



**PS080, PowerTool™ 800
Development Software
User's Guide**

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip's products as critical components in life support systems is not authorized except with express written approval by Microchip. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

Trademarks

The Microchip name and logo, the Microchip logo, Accuron, KEELOQ, MPLAB, PIC, PICmicro, PowerSmart and SmartShunt are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SmartSensor and The Embedded Control Solutions Company are registered trademarks of Microchip Technology Incorporated in the U.S.A.

PowerCal, PowerInfo, PowerMate, PowerTool, Select Mode, Smart Serial and SmartTel are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2005, Microchip Technology Incorporated. Printed in the U.S.A., All Rights Reserved.



Printed on recycled paper.

Chapter 1. Preface

Features

- Supports user-friendly environments for development of battery systems incorporating Microchip's PS8XX IC family
- Microsoft® Windows® XP compatible
- Interfaces to PS8XX using Microchip PowerInfo™ 2 or PowerCal™ 2 hardware
- Direct input of system parameters in battery cell specified units
- Advanced interactive editor allows quick IC configuration
- Logs reported parameters during discharge test for PS8XX device-based battery systems
- Verifies proper assembly and correct communication
- Can be used without hardware to develop configuration files for PS8XX

Ordering Information

Part No.	Description
PS080	PowerTool™ 800 Development Software

Supported Hardware

Part No.	Description
PS051	PowerInfo™ 2 Interface Board
PS052	PowerCal™ 2 Calibration Board
PS8070	PS8XX Fuel Gauge Evaluation Board

NOTES:

Chapter 2. Overview

2.1 GENERAL OVERVIEW

PowerTool 800 is a Windows XP compatible software package that supports the rapid development and production of rechargeable battery systems based on Microchip's PS8XX ICs. PowerTool 800 simplifies the design process by providing a high-level, menu driven environment that allows the designer to quickly and easily develop, calibrate and test PS8XX device-based battery systems.

PowerTool 800 software interfaces to the battery system through the PowerInfo 2 interface board and PowerCal 2 calibration board. Dual data screens for raw and calculated data provide a user-friendly environment for design and debug.

During development, configuration defaults allow quick setup of PS8XX controlled systems. A simple parameter editor and an enhanced, interactive wizard help tailor the IC to the specific needs of the application and battery. Entry of battery parameters is performed using battery cell specified units, such as volts (V), millivolts (mV), milliamperes (mA) and milliampere-hours (mAh). The PowerTool 800 interface is divided into several pages which give access to a variety of fuel gauge functions.

With all of its advanced features, PowerTool 800 software increases the value of the complete Microchip battery management solution by lowering the costs associated with development, minimizing time to market and maximizing production throughput. PowerTool 800 software is offered free of charge and is available for download on the Microchip web site. It is also included with Microchip's hardware development tools summarized in Table 5-1. The following is a very brief overview of PowerTool 800 features. Please use the HTML Helpfile for additional information. It can be activated by clicking "Help" in the lower right corner of PowerTool 800.

2.1.1 Configuration Wizard

Upon initial start-up of PowerTool 800, the configuration wizard begins. This five-step wizard guides you through basic PS8XX configuration. Click "Step 1" to begin.

NOTES:

Chapter 3. Manufacturing Mode

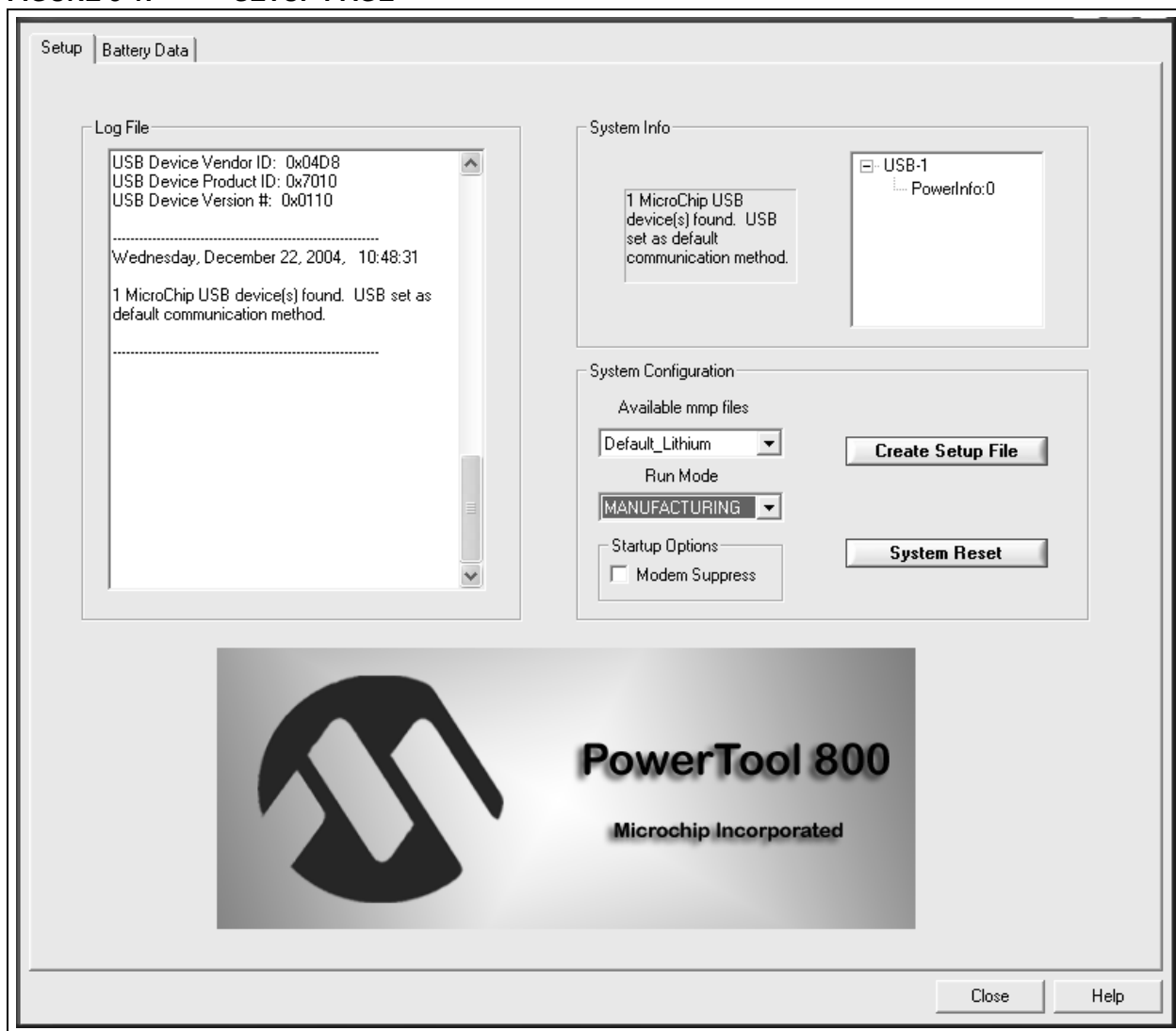
3.1 MANUFACTURING MODE

PowerTool 800 can be run in Manufacturing or Advanced Configuration mode. Manufacturing mode is typically used in production environments to limit access to only the programming and calibration functions.

3.1.1 Setup Page

Page which contains detailed operation log, Run mode selection, system information and software Reset.

FIGURE 3-1: SETUP PAGE



3.1.2 Battery Data Page

Read all battery data values which are available over the communication interface. Write the values to a file and read and log data continuously from this page.

FIGURE 3-2: BATTERY DATA PAGE

Setup Battery Data

Port 1

Temperature		AbsoluteSOC		CycleCount		ManufID	
Voltage		RemCap		DesignCap		DeviceID	
Current		FullChargeCap		CoinVoltage		KEELOQ	
AvgCurrent		AvgTTEmpty		ManufDate		GPIO	
RelativeSOC		BatteryStatus		SerialNumber			

PowerTool 800 Battery Data

Read Registers Read Continuous Clear Registers Write Screen To ASCII

Close Help

3.1.3 Calibration Page

Set up and perform parameter initialization, calibration and testing. Use the View buttons to display the various routines. Click "Start" to write the configuration hexa-decimal data file and fuel gauge created with the wizard and the date (the green buttons indicate that these two functions are enabled) to PS8XX memory.

