

EV2200-18

Evaluation System User Guide

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Introduction

The bq2018 PowerMinder[™] IC provides a battery-powered system with accurate charge and discharge counting of coulomb counting. The bq2018 works with an intelligent host controller to form a complete battery monitor/fuel gauge system.

General Description

The EV2200-18 is an evaluation and demonstration system for the bq2018 PowerMinder device. It has been designed to demonstrate the functionality of the bq2018 within a battery system, and also allow flexibility for the user to configure the system to their own requirements for true application evaluation.

Kit Contents

The EV2200-18 contains the following items:

- 1 EV2200 Interface Board
- 1 Serial PC cable
- 3 Software disks entitled EV2200-18 Software

This kit should be used in conjunction with the bq2018 data sheet for reference.



Hardware and Software Setup

For the board to work correctly, an IBM PC-AT compatible computer with an available serial port is required. This computer can be running under either Windows 3.x or Windows95, with approximately 5M bytes of hard disk space required for a full installation.

Hardware Installation

PC Connection:

The serial cable should be connected between the spare serial communications (COM) port on the PC and the 9pin D-type connector on the EV2200 interface board. Your computer manual shows the COM port locations if you are unsure.

bq2018 Connection

Connect a bq2018-based circuit, such as the bq2118, to the EV2200. Only two connections on the EV2200 are required for this operation, SMBD/HDQ1 and VSS. These two connections should be made to the HDQ and GND connections on the bq2018-based module, respectively. The bq2018 circuit should be powered correctly, as detailed in the bq2018 data sheet.

Note: The hardware should be connected correctly and powered *before* the EV2200–18 software is run.

EV2200-18

Software Installation

The following steps install the EV2200 software,

- 1. Insert disk 1 into a 3 ½ inch floppy drive.
- 2. Select the 3 ½ inch drive using **My Computer** or **File Manager**.
- 3. Double-click on the **Setup.exe** icon.
- 4. The setup program prompts for the remaining disks and installs a Windows application group.

Starting the Program

The installation process creates an icon labeled *Ev2018ev.* Find this icon and double-click on it. The evaluation software loads in 3 to 10 seconds, depending on the speed of the PC.

During this time the EV2200 software is testing the communications to the EV2200. The subsequent message indicates the board status. After the communications port is detected, the software displays the **bq2018 Registers screen**. See Figure 1.

If you do not see the **bq2018 Registers screen**, see the *Troubleshooting Guide*.

bq	2018 Informa	tion Scre	en					
File	e Options Co	ommunicatio	on Help A	About				
2	018 Register	s	Graphs	Read/W	'rite Regs.	Se Se	etup	All Ram
[- 2018 Register:	s		User Def	ined Ram Lo	cations		-Polling
	⊙ Dec (C Hex	C Preferred	O Dec	CHex	-		Enable Polling
	Location	Value		Location	Value	C	Preferre	Poll User RAM
	DCR	1	7e/7f 🗖			Byte 💌] 🗆	15 Sec
	CCR	0	7c/7d 🗖	0	0	Byte 💌] 🗆	\Box
	SCR	0	7a/7b 🗖		0	Byte 💌] 🗆	
	DTC	225	78/79	0	0	Byte 💌] 🗆	Scan Registers
	CTC	0	76/77	0	0	Byte 💌] 🗆	Scan User Loc
	MODE/WOE	15	75 🗖	0	0	Byte 💌] 🗆	
	TMP/CLR	64	74 🗖	0	0	Byte 💌] 🗆	
	OFR	-85	73 🗖	0	0	Byte 💌] 🗆	Log Count:
l r								

Figure 1. bq2018 Registers Screen

Software Instructions

When the software is running, you can select 5 tabs: 2018 Registers, Graphs, Read/Write Regs., Setup, and All Ram.

Setup Screen

Enter the Battery Capacity and the R_{SNS} value in $m\Omega$ on this screen. See Figure 2. You can also format the graph axis here. After the correct settings have been entered you can save the settings by clicking on the **Write Settings to File** button and click on the **Initialize Battery** button to ensure these values are used.

