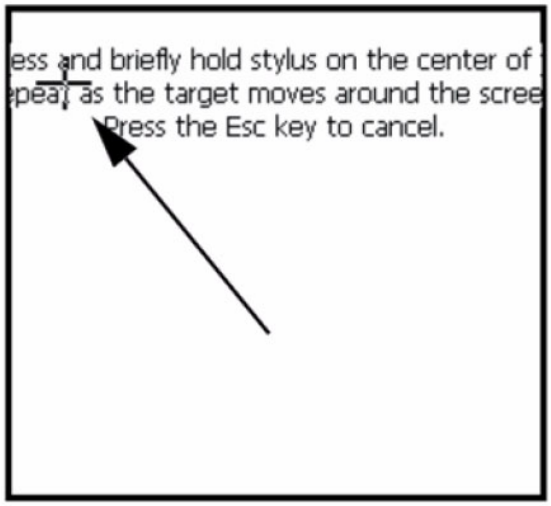
After you have charged the PWS-440 for about 3 hours the device is ready to be used. You can now start up the PWS-440 when you can calibrate the touch screen, practice with the stylus and set the date, time and zone. Turn on your device by pressing the power button on the front panel.

## 2.4 Calibrating the touch screen

The calibration screen automatically appears when the unit is powered on for the first time or after the system is reset.

1. Tap the center cross hair firmly and accurately with the stylus. The cross hair moves to the next location.

2. Follow the cross hair and continue tapping until the screen has been calibrated.

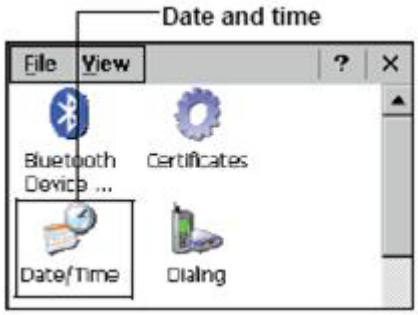


3. After calibration is finished, press the Enter key to save the settings or press Esc to revert to the previous settings.

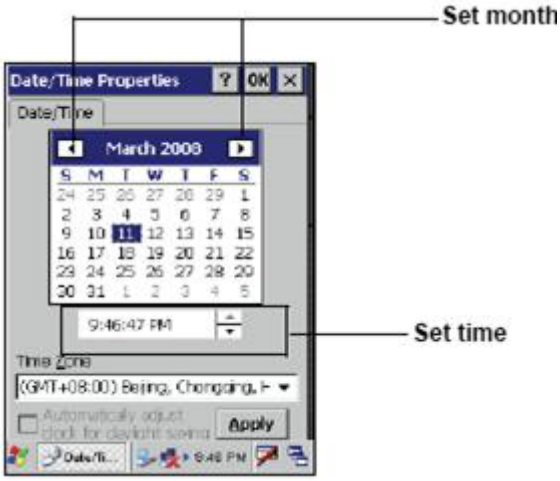
***Note!*** *To recalibrate the screen at any time, tap **Start -> Settings -> Control Panel**.Then double-tap **Stylus**. Tap the Calibration tab, and tap **Recalibrate**.*

## 2.5 Setting the Time and Date

1. Tap **Start -> Settings -> Control Panel**.




2. Double-tap Date/Time.
3. Tap the arrows next to the month to select the correct month.



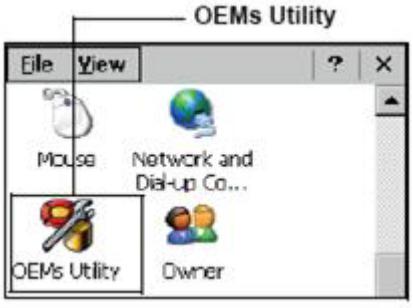

4. Select a field in the time box and tap the arrows next to the time to change the value of the field.

5. Tap the drop-down arrow next to Time Zone to select the correct time zone for your area.
6. Check the box next to **Automatically adjust...** to have the OS automatically update the time for daylight saving.