Chapter 4. Advanced Configuration Mode

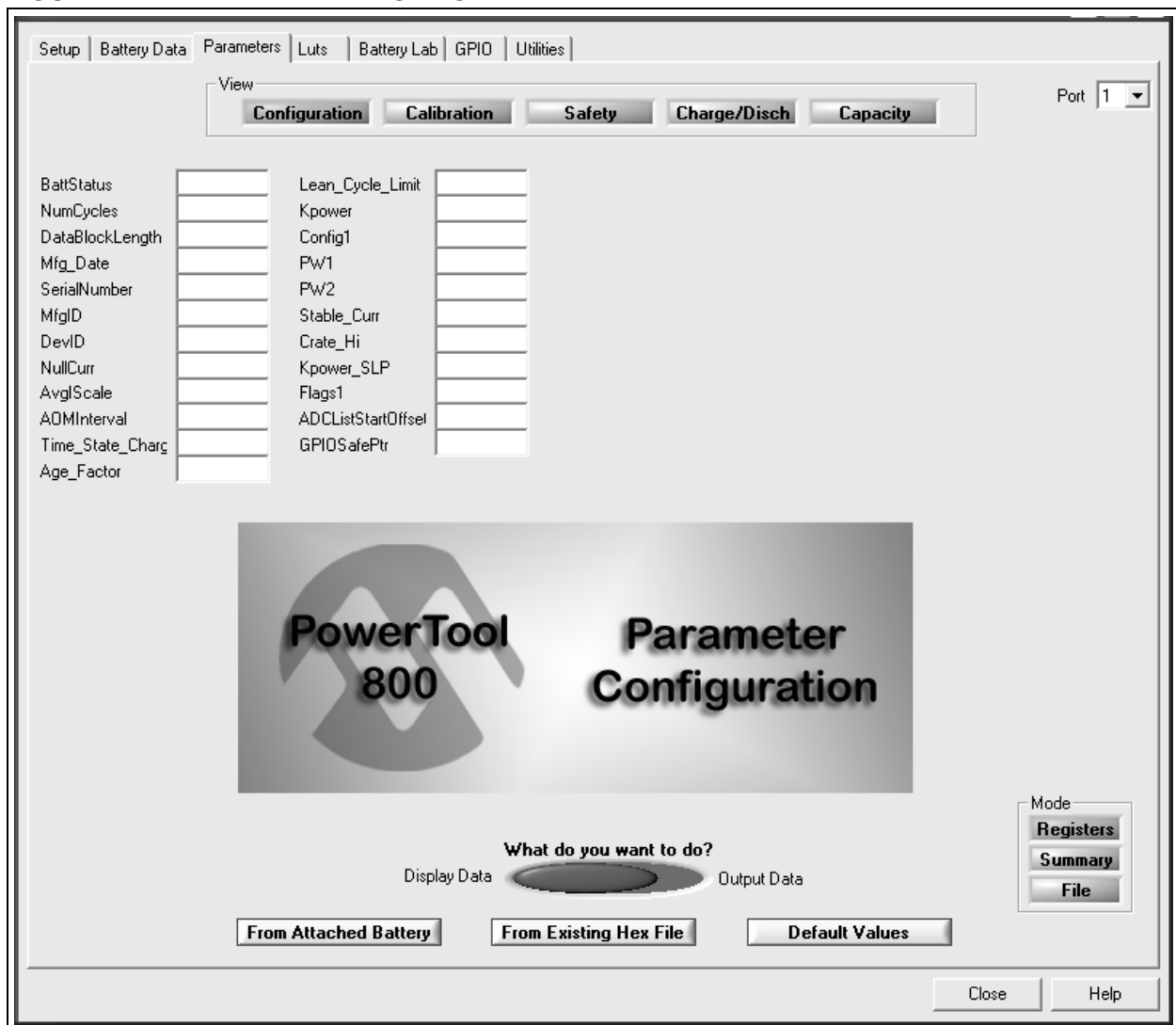
4.1 ADVANCED CONFIGURATION MODE

PowerTool 800 can be run in Manufacturing or Advanced Configuration mode. Advanced Configuration mode is typically used by engineers during system development and testing. Advanced Configuration mode includes the pages available in Manufacturing mode and those explained in this section.

4.1.1 Parameters Page

Read and write all memory locations. Use buttons in the View box to display parameters in various categories. Click in the value text box of any parameter to display a description.