2018 Registers	Graphs	Read/Write	Regs.	Setup	All Ram
Battery		1	Evaluation	Graph	
Battery Capacity	600	MAH	Number of	Graph Points	20
Sense Resistor	50	mOhm	Y Axis	 Relative 	C Absolute
			X Axis	• Time up	C Time Down
				C Count up	C Count Down
			Write Setti	ings to File	Initialize Battery
		Ē	Modem St	tatus	
			Sync 1	Byte Lost	
Program Suggeted	d Ram Locations	istor C	iitialize B	attery perform	s:
Program Suggeter Loc O Charge C Loc 1 Flag Regi	d Ram Locations ompensation Reg ister	jister S	iitialize B et NAC to et CAP to	attery perform Value in Batt 0	s: ery Capacity
Program Suggeter Loc O Charge C Loc 1 Flag Regi Loc 2/3 NAC Nom	d Ram Locations ompensation Reg ister inal Available Ca	jister S Spacity C	iitialize B et NAC to et CAP to alculate a	attery perform) Value in Batt) O and Set LMD	s: ery Capacity
Program Suggeter Loc O Charge C Loc 1 Flag Regi Loc 2/3 NAC Nom Loc 4/5 CAP Capa	d Ram Locations ompensation Reg ister iinal Available Ca acity	ister S S Ipacity C S	iitialize B et NAC to et CAP to alculate a et SRL	attery perform) Value in Batt) O and Set LMD	s: ery Capacity
Program Suggeted Loc 0 Charge C Loc 1 Flag Regi Loc 2/3 NAC Nom Loc 4/5 CAP Cap Loc 6/7 LMD Last	d Ram Locations ompensation Reg ister inal Available Ca acity t Measured Disch	jister Si spacity C sarge Si	itialize B et NAC to et CAP to alculate a et SRL et SDR to	attery perform) Value in Batt) O and Set LMD) 9	s: ery Capacity

Figure 2. Setup Screen

bq2018 Registers Screen

The register section at the top of this screen is common to the Graphs and the Read/Write Regs. tabs. In the register display section, each of the allocated bq2018 registers can be viewed in hexadecimal (Hex) or decimal (Dec). Ten-user locations can also be monitored. To update each register, click on the **Scan Registers** or **Scan User Loc** buttons. This can be made automatic by checking the **Enable Polling** or **Poll User RAM** buttons, respectively. The period of each scan is set in the timing box provided beneath the automatic polling check boxes. At the bottom of this screen is shown the data being collected when the data logging is active. Click the **Turn Log On** button and follow the instructions on the screen to activate this function. See Figure 3.

bq	2018 Informa	ation Scre	en					_ 🗆 🗵
File 2	018 Begister	ommunicati	on Help AD Graphs	Bead/w	rite Reas.	<u>Y</u>	Setup	All Bam
::::	- 2018 Registe	rs		User Def	ined Ram Lo	i cations -		Polling
	• Dec	CHex	C Preferred	• Dec	CHex			Enable Polling
	Location	Value		Location	Value		C Preferre	Poll User HAM
	DCR	4	7e/7f 🗖	0	0	Byte	┓□	
	CCR	0	7c/7d	0	0	Byte		\square
	SCR	0	7a/7b	0	0	Byte	J 🗆	
	DTC	1673	78/79	0	0	Byte	•	Scan Registers
	CTC	0	76/77	0	0	Byte	•	Scan User Loc
	MODE/WO	E 15	75 🗖	0	0	Byte		Turnlog On
	TMP/CLR	64	74 🗖	0	0	Byte	•	
	OFR	-85	73 🗖	0	0	Byte	•	Log Count:
E F								

Figure 3. bq2018 Registers Screen

Rev. B Board

Graphs Screen

Below the register set display on this tab is shown a graph. The user chooses the data for this graph by checking the appropriate box on the right of the register desired. Any of the registers can be displayed and as many together as the user desires. An example of the Graph feature is shown in Figure 4.



Figure 4. Graphs Screen

Read/Write Regs Screen

The function of this tab is to allow the user to program any of the data registers, counters, and control registers within the bq2018. Use the memory map in the bq2018 data sheet for a guide to their individual uses. Simply enter the address and any data (for Writes) and click the appropriate button. The control registers will show the binary version below the address and data entry boxes to give a guide as to the state of the device at that time. See Figure 5.

018 Begisters	Granh	Bead	rite Beas	Setu	Ň	All Bam
2018 Registers		User Defi	ned Ram Lo	cations	- Pol	ina
Dec Cl	Hex C Prefe	rred C Dec	C Hex			Enable Polling
Location	lí skup	Location	Value	C Pre	erre 🔽 I	Poll User RAM
DCR	322 7e/7			Bute 🔽 🛙	- 5	Sec
CCR	0 7c/7			Ruto V	-	(
SCR	0 7a/7			Ruto V	-	
DIC	3115 78/7			Dute I	- s	can Registers
CTC	0 76/7			Dute -		
MODEAVOE	15 75			Byte I	_	can User Loc
TMP/CLP	74			Byte		Turn Log On
orp	64 74			Byte		
UFR	-85 73		0	Byte 💌	Log	i Count:
	1	Address		Conte	nts	
Send Break	read	Dec		Dec		
·		U		- Hau		
Initialize All Memory	write	1100		1165		
momory						

Figure 5. Read/Write Regs Screen

All Ram Screen

The bq2018 has a section of RAM that is available to the user for adding extra features such as serial number storage and configuration data storage. By clicking the Read RAM button all the data in memory will be shown. Using the Read/Write Regs tab gives access to all of these locations. See Figure 6.

Troubleshooting Guide

 ${\bf Q}$ – Why can't my software communicate with the EV2200 interface board?

 ${\bf A}$ – If you are shown the screen in Figure 7 when you first clicked on the Ev2018ev icon, the serial link is not connected correctly. Secure the serial cable connection at the EV2200 and the PC and check with the computer manual to verify the COM port selection.

bq	20	18 Inf	ormati	ion So	reen											-	
Fil	e I	Options	: Con	nmunic	ation	Help	Abou	1									
2	01	8 Reg	isters	ľ	Gr	aphs	ľ	Read	Write	Regs.	ľ	Sel	tup	ľ	A	ll Ran	n Ì
								R	ead R/	M							
		0	1	2	3	_4	5	6	7	8	9		В	<u> </u>	D	E	F
	0	00	00	58	02	00	00	60	09	32	09	AA	BF	33] 1F	8D	FB
	10	F1	2D	B3	C4	C7	FF	28	7B	13	DE	7B	EF	C5	77	7F	70
	20	CB	74	DE	71	DF	DE	EC	7D	FD	58	7F	28	2B	E3	FB	8F
	30	9F	FC	DF	7E	AE	FB	5E	EF	FF	6E	DF	B9	3B	30	3D	3E
	40	9F	AA	9E	FE	69	68	3E	F4	B3	3D	E2	DE	C9	D5	EE	75
	50	7F	25	77	BF	<u>89</u>	13	F9	F6	FE	B5	73	DA	D9	D9	F2	EE
	60	FE	FF	D5	EC	62	E1	EA	EF	00	2A	OB	FF	38	E9	EC	AC
	70	66	7D	FO	AB	40	OF	00	00	72	OD	00	00	00	00	42	01
	E.	Progra	m Su	aaete	d Ran	n Loca	ations										
		_oc 0 _oc 1 _oc 2/ _oc 4/ _oc 6/ _oc 8 _oc 9	Cha Flag 3 NA 5 CAI 5 CAI 7 LM SRI SDI	arge C g Reg C Nor P Cap D Las L Sen R Sell	Compe ister ninal / acity t Mea se Re Disc	nsatic Availa sured sistor harge	on Reg ble Ca Disch Value Rate	gister apacit aarge	y	Sugg 2018	ested Regi	l Ram sters	Loca	tions			

Figure 6. All RAM Screen

Communications
Eval not detected
Evaluation Board is connected to : -none-
Board Detection
Continue with program
Retry Autodetection
Force Detection on a Port
Abort Program

Figure 7. Board Detection Screen

 ${\rm Q}$ – The EV2200 is communicating properly but the data registers are all FFh (255 Dec); see Figure 8. What is wrong?

A – The problem here is that the HDQ interface between the bq2018 and the EV2200 is not functioning. Ensure that the bq2018 and EV2200 are connected correctly and the bq2018 circuit is powered correctly. The bq2018 IC must see a potential of 3.0–3.9V on V_{CC} (pin 2) for proper operation.

018 Registers) G	iraphs	Read/w	rite Regs	.)	Setup	All Ram
- 2018 Registers -			User Def	ined Ram L	ocations		Polling
C Dec 🔹 💽	Hex C	Preferred	• Dec	CHex		_	Enable Polling
Location	Value		Location	Value		C Preferre	Poll User RAM
DCR	FFFF	7e/7f 🥅	0	255	Byte		
CCR	FFFF	7c/7d 🦵	0	255	Byte		G
SCR	FFFF	7a/7b 🥅	0	255	Byte		
DTC	FFFF	78/79 🗖	0	255	Byte		Scan Registers
CTC	FFFF	76/77 🗖	0	255	Byte		Scan User Loc
MODE/WOE	FF	75 🗖	0	255	Byte	≣⊏∣	
TMP/CLR	FF	74 🗖	0	255	Byte	ਙਿ⊏∣	Turn Log On
OFR	FF	73 🗖	0	255	Byte	Ī -	Log Count:

Figure 8. bq2018 Registers Screen

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