

11/06/2019
 Bq studio 1.3.54.1
 EV2400
 Bq34Z100G1
 Before Voltage calibration :

Battery Management Studio (bqStudio) 1.3.54.1

File View Window Help

Charger Registers Data Memory Registers Commands FOD Resistor Calibration Calibration Calibration bq78350 Calibration bq78350_R1 Authentication Authentication Seal_Unseal Advanced Comm SMB Advanced Comm Chemistry One Time Programmable Memory Field Programmer Firmware WPKD Sec to FlashStream HDQ I2C To HDQ GPCPackager Watch Watch Data Graph

Battery Management Studio Perspective

Dashboard

Auto Refresh is ON. Click to Turn OFF
 bqStudio Version: 1.3.54.1

EV2400
 Version:0.28

I2C

bq34z100G1
 0100_0_16
 Addr: 0xAA
 18.7 °C

3997 mV
 79%

Manual Control Panel

Enter Cmd Delay Ms Access Style
 1000 1

Read Addr Length

Log Panel

Transaction Log

Name	Cmd	Result	Read A...

Registers

Registers

Name	Value	Units
Control	0x0014	Hex
State Of Charge	79	%
Max Error	100	%
Remaining Capacity	760	mAh
Full Charge Capacity	974	mAh
Voltage	3997	mV
Current	0	mA
Average Current	0	mA
Temperature	18.7	°C
Average Time to Empty	65535	Min

Name	Value	Units
Average Time to Full	65535	Min
Available Energy	2851	mWhr
Average Power	0	mW
Internal Temperature	19.5	°C
Cycle Count	0	Counts
State Of Health	61	%
Charge Voltage	4200	mV
Charge Current	800	mA
Grid Number	0	-
Learned Status	0	hex

Name	Value	Units
DoDatEOC	112	-
Qstart	214	mAh
True RC	760	mAh
True FCC	974	mAh
State Time	131	sec
DOD0 Passed Q	0	mAh
DOD0 Time	0	hr/16
DOD0	3616	-
Qmax DOD0	0	-
Qmax Passed Q	0	mAh
Qmax Time	0	hr/16

Bit Registers

Name	Value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Control Status (high)	0x0014	RSVD	FAS	SS	CALEN	CCA	BCA	CSV	RSVD
Control Status (low)		RSVD	RSVD	FULLSLEEP	SLEEP	LDMD	RUP_DIS	VOK	QEN
Pack Configuration...	0x41D9	RESCAP	CAL_EN	SCALED	RSVD	VOLSEL	WAKE	RSNS1	RSNS0
Pack Configuration...		RFACTSTEP	SLEEP	RMFCC	NDT	NDV	PB_RESTART	GNDSEL	TEMPS
Flags (high)	0x0110	OTC	OTD	BATHI	BATLOW	CHG_INH	XCHG	FC	CHG
Flags (low)		OCVTAKEN	RSVD	RSVD	CF	RSVD	SOC1	SOCF	DSG
Flags B (high)	0x2400	SOH	LIFE	FIRSTDOD	RSVD	RSVD	DODEOC	DTRC	RSVD
Flags B (low)		RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

TEXAS INSTRUMENTS Scanning:

VOLSEL = 0L → So we use the internal divider of the Bq34Z100G

We are unseal full access.

Now , I trie to calibrate the voltage mode of the BQ34Z100G

'Data Memory':

With all parametres..