FIGURE 4-1: PARAMETERS PAGE



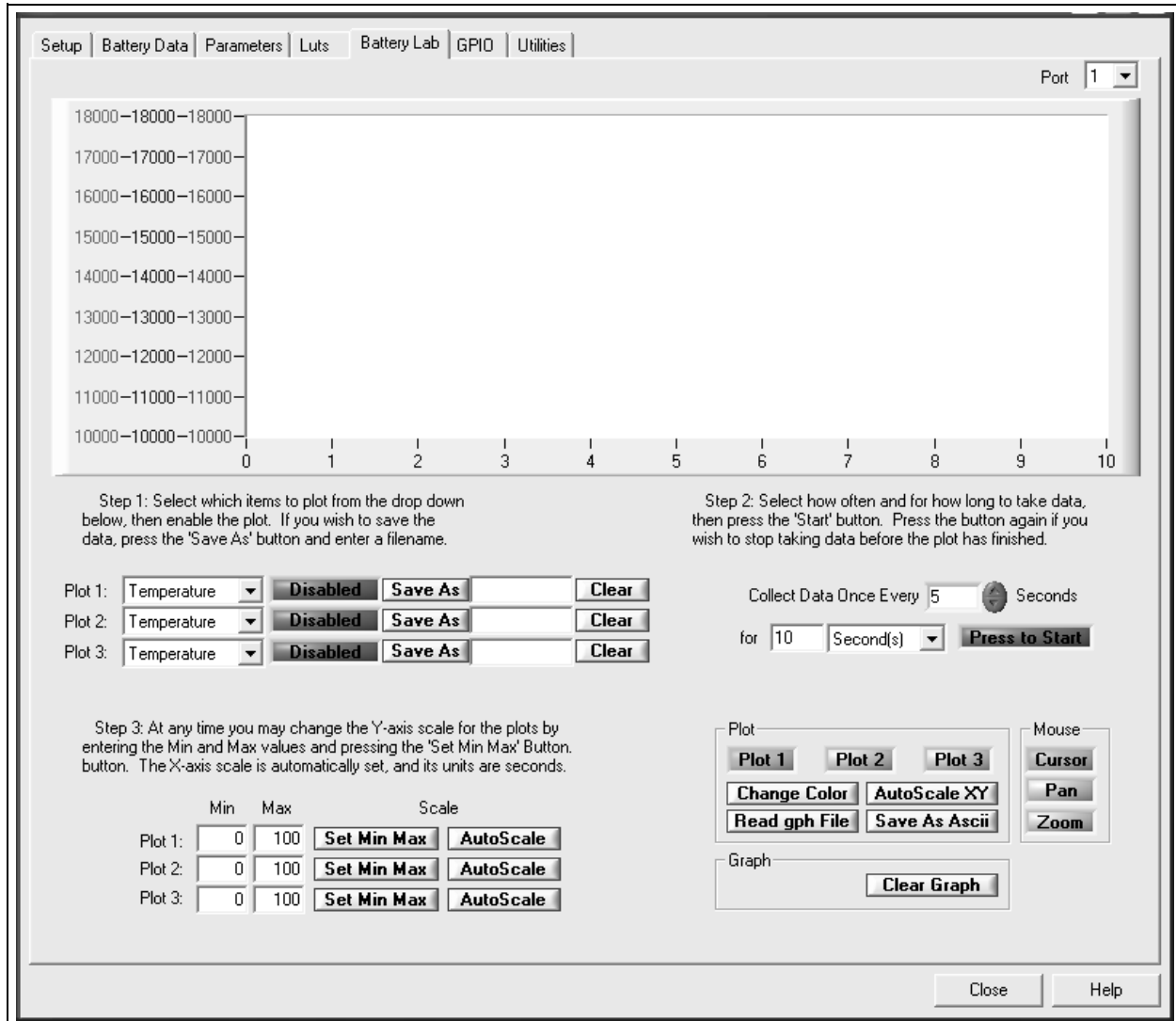
The modeled cell data is displayed here in raw (internal units) or decoded format.

[illegible]

4.1.3 Battery Lab Page

Graphical data can be collected and saved using the integrated plot utility.

