Return-To-Factory Warranty
Psion Inc. provides a return to factory warranty on this product for a period of twelve (12) months in accordance with the Statement of Limited Warranty and Limitation of Liability provided at:
http://www.psion.com/warranty

The warranty on Psion manufactured equipment does not extend to any product that has been tampered with, altered, or repaired by any person other than an employee of an authorized Psion service organization. See Psion terms and conditions of sale for full details.

Important: Psion warranties take effect on the date of shipment.

Service and Information
Psion provides a complete range of product support services and information to its customers worldwide. Services include technical support and product repairs. To locate your local support services, please go to:
http://www.psion.com/service-and-support.htm

To access further information on current and discontinued products, please go to the Psion Community site and click on "Sign In" to log in. If you do not already have an account, click on "Join" to create one. If you already have an account for our old Teknet site, your Teknet username and password should be valid on the Psion Community site.
http://community.psion.com/support

A section of archived product information is also available online:
http://www.psion.com/products
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1.1 About This Manual

This manual provides guidance on using the EP10 HDK to create peripherals that attach to the docking connector of the Psion EP10 hand-held computer. The manual is organised into the following chapters:

**Chapter 1: Introduction**
provides an overview of the EP10 Hand-Held Computer and the EP10 HDK.

**Chapter 2: Hardware**
describes, in general terms, the hardware of EP10.

**Chapter 3: Software**
gives an overview of the registry entries and API for controlling peripherals and the installation of device drivers.

**Chapter 4: Mechanical Considerations**
describes the physical considerations of designing peripherals.

**Chapter 5: Connections**
describes the physical and electrical aspects of the docking connector of the EP10, and of the connectors available on the EP10 snap modules.

**Chapter 6: HDK Demo Application**
describes the features and functions of the HDK Demo application program.

**Appendix A: Resources**
lists extra resources which may be of use in conjunction with the HDK.

**Appendix B: EP10 Specifications**
lists the specifications of the EP10.

**Appendix C: HDK License Agreement**
provides the license agreement that is assumed by using the EP10 HDK.

1.2 Text Conventions

The following conventions and syntax are followed throughout this document:

- **Note:** Notes highlight additional helpful information.

- **Important:** These statements provide important instructions or additional information that is critical to the operation of the computer or other equipment.

- **Warning:** These statements provide important information that may prevent injury, damage to the equipment, or loss of data.

An arrow next to field description information (usually in tables) indicates a recommended or suggested configuration setting.

1.3 About the HDK

The EP10 HDK (Hardware Development Kit) provides the software tools and technical information necessary to design and integrate peripherals for your EP10 hand-held computer.

The docking connector on the EP10 provides access to USB and serial interfaces for connecting to standard devices (barcode scanners, imagers, RFID readers, etc.).

3D model files and 2D schematic drawings are provided which give the precise measurements needed for designing custom devices that fit snugly with the main housing around the docking connector.

Finally, the EP10 HDK API library provides the software tools necessary to access and control the peripheral attached to the docking connector.

1.4 Development Platform

1.5 Contents of the HDK

The HDK (Hardware Development Kit) for EP10 includes the following items:

- This manual.
- Installer for development files, including C header files for managing peripherals and HDK Demo application. See Section 3.7 EP10 HDK Application Development Software and Section 3.8 EP10 HDK Demo Application for more details on these files.

1.5.1 Files in the HDK

The following files are included with the EP10 Hardware Development Kit:

<table>
<thead>
<tr>
<th>Filename</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hdk7515.h</td>
<td>EP10 HDK header file</td>
</tr>
<tr>
<td>Hdk7515Const.h</td>
<td>EP10 HDK constants header file</td>
</tr>
<tr>
<td>7515HDK.exp</td>
<td>EP10 HDK export file</td>
</tr>
<tr>
<td>7515HDK.lib</td>
<td>EP10 HDK library file</td>
</tr>
<tr>
<td>7515HDK.dll</td>
<td>EP10 HDK dynamic link library</td>
</tr>
<tr>
<td>EP10HDKDemo.exe</td>
<td>EP10 HDK demo application</td>
</tr>
<tr>
<td>EP10HDKDemoSrc.zip</td>
<td>Zip file containing the source code of the demo application</td>
</tr>
<tr>
<td>EP10.stp</td>
<td>3D step file of the EP10 external case</td>
</tr>
<tr>
<td>EP10_Case_Front.pdf</td>
<td>2D drawing of EP10 front case</td>
</tr>
<tr>
<td>EP10_Case_Rear.pdf</td>
<td>2D drawing of EP10 rear case</td>
</tr>
<tr>
<td>Serial_SnapOn.stp</td>
<td>3D step file of the DE9 RS-232 snap module assembly</td>
</tr>
<tr>
<td>Serial_SnapOn_Lower.pdf</td>
<td>2D drawing of the lower housing of the DE9 RS-232 snap module</td>
</tr>
<tr>
<td>Serial_SnapOn_Upper.pdf</td>
<td>2D drawing of the upper housing of the DE9 RS-232 snap module</td>
</tr>
<tr>
<td>Snap_On_Latch_Left.pdf</td>
<td>2D drawing of the left latch for an EP10 snap module</td>
</tr>
<tr>
<td>Snap_On_Latch_Right.pdf</td>
<td>2D drawing of the right latch for an EP10 snap module</td>
</tr>
<tr>
<td>USB_SnapOn_Lower.pdf</td>
<td>2D drawing of the lower housing of the USB snap module</td>
</tr>
<tr>
<td>USB_SnapOn_Upper.pdf</td>
<td>2D drawing of the upper housing of the USB snap module</td>
</tr>
<tr>
<td>USB_SnapOn.stp</td>
<td>3D step file of the USB snap module assembly</td>
</tr>
<tr>
<td>Serial_SnapOn_Schematics.pdf</td>
<td>Electrical schematics of the DE9 RS-232 snap module</td>
</tr>
<tr>
<td>USB_SnapOn_Schematics.pdf</td>
<td>Electrical schematics of the USB snap module</td>
</tr>
<tr>
<td>licenseagreement.doc</td>
<td>Psion HDK License Agreement document</td>
</tr>
<tr>
<td>Psion EP10 HDK User Manual</td>
<td>This document (P/N 8000255)</td>
</tr>
</tbody>
</table>
1.6 Obtaining the HDK

The EP10 HDK is available for download on the Psion Community website (http://community.psion.com). You will need an account on the website in order to download files. An account can be easily created by clicking on the Join link in the upper right corner of the home page.

To download the HDK:
1. Click on the Downloads link in the top bar of the Community home page.
2. Click on Psion HDK in the list that appears.
3. Click on Hardware Development Kit (HDK) for EP10.
4. Click on the link to view the license agreement and download the .zip file containing the HDK files.
5. Open the .zip file and extract the files within to a folder on your PC hard drive.

To continue with installing the HDK files required for developing applications to work with your peripherals, see Section 3.7 EP10 HDK Application Development Software.

1.7 About the EP10 Hand-Held Computer

The EP10 hand-held computer is a small and durable PDA device that has been built to withstand challenging weather and environmental conditions. EP10 uses the Microsoft® Windows® Embedded 6.5 operating system.

2.1 Overview

This chapter gives an overview of the hardware of EP10.

2.2 Hardware Variants

2.2.1 Keyboard Variants

EP10 has three standard variants for the keyboard layout: numeric, QWERTY and AZERTY.

**Numeric Keyboard**

This numeric keyboard has the number keys arranged telephone-style, with the numbers 1, 2, 3 along the top row. The alphabetic characters are also arranged telephone-style, in groups of 3 or 4 [FN]-shifted characters on the number keys.

**QWERTY Keyboard**

This alphabetic keyboard has the alpha keys arranged in standard QWERTY layout. The number keys are accessed as [FN]-shifted characters on the left-middle side of the keyboard, and are arranged telephonic-style, with the numbers 1, 2, 3 along the top row (on the E, R, and T keys, respectively).

**AZERTY Keyboard**

This alphabetic keyboard has the alpha keys arranged in the AZERTY layout favoured by many French-speaking parts of Europe. It is identical to the QWERTY keyboard in all respects except that the locations of the Q and W keys are interchanged with the A and Z keys, respectively.

2.2.2 Barcode Scanner/Imager Variants

EP10 comes standard with no barcode scanner/imager installed. An optional EA11 2D imager is available. Specifications of the EA11 imager can be found in Appendix B: “EP10 Specifications”.

2.2.3 WWAN Radio Variants

The EP10 is available with one of the following Wireless WAN (WWAN) radio options:

- Cinterion PH8 GSM/UMTS (worldwide)
- Sierra Wireless MC5728v CDMA Sprint (US)
- Sierra Wireless MC5728v CDMA Verizon (US)

Specifications of these radios can be found in Appendix B: “EP10 Specifications”.

2.3 Processor

EP10 is built around a Texas Instruments AM3715 800MHz ARM Cortex-A8 processor.