Charger

Registers

Data Memory

Registers

Commands

FOD Resistor Calibration

Calibration

Calibration bq78350

Calibration

Calibration bq78350_R1

Authentication

Authentication

Seal_Unseal

Advanced Comm SMB

Advanced Comm

Chemistry

One Time Programmable Memory

Field Programmer

Firmware

WPK

Sec to FlashStream

HDQ

I2C To HDQ

GPCPacker

Watch

Watch

Data Graph

Battery Management Studio Perspective

Dashboard

Auto Refresh is ON - Click to Turn OFF

bqStudio Version: 1.3.54.1

EV2400

Version:0.28

I2C

bq34z100G1

0100_0_16

Addr: 0xAA

19.1 °C

3998 mV

79%

-1000

1000

-2000

2000

0

Commands

CONTROL_STATUS

FW_VERSION

RESET_DATA

CHEM_ID

CC_OFFSET

DF_VERSION

STATIC_CHEM_CHKSUM

STATIC_DF_CHKSUM

IT_ENABLE

RESET

ENTER_CAL

UNSEAL

DEVICE_TYPE

HW_VERSION

PREV_MACWRITE

BOARD_OFFSET

CC_OFFSET_SAVE

SET_FULLSLEEP

ALL_DF_CHKSUM

SEALED

CAL_ENABLE

EXIT_CAL

OFFSET_CAL

UNSEAL_FULL_ACCESS

Manual Control Panel

Enter Cmd

Delay Ms

Access Style

1000

1

Read Addr

Length

Log Panel

Transaction Log

Name	Cmd	Result	Read A...

Data Memory

Read/Write Data Memory Contents

Name	Value	Unit
SOC1 Set Threshold	150	mAh
SOC1 Clear Threshold	175	mAh
SOCF Set Threshold	75	mAh
SOCF Clear Threshold	100	mAh
Cell BL Set Volt Threshold	2800	mV
Cell BL Set Volt Time	2	Seconds
Cell BL Clear Volt Threshold	2900	mV
Cell BH Set Volt Threshold	4300	mV
Cell BH Volt Time	2	Seconds
Cell BH Clear Volt Threshold	4200	mV
Cycle Delta	0.05	%
Manufacturer Data		
Pack Lot Code	0000	hex
PCB Lot Code	0000	hex
Firmware Version	0000	hex
Hardware Revision	0000	hex
Cell Revision	0000	hex
DF Config Version	0000	hex
Lifetime Data		
Lifetime Max Temp	30.0	1degC
Lifetime Min Temp	20.0	1degC
Lifetime Max Chg Current	0	mA
Lifetime Max Dsg Current	0	mA
Lifetime Max Pack Voltage	160	20mV
Lifetime Min Pack Voltage	175	20mV
Lifetime Temp Samples		
LT Flash Cnt	0	Count
Registers		
Pack Configuration	41d9	flags
Pack Configuration B	af	flags
Pack Configuration C	37	flags
LED_Comm Configuration	93	flags
Alert Configuration	0000	flags
Number of series cell	1	num
Lifetime Resolution		
LT Temp Res	1.0	1degC
LT Cur Res	100	mA
LT V Res	1	20mV
LT Update Time	60	Seconds
LED Display		
LED Hold Time	4	Num
Power		
Flash Update OK Cell Volt	2800	mV
Sleep Current	10	mA
FS Wait	0	Seconds

