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

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1. This document describes the proprietary Intelligent Battery Management
2. The IBMS represents a mission-critical component of the Company's auto-
2. TECHNICAL SPECIFICATIONS
- 1. System Architecture
1. System Architecture

1.1. The IBMS comprises three primary subsystems:

(a) Power Distribution Control Unit (PDCU)

(c) Dynamic Load Balancing System (DLBS)

(b) Predictive Analytics Engine (PAE)

2 -
1.2. Core Processing Components:
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Primary Controller: ARM Cortex-M7 microprocessor
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Secondary Controller: Custom FPGA implementation
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Sensor Array: 16 distributed voltage/current monitors
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2. Performance Parameters
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2.1. Operating Specifications:
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Voltage Range: 18V - 52V DC

- - 3 -

Maximum Current: 75A continuous

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Response Time: <500 microseconds

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Operating Temperature: -10 $^{\circ}$ C to 60 $^{\circ}$ C

3. INTELLECTUAL PROPERTY RIGHTS

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1. Patents

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1.1. Issued Patents:

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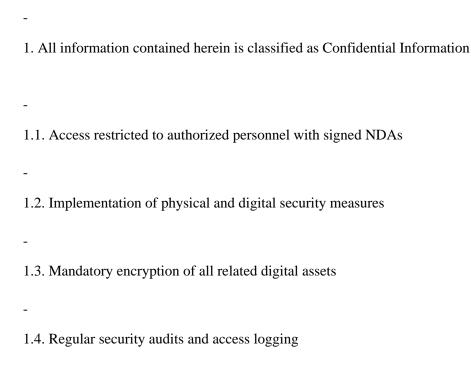
US Patent No. 11,234,567: "Method and System for Predictive Battery Man
US Patent No. 11,345,678: "Dynamic Load Balancing for Multi-Cell Batter
-
1.2. Pending Applications:
PCT/US2023/123456: "Machine Learning-Based Battery Life Optimization
- US Application No. 17/123,456: "Distributed Power Management in Roboti
OS Application No. 17/123,430. Distributed Fower Management in Roboti
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. Integration Requirements - 1.1. Hardware Integration:
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Isolated gommunication channels
-
Redundant safety systems
-
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
Zarry production protocols
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Remote monitoring capabilities

5. CONFIDENTIALITY AND PROTECTION



6. COMPLIANCE AND CERTIFICATION

1. Safety Standards:

UL 1642 compliance for lithium batteries

IEC 62133 certification

CE marking requirements

UN 38.3 transportation testing

2. Environmental Standards:

- -9RoHS 3 compliance
REACH registration

Battery recycling protocols

7. WARRANTY AND LIABILITY

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

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: -11-

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)

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