2.4 Identifying Hardware

An overview of the operating system and the installed hardware on EP10 can be viewed by opening the System applet in the Windows Control Panel.

2.5 LEDs

Three LEDs are located on the upper-right side of the EP10, just above the display. When you press the Power button, the LED flashes yellow to indicate that the EP10 has been powered up.
Keep in mind that the application running on the EPI0 can dictate how the application LED operates. Review the documentation provided with your application to determine LED behaviour.

Table 2.1 Function of EPI0 LEDs

<table>
<thead>
<tr>
<th>LED Function</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green/Yellow/Red Charge LED</td>
<td>Charge indicator, when connected to an external power supply. See the</td>
</tr>
<tr>
<td>(left-most LED)</td>
<td>table below for descriptions of Charge LED behaviour.</td>
</tr>
<tr>
<td>Yellow Application LED (centre LED)</td>
<td>Application LED. The behaviour of this LED is application dependent.</td>
</tr>
<tr>
<td>Blue Radio Power LED (right-most LED)</td>
<td>Radio power indicator.</td>
</tr>
</tbody>
</table>

If the EPI0 is attached to an external power supply (through a snap module or dock), the charge LED (the left-most LED) reflects the battery charge status.

Table 2.2  EPI0 Charge LED Behaviour

<table>
<thead>
<tr>
<th>Charging Status</th>
<th>LED Colour</th>
<th>LED Flash Rate</th>
<th>Duty Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>No external power detected.</td>
<td>Not applicable</td>
<td>OFF</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Battery charge complete.</td>
<td>GREEN</td>
<td>Solid ON</td>
<td>Continuous</td>
</tr>
<tr>
<td>Battery charging normally.</td>
<td>GREEN</td>
<td>Slow</td>
<td>Regular</td>
</tr>
<tr>
<td>Battery not charging because battery temperature is outside the allowable range: 0°C to 40°C, 32°F to 104°F.</td>
<td>YELLOW</td>
<td>Normal</td>
<td>Regular</td>
</tr>
<tr>
<td>Battery charge failure. Unable to read battery or non Psion battery.</td>
<td>RED</td>
<td>Solid ON</td>
<td>Continuous</td>
</tr>
</tbody>
</table>

2.6 Power Management

EPI0 is powered by a lithium-ion rechargeable battery pack and can also be powered from external power. When EPI0 is powered from external power, the battery pack also charges. Use only power sources recommended or sold by Psion for EPI0.

2.6.1 Batteries

Two Lithium-Ion battery pack variants are available for the EPI0: High Capacity 3600 mAh battery pack, Model Number RV3010 and Standard Capacity 2400 mAh battery pack, Model Number RV3005. For more details on battery safety, charging and usage, refer to the EPI0 Hand-Held Computer User Manual (P/N 8000227).
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
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</thead>
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<td>Psion Mobile Devices SDK</td>
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<td>3.7.2</td>
<td>EP10 HDK Development Files</td>
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<tr>
<td>3.7.3.2</td>
<td>Hdk7515_Close</td>
<td>22</td>
</tr>
<tr>
<td>3.7.3.3</td>
<td>Hdk7515_SetPower</td>
<td>23</td>
</tr>
<tr>
<td>3.7.3.4</td>
<td>Hdk7515_GetPower</td>
<td>23</td>
</tr>
<tr>
<td>3.7.3.5</td>
<td>Hdk7515_SetPowerMode</td>
<td>24</td>
</tr>
<tr>
<td>3.7.3.6</td>
<td>Hdk7515_GetPowerMode</td>
<td>25</td>
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<td>3.7.4</td>
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<tr>
<td>3.7.4.1</td>
<td>Hdk7515_PowerMode</td>
<td>26</td>
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<td>27</td>
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<td>3.8</td>
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<td>27</td>
</tr>
</tbody>
</table>
Chapter 3: Software Overview

3.1 Overview

This chapter describes the software aspects of the EP10.

3.2 Drivers

3.2.1 Windows Drivers

The Peripherals Driver
Psion provides the peripherals driver for all expansion and docking peripherals. The peripherals driver is a stream driver activated very early in the boot sequence.

The Serial Port Driver
The full-function UART (Universal Asynchronous Receiver/Transmitter) serial port driver is loaded if required, as determined by the registry settings for any peripherals detected. For details on the registry settings, see Section 3.4.1: "Peripheral Registry Settings".

3.2.2 Non-Psion Drivers

The Psion platform loads standard device drivers. If the peripheral uses standard drivers such as serial or USB, there is no need to load custom drivers.

There must be a registry entry for the driver and its parameters. For more information see Section 3.4: "Registry Keys".

3.3 System Initialization

During system startup on EP10, the following sequence occurs:

1. The device ID is read (if a dock is connected).
2. The USB (OTG or Host) ports/hub are enabled.
3. The device-specific driver (if there is one) is loaded.
4. A dock notification is sent out when the shell is ready.

3.4 Registry Keys

3.4.1 Peripheral Registry Settings

This section describes the registry keys required by the peripherals driver to identify and define the behaviour of peripherals. The parent key for all of the device-specific subkeys is:

\[HKLM\Drivers\BuiltIn\Peripherals\devices\]

Within that key, create a subkey (if it does not already exist) for the type of connector that the peripheral will attach to. For the EP10, only the docking connector is available, which is identified with the subkey ‘4’.

For example, the registry keys that describe peripherals connecting to the docking connector would be stored in the subkey:

\[HKLM\Drivers\BuiltIn\Peripherals\devices\4\]

Within the connector type subkey create a further subkey using the Device ID reported by the peripheral. For peripherals that attach to the docking connector, an integer value based on a resistor ID in the peripheral is used for identification (see Table 3.3: "Docking Device Identification" for resistor values). For example, the Device Name (resistor ID) for the EP10 single desktop dock is 8, therefore the correct registry key for parameters pertaining to that peripheral is:

\[HKLM\Drivers\BuiltIn\Peripherals\devices\4\8\]

Device Registry Values

Within the subkey for the specific peripheral, add the following device registry values:

- Name (REG_SZ): A descriptive name for the peripheral.
Chapter 3: Software
Peripheral Registry Settings

- **PowerMode** (REG_DWORD): This value determines how and when the peripheral hardware is powered by the peripherals driver. The possible values are 1 (Auto) and 2 (Manual). If the power mode is set to Auto, the peripheral power is managed by the peripherals driver; the peripheral is powered off when the computer enters suspend mode and powered on when the computer resumes activity.

The default setting for this value is 2, which is the recommended setting. Under this setting, power to the peripheral must be controlled by a loaded device driver or application.

- **Notifications** (REG_DWORD): The notifications registry value determines how the user is notified about peripherals.
  This value is a bit field as defined in the following table:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Functionality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (LSB)</td>
<td>No Notification</td>
<td>No notification is displayed.</td>
</tr>
<tr>
<td>1 (MSB)</td>
<td>Notification Enabled</td>
<td>Setting this flag causes a “new device” pop-up to be displayed, containing the name and status of the peripheral. The name reported is the <strong>DeviceNameID</strong> registry value. If that value does not exist, the <strong>Name</strong> registry value is used instead. If that also does not exist, the Device Name from the registry key itself is used.</td>
</tr>
</tbody>
</table>

The default setting for this value is 0.

- **LoadFlags** (REG_DWORD): The load flags specify the functionality required by the attached peripheral, and therefore the device driver (e.g. USB, UART, etc.) that needs to be loaded to support the peripheral. The LoadFlags value is treated as a bit field, as defined in the following table:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Functionality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (LSB)</td>
<td>Reserved</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>USB Host</td>
<td>This flag indicates a peripheral that requires USB Host functionality. When this bit is set, the USB hub and ports are powered and enabled for the docking connector. This bit must be set for any docking peripheral with a USB Host connector.</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>USB OTG</td>
<td>This flag is required for docking peripherals with USB On-The-Go functionality.</td>
</tr>
<tr>
<td>5 (MSB)</td>
<td>Dock Power Out</td>
<td>The connected peripheral requires power from the battery.</td>
</tr>
</tbody>
</table>

If this flag is not specified, any custom device drivers required by the peripheral must be specified in the driver registry subkey (see Section 3.4.1.1: "Device Driver Registry Keys”).

- **Icon** (REG_DWORD): This is the Resource ID of the icon to be displayed for this peripheral in the status bar. Currently, icons can only be loaded from Psion DLLs.

- **DeviceNameID** (REG_DWORD): This is the Resource ID of the name string to be displayed in the “New Device” window. Currently, the name string can only be loaded from Psion DLLs.

