Features

- Measures from 4 to 14 cells in series, with 0 us desynchronization delay between samples. Supports also busbar connection without altering cell results.
- Coulomb counter supporting pack overcurrent detection in both ignition on and off states.
- Fully synchronized current and voltage samples.
- 16-bit voltage measurement.
- 2.66 Mbps isolated serial communication with regenerative buffer, supporting dual access ring.
- Transformer based isolation.
- Up to 4 analog inputs for NTC sensing, plus PCB temperature sensing.
- Onboard microcontroller SPC574S64E3 with 32-bit Power Architecture MCU for Automotive Chassis and Safety Applications.
- Onboard L9001 regulator as microcontroller power supply.

Description

The EVAL-L9963-MCU is a hardware tool for evaluation of L9963, automotive chip for battery management applications. It can be used for the development of a 48 V battery management system (BMS) or as lower stage of a distributed BMS (depending on total battery voltage. Additional stages can be added thanks to EVAL-L9963-NDS).

EVAL-L9963-MCU allows the user to connect up to 14 channels for cell voltage sensing, one channel for current sensing, and up to 4 analog input for temperature sensing (plus an additional on-board NTC to sense PCB temperature). The board provides an onboard microcontroller with preloaded GUI firmware intended to be used with STSW-L9963 PC Graphical User Interface.

<table>
<thead>
<tr>
<th>Product summary</th>
<th></th>
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<tbody>
<tr>
<td>Order code</td>
<td>EVAL-L9963-MCU</td>
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<tr>
<td>Reference</td>
<td>EVAL-L9963-MCU Evaluation board</td>
</tr>
</tbody>
</table>
1 Hardware description

The EVAL-L9963-MCU board provides maximum flexibility, giving access to all pins to simplify the evaluation and debug phase of the device.

1.1 Block Diagram

![EVAL-L9963-MCU block diagram](image)

1.2 Featured components

The EVAL-L9963-MCU can be considered a reference design for a 48 V BMS or as a first layer of a distributed BMS system. In the following table there is a short description of all the ST featured components.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>L9963</td>
<td>Automotive chip for battery management applications</td>
</tr>
<tr>
<td>L9963T</td>
<td>Automotive SPI to isolated SPI transceiver</td>
</tr>
<tr>
<td>L9001</td>
<td>Automotive power supply IC with multiple voltage regulators</td>
</tr>
<tr>
<td>SPC574S64E3</td>
<td>32-bit Power Architecture MCU for Automotive Chassis and Safety Applications</td>
</tr>
</tbody>
</table>
2 Minimum system requirements

- PC with Windows 7.0 or higher
- Mini USB to USB type A cable
- Power supply:
  - At least 3 output 0 ~ 30 V (if possible 60V):
  - 1 output to power L9963 (0:60 V)
  - 1 output to simulate Cells common mode voltage (0:60V)
  - 1 output to simulate Cell voltage (0:5V)
EVAL-L9963-MCU Evaluation board schematic

Figure 2. Board schematic: page 1
Figure 3. Board schematic: page 2
Figure 4. Board schematic: page 3
Figure 5. Board schematic: page 4
Figure 6. Board schematic: page 5
4 Board layout

Figure 7. Assembly TOP

Figure 8. Inner 1
Figure 9. Inner 2

Figure 10. Assembly BOTTOM
5 Demonstration software

STSW-L9963 Software is available for demonstration purpose. For more information and download, please refer to ST website.
## Revision history

**Table 2. Document revision history**

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
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</thead>
<tbody>
<tr>
<td>26-Mar-2020</td>
<td>1</td>
<td>Initial release.</td>
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</table>
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