REAL-TIME SURFACE MOISTURE DETECTION SYSTEM

REAL-TIME SURFACE MOISTURE DETECTI

TECHNICAL SPECIFICATION AND INTELLECTUA

NaviFloor Robotics, Inc.

Document Reference: IP-RTM-2023-142

Last Updated: December 15, 2023

1. PROPRIETARY NOTICE

This document contains confidential and proprietary information belonging t

NaviFloor Robotics, Inc., a Delaware corporation ("Company"). This docum

the information contained herein may not be reproduced, used, or disclosed

without the express written permission of the Company.

2. SYSTEM OVERVIEW

-

1. The Real-Time Surface Moisture Detection System ("System") comprises

-

2. The System incorporates the following proprietary components:

a) Multi-spectral moisture sensing array (Patent Pending, US Application No

17/482,XXX)

b) Advanced signal processing algorithms

c) Environmental condition compensation protocols

d) Machine learning-based surface characterization software

3. TECHNICAL SPECIFICATIONS

-

1. Sensor Array Configuration

-

Primary sensor: 850nm near-infrared reflectance detector

-

Secondary sensor: Capacitive moisture measurement grid

-

Tertiary sensor: Temperature and humidity compensation array

-

Sampling rate: 240Hz

-

Detection range: 0.1% to 100% surface moisture content

-

2. Processing Unit Specifications

-

Processor: Custom ASIC (NaviFloor Model NF-2023-M)

-

Processing speed: 1.2 TFLOPS

-

Memory: 8GB LPDDR5

-

Power consumption: 4.2W nominal

4. INTELLECTUAL PROPERTY RIGHTS

1. Patents

- US Patent Application No. 17/482,XXX: "Method and System for Real-Tim

- PCT Application No. PCT/US2023/XXXXX

- European Patent Application No. EP23XXXXXX.X

-

2. Trade Secrets

The following components are maintained as trade secrets:

a) Surface characterization algorithms

b) Environmental compensation matrices

c) Sensor calibration methodologies

d) Machine learning training datasets

5. INTEGRATION SPECIFICATIONS

-

1. Hardware Integration

-

Operating voltage: 12V DC ± 0.5V

-

Communication interface: CAN-FD, RS-485

-

Physical dimensions: 82mm x 64mm x 18mm

-

Operating temperature range: -20°C to +60°C

2. Software Integration

-

API Version: 3.2.1

-

SDK compatibility: NaviFloor Core Platform v4.x

-

Data output format: JSON/Protocol Buffers

-

Update frequency: 60Hz

6. PERFORMANCE METRICS

-

1. Accuracy Specifications

- Moisture content measurement accuracy: ±2% absolute
- Response time: <50ms
- False positive rate: <0.1%
- Operating range: Up to 2m from surface

- 2. Environmental Tolerances
- Humidity: 5% to 95% non-condensing
- Atmospheric pressure: 70kPa to 106kPa

Vibration resistance: 2g RMS, 10-500Hz

7. COMPLIANCE AND CERTIFICATION

-

1. The System has been certified to meet:

-

IEC 61508 SIL 2

-

ISO 13849-1 PLd

-

CE marking requirements

-

FCC Part 15 Class A

8. CONFIDENTIALITY AND USE RESTRICTIONS

-

1. All information contained in this document is classified as Confidential In

-

2. Access to this document is restricted to authorized personnel who have ex

9. DOCUMENT CONTROL

-

1. Version History

-

v1.0: Initial release (2023-06-15)

-

v1.1: Updated patent information (2023-09-30)

-

v1.2: Current version (2023-12-15)

-

2. Document Owner

NaviFloor Robotics, Inc.

Technical Documentation Department

Reference: DOC-2023-142

10. AUTHORIZATION

This document has been reviewed and approved by:

/s/ Dr. Elena Kovacs

Chief Research Officer

NaviFloor Robotics, Inc.

Date: December 15, 2023

/s/ Marcus Depth

Chief Technology Officer

NaviFloor Robotics, Inc.

Date: December 15, 2023