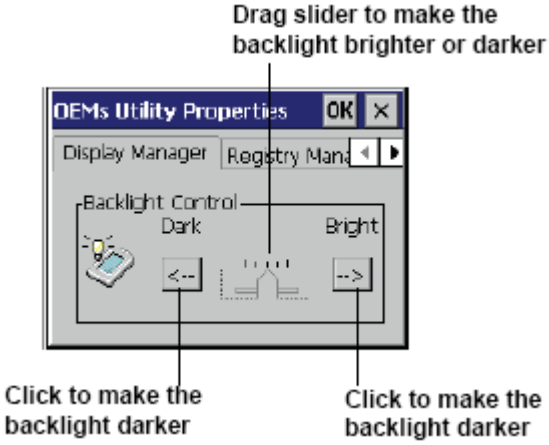
7. Tag **Apply** to save the settings.

## 2.6 Adjusting the Screen Brightness

1. Tap **Start ->Settings -> Control Panel**.




2. Double-tap **OEMs Utility**.
3. Click the **Display Manager** tab.
4. Under Backlight Control, click the **Dark** arrow to make the screen darker, or click the **Bright** arrow to make the screen brighter.




5. Click OK to save and exit the utility.

# Chapter 3

## Using the Hardware

# 3.1 Keypads and Function Buttons

The keypad enables you to both enter information and interact with the PWS-440 operating system.

## 3.1.1 Entering Characters with the Keypad

The operating system has an onscreen keyboard that enables you to enter alphanumeric characters with the stylus. Press the input panel icon in the system tray to view the input panel menu. Tap **Keyboard** to view the onscreen keyboard.

Tap **Hide Input Panel** to close the keyboard.

The keyboard emulates a standard computer keyboard. Tap the onscreen keyboard to enter, edit, and delete text.

## 3.2 Using the Stylus

***Caution!*** *Never use anything other than the PWS-440 stylus on the screen. Using another object as a stylus could cause permanent damage. You can use your finger to interact with the screen as well.*

1. Remove the stylus from its holder.
2. Hold the stylus as you would a pencil.
3. To make a selection from a menu, lightly tap the tip of the stylus on that item.

**Adjusting the Double-Tap Rate**

Set the stylus double-tap rate as follows.

1. Tap **Start ->Settings -> Control Panel**.
2. Double-tap **Stylus**.
3. Tap the Double-Tap tab.

4. Double-tap on the checkerboard graphic to set your double tap rate.

## 3.3 Inserting an Micro SD Memory Card

The PWS-440 has a SD card slot compatible with a wide range of Micro SD cards, which are primarily used to back up or transfer files and data. The slot also supports SDHC cards.

To insert a Micro SD card into the Micro SD slot.

1. Open the right centre door.

2. Insert the Micro SD card with the notched corner as oriented as shown below.

3. Press the card into the slot. The card is secure when it is flush with the slot.
4. Close and lock the door.

## 3.4 Removing a Storage Card

1. Open the right centre door.
2. Press the card in and release. The card pops out.
3. Remove the card from the slot.
4. Close and lock the door.

# 3.6 Connecting Devices to the PWS-440

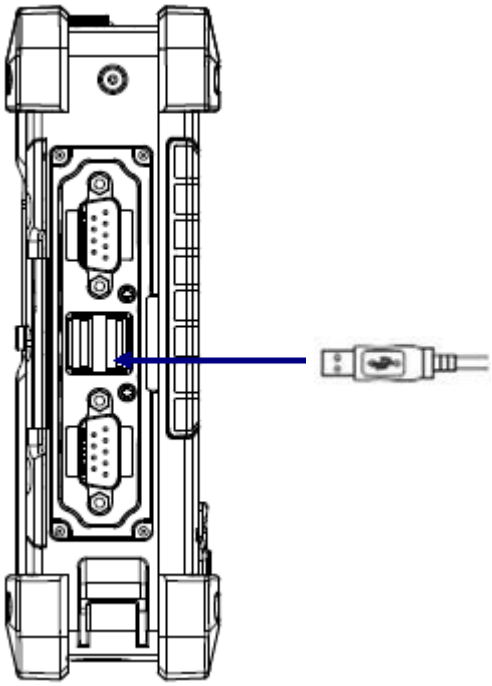
This section describes how to connect devices to the PWS-440. Connection can be made directly to the PWS-440 or using the cradle.