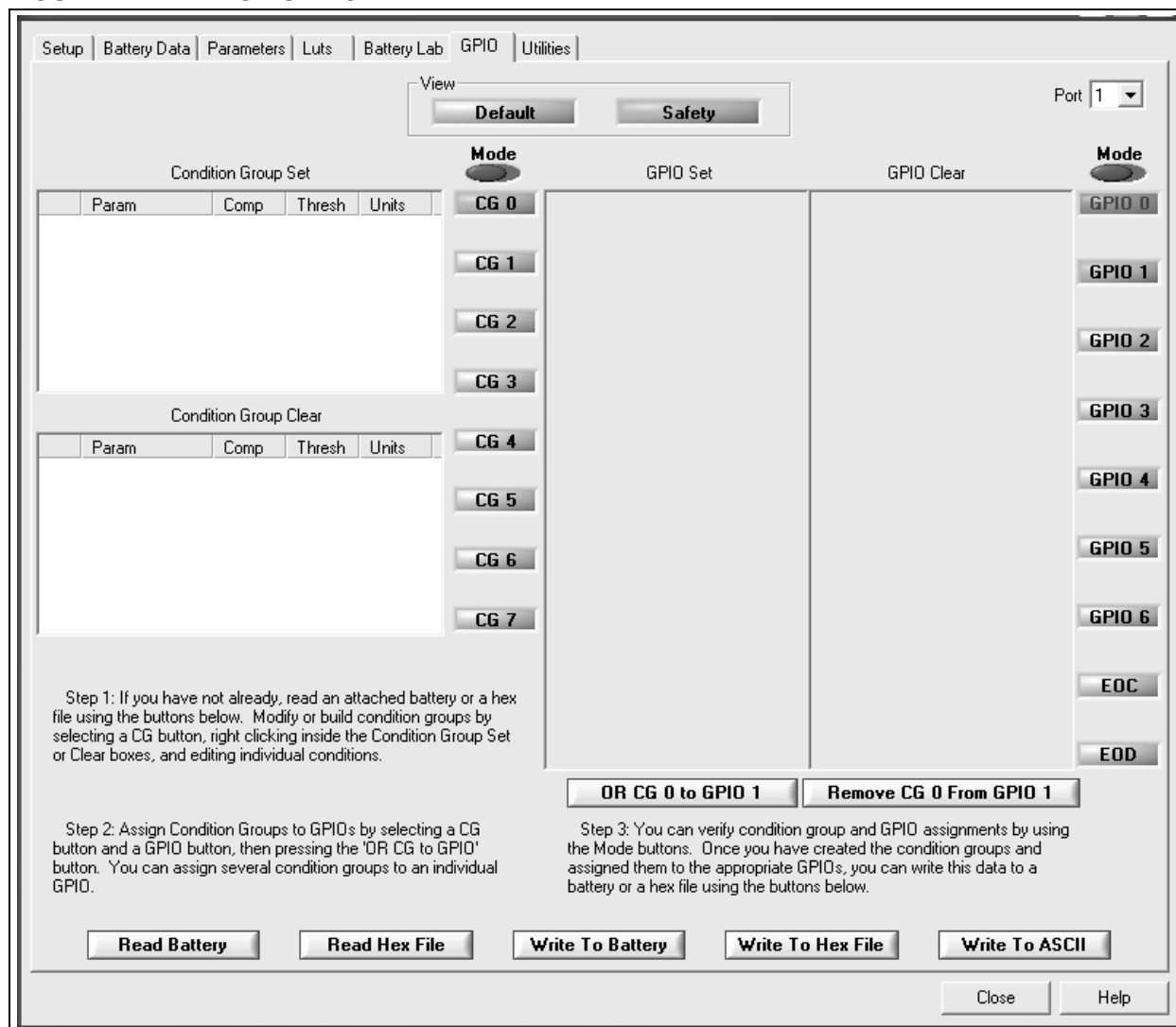
FIGURE 4-3: BATTERY LAB PAGE



4.1.4 GPIO Page

The general purpose I/Os are configured with the utility on this page. It is very flexible and allows the user to easily set up complex conditions to set and clear the GPIO pins.

FIGURE 4-4: GPIO PAGE



4.1.5 Utilities Page

Various utilities related to the power controller boards, PowerInfo 2 and PowerCal 2, are located here.

FIGURE 4-5: UTILITIES PAGE

Setup | Battery Data | Parameters | Luts | Battery Lab | GPIO | Utilities |

Port 1

PowerController

These operations allow you to display information about the powercontroller, download new firmware, and perform basic diagnostics. Activity is displayed in the text box to the right and automatically written to the log file.

- PwrController Info
- Cal Factor Check
- LED Test
- COM Test
- TPIN Test
- Download F/W
- VPP Off

Attach battery first

Detach battery first

Clear All

PS8xx

These diagnostics perform pass/fail tests on various functions of the PS8xx. Activity is displayed in the text box to the left and is automatically written to the log file.