3.4.1.1 Device Driver Registry Keys

If the peripheral requires an additional driver to be loaded, registry keys need to be created to specify the information for the driver. As a rule, docking peripherals do not require additional drivers, nor do many USB peripherals. For peripherals that do require an additional driver to be loaded, follow these steps:

Within the device registry key, add a “driver” subkey. For example:

```
[HKL\Drivers\BuiltIn\Peripherals\devices\4\1\driver]
```
Under the \driver subkey, add the following standard registry values for drivers:

- **Prefix** (REG_SZ)
- **Dll** (REG_SZ)
- **Index** (REG_DWORD)
- **Flags** (REG_DWORD)
- **IClass** (REG_MULTI_SZ)

For descriptions and details of these values, consult the Microsoft documentation on developing device drivers. Note that the **Order** value is not used here.

The registry keys and values in the \driver subkey are not accessed directly, but are used as a template to create a driver entry in a different registry location. The \driver subkey and all of its entries are copied to the following registry location:

```
[HKLM\Drivers\BuiltIn\Peripherals\devices\active\4\[Device ID]
```

**Note:** The driver entries are only copied if the driver key is present and contains a Dll registry value.

The drivers for detected peripherals are loaded from this “active” registry location. The driver is loaded through a call to `ActiveDeviceEx()` after other initialization is finished.

It may also be necessary to copy registry keys from one location to another in the registry before loading a driver. To do this, first create a “RegCopy” subkey. For example:

```
[HKLM\Drivers\BuiltIn\Peripherals\devices\4\1\RegCopy]
```

Within the \RegCopy subkey, add one or more entries in the form of “\source\” = “\dest\”, where **source** is the source registry key and **dest** is the destination registry key.

**Note:** In the rare case that registry information needs to be copied outside HKEY_LOCAL_MACHINE, instead name the subkey “RegCopy_HKCU” (for HKEY_CURRENT_USERS) or “RegCopy_HKCR” (for HKEY_CLASSES_ROOT).

Remember that the backslash ‘\’ characters in the registry key strings will need to be ‘escaped’ with another backslash character. For example:

```
[HKLM\Drivers\BuiltIn\Peripherals\devices\4\1\RegCopy]
"Drivers\BuiltIn\Peripherals\devices\4\1\RegKeys" = "Software\Psion\DeviceDriver"
```

This function copies the specified source key and all subkeys underneath it to the target location.

In rare cases, multiple drivers may need to be loaded to support a single piece of hardware. In these cases, the Windows bus enumerator can be used (see the Microsoft documentation at [http://code.msdn.microsoft.com/BusEnum2](http://code.msdn.microsoft.com/BusEnum2)). Alternatively, the driver specified in the driver key can load the other drivers.

### 3.4.2 Software Registry Entries

If the peripheral uses custom software, the version information for the software can be added to the System Properties of the System Control Panel applet.

Using the registry functions, create the following registry key (where \name\ is the name of the software component as it will appear in the System Properties):

```
[HKLM\Software\Psion\SystemProperties\Software\<name>]
```

Beneath that key, set the following registry values:

- **@** (REG_SZ): Default value. Set to “Components” to make the software information appear in the Components list of the System Properties.
- **Value** (REG_SZ): Enter the version of the software component here.
For example:

```
; Registry entry for a software program named Scanner Program, version 1.5.21
;
[HKLM\Software\Psion\SystemProperties\Software\Scanner Program]
    "@"="Components"
    "Value"="1.5.21"
```

This example creates an entry in the Components list of the System Properties tab of the System Control Panel applet, which reads “Scanner Program: 1.5.21”.

### 3.5 Peripheral Detection and Driver Loading Sequence

When a peripheral is attached to the docking connector, the following steps are performed to detect and identify the connected hardware and load the appropriate drivers:
1. The device ID is detected.
2. The registry is searched for a matching device ID. If a matching entry is not found, the detect operation terminates.
3. If a matching device entry is found, the registry entry for the driver (if any) is copied to the active registry key.
4. If one or more RegCopy entries are found, the source keys are copied to the destination key locations.
5. Power is enabled to the connector.
6. If USB functionality is specified, the USB (OTG or Host) ports/hub are enabled.
7. The device-specific driver (if there is one) is loaded.

The peripheral attached to the docking connector is identified to the EP10 by means of a resistor. The value of the resistor provides a Device ID number, and indicates which functionalities of the EP10 must be enabled for that peripheral, according to the following table:

<table>
<thead>
<tr>
<th>Device ID</th>
<th>Resistor</th>
<th>Peripheral</th>
<th>USB OTG</th>
<th>USB Host</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 MΩ</td>
<td>Open circuit; nothing attached</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>150 KΩ</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>59 KΩ</td>
<td>RV4002 DB9 RS-232 snap module</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>34.8 KΩ</td>
<td>RV4001 USB snap module</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>23.2 KΩ</td>
<td>User defined (for use with HDK)(^1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>16.2 KΩ</td>
<td>Vehicle cradle</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>6</td>
<td>11.8 KΩ</td>
<td>User defined (for use with HDK)(^1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8.66 KΩ</td>
<td>Quad dock</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>8</td>
<td>6.34 KΩ</td>
<td>Single dock</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>9</td>
<td>4.53 KΩ</td>
<td>Single dock with expansion (reserved)</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>10</td>
<td>3.01 KΩ</td>
<td>Reserved</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>11</td>
<td>1.82 KΩ</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>825Ω</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0 Ω</td>
<td>Short circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) These IDs are available for 3rd party peripherals, but may be used by Psion for other devices in the future.
3.6 **Serial (COM) Port Assignments**

The default serial port assignments for the EP10 are shown in the following table. Ports not listed are unassigned.

<table>
<thead>
<tr>
<th>Serial Port</th>
<th>Default Assignment</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM0:</td>
<td>ActiveSync</td>
<td>ActiveSync Port - Reserved.</td>
</tr>
<tr>
<td>COM2:</td>
<td>GPS</td>
<td>This COM port is opened by applications that require GPS data. This COM port may instead be opened by the GPS intermediate driver.</td>
</tr>
<tr>
<td>COM5:</td>
<td>External USB-serial adaptor</td>
<td>External USB-to-serial adaptor WA4015 can be plugged into microA/B USB port on RV4001 snap module.</td>
</tr>
<tr>
<td>COM6:</td>
<td>USB port replicator</td>
<td>RS-232 port on RV4002 snap-on module. RS-232 port on vehicle cradle.</td>
</tr>
<tr>
<td>COM7:</td>
<td>Reserved.</td>
<td></td>
</tr>
<tr>
<td>COM9:</td>
<td>WWAN virtual serial port</td>
<td>WAN COM port.</td>
</tr>
<tr>
<td>COM8</td>
<td>WWAN hardware (private)</td>
<td>Reserved for internal use.</td>
</tr>
<tr>
<td>COM9</td>
<td>GPS hardware (private)</td>
<td>Reserved for internal use.</td>
</tr>
<tr>
<td>COM20</td>
<td>Bluetooth hardware (private)</td>
<td>Reserved for internal use.</td>
</tr>
<tr>
<td>COM24</td>
<td>GPS power (private)</td>
<td>Reserved for internal use.</td>
</tr>
</tbody>
</table>

**Note:**
1. The proper name for COM ports above COM9 is \$device\COMxx (no “:” following the COM port number).
2. COM ports cannot be reassigned on the EP10.
3. Bluetooth creates and destroys many virtual ports.

3.7 **EP10 HDK Application Development Software**

To develop software applications for the EP10 and its peripherals using the Mobile Devices SDK, you must install the following software packages on your development system. All packages are available on the Psion Community website (http://community.psion.com), in the Downloads section (free registration is required for downloading).

3.7.1 **Psion Mobile Devices SDK**

The Mobile Devices SDK contains many APIs designed specifically for interacting with Psion mobile devices and peripherals. Very simple and generic applications may not require these APIs, so it may not be necessary to install this package, but it is recommended.

This package is located in the Mobile Devices SDK subfolder of the Community website Downloads section as “MDSDK [version] - Installer” (the current version at the time of this publication is 5.4). Download and execute the setup program, and follow the onscreen instructions to install the package.

3.7.2 **EP10 HDK Development Files**

The EP10 HDK files provide an API library of C functions to interact with custom-built hardware connected to the EP10 docking ports, as well as an HDK Demo application program.

The installation program for these files is included in the EP10 HDK package. See Section 1.6: "Obtaining the HDK" for instructions on how to download this package to your computer.
Follow these instructions to install the EP10 HDK API library and HDK Demo application files:

1. Navigate to the folder with the HDK files, and double-click on the file EP10HDK_Setup.exe to begin the installation.
   *The License Agreement dialog box appears:*

2. Use the scroll bar or press the **Page Down** key to read through the entire license agreement, then click the **I Agree** button to proceed.
   *The Choose Components dialog box appears:*

3. Select the destination platform(s) you will be developing the applications for. EP10 only supports the Microsoft Windows Embedded 6.5 operating system, but future EP10 HDK releases may have additional options. Ensure there is a check mark in the box next to **HDK for WinMobile 6.5.3 Pro**, then click **Next >**.
   *The Choose Install Location dialog box appears:*
4. To change the default installation folder, type the path into the field, or click the Browse button and navigate to the destination folder. Click Install to proceed. The progress dialog box appears as the installer extracts and copies the files to the destination folders.

