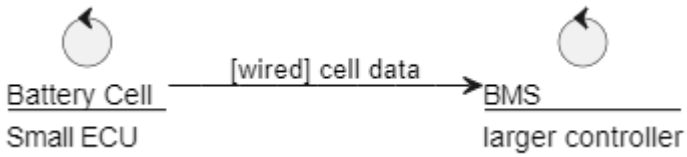
Senior Software Developer (job interview)

Division Automotive Team E/E

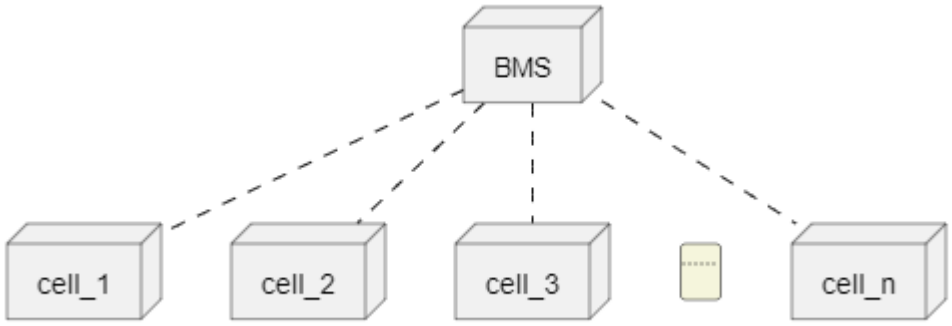
28.03.2025

Project:

Project goal is to provide a battery cell monitor. The cell monitor shall measure voltage and temperature of a battery cell. Data must be sent to a BMS.



Keep in mind that a target system consists of many battery cells combined to a pack:



Write a sample code for the requirements below. 4 hours should be enough for working on this. Be prepared to give us a 10-minute introduction on site afterwards.

Requirements:

1.) NTC resistance (for Battery temperature) (resolution: 1/100 Ω) must be calculated from measured voltage (resolution: mV) and provided accordingly:
Ntc_resistance = 100*((3300 -voltage)/voltage)

2.) Battery temperature (resolution: 0.5°C) shall be taken from input of NTC thermistor resistance, conversion can be done with the following table:

-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
2192.61Ω	1255.83Ω	743.62Ω	454.16Ω	285.45Ω	184.25Ω	121.89Ω	82.419Ω	57.02Ω	40.20Ω

3.) Transmit to IF *IF_ReportData(uint16 CellId, uint16 CellVolt, uint16 CellCurrent, uint16 CellTemp)*

4.) If voltage threshold of 4.2V is reached, raise an alert (*IF_ReportVoltAlert(uint16 CellId, uint16 CellVolt)*)

Deliver in the programming language of your choice, be ready to show us the results.

Additional:

Additional questions for delivery (Bonus when also available as implementation):

1.) Which steps for continuous integration would you take?
2.) How would you version your implementation?
3.) Which test must be conducted to ensure quality?
4.) Which tests are appropriate for this type of project?
5.) What must be considered if several cells are operating next to each other?
6.) What should be given as special testcases in this case to ensure interoperability?
7.) What communication patterns should be used for *IF_ReportData* and *IF_ReportVoltAlert* ?

In case of any technical questions: contact laura.steffan@hoerbiger.com

Send a copy of your work to the mail address above, at least 2 hours prior to the appointment.