

DKCMS Core System Hub

The DK8202-AR-25 System Hub manages and synchronizes a network of DK8102-AQ-25 Cell Monitors, transferring data to and from the BMS host. The System Hub and Cell Monitors along with the DKCMS Library API and proprietary protocol C-SynQ® form the Dukosi Cell Monitoring System (DKCMS).

Communication between the Cell Monitors and the System Hub is contactless via a single RF bus antenna and utilizes Dukosi's proprietary C-SynQ® communication protocol. Communication with the BMS Host is via SPI. The System Hub has a suite of features to ensure robust and reliable communication even in the presence of interference.

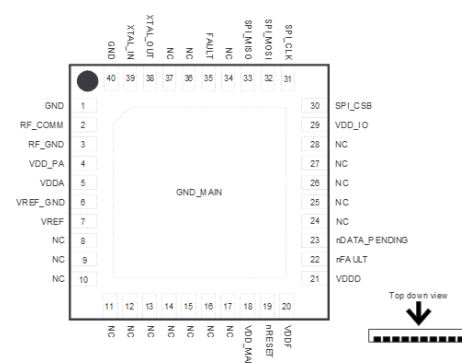


Features

- ◆ Each DK8202-AR-25 System Hub can manage up to 216 DK8102-AQ-25 Cell Monitors
- ◆ Synchronizes Cell Monitor measurements across the entire pack
- ◆ Secure, robust, contactless communication to the Cell Monitors via bus antenna, utilizing Dukosi's proprietary C-SynQ protocol:
 - ❖ Adaptive channel hopping, with automatic or manual channel masking
 - ❖ Auto rejoin feature
 - ❖ RF diagnostics and configurable transmit power levels
- ◆ Industry standard SPI connection to the BMS Host
- ◆ Wake-on-fault notification for when BMS is in a sleep mode
- ◆ Unique System Hub ID stored on-chip
- ◆ AEC-Q100 qualified
- ◆ Safety collateral available (Safety Manual, FMEDA and FIT rate calculation)

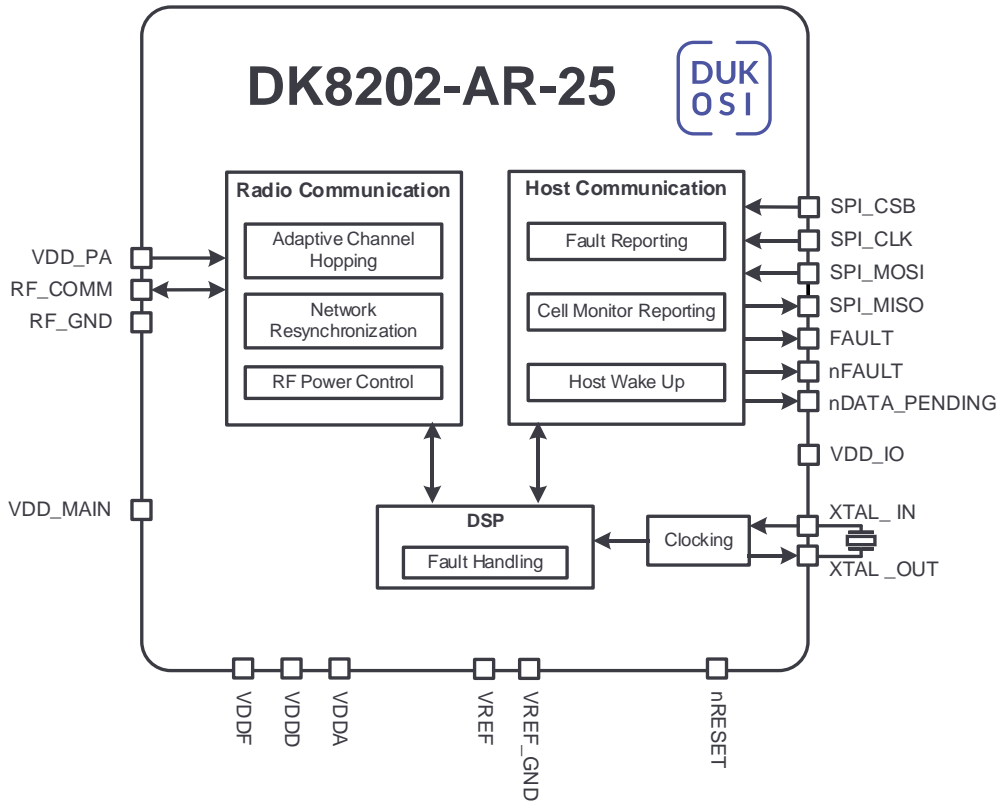
Benefits

- ◆ Managing up to 216 DK8102-AQ-25 Cell Monitors, a single DK8202-AR-25 System Hub addresses the needs of the majority of battery packs
- ◆ Contactless communication using Dukosi C-SynQ and a bus antenna enables:
 - ❖ Wired-like, star-network behavior with predictable communication latency
 - ❖ Inherent isolation of the BMS from the pack HV simplifying the BMS design
 - ❖ Reduced BOM, with potential failure modes designed out as complexities associated with wire harnesses and connectors are eliminated
 - ❖ Simplified pack design, manufacturing, and test
- ◆ Adaptive channel hopping minimizes disruption caused by RF interference, giving inherent security and robustness
 - ❖ Automatic temporary channel masking can be used to temporarily mask channels where consecutive packet errors have been detected
 - ❖ Manual masking of channels is possible in advance to avoid known system interferers



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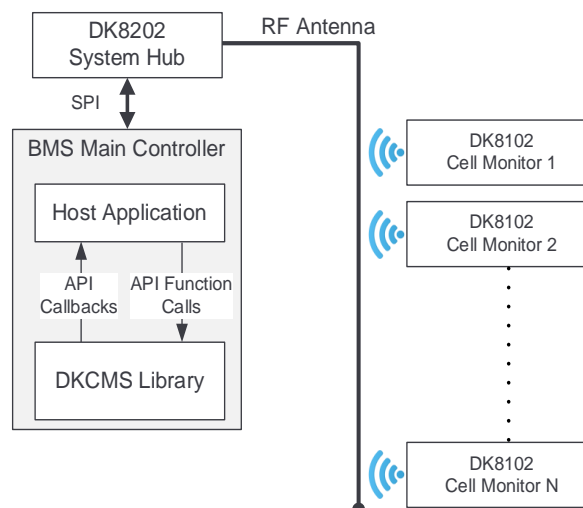
Block Diagram



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Use Case

The DK8202-AR-25 System Hub is situated at the main BMS Host with which it communicates via SPI connection. It is also connected to an RF bus antenna that passes over the DK8201-AQ-25 Cell Monitors in the pack to form a contactless communication network. The System Hub manages the bi-directional communication between the Cell Monitors and the BMS Host, and ensures all of the Cell Monitor measurements are synchronized.



Applications

- Multi-cell Li-ion battery systems
- Grid scale utility, commercial and industrial, and residential BESS
- Industrial power systems, and robotics
- Automotive
- Compatible with a range of cell chemistries and pack architectures

Key Parameters

| Parameter | Typical Value (At $T_A = 25\text{ }^\circ\text{C}$) | Comments |
|--------------------------------|---|--|
| No. of Cell Monitors Supported | 216 | |
| RF Band | 2.402 to 2.480 GHz | Near-field communication, employing channel hopping for robustness and EMC performance |
| RF Data Rate | 2 Mbit/s | |
| Operating Temperature Range | -40 $^\circ\text{C}$ to +105 $^\circ\text{C}$ | AEC-Q100 (Grade 2) |

Ordering Table

| Part Number | Description | Packaging | MOQ |
|----------------|---|-----------|------|
| DK8202-AR-25/C | System Hub, AEC Q100 (Grade 2), packaged in a 6 mm x 6 mm, 40-pin QFN | Cut Tape | 1 |
| DK8202-AR-25/R | | 13" Reel | 4000 |

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