5. If you wish to see a breakdown of the installation progress, click the Show details button. The details window appears. Click and drag the scroll bar on the right to scroll the information up or down.

6. Click Close to end the installation.

3.7.3 EP10 HDK API Functions

The following sections describe the C functions declared in the file Hdk7515.h.

Note: HDK functions cannot be called from the xxx_Init method of a driver loaded by the peripherals driver.

3.7.3.1 Hdk7515_Open

Syntax

```c
DWORD Hdk7515_Open( HANDLE *hdk, Hdk7515_Connector connector );
```

Parameters

- `hdk` - [out] pointer to a HANDLE. If the open call succeeds, the handle is changed to a valid handle value that can be used in other HDK operations.
- `connector` - [in] one of the values in the Hdk7515_Connector enumeration identifying the expansion slot (or other connector) being controlled.
Description
This function is used to open a handle to the Psion HDK. The handle opened can then be used in other HDK functions. The handle must be closed using Hdk7515_Close(). This parameter must not be null. Each handle is tied to a single particular expansion slot or connector.

The expansion slot or other connector being controlled is determined by the 'connector' parameter.

Returns
- ERROR_SUCCESS - if successful. The handle pointed to by 'hdk' is now valid.
- ERROR_INVALID_PARAMETER - the 'hdk' pointer is null, or the specified connector is invalid.
- ERROR_INVALID_DATA - an exception was generated.
- ERROR_NOT_SUPPORTED - this peripheral is not supported by the HDK.
- Other errors are possible.

Sample Code

```c
DWORD OpenAndCloseHdk( )
{
    HANDLE hdkHandle = INVALID_HANDLE_VALUE;

    DWORD result = Hdk7515_Open(&hdkHandle, Hdk7515_Connector_Docking);
    if( result != ERROR_SUCCESS ) {
        return ERROR_NOT_SUPPORTED;
    }

    // ...

    Hdk7515_Close(hdkHandle);
    hdkHandle = INVALID_HANDLE_VALUE;

    return ERROR_SUCCESS;
}
```

3.7.3.2 Hdk7515_Close

Syntax
DWORD Hdk7515_Close( HANDLE hdk );

Parameters
- hdk - [in] a valid open HDK handle.

Description
This function is used to close an open HDK handle and release all the resources it owns. The handle cannot be used after it is closed.

Returns
- ERROR_SUCCESS - if successful. The handle is now closed.
- ERROR_INVALID_HANDLE - the specified handle is invalid or null.
- ERROR_INVALID_DATA - an exception was generated.
- Other errors are possible.

Sample Code
See sample code for Section 3.7.3.1: "Hdk7515_Open".
### 3.7.3.3 Hdk7515_SetPower

**Syntax**

```c
DWORD Hdk7515_SetPower( HANDLE hdk, BOOL enable );
```

**Parameters**

- `hdk` - [in] an open HDK handle.
- `enable` - [in] the new power state of the connector being controlled (see Section 3.7.3.1: "Hdk7515_Open").

**Description**

Powers on/off the connector being controlled.

The power state is reference-counted. If this function is called multiple times with the 'enable' parameter set to TRUE, it has to be called the same number of times with the 'enable' parameter set to FALSE in order to power the connector off.

The default power state for connectors is off.

**Returns**

- `ERROR_SUCCESS` - if successful.
- `ERROR_INVALID_HANDLE` - the specified handle is invalid.
- `ERROR_INVALID_DATA` - an exception was generated.
- Other errors are possible.

**Sample Code**

```c
DWORD SetPower(BOOL powerState)
{
    HANDLE hdkHandle = INVALID_HANDLE_VALUE;
    DWORD result = Hdk7515_Open(&hdkHandle, Hdk7515_Connector_Docking);
    if( result != ERROR_SUCCESS ) {
        return ERROR_NOT_SUPPORTED;
    }
    result = Hdk7515_SetPower(hdkHandle, powerState);
    Hdk7515_Close(hdkHandle);
    hdkHandle = INVALID_HANDLE_VALUE;
    return result;
}
```

### 3.7.3.4 Hdk7515_GetPower

**Syntax**

```c
DWORD Hdk7515_GetPower( HANDLE hdk, BOOL *enabled );
```

**Parameters**

- `hdk` - [in] an open HDK handle.
- `enabled` - [out] pointer to a BOOL containing the current connector power state.

**Description**

This function is used to determine the current power state of a connector.

The default power state for connectors is off.
Returns
- ERROR_SUCCESS - if successful.
- ERROR_INVALID_HANDLE - the specified handle is invalid.
- ERROR_INVALID_PARAMETER - one of the parameters is incorrect or invalid.
- ERROR_INVALID_DATA - an exception was generated.
- Other errors are possible.

Sample Code

```c
DWORD GetPower(BOOL *powerState)
{
    HANDLE hdkHandle = INVALID_HANDLE_VALUE;

    DWORD result = Hdk7515_Open(&hdkHandle, Hdk7515_Connector_Docking);
    if( result != ERROR_SUCCESS ) {
        return ERROR_NOT_SUPPORTED;
    }

    BOOL powerEnabled = FALSE;
    result = Hdk7515_GetPower(hdkHandle, &powerEnabled);
    if( result == ERROR_SUCCESS ) {
        *powerState = powerEnabled;
    }

    Hdk7515_Close(hdkHandle);
    hdkHandle = INVALID_HANDLE_VALUE;

    return result;
}
```

3.7.3.5 Hdk7515_SetPowerMode

Syntax
`DWORD Hdk7515_SetPowerMode( HANDLE hdk, Hdk7515_PowerMode mode );`

Parameters
- hdk - [in] an open HDK handle.
- mode - [in] the new power mode for the peripheral.

Description
This function is used to configure the power mode for the peripheral attached to the connector. There are currently two modes available: Auto and Manual.

If the power mode of the peripheral is Manual, the connector power will not be controlled by the Peripherals Driver. A loaded device driver/application must enable and disable the power.

If the power mode of the peripheral is Auto, the Peripherals driver will enable/disable power to the connectors automatically. Power to the connector is:
1. Applied initially before the device driver for the connected hardware is loaded.
2. Removed when the hand-held is suspended.
3. Reapplied when the hand-held resumes from suspend.

The default power mode is Manual.
Returns
- ERROR_SUCCESS - if successful.
- ERROR_INVALID_HANDLE - the specified handle is invalid.
- ERROR_INVALID_PARAMETER - one of the parameters is incorrect or invalid.
- ERROR_INVALID_DATA - an exception was generated.
- Other errors are possible.

Sample Code

```c
DWORD SetPowerMode(Hdk7515_PowerMode powerMode)
{
    HANDLE hdkHandle = INVALID_HANDLE_VALUE;

    DWORD result = Hdk7515_Open(&hdkHandle, Hdk7515_Connector_Docking);
    if( result != ERROR_SUCCESS ) {
        return ERROR_NOT_SUPPORTED;
    }

    Hdk7515_PowerMode mode = Hdk7515_PowerMode_Manual;
    result = Hdk7515_GetPowerMode(hdkHandle, &mode);
    if( result != ERROR_SUCCESS ) {
        Hdk7515_Close(hdkHandle);
        hdkHandle = INVALID_HANDLE_VALUE;
        return result;
    }

    if( mode != powerMode ) {
        result = Hdk7515_SetPowerMode(hdkHandle, powerMode);
    }

    Hdk7515_Close(hdkHandle);
    hdkHandle = INVALID_HANDLE_VALUE;

    return result;
}
```

3.7.3.6 Hdk7515_GetPowerMode

Syntax

dWORD Hdk7515_GetPowerMode( HANDLE hdk, Hdk7515_PowerMode *mode );

Parameters
- hdk - [in] an open HDK handle.
- mode - [out] pointer to a Hdk7515_PowerMode value that will contain the current power mode of
  the connector.

Description
This function is used to retrieve the current power mode of the peripheral attached to the connector. There
are currently two modes available: Auto and Manual.
The default power mode is Manual.
This function can only be called by a driver, not by an application. The driver that calls this function must be loaded by the Peripherals driver at startup.

**Returns**
- ERROR_SUCCESS - if successful.
- ERROR_INVALID_HANDLE - the specified handle is invalid.
- ERROR_INVALID_PARAMETER - one of the parameters is incorrect or invalid.
- ERROR_INVALID_DATA - an exception was generated.
- Other errors are possible.

**Sample Code**

```c
DWORD GetPowerMode(Hdk7515_PowerMode *powerMode)
{
    HANDLE hdkHandle = INVALID_HANDLE_VALUE;

    DWORD result = Hdk7515_Open(&hdkHandle, Hdk7515_Connector_Docking);
    if( result != ERROR_SUCCESS ) {
        return ERROR_NOT_SUPPORTED;
    }

    Hdk7515_PowerMode mode = Hdk7515_PowerMode_Manual;
    result = Hdk7515_GetPowerMode(hdkHandle, &mode);
    if( result == ERROR_SUCCESS ) {
        *powerMode = mode;
    }

    Hdk7515_Close(hdkHandle);
    hdkHandle = INVALID_HANDLE_VALUE;

    return result;
}
```

### 3.7.4 API Enumerations

The following enumerations are declared in the file Hdk7515Consts.h:

#### 3.7.4.1 Hdk7515_PowerMode

The Hdk7515_PowerMode enumeration is defined as follows:

```c
typedef enum {
    Hdk7515_PowerMode_Auto = 1,
    Hdk7515_PowerMode_Manual = 2,
    Hdk7515_PowerMode_Invalid = 0xffffffff
} Hdk7515_PowerMode;
```
3.7.4.2 Hdk7515_Connector

The Hdk7515_Connector enumeration is defined as follows:

```c
typedef enum {
    Hdk7515_Connector_Docking = 6,
    Hdk7515_Connector_Invalid = 0xffffffff
} Hdk7515_Connector;
```

3.8 EP10 HDK Demo Application

Bundled with the EP10 HDK is a demo application that can be used to test the basic functionality of an expansion peripheral. The files for this application (including the source code) can be located in the ..\DemoApp subfolder of where you installed the HDK files.

To run the HDK demo application, copy the 7515HDK.dll and EP10HDKDemo.exe files to the file system on your EP10 hand-held computer. The .dll file must be located in the same folder as the executable file, or in the system folder.

Double-tap on the executable file on the EP10 to launch the demo application. The application will run through a sequence of function calls and report the results in status windows on the EP10 display.

- Check power mode (Auto/Manual), and set to Manual if not already set. Report result.
- Report current power state (enabled/disabled).
- Toggle the power state, and report.
- Restore the power state to original value, and report.

Tap OK to proceed through the report messages, and cycle through to the end of the application.
# Mechanical Considerations

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4.1 Overview

This chapter describes the physical aspects of manufacturing and mounting peripherals to the base of the EP10.

4.2 Materials

The EP10 snap-modules manufactured by Psion are manufactured using ABS + PC CX7240, and the texturing is VDI27. We recommend using a similar material for your peripherals.

4.3 HDK Mechanical Files

The Hardware Development Kit provides the following mechanical models and drawings:

4.3.1 3D Files

STEP files provide 3D models of the EP10 and snap modules for viewing with CAD software. These models give the exact forms and dimensions of the components so that peripherals can be designed to fit the EP10 precisely.

Table 4.1 3D Files

<table>
<thead>
<tr>
<th>Description</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D step file of the EP10 housing</td>
<td>EPI0.stp</td>
</tr>
<tr>
<td>3D step file of the EP10 DE9 RS-232 snap module</td>
<td>Serial_SnapOn.stp</td>
</tr>
<tr>
<td>3D step file of the EP10 USB snap module</td>
<td>USB_SnapOn.stp</td>
</tr>
</tbody>
</table>

4.3.2 2D Files

PDF files provide 2D drawings of the surfaces and attachment points of the EP10 and snap modules. The drawings show the exact locations and relative positions of screw mountings, etc.

Table 4.2 2D Files

<table>
<thead>
<tr>
<th>Description</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>2D pdf drawing of the EP10 front casing</td>
<td>EPI0_Case_Front.pdf</td>
</tr>
<tr>
<td>2D pdf drawing of the EP10 rear casing</td>
<td>EPI0_Case_Rear.pdf</td>
</tr>
<tr>
<td>2D pdf drawing of the left latch for an EP10 snap module</td>
<td>Snap_On_Latch_Left.pdf</td>
</tr>
<tr>
<td>2D pdf drawing of the right latch for an EP10 snap module</td>
<td>Snap_On_Latch_Right.pdf</td>
</tr>
<tr>
<td>2D pdf drawing of the EP10 USB snap module lower casing</td>
<td>USB_SnapOn_Lower.pdf</td>
</tr>
<tr>
<td>2D pdf drawing of the EP10 USB snap module upper casing</td>
<td>USB_SnapOn_Upper.pdf</td>
</tr>
</tbody>
</table>

4.4 Peripheral Design

4.4.1 Physical Design Considerations

Custom EP10 peripherals connect through the docking connector on the base of the unit. Whether this peripheral uses a “snap module”-type design that attaches to the unit and travels with it, or a “desktop dock”-type design, in which the EP10 will remain at rest, there are a few important points to bear in mind when designing your peripheral.

There are no threaded inserts for screws in the EP10 to secure the peripheral. However, there is a small cavity on both sides of the EP10 for spring-mounted catches to latch on to. Your peripheral should include...
catches which fit in these cavities and hold the peripheral securely to the unit, but are also easily released by the user. The EPI0 HDK includes drawings and schematics of the left and right latches from the Psion snap modules, for reference in designing these catches.

When designing your peripheral consider whether the user will need full access to the keyboard, microphone, hand-strap latch, or the battery compartment while the peripheral is attached, and make sure these areas are not covered.

There are small alignment holes on either side of the docking connector designed to accommodate studs on the peripheral. This helps align the electrical contacts on the peripheral precisely with the contacts of the EPI0 docking connector, and to keep them from shifting during use. It is highly recommended that the design of your peripheral includes these alignment studs.

### 4.4.2 USB-Serial Configuration

The C8051 microprocessor chip used with the Psion USB-serial firmware is capable of reporting different configurations to the Psion hand-held computer. The configuration is dependant on the voltages present on some of the C8051 GPIO pins at initialization time. See the table below for configurations supported by EPI0.

<table>
<thead>
<tr>
<th>P0.0</th>
<th>P0.1</th>
<th>P0.6</th>
<th>P0.7</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>Standard USB serial adaptor (COM5)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>USB-Serial &quot;Port 1&quot; (COM6)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>USB-Serial &quot;Port 2&quot; (requires additional registry keys for support)</td>
</tr>
</tbody>
</table>

* All other combinations reserved for Psion use.

0 = pulled low 1 = pulled high * = high or low

The assignments are as shown to avoid conflicts when plugging in a standard USB-serial adaptor into a vehicle cradle or desktop dock. Thus you can have two serial ports on these devices and they will not conflict with each other.
5 CONNECTIONS

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   5.3.2 RV4002 Snap Module RS-232 DB9 ......................... 36
5.1 Overview

This chapter describes the details of the EP10 docking connector, and the connectors of the snap modules available for the EP10.

5.2 Docking Connector

The 16-pin docking connector on the EP10 main logic board provides power connectivity in both directions (to power/charge the EP10 from the peripheral, or to use the EP10 to provide power to a peripheral), as well as USB connectivity. For serial connectivity, a USB-to-serial component must be included in the peripheral (such as in the RV4002 snap module).

Connector Details
- Manufacturer: Molex
- Manufacturer Part No.: Handylink 44828 SMT
- Mating Connectors: Handylink 45339, 45593, 45560
- Number of Pins: 16
- Current Rating: 1.0 A per pin

Figure 5.1 Diagram of EP10 Docking Connector Pins

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>I/O Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
<td>Ground</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DC power</td>
<td>Input</td>
<td>3 A maximum</td>
</tr>
<tr>
<td>3</td>
<td>DC power</td>
<td>Input</td>
<td>3 A maximum</td>
</tr>
<tr>
<td>4</td>
<td>DC power</td>
<td>Input</td>
<td>3 A maximum</td>
</tr>
<tr>
<td>5</td>
<td>Power out (battery)</td>
<td>Output</td>
<td>1 A maximum</td>
</tr>
<tr>
<td>6</td>
<td>USB Host D+</td>
<td>I/O</td>
<td>Full speed 2.0</td>
</tr>
<tr>
<td>7</td>
<td>USB Host D-</td>
<td>I/O</td>
<td>Full speed 2.0</td>
</tr>
<tr>
<td>8</td>
<td>USB OTG VBUS</td>
<td>Output</td>
<td>5 V power in (1.5 A); Power out (500 mA)</td>
</tr>
<tr>
<td>9</td>
<td>Dock ID</td>
<td>I/O</td>
<td>See Table 3.3: &quot;Docking Device Identification&quot;</td>
</tr>
<tr>
<td>10</td>
<td>USB OTG D-</td>
<td>I/O</td>
<td>High speed 2.0</td>
</tr>
<tr>
<td>11</td>
<td>USB OTG D+</td>
<td>I/O</td>
<td>High speed 2.0</td>
</tr>
<tr>
<td>12</td>
<td>USB OTG ID</td>
<td>Input</td>
<td>OTG ID</td>
</tr>
<tr>
<td>13</td>
<td>Ground</td>
<td>Ground</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
<td>N/A</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
<td>N/A</td>
<td>Reserved</td>
</tr>
<tr>
<td>16</td>
<td>Ground</td>
<td>Ground</td>
<td></td>
</tr>
</tbody>
</table>
5.3 Snap Module Connectors

There are two single-unit desktop docking stations available for EP10: models RV4001 and RV4002. The USB & Charger Snap Module (RV4001) allows you to connect a micro-USB cable and a power cable to the EP10. The DE9 RS-232 & Charger Snap Module (RV4002) provides an RS-232 connection and a power connection to the EP10.