## 3.6.1 Connecting USB

The PWS-440 can accommodate both USB Type A and USB mini Type B.

### Connecting a USB Type A

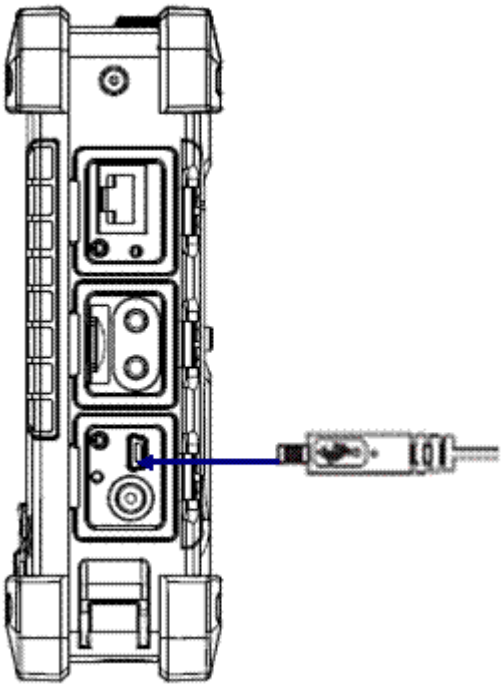
The illustration below shows how to connect a USB type A device to the PWS-440. The connector can only go in one way. If it does not go in smoothly, check the orientation and try again.



**Connecting a MINI USB Type B**

The illustration below shows how to connect a mini USB type B cable to the PWS-440.

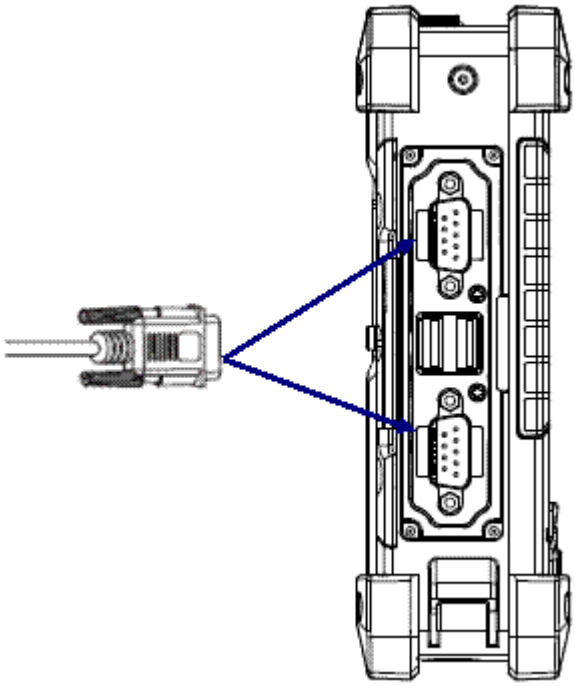
The connector is keyed to only go in one way. If it does not go in smoothly, check the orientation and try again.