- P8 Status
- P8 Version Info
- P8 FDB Pointer
- P8 Reset
- P8 Unlock
- Enter Bootloader Mode
- Exit Bootloader Mode
- SCLSET Cmd
- Trigger GPIO 0

PowerCal Calibration

To calibrate PowerCal, select parameter to calibrate, press 'Begin' and follow instructions. Old and new calibration factors are displayed on the right and automatically written to the log file.

Parameter to Calibrate	Instructions	Old	New
VPack	Press 'Begin' to begin calibration.	CO:	
Actual		CF:	

Begin

Start Over

Close Help

NOTES:

Chapter 5. Development Tools

5.1 DEVELOPMENT TOOL SUMMARY

Microchip provides all the necessary hardware and software to enable easy tailoring of charging, battery control algorithm parameters and cell performance models to meet specific application requirements and attain the highest accuracy available anywhere. Table 5-1 summarizes the development tool offering from Microchip to support the PS8XX family. Please refer to the Microchip web site for ordering information and design documentation (including schematics) at www.microchip.com.

TABLE 5-1: MICROCHIP DEVELOPMENT TOOL SUMMARY

Development Tool	Use
PowerInfo™ 2 hardware with PowerTool™ 800 software (PS051)	Read and write memory and test
PowerCal™ 2 hardware with PowerTool™ 800 software (PS052)	Read and write memory, calibration and test



WORLDWIDE SALES AND SERVICE

AMERICAS

Corporate Office

2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
<http://support.microchip.com>
Web Address:
www.microchip.com

Atlanta

Alpharetta, GA
Tel: 770-640-0034
Fax: 770-640-0307

Boston

Westford, MA
Tel: 978-692-3848
Fax: 978-692-3821

Chicago

Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Dallas

Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit

Farmington Hills, MI
Tel: 248-538-2250
Fax: 248-538-2260

Kokomo

Kokomo, IN
Tel: 765-864-8360
Fax: 765-864-8387

Los Angeles

Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608

San Jose

Mountain View, CA
Tel: 650-215-1444
Fax: 650-961-0286

Toronto

Mississauga, Ontario,
Canada
Tel: 905-673-0699
Fax: 905-673-6509

ASIA/PACIFIC

Australia - Sydney

Tel: 61-2-9868-6733
Fax: 61-2-9868-6755

China - Beijing

Tel: 86-10-8528-2100
Fax: 86-10-8528-2104

China - Chengdu

Tel: 86-28-8676-6200
Fax: 86-28-8676-6599

China - Fuzhou

Tel: 86-591-8750-3506
Fax: 86-591-8750-3521

China - Hong Kong SAR

Tel: 852-2401-1200
Fax: 852-2401-3431

China - Shanghai

Tel: 86-21-5407-5533
Fax: 86-21-5407-5066

China - Shenyang

Tel: 86-24-2334-2829
Fax: 86-24-2334-2393

China - Shenzhen

Tel: 86-755-8203-2660
Fax: 86-755-8203-1760

China - Shunde

Tel: 86-757-2839-5507
Fax: 86-757-2839-5571

China - Qingdao

Tel: 86-532-502-7355
Fax: 86-532-502-7205

ASIA/PACIFIC

India - Bangalore

Tel: 91-80-2229-0061
Fax: 91-80-2229-0062

India - New Delhi

Tel: 91-11-5160-8631
Fax: 91-11-5160-8632

Japan - Kanagawa

Tel: 81-45-471- 6166
Fax: 81-45-471-6122

Korea - Seoul

Tel: 82-2-554-7200
Fax: 82-2-558-5932 or
82-2-558-5934

Singapore

Tel: 65-6334-8870
Fax: 65-6334-8850

Taiwan - Kaohsiung

Tel: 886-7-536-4818
Fax: 886-7-536-4803

Taiwan - Taipei

Tel: 886-2-2500-6610
Fax: 886-2-2508-0102

Taiwan - Hsinchu

Tel: 886-3-572-9526
Fax: 886-3-572-6459

EUROPE

Austria - Weis

Tel: 43-7242-2244-399
Fax: 43-7242-2244-393

Denmark - Ballerup

Tel: 45-4450-2828
Fax: 45-4485-2829

France - Massy

Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Ismaning

Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Italy - Milan

Tel: 39-0331-742611
Fax: 39-0331-466781

Netherlands - Drunen

Tel: 31-416-690399
Fax: 31-416-690340

England - Berkshire

Tel: 44-118-921-5869
Fax: 44-118-921-5820

10/20/04