5.3.1 RV4001 Snap Module USB Connector

The RV4001 snap module provides one standard microAB USB 2.0 receptacle, and one 5 V DC power jack for charging from a standard vehicle power adaptor or an AC wall adaptor.

USB 2.0 microAB Interface

The USB microAB receptacle on the snap module allows the EP10 to connect to a USB host or client device. It supports low speed (1.5 Mbps), full speed (12 Mbps) and high speed (480 Mbps) communications.

Figure 5.2 USB MicroAB Receptacle

Table 5.1 Pinout Of The USB MicroAB Connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Description</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VBUS</td>
<td>DC current from external host</td>
<td>Input from connected peripheral.</td>
</tr>
<tr>
<td>2</td>
<td>USB_D-</td>
<td>USB Client D-</td>
<td>Bidirectional (half-duplex).</td>
</tr>
<tr>
<td>3</td>
<td>USB_D+</td>
<td>USB Client D+</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ID</td>
<td>ID connected plug (Only microB plug is supported in the desktop docking stations.)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.3.2 RV4002 Snap Module RS-232 DB9

The RV4002 desktop docking station provides a male DB9 port for connecting serial peripherals, and a 5 V DC power jack for charging from a standard vehicle power adaptor or an AC wall adaptor.

RS-232 DB9M Interface

The 9-pin male RS-232 receptacle on the snap module connects to a standard serial cable with a 9-pin female connector. The port is capable of communicating at speeds from 300 kbps up to 460800 kbps.
Figure 5.3  RS-232 DB9M Receptacle

Table 5.2  Pinout Of The RS-232 DB9M Connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DCD</td>
<td>Data Carrier Detect</td>
</tr>
<tr>
<td>2</td>
<td>RXD</td>
<td>Received Data</td>
</tr>
<tr>
<td>3</td>
<td>TXD</td>
<td>Transmitted Data</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td>Data Terminal Ready</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>DSR</td>
<td>Data Set Ready</td>
</tr>
<tr>
<td>7</td>
<td>RTS</td>
<td>Request To Send</td>
</tr>
<tr>
<td>8</td>
<td>CTS</td>
<td>Clear To Send</td>
</tr>
<tr>
<td>9</td>
<td>RI</td>
<td>Ring Indicator</td>
</tr>
</tbody>
</table>
Most of the following resources are available on the Psion Community website, located at http://community.psion.com. Website registration is required to log in to the site and obtain the materials.

**A.1 Psion User Manuals**

The following user manuals are available on the Psion Community website, under Knowledge > Knowledge Base > Product Manuals:

**A.2 Psion Downloadable Software**

The following software is available on the Psion Community website, under Downloads > Firmware/Software & Demos > Software Demos, Tools & Drivers:
- Psion USB setup utility

The following software is available on the Psion Community website, under Downloads > Developer (SDK/HDK):
- EPI0 HDK (click on Psion HDK)
- Mobile Devices SDK

**A.3 Psion Accessory And Parts Information**

For more information on accessories and parts for the EPI0, visit http://www.psion.com/products.
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  B.1.2 Software ........................................................... B-3
  B.1.3 Wireless Communication .......................................... B-4
  B.1.4 Power Management ............................................... B-4
  B.1.5 Expansion Slot .................................................. B-4
  B.1.6 Bar Code Scanner ................................................ B-4
  B.1.7 Digital Camera ................................................... B-4
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  B.1.9 Accessories ........................................................ B-4
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B.1 EP10 Specifications – Model No. 7515

Note: Performance specifications are nominal and subject to change without notice.

B.1.1 Hardware

Physical Dimensions
- Device: 6.2” x 3.1” x 1.2” (158 mm x 78 mm x 30.6 mm)

Weight (with battery pack)
- Weight with 2400 mA battery: 0.8 lb (336 g)

User Interface
- Display (Backlit)
  - 3.7 in. VGA portrait mode
  - Backlight feature 165 cd/m2 output
  - Sunlight readable with integrated touchscreen
  - Colour 480 x 640 graphic TFT
  - Passive stylus or finger operation
- Audio
  - Built-in 85db mono speaker
  - microphone
  - receiver
- Keyboard (Backlit)
  - Numeric, QWERTY or AZERTY
  - High reliability keypad ultra-white backlight
  - Ergonomically enhanced for ambidextrous one-hand operation
- Camera
  - 3.2 Mega Pixel Colour
  - Auto Focus
  - Dual LED Flash
  - Video capture capability

B.1.2 Software

Platform
- AM3715 Processor
- 800 MHz (ARM Cortex A8)
- On-board RAM: 256 MB SDRAM
- On-board ROM: 2 GB Flash

Operating System
- Microsoft Windows Embedded 6.5

Programming Environment
- HTML, XML
- Mobile Devices SDK
- JavaTM
- Visual Studio® 2008
- Standard protocol APIs - Windows® sockets
Appendix B: EP10 Specifications

Wireless Communication

B.1.3 Wireless Communication

Note: 802.11ab/g/n and Bluetooth are available simultaneously.

- On-board IEEE 802.11a/b/g/n
- Bluetooth v2.1 radio (CCX V4 Certified
  - UMTS 3.5G HSPA radio options (TBD)
  - Integrated 5 band Antenna, supports both voice and data
  - SiRF starIV GPS

B.1.4 Power Management

- Optional 3.7 V @ 2400 mAh or High Cap 3600 mAh Li-ion rechargeable batteries
- Full Shift operation
- SMART battery
- System backup (5 minutes) during battery swap

B.1.5 Expansion Slot

- One microSD slot

B.1.6 Bar Code Scanner

Note: User upgradeable.

- 2D EA11 imager

B.1.7 Digital Camera

- 3.2 mega pixel colour
- Auto Focus
- Dual LED Flash
- Video capture capability

B.1.8 Voice Over IP (VOIP)

- Push-to-talk

B.1.9 Accessories


- Carrying Accessories:
  - Hand strap
  - Carrying case

- Communications:
  - Quad dock (4-site) with 10/100 BaseT Ethernet and charge functions.
  - Desktop dock with Type A and Type B USB connectivity and charge functions for an internal battery along with a spare battery.
• **Power supplies:**
  - AC wall adaptor
  - Vehicle power outlet adaptor
  - Quad charger (4-site)
  - Snap Module: USB DE9M powered serial plus Charger
  - Snap Module: USB Host/Client plus Power/Charger

• **Vehicle peripherals:**
  - Powered and Non-powered cradle
  - RAM Mount with screws

### B.1.10 Approvals

- FCC Parts 15B, 15C, 15E, 22H, 24E, 27
- IC RSS-210, RSS-132, RSS-133
- EN 300 328, EN 301 489, EN 55022, EN55024, EN301 511, EN301 908, EN300 440, EN301 893
- Safety IEC/EN 60950-1
- Laser Safety IEC 60825-1

### B.1.11 Environmental Specifications

- Operating Temperature: 14°F to 122 °F (-10°C to +50°C)
- Storage Temperature: -4°F to 140°F (-20°C to +65°C)
- Relative Humidity: 5% to 95% RH non-condensing
- Rain & Dust Protection: IP54, IEC 529
- Drop: 5 ft (1.5 m) - 26 drops to polished concrete
- Tumble: 250 times at 0.5 m
- ESD: +/- 15k VDC air discharge, +/- 8k VDC contacts

### B.2 Radio Specifications

#### B.2.1 Murata 802.11 a/b/g/n Direct Sequence Spread Spectrum Radio

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-parameters</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Embedded surface mount module, 11.4 x 9.4 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* This is a combo module containing both Wi-Fi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>802.11a/b/g/n and Bluetooth V2.1+EDR radio</td>
<td></td>
</tr>
<tr>
<td>Antenna Port</td>
<td>802.11b/g/n</td>
<td>U.FL jack. Non-diversity.</td>
</tr>
<tr>
<td></td>
<td>802.11a/n</td>
<td>U.FL jack. Non-diversity.</td>
</tr>
<tr>
<td>Antenna Type</td>
<td>802.11b/g/n</td>
<td>PIFA antenna. Covers 2400-2484 MHz</td>
</tr>
<tr>
<td></td>
<td>@ &lt;2.0:1 VSWR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>802.11a/n</td>
<td>PIFA antenna. Covers 5150-5860 MHz</td>
</tr>
<tr>
<td></td>
<td>@ &lt;2.0:1 VSWR</td>
<td></td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>802.11b/g/n</td>
<td>3.73 dBi</td>
</tr>
<tr>
<td></td>
<td>802.11a/n</td>
<td>4.85 dBi</td>
</tr>
<tr>
<td>Transmit Power</td>
<td>802.11b</td>
<td>+18 dBm typical</td>
</tr>
<tr>
<td></td>
<td>802.11g</td>
<td>+13 dBm typical</td>
</tr>
<tr>
<td></td>
<td>802.11a</td>
<td>+12 dBm typical</td>
</tr>
<tr>
<td></td>
<td>802.11n (2.4 GHz)</td>
<td>+12 dBm typical</td>
</tr>
<tr>
<td></td>
<td>802.11n (5 GHz)</td>
<td>+12 dBm typical</td>
</tr>
</tbody>
</table>
### Appendix B: EP10 Specifications

