

Pack Assembly and The bq20zxx

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Battery Management

This application report describes a recommended assembly sequence for a bq20zxx-based battery pack. This procedure results in the most time-efficient setup of the battery pack. Following are the steps for connecting a 4-series cell battery to the bq20zxxEVM board. Review the application report *bq20zxx EVM Data Flash Settings for Number of Serial Cells and Pack Capacity*, [SLVA208](#), for further details on 2- and 3-series cell arrangements.

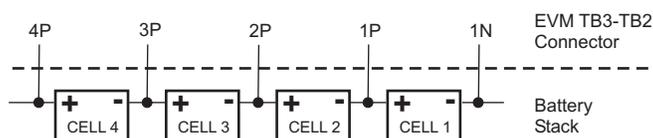


Figure 1. Connection Sequence

1. Connect the most negative terminal (– terminal of cell 1) of the serially-connected, 4-cell battery stack to the 1N PIN of the TB3–TB2 connector as shown in [Figure 1](#).
2. Connect the positive terminal of cell 1 to 1P.
3. Connect the positive terminal of cell 2 to 2P.
4. Connect the positive terminal of cell 3 to 3P.
5. Connect the positive terminal of the battery stack (+) to 4P.
6. Connect external power (from 6 to 16.8V) to the Pack+ and Pack– terminals on connectors TB1 and TB4 to wake up the EVM from shutdown mode. External power does not need to remain connected once the bq20zxx has exited Shutdown Mode.
7. Connect the SMBus connector (J1) to the EV2300 adapter and start the EV software.
8. Navigate to the *Flash Screen*. Change the flash constants that correspond to the specific parameters of your application (refer to the data sheet or other application reports). For the first evaluation, the default values may be used.
9. Navigate to the *Calibration screen*. Select the check-box for *CC Offset Calibration*. Click the *calibrate part* button. It should show OK.
10. Uncheck previously-selected boxes. Select the check-box for voltage near *Measured voltage* field. Measure the actual pack voltage between pins 1N and 4P, and enter the value into the *Enter actual voltage* field. Click the *calibrate part* button.
11. To start fuel-gauging, navigate to the *Pro screen* in the EV software. Make sure that the *Write SMB Word* section reads: "SMB Command: 00 Word (hex): 0021" as shown in [Figure 2](#), and click the *Write* button.

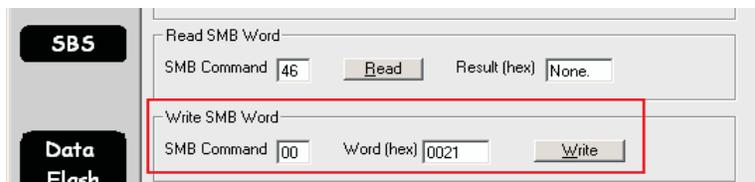


Figure 2. Fuel Gauging Command

12. Navigate to the SMB Screen and be sure that the QEN bit in Operation Status is set (red). The *Relative State of Charge* value is now updated to the correct value that corresponding to the state of charge of the attached cells.
13. Now the pack is ready. Simulate insertion into a system by shorting between the *Sys Pres* (System

Present) and the VSS pins on the TB1–TB4 connector. At this point, the discharge and charge FETs are ON (as indicated by value of 0006 in the *FET Status* field in the SMB Screen of the EV software), and charge/discharge tests can be conducted. This step is not needed if the NR bit (nonremovable pack) is enabled in Operation Cfg B register.

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