TEXAS INSTRUMENTS

Data Memory
Registers
Registers

Data Memory

Filter/Search

Auto Export
Export
Import
Write_All
Read All

Read/Write Data Memory Contents

Configuration
System Data
Gas Gauging
Ra Tables
Calibration
Security

Name	Value	Unit
☒ Charge Termination		
Taper Current	100	mAmp
Min Taper Capacity	25	mAmpHr
Cell Taper Voltage	100	mVolt
Current Taper Window	40	Seconds
TCA Set %	99	Percent
TCA Clear %	95	Percent
FC Set %	100	Percent
FC Clear %	98	Percent
DODatEOC Delta T	10.0	1degC
NiMH Delta Temp	3.0	1degC
NiMH Delta Temp Time	180	Seconds
NiMH Hold Off Time	100	Seconds
NiMH Hold Off Current	240	mAmp
NiMH Hold Off Temp	25.0	1degC
NiMH Cell Negative Delta Volt	17	mVolt
NiMH Cell Negative Delta Time	16	Seconds
NiMH Cell Neg Delta Qual Volt	4200	mVolt
☒ Data		
Manufacture Date	1980-1-1	Day + Mo*32 + (Yr -1980)*256
Serial Number	0001	hex
Cycle Count	0	Count
CC Threshold	900	mAmpHr
Max Error Limit	100	%
Design Capacity	1600	MilliAmpHour
Design Energy	6720	MilliWattHour
SOH Load I	-400	MilliAmp
Cell Charge Voltage T1-T2	4200	mV
Cell Charge Voltage T2-T3	4200	mV
Cell Charge Voltage T3-T4	4100	mV
Charge Current T1-T2	10	Percent
Charge Current T2-T3	50	Percent
Charge Current T3-T4	30	Percent
JEITA T1	0	degC
JEITA T2	10	degC
JEITA T3	45	degC
JEITA T4	55	degC
Design Energy Scale	1	Number
Device Name	bq34z100-G1	-
Manufacturer Name	Texas Inst.	-
Device Chemistry	LION	-
☒ Discharge		
SOC1 Set Threshold	150	mAh
SOC1 Clear Threshold	175	mAh
SOCF Set Threshold	75	mAh

Data Memory

Read/Write Data Memory Contents

Configuration	Name	Value	Unit
System Data	Safety		
Gas Gauging	OT Chg	55.0	1degC
Ra Tables	OT Chg Time	2	Seconds
Calibration	OT Chg Recovery	50.0	1degC
Security	OT Dsg	60.0	1degC
	OT Dsg Time	2	Seconds
	OT Dsg Recovery	55.0	1degC
	Charge Inhibit Cfg		
	Chg Inhibit Temp Low	0	1degC
	Chg Inhibit Temp High	45.0	1degC
	Temp Hys	5.0	1degC
	Charge		
	Suspend Low Temp	-5.0	1degC
	Suspend High Temp	55.0	1degC
	Pb EFF Efficiency	100	%
	Pb Temp Comp	24.960	%
	Pb Drop Off Percent	96	%
	Pb Reduction Rate	10.000	%
	Charge Termination		

In Register : → Number of cell is : 1
→ Serial Number 0001 H

Question Bq34Z100 do not use all the indication?
What Bq34Z100G use exactly?

Now I go in calibration nenu, the third on the right at the top of the screen.

Battery Management Studio (bqStudio) 1.3.54.1

File View Window Help

Charger Registers Data Memory Registers Commands FOD Resistor Calibration Calibration Calibration bq78350 Calibration Calibration bq78350_R1 Authentication

Authentication Seal_Unseal Advanced Comm SMB Advanced Comm Chemistry One Time Programmable Memory Field Programmer Firmware WPKD Sec to FlashStream HDQ I2C To HDQ GPCPackager Watch Watch Data Graph

Battery Management Studio Perspective

DashBoard

Auto Refresh is ON - Click to Turn Off
bqStudio Version: 1.3.54.1

EV2400
Version:0.28

I2C

bq34z100G1
0100_0_16
Addr: 0xA4
20.1 °C

3999 mV
79%

Commands

CONTROL_STATUS	DEVICE_TYPE
FW_VERSION	HW_VERSION
RESET_DATA	PREV_MACWRITE
CHEM_ID	BOARD_OFFSET
CC_OFFSET	CC_OFFSET_SAVE
DF_VERSION	SET_FULLSLEEP
STATIC_CHEM_CHKSUM	ALL_DF_CHKSUM
STATIC_DF_CHKSUM	SEALED
IT_ENABLE	CAL_ENABLE
RESET	EXIT_CAL
ENTER_CAL	OFFSET_CAL
UNSEAL	UNSEAL_FULL_ACCESS