**Murata Bluetooth Radio**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-parameters</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>802.11b/g/n</td>
<td>2400-2484 MHz</td>
</tr>
<tr>
<td></td>
<td>802.11a/n</td>
<td>5150-5350 MHz, 5480-5720 MHz and 5725-5845 MHz</td>
</tr>
<tr>
<td>RX Sensitivity</td>
<td>802.11b</td>
<td>-78 dBm @ 11 Mbps</td>
</tr>
<tr>
<td></td>
<td>802.11g</td>
<td>-67 dBm @ 54 Mbps</td>
</tr>
<tr>
<td></td>
<td>802.11a</td>
<td>-67 dBm @ 54 Mbps</td>
</tr>
<tr>
<td></td>
<td>802.11n (2.4 GHz)</td>
<td>-66 dBm @ 65 Mbps</td>
</tr>
<tr>
<td></td>
<td>802.11n (5 GHz)</td>
<td>-66 dBm @ 65 Mbps</td>
</tr>
<tr>
<td>Data Rates</td>
<td>802.11b</td>
<td>1, 2, 5, 5.5, 11 Mbps</td>
</tr>
<tr>
<td></td>
<td>802.11a/g</td>
<td>6, 9, 12, 18, 24, 36, 48, 54 Mbps</td>
</tr>
<tr>
<td></td>
<td>802.11n</td>
<td>6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps</td>
</tr>
<tr>
<td>EVM</td>
<td>802.11b</td>
<td>32% max</td>
</tr>
<tr>
<td></td>
<td>802.11g</td>
<td>-26 dB max</td>
</tr>
<tr>
<td></td>
<td>802.11a</td>
<td>-26 dB max</td>
</tr>
<tr>
<td></td>
<td>802.11n (2.4 GHz)</td>
<td>-29 dB max</td>
</tr>
<tr>
<td></td>
<td>802.11n (5 GHz)</td>
<td>-29 dB max</td>
</tr>
<tr>
<td>Bluetooth Coexistence</td>
<td></td>
<td>TI Wilink6 proprietary WiFi-BT co-existent scheme.</td>
</tr>
</tbody>
</table>

#### B.2.2 Murata Bluetooth Radio

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>Embedded surface mount module, 11.4 x 9.4 mm</td>
</tr>
<tr>
<td></td>
<td>* This is a combo module containing both Wi-Fi 802.11a/b/g/n and Bluetooth V2.1+EDR radio</td>
</tr>
<tr>
<td>Antenna Port</td>
<td>U.FL jack (shared with Wi-Fi 802.11b/g/n radio)</td>
</tr>
<tr>
<td>Antenna Type</td>
<td>PIFA antenna. Covers 2400-2484 MHz @ &lt;2.0:1 VSWR</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>3.73 dBi</td>
</tr>
<tr>
<td>Transmit Power</td>
<td>6.5 dBm typical</td>
</tr>
<tr>
<td>Frequency Range</td>
<td>2.400-2.4835 GHz</td>
</tr>
<tr>
<td>Channel</td>
<td>79</td>
</tr>
<tr>
<td>RX Sensitivity</td>
<td>-90 dBm typical, -70 dBm max</td>
</tr>
<tr>
<td>Data Rates</td>
<td>-90 dBm typical, -70 dBm max</td>
</tr>
<tr>
<td>802.11 Coexistence</td>
<td>TI Wilink6 proprietary WiFi-BT co-existent scheme.</td>
</tr>
</tbody>
</table>
### B.2.3 Sierra Wireless MC5728V

<table>
<thead>
<tr>
<th>Features</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| Physical          | • Small PCI-Express Mini Card standards-based form factor. Adheres to Rev 1.2 of the PCI Express Mini Card Specification  
|                   | • Two U.FL RF connector jacks                                                 |
| Electrical        | The MC5728V Mini Card is self-shielded; no additional shielding is required.   |
| Environmental     | Temperature operating range:  
|                   | • IS-98D compliance: -30 to +60° C                                           
|                   | • Reduced RF performance: +60 to +75° C                                       |
| RF                | • Dual-band support for both the 800 MHz cellular and 1.9 GHz PCS bands        
|                   | • Receive diversity support for the 800 MHz cellular and 1.9 GHz PCS bands    
|                   | • Adheres to CDMA authentication as specified in CDMA 1X                      
|                   | • Support for IS-95A/B and CDMA 1X Release 0/A                                
|                   | • Support for IS-856 1xEV-DO Revision A                                       
|                   | • Support for gpsOne™ and stand-alone GPS                                     |
| Application Interface | • USB supporting multiple logical channels over the USB MUX protocol       
|                   | • USB selective suspend supported for maximum power savings                   
|                   | • Wakeup Enable—the modem can be set to wake the host device upon ring, restoration of radio coverage, and/or receipt of SMS   
|                   | • AT command interface                                                       |
| Voice             | The MC5728V Mini Card has internal IS-127 and IS-733 vocoders and supports:  
|                   | • Call origination                                                           
|                   | • Silent retry call origination protocol                                     
|                   | • Echo cancellation                                                          
|                   | • E911                                                                      
|                   | • Incoming call notification                                                 |
| Packet Mode       | • IS-2000 data rates up to 1531 kbps, simultaneous forward and reverse channel  
|                   | • IS-856 1xEV-DO Rev. A data rates up to 3.1 Mbps forward channel and 1.8 Mbps reverse channel |
| IS-95 circuit-switched | • V.34 data rates to 14.4 kbps                                                |
|                   | • Quick Net Connect (QNC) support                                              |
| Short Message Service (SMS) | • Send and receive                                                            |
|                   | • Notification of new messages                                                |

### B.2.4 Cinterion PH8 GSM/GPRS/EDGE/UMTS Radio

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| General          | GSM/GPRS/EDGE: Quad band, 850/900/1800/1900MHz  
| Frequency bands  | UMTS/HSPA+: Five band, 800/850/AWS/1900/2100MHz                                |
| GSM class        | Small MS                                                                     |
| Output power (according to Release 99)  | Class 4 (+33dBm +2dB) for EGSIM850                                           
|                   | Class 4 (+33dBm +2dB) for EGSIM900                                           
|                   | Class 1 (+30dBm +2dB) for GSM1800                                            
|                   | Class 1 (+30dBm +2dB) for GSM1900                                            
|                   | Class E2 (+27dBm + 3dB) for GSM 850 8-PSK                                     
|                   | Class E2 (+27dBm + 3dB) for GSM 900 8-PSK                                     
|                   | Class E2 (+26dBm +3 /-4dB) for GSM 1800 8-PSK                                 
|                   | Class E2 (+26dBm +3 /-4dB) for GSM 1900 8-PSK                                 
|                   | Class 3 (+34dBm +1/-3dB) for UMTS 2100, WCDMA FDD Bd I                       
|                   | Class 3 (+34dBm +1/-3dB) for UMTS 1900;WCDMA FDD Bd II                       
|                   | Class 3 (+34dBm +1/-3dB) for UMTS AWS, WCDMA FDD Bd IV                        
|                   | Class 3 (+34dBm +1/-3dB) for UMTS 850;WCDMA FDD Bd V                         
|                   | Class 3 (+34dBm +1/-3dB) for UMTS 800;WCDMA FDD Bd VI                        |
## Appendix B: EP10 Specifications

### Cinterion PH8 GSM/GPRS/EDGE/UMTS Radio

### Psion EP10 HDK User Manual

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| Operating Temperature (board temperature)   | Normal operation: -30°C to +85°C  
Restricted operation: -40°C to +95°C       |
| Physical                                     | Dimensions: 33.9mm x 50mm x 3.1mm  
Weight: approx. 9.5g                   |
| RoHS                                         | All hardware components fully compliant with EU RoHS Directive                |

### HSPA features

- **3GPP Release 6, 7**
  - DL 14.4Mbps, UL 5.7Mbps
  - UE CAT. [1-6], 11, 12 supported
  - Compressed mode (CM) supported according to 3GPP TS25.212