## 3.6.2 Connecting a Serial Device

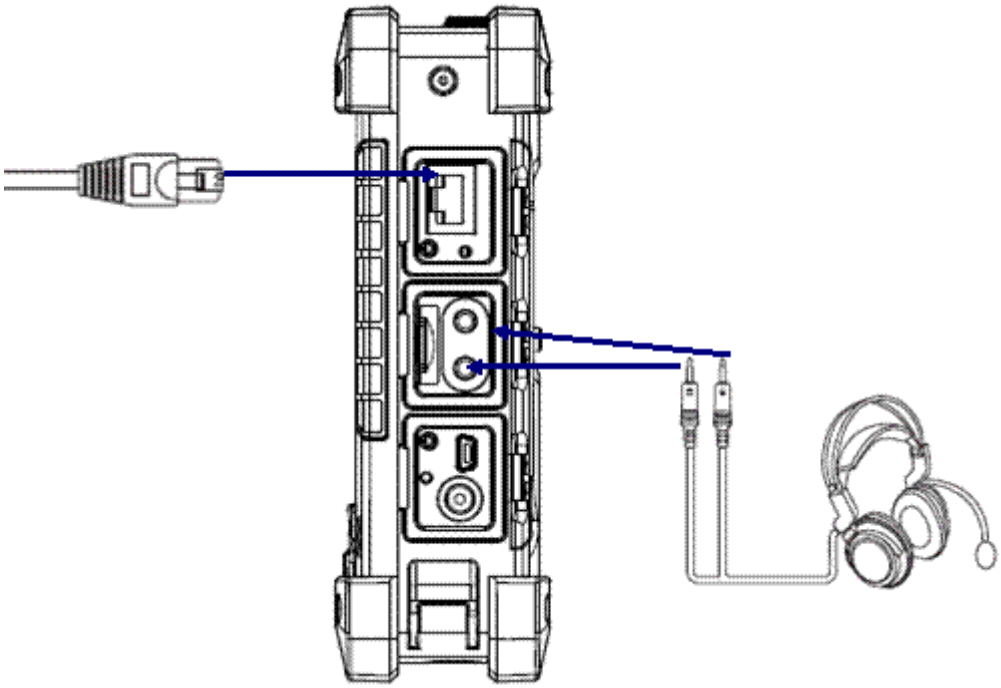
Connect a serial device to the PWS-440 to perform serial communications.

Please see below illustration



### 3.6.3 Connection to a LAN

The PWS-440 is connected using a RJ-45 connector. See below:

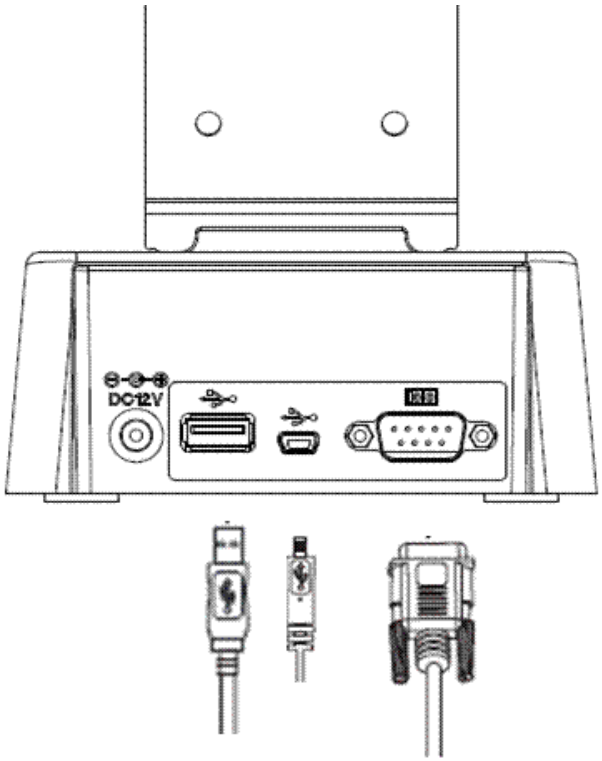


### 3.6.4 Connecting Headphones and a Microphone

The PWS-440 utilizes an external microphone and speaker. A headset and microphone can be used in noisy environments. See the illustration above.

### 3.6.5 Connecting to the Cradle (Optional)

The cradle allows for charging the batteries as well as connecting USB and serial devices.



### Connecting USB

There is one USB Type A connector on the back which supports both USB keyboard and mouse. In addition there is one Mini Type B USB port next to the Type A USB connector. See the above illustration

### Connecting a Serial Cable

A serial cable can be connected thePWS-440 cradle. See the above illustration