Manual Control Panel

Enter Cmd Delay Ms Access Style

1000 1

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset

☐ Calibrate CC Offset

Board Offset

☐ Calibrate Board Offset

Temperature

Gauge Applied Temperature

20.1 °C deg C ☐ Calibrate Temperature ☒ Internal Temp ☐ External Temp

Current

Gauge Applied Current

0 mA mA ☐ Calibrate Current

Voltage

Gauge Applied Voltage

3999 mV mV ☐ Calibrate Voltage

Calibrate Gas Gauge

I calibrate CC offset

Battery Management Studio (bqStudio) 1.3.54.1

File View Window Help

ChargerRegistersData MemoryRegistersCommandsFOD Resistor CalibrationCalibrationCalibration bq78350CalibrationCalibration bq78350_R1AuthenticationAuthenticationSeal_UnsealAdvanced Comm SMBAdvanced CommChemistryOne Time Programmable MemoryField ProgrammerFirmwareWPKDSrec to FlashStreamHDQI2C To HDQGPCPackagerWatchWatchData Graph

Battery Management Studio Perspective

Dashboard

Auto Refresh is ON - Click to Turn OFF

bqStudio Version: 1.3.54.1



EV2400
Version:0.28



I2C



bq34z100G1
0100_0_16
Addr: 0xAA
19.9 °C



3999 mV
79%



-10001000

-20002000

0

Commands

CONTROL_STATUS

FW_VERSION

RESET_DATA

CHEM_ID

CC_OFFSET

DF_VERSION

STATIC_CHEM_CHKSUM

STATIC_DF_CHKSUM

IT_ENABLE

RESET

ENTER_CAL

UNSEAL

DEVICE_TYPE

HW_VERSION

PREV_MACWRITE

BOARD_OFFSET

CC_OFFSET_SAVE

SET_FULLSLEEP

ALL_DF_CHKSUM

SEALED

CAL_ENABLE

EXIT_CAL

OFFSET_CAL

UNSEAL_FULL_ACCESS

Manual Control Panel

Enter Cmd

Delay Ms

Access Style

1000

1

Read Addr

Length

Log Panel

Clear Log

Transaction Log

Name	Cmd	Result	Read A...

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset

☒ Calibrate CC Offset

Board Offset

☐ Calibrate Board Offset

Temperature

Gauge

Applied Temperature

Internal Temp

19.9 °C

deg C

☐ Calibrate Temperature

External Temp

Current

Gauge

Applied Current

☐ Calibrate Current

0 mA

mA

Voltage

Gauge

Applied Voltage

☐ Calibrate Voltage

3999 mV

mV

Calibrate Gas Gauge

Data Memory
Calibration
Registers
Registers

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset
☒ Calibrate CC Offset

Board Offset
☐ Calibrate Board Offset

Temperature

Gauge
Applied Temperature
☒ Internal Temp
☐ External Temp

deg C
☐ Calibrate Temperature

Current

Gauge
Applied Current

mA
☐ Calibrate Current

Voltage

Gauge
Applied Voltage

mV
☐ Calibrate Voltage

Calibrate Gas Gauge


I calibrate board offset

alibration

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset
☐ Calibrate CC Offset

Board Offset
☒ Calibrate Board Offset

Temperature

Gauge
Applied Temperature
☒ Internal Temp
☐ External Temp

deg C
☐ Calibrate Temperature

Current

Gauge		Applied Current	
0 mA		mA	☐ Calibrate Current

Voltage	
Gauge	Applied Voltage
4000 mV	
mV	☐ Calibrate Voltage

Calibrate Gas Gauge

I calibrate temperature :

I measure the temperature in the room. 20,3°C

Bq34Z100EVM use an external CTN 10K. So I configure external temperature.

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset
☐ Calibrate CC Offset

Board Offset
☐ Calibrate Board Offset

Temperature

Gauge	Applied Temperature	☐ Internal Temp ☒ External Temp
20.2 °C	20.2 deg C	☒ Calibrate Temperature

Current

Gauge	Applied Current
0 mA	
mA	☐ Calibrate Current

Voltage

Gauge	Applied Voltage
3999 mV	
mV	☐ Calibrate Voltage

Calibrate Gas Gauge

The calibration for the temperature is OK

I glance an eye on my reference thermemeter

I trie a new temperature calibration.

The temperaturtute is 20,0°C

Why the calibration is now not possible?

I trie again. Not good.

I trie again not good.

I trie again Good.

Data Memory

Calibration

Registers

Registers

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset

☐ Calibrate CC Offset

Board Offset

☐ Calibrate Board Offset

Temperature

Gauge

Applied Temperature

20.1 °C

20

deg C

☒ Calibrate Temperature

☐ Internal Temp

☒ External Temp

Current

Gauge

Applied Current

0 mA

mA

☐ Calibrate Current

Voltage

Gauge

Applied Voltage

4000 mV

mV

☐ Calibrate Voltage

Calibrate Gas Gauge

Now curent calibration :

I use a charge curent set to 2A

Data Memory

Calibration

Registers

Registers

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

vice type

CC Offset

☐ Calibrate CC Offset

Board Offset

☐ Calibrate Board Offset

Temperature

Gauge

21.2 °C

Applied Temperature

20

deg C

☐ Internal Temp

☒ External Temp

☐ Calibrate Temperature

Current

Gauge

-2000 mA

Applied Current

-2000

mA

☒ Calibrate Current

Voltage

Gauge

3812 mV

Applied VoltagemV

☐ Calibrate Voltage

Calibrate Gas Gauge

The calibration is OK.

I try now, to calibrate the voltage system.

I mesure the voltage of the batterie : Vbat = 4003 mV I enter the value in the calibration software

Battery Management Studio (bqStudio) 1.3.54.1

File View Window Help

Charger Registers Data Memory Registers Commands FOD Resistor Calibration Calibration Calibration bq78350 Calibration Calibration b

Authentication Seal_Unseal Advanced Comm SMB Advanced Comm Chemistry One Time Programmable Memory Field Programmer Firmware WPD

Battery Management Studio Perspective

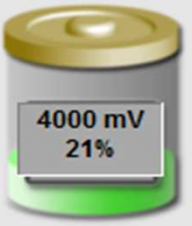
8 Dashboard

Auto Refresh is ON - Click to Turn OFF
bqStudio Version: 1.3.54.1

 **EV2400**
Version:0.28

 I2C

 **bq34z100G1**
0100_0_16
Addr: 0xAA
20.9 °C

 **4000 mV**
21%



Commands

CONTROL_STATUS	DEVICE_TYPE
FW_VERSION	HW_VERSION
RESET_DATA	PREV_MACWRITE
CHEM_ID	BOARD_OFFSET
CC_OFFSET	CC_OFFSET_SAVE
DF_VERSION	SET_FULLSLEEP
STATIC_CHEM_CHKSUM	ALL_DF_CHKSUM
STATIC_DF_CHKSUM	SEALED
IT_ENABLE	CAL_ENABLE
RESET	EXIT_CAL
ENTER_CAL	OFFSET_CAL
UNSEAL	UNSEAL_FULL_ACCESS

Manual Control Panel

Enter Cmd	Delay Ms	Access Style
	1000	1
Read Addr	Length	

Log Panel

Transaction Log

Name	Cmd	Result	Read A...

Calibration

Perform Calibration

Select the type of calibration to perform and enter the actual input parameters.

CC Offset

☐ Calibrate CC Offset

Board Offset

☐ Calibrate Board Offset

Temperature

Gauge Applied Temperature ☐ Internal Temp ☐ External Temp

deg C ☐ Calibrate Temperature

Current

Gauge Applied Current ☐ Calibrate Current

mA

Voltage

Gauge Applied Voltage ☒ Calibrate Voltage

mV





I can trie again. No good.