QUALITY ASSURANCE TESTING PROTOCOL

NF-2000 SERIES AUTONOMOUS MOBILE ROBOTS

NaviFloor Robotics, Inc.

Document No.: QA-2023-NF2K-001

Effective Date: January 15, 2024

1. PURPOSE AND SCOPE

1. This Quality Assurance Testing Protocol ("Protocol") establishes th

2. This Protocol applies to all NF-2000 Series Units manufactured at N

2. DEFINITIONS

1. "Critical Systems" means the core operational components includin

(a) LiDAR navigation system

(b) Terrain-mapping processors

(c) Safety stop mechanisms

(d) Battery management system

(e) Primary drive components

2. "Testing Environment" means the designated quality assurance tes

3. "Test Engineer" means a NaviFloor employee certified in NF-2000

3. MANDATORY TESTING PROCEDURES

1. Pre-Testing Requirements

1.1. Each Unit shall undergo a minimum 12-hour charging cycle prior

1.2. Testing Environment conditions must be verified:

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Temperature: 68 F   5 F

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Humidity: 45%   10%

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Lighting: 500-750 lux

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Clear testing area: 100' x 100' minimum

2. Core Systems Testing

2.1. Navigation Accuracy Test

(a) Conduct minimum 50 waypoint navigation cycles

(b) Maximum acceptable deviation: 2cm

(c) Record all deviations exceeding 1cm

2.2. Obstacle Detection Test

(a) Static obstacle detection at 0.5m, 1m, 2m, and 5m

(b) Dynamic obstacle detection at relative velocities up to 2m/s

(c) Minimum 100 detection cycles per distance point

2.3. Surface Adaptation Test

(a) Test on all NaviFloor standard surface types:

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Smooth concrete

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Textured concrete

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Industrial epoxy

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Steel plate

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Expansion joints

(b) Minimum 20 transitions per surface type

4. PERFORMANCE CRITERIA

1. Navigation Performance

1.1. Path Planning

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99.9% successful route completion

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Maximum rerouting attempts: 2 per obstacle

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Path optimization within 105% of theoretical optimal

1.2. Position Accuracy

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Static position error < 1cm

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Dynamic position error < 2cm at 1.5m/s

2. Safety Systems

2.1. Emergency Stop

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Activation time < 100ms

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Stop distance < 10cm at full speed

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Force reduction to 0 within 200ms

2.2. Collision Avoidance

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Detection range   5m

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False positive rate < 0.1%

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False negative rate: 0%

5. DOCUMENTATION AND REPORTING

1. Required Test Documentation

1.1. Each Unit must have:

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Unique test record identifier

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Test Engineer certification number

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Date and time stamps for all tests

-

Environmental condition logs

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Raw sensor data recordings

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Performance metric calculations

2. Test Results

2.1. All test results shall be recorded in NaviFloor's Quality Manageme

2.2. Any deviation from acceptance criteria requires:

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Immediate notification to Quality Manager

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Root cause analysis

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Corrective action documentation

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Retest authorization

6. CERTIFICATION

1. Units meeting all test criteria shall receive:

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Quality Assurance certification number

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Digital test record signature

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Physical certification label

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Certificate of Compliance

2. Failed units shall be:

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Tagged for engineering review

Logged in defect tracking system

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Quarantined pending disposition

7. PROTOCOL MAINTENANCE

1. This Protocol shall be reviewed annually by the Quality Assurance

2. Revisions require approval from:

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Chