BATTERY MANAGEMENT SYSTEM INTEGRATION GUIDE

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NaviFloor Robotics, Inc.

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1. INTRODUCTION AND SCOPE

1. This Battery Management System Integration Guide ("Guide") is a

2. This Guide applies to all Series N-2000 and N-3000 AMR platforms

2. DEFINITIONS

1. "BMS" means the electronic system that manages a rechargeable l

2. "Critical Parameters" means the core operational metrics including

3. "Integration Protocol" means the Company's proprietary communica

4. "Safety Circuit" means the embedded protective circuitry designed

3. TECHNICAL REQUIREMENTS

1. **Voltage Requirements**

-

Operating Range: 48V 2V DC

-

Maximum Charging Voltage: 54.6V

-

Low Voltage Disconnect: 42V

-

Voltage Measurement Accuracy: 0.1%

2. **Current Management**

-

Maximum Continuous Discharge: 150A

-

Peak Discharge (30 seconds): 200A

-

Charging Current: 75A maximum

Current Measurement Resolution: 0.1A

3. **Temperature Control**

-

Operating Range: -10 C to 45 C

-

Storage Range: -20 C to 60 C

-

Temperature Measurement Points: Minimum 4 sensors

-

Thermal Shutdown Threshold: 55 C

4. COMMUNICATION PROTOCOLS

1. **Data Interface**

-

Primary Protocol: CAN 2.0B

-

Secondary Protocol: RS-485

-

Minimum Update Rate: 100Hz

-

Error Checking: CRC-16

2. **Required Data Parameters**

-

Cell Voltages (individual)

-

Pack Current

State of Charge

-

Temperature Readings

-

Fault Codes

-

Cycle Count

5. SAFETY AND COMPLIANCE

1. **Certification Requirements**

-

UL 1642 compliance for lithium cells

-

UN 38.3 transportation certification

-

IP67 environmental protection rating

-

CE marking for European markets

2. **Protection Features**

-

Overcurrent protection

-

Short circuit protection

-

Overcharge protection

-

Over-discharge protection

- Temperature protection
- Cell balancing capability

6. INTEGRATION PROCEDURES

1. **Pre-Integration Testing**
   - Verification of voltage parameters
   - Communication protocol validation
   - Safety circuit testing
   -

Environmental condition simulation

2. **Physical Integration**

-

Mounting specifications per Drawing TD-BMS-M001

-

Connector types: Anderson SB-350

-

Cooling system interface requirements

-

EMI shielding specifications

7. QUALITY ASSURANCE

1. Each BMS integration must undergo testing according to Company

- Full charge/discharge cycle testing
- Communication reliability verification
- Environmental stress testing
- Safety system validation

2. Documentation requirements for each integration:

- Test results log
- Calibration certificates
-

Safety compliance documentation

-

Integration checklist completion

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10. DOCUMENT CONTROL

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