### UMTS features

- **3GPP Release 4**
  - PS data rate - 384 kbps DL / 384 kbps UL
  - CS data rate - 64 kbps DL / 64 kbps UL

### GSM/GPRS/EGPRS features

- **Data transfer**
  - GPRS:
    - Multislot Class 12
    - Full PBCCH support
    - Mobile Station Class B
    - Coding Scheme 1-4
  - EGPRS:
    - Multislot Class 12
    - EDGE E2 power class for 8 PSK
    - Downlink coding schemes - CS 1-4, MCS 1-9
    - Uplink coding schemes - CS 1-4, MCS 1-9
    - SRB loopback and test mode B
    - 8-bit, 11-bit RACH
    - PBCCH support
    - 1 phase/2 phase access procedures
    - Link adaptation and IR
    - NACC, extended UL TBF
    - Mobile Station Class B
    - CSD:
      - V.110, RLP, non-transparent
      - 14.4kbps
      - USSD

### GPS features

- **Protocol**
  - NMEA
- **Modes**
  - Standalone GPS, Assisted GPS (control plane AGPS, E911 / user plane AGPS, gpsOneXTRA™)
- **General**
  - Power saving modes
  - GPS tracking in parallel to 2G/3G diversity operation

### Software

- **AT commands**
  - Hayes, 3GPP TS 27.007 and 27.005, and proprietary Cinterion Wireless Modules commands
- **SIM application toolkit**
  - SAT Release 99
- **Audio**
  - Audio speech codecs
    - GSM: AMR, EFR, FR, HR
    - 3GPP: AMR
  - Speakerphone operation, echo cancellation, noise suppression
- **Firmware update**
  - Generic update from host application over ASC0 or USB

### Interfaces

- **Module interface**
  - 80-pin board-to-board connector
- **Antenna**
  - 50Ohms. Main GSM/UMTS antenna, UMTS diversity antenna, GPS antenna (active/passive)
### Lithium-Ion 2400 mAh Battery Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number</td>
<td>RV3005</td>
</tr>
<tr>
<td>Part Number</td>
<td>1100911-000</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Lithium-Ion (Li-Ion)</td>
</tr>
<tr>
<td>Battery Voltage</td>
<td>2.7 V ~ 4.2 V (minimum ~ maximum)</td>
</tr>
<tr>
<td></td>
<td>3.7 V (nominal)</td>
</tr>
<tr>
<td>Capacity</td>
<td>2300 mAh/8.5 Whr (typical)</td>
</tr>
<tr>
<td></td>
<td>2400 mAh/8.8 Whr (minimum)</td>
</tr>
<tr>
<td>Charge Current</td>
<td>1.15 A (typical)</td>
</tr>
<tr>
<td>Charge Voltage</td>
<td>4.2 V +/- 0.05</td>
</tr>
<tr>
<td>Charge Method</td>
<td>Constant-current/constant-voltage (CC/CV)</td>
</tr>
<tr>
<td>Discharge Current</td>
<td>1.15 A (typical)</td>
</tr>
<tr>
<td></td>
<td>2.8 A (maximum)</td>
</tr>
<tr>
<td>Internal Resistance</td>
<td>135 mΩ (typical)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20°C to +60°C (-4°F to +140°F)</td>
</tr>
<tr>
<td>Charge temperature</td>
<td>0°C to +45°C (32°F to +113°F) (typical)</td>
</tr>
<tr>
<td>Discharge Temperature</td>
<td>-20°C to +60°C (-4°F to +140°F) (typical)</td>
</tr>
<tr>
<td>Charge Taper Current</td>
<td>48 ~ 120 mA</td>
</tr>
<tr>
<td>Charge Time</td>
<td>3 hrs. (typical)</td>
</tr>
<tr>
<td>Pre-condition Charge Current</td>
<td>200 ~ 240 mA</td>
</tr>
<tr>
<td>Pre-condition Charge Termination Voltage</td>
<td>3 V</td>
</tr>
<tr>
<td>Cycle Life</td>
<td>300 charge/discharge cycles with no degradation below 80% of nominal capacity based on 0.5 C charge / 0.5 C discharge rates (to 3.0 V) @ 23°C.</td>
</tr>
</tbody>
</table>
Appendix B: EP10 Specifications

Lithium-Ion 3600 mAh Battery Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number</td>
<td>RV3010</td>
</tr>
<tr>
<td>Part Number</td>
<td>1100912-000</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Lithium-Ion (Li-Ion)</td>
</tr>
<tr>
<td>Battery Voltage</td>
<td>2.7 V ~ 4.2 V (minimum ~ maximum)</td>
</tr>
<tr>
<td></td>
<td>3.7 V (nominal)</td>
</tr>
<tr>
<td>Capacity</td>
<td>3600 mAh/13.32Whr (typical)</td>
</tr>
<tr>
<td></td>
<td>3450 mAh/12.76 Whr (minimum)</td>
</tr>
<tr>
<td>Charge Current</td>
<td>1.72 A (typical)</td>
</tr>
<tr>
<td>Charge Voltage</td>
<td>4.2V +/- 0.05</td>
</tr>
<tr>
<td>Charge Method</td>
<td>Constant-current/constant-voltage (CC/CV)</td>
</tr>
<tr>
<td>Discharge Current</td>
<td>1.72 A (typical)</td>
</tr>
<tr>
<td></td>
<td>2.8 A (maximum)</td>
</tr>
<tr>
<td>Internal Resistance</td>
<td>125 mΩ (typical)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20°C to +60°C (-4°F to +140°F)</td>
</tr>
<tr>
<td>Charge Temperature</td>
<td>0°C to +45°C (32°F to +113°F) (typical)</td>
</tr>
<tr>
<td>Discharge Temperature</td>
<td>-20°C to +60°C (-4°F to +140°F) (typical)</td>
</tr>
<tr>
<td>Charge Taper Current</td>
<td>48 ~ 120 mA</td>
</tr>
<tr>
<td>Charge Time</td>
<td>3 hrs. (typical)</td>
</tr>
<tr>
<td>Pre-condition Charge Current</td>
<td>300 ~ 360 mA</td>
</tr>
<tr>
<td>Pre-condition Charge Termination Voltage</td>
<td>3 V</td>
</tr>
<tr>
<td>Cycle Life</td>
<td>300 charge/discharge cycles with no degradation below 80% of nominal capacity based on 0.5 C charge / 0.5 C discharge rates (to 3.0 V) @ 23°C.</td>
</tr>
</tbody>
</table>

B.5 Internal Imager

This section lists specifications for the EA11 Decoded 2D imager.

B.5.1 EA11 Decoded 2D Imager

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan Rate</td>
<td>2D mode: 56 images/s auto adaptive</td>
</tr>
<tr>
<td>Linear Emulation Mode</td>
<td>200 scans/s auto adaptive</td>
</tr>
<tr>
<td>Scan Angle</td>
<td>38.9° (horizontal), 25.4° (vertical)</td>
</tr>
<tr>
<td>Optical Resolution</td>
<td>752 (H) x 480 (V) pixels, 256 gray levels</td>
</tr>
<tr>
<td>Print Contrast</td>
<td>Down to 25%</td>
</tr>
<tr>
<td>Versions</td>
<td>Standard range and high density</td>
</tr>
</tbody>
</table>
### EA11 Decoded 2D Imager

#### B.5.1.1 EA11 Typical Reading Distances

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbologies - 1D</td>
<td>EAN/UPC, GS1 Databar (limited expanded &amp; omni-directional), RSS, Code 39,</td>
</tr>
<tr>
<td></td>
<td>2 of 5, Codabar, Code 93/93i, Code 11, MSI, Plessey, Telepen, postal codes</td>
</tr>
<tr>
<td></td>
<td>(Australian Post, BPO, Canada Post, Dutch Post, Japan Post, PostNet, Sweden Post)</td>
</tr>
<tr>
<td>Symbologies - 2D</td>
<td>Data Matrix, PDF417, Micro PDF 417, Codablock Maxicode, QR, Aztec GS1 composite codes</td>
</tr>
<tr>
<td>Voltage (optics)</td>
<td>3.3V -5% / +10% (typical values)</td>
</tr>
<tr>
<td>Operating Current</td>
<td>170mA - 310mA (lighting condition dependent)</td>
</tr>
<tr>
<td>Power Saving Mode</td>
<td>2mA</td>
</tr>
<tr>
<td>Ambient Light</td>
<td>Works in any lighting conditions, from 0 to 100,000 lux</td>
</tr>
<tr>
<td>Regulatory Approvals</td>
<td>UL, VDE certified, RoHS compliant</td>
</tr>
</tbody>
</table>

---

**EA11 Standard Optics**

**EA11 High Density Optics**
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You acknowledge that you have read this Agreement, understand it, and that it is the complete agreement between you and Psion with respect to the subject matter hereof and supersedes all prior agreements, oral or written.
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