bq275xx Data Flash Subclass read

1 Overview

Proper gauging accuracy tests often require additional information read out of the data flash to assist debug and to verify operation of the algorithm.

Additional dataflash required:

bq27510-G2 and bq27520-G3
1. Ra Tables Subclasses 87,88,91-94 = size 19 bytes/subclass
2. State(Gas Gauging) Subclass 82 = size 28 bytes

bq27541-V200 / bq27541-G1
3. Ra Tables Subclasses 88 & 89 = size 32 bytes/subclass
4. State(Gas Gauging) Subclass 82 = size 19 bytes

In addition, be sure to log all DataRAM registers during testing to give the complete picture of algorithm operation.

Note that subclass ID and Offset values in the Data Flash Summary tables of the datasheets are in decimal format. The example below has converted these to hexadecimal. For example, the *State* subclass is d82 = 0x52.

1.1 Read a Subclass in UNSEALED Mode

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1. Unseal the device by using the *Control()* (0x00/0x01) command if the device is SEALED.
   a. Write the first 2-bytes of the UNSEAL key using the *Control(*0x0414*)* command.
      (*wr 0x00 0x14 0x04*)
   b. Write the second 2-bytes of the UNSEAL key using the *Control(*0x3672*)* command.
      (*wr 0x00 0x72 0x36*)
2. Write 0x00 using *BlockDataControl()* command (0x61) to enable block data flash control.
   (*wr 0x61 0x00*)
3. Write 0x40 (*0xSubClassID*) using the *DataFlashClass()* command (0x3E) to access the desired subclass. 0xSubClassID = 0x52 for the State (Gas Gauging) parameters (*wr 0x3E 0x82*)
4. Write the block offset location using *DataFlashBlock()* command (0x3F). To access data located at offset 0 to 31 use offset = 0x00. To access data located at offset 32 to 41 use offset = 0x01.
   For example, the offsets of all the *State* parameters are less than 32 so it is in the first block.
   (*wr 0x3F 0x00*)
5. To read the data of a specific offset use address 0x40 + mod(offset, 32).
   For example, for bq27520-G3, *Avg I Last Run* (offset = 16) is located at 0x50, read 2 bytes starting at 0x50 address. (*rd 0x50 Avg_I_Last_Run*)

6. To read the data from the entire block, read address 0x40 to 0x5F, where byte0 will be at register 0x40 and byte31 will be at register 0x5F. It can be done by reading subclass_size(max of 32) bytes from register 0x40. (*rd 0x40 byte1…byte31*).
7. If needed, SEAL the gauge by using *Control(*0x0020*)*. (*wr 0x00 0x20 0x00*)

Example - Data flash read from subclass 82 – State(Gas Gauging). Subclass 82 is 28 bytes for bq27520.

1. Unseal the gauge
    a. wr 0x00 0x14 0x04
    b. wr 0x00 0x72 0x36
2. Enable block data flash control
    a. wr 0x61 0x00
3. Set SubclassId to 82(0x52)
    a. wr 0x3E 0x52
4. Set Subclass offset to 0 – we will read from the beginning of subclass
    a. wr 0x3F 0x00
5. Read 28(0x1C) bytes of data
    a. rd_block 0x40 0x1C
6. Reseal the gauge. Write 2 bytes 0x0020 to Control command 0x00
    a. wr 0x00 0x20 0x00

2 Document Change List

Version	Date	Notes
V1.0	August 10, 2011	• Release to customer
V2.0	June 19, 2012	• Update to cover more examples
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