INTELLIGENT BATTERY MANAGEMENT FOR AUTONOMOUS ROBOTS

INTELLIGENT BATTERY MANAGEMENT SY

TECHNICAL SPECIFICATION AND INTELLECTUA

NaviFloor Robotics, Inc.

Document No. IP-2024-BTM-001

Version 1.3

Last Updated: January 11, 2024

1. OVERVIEW AND SCOPE

1. This document describes the proprietary Intelligent Battery Management S

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2. The IBMS represents a mission-critical component of the Company's auto

2. TECHNICAL SPECIFICATIONS

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1. System Architecture

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1.1. The IBMS comprises three primary subsystems:

(a) Power Distribution Control Unit (PDCU)

(b) Predictive Analytics Engine (PAE)

(c) Dynamic Load Balancing System (DLBS)

1.2. Core Processing Components:

- Primary Controller: ARM Cortex-M7 microprocessor
- Secondary Controller: Custom FPGA implementation
- Sensor Array: 16 distributed voltage/current monitors

2. Performance Parameters

2.1. Operating Specifications:

- Voltage Range: 18V - 52V DC

Maximum Current: 75A continuous

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Response Time: <500 microseconds

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Operating Temperature: -10°C to 60°C

3. INTELLECTUAL PROPERTY RIGHTS

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1. Patents

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1.1. Issued Patents:

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US Patent No. 11,234,567: "Method and System for Predictive Battery Mana

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US Patent No. 11,345,678: "Dynamic Load Balancing for Multi-Cell Battery

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1.2. Pending Applications:

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PCT/US2023/123456: "Machine Learning-Based Battery Life Optimization"

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US Application No. 17/123,456: "Distributed Power Management in Robotic

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2. Trade Secrets

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2.1. The following components are maintained as trade secrets:

(a) Predictive analytics algorithms

(b) Load balancing optimization formulas

(c) Cell degradation prediction models

(d) Custom FPGA configurations

4. IMPLEMENTATION PROTOCOLS

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1. Integration Requirements

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1.1. Hardware Integration:

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Dedicated power management bus

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Isolated communication channels

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Redundant safety systems

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EMI shielding specifications

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1.2. Software Integration:

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Real-time operating system compatibility

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Secure boot implementation

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Encrypted communication protocols

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Remote monitoring capabilities

5. CONFIDENTIALITY AND PROTECTION

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1. All information contained herein is classified as Confidential Information

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1.1. Access restricted to authorized personnel with signed NDAs

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1.2. Implementation of physical and digital security measures

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1.3. Mandatory encryption of all related digital assets

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1.4. Regular security audits and access logging

6. COMPLIANCE AND CERTIFICATION

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1. Safety Standards:

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UL 1642 compliance for lithium batteries

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IEC 62133 certification

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CE marking requirements

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UN 38.3 transportation testing

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2. Environmental Standards:

RoHS 3 compliance

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REACH registration

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Battery recycling protocols

7. WARRANTY AND LIABILITY

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1. The IBMS is warranted to perform according to specifications under norm

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2. This warranty excludes:

(a) Damage from misuse or unauthorized modification

(b) Environmental damage beyond specified parameters

(c) Integration with unauthorized components

8. EXECUTION AND VALIDATION

IN WITNESS WHEREOF, this document has been executed by the authoriz representatives of NaviFloor Robotics, Inc.

NAVIFLOOR ROBOTICS, INC.

By:

Name: Dr. Elena Kovacs

Title: Chief Research Officer

Date: January 11, 2024

By:

Name: Marcus Depth

Title: Chief Technology Officer

Date: January 11, 2024

9. DOCUMENT CONTROL

Version History:

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0 - Initial Release (2023-09-15)

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1 - Updated Patent Information (2023-10-30)

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2 - Added Compliance Standards (2023-12-01)

3 - Updated Technical Specifications (2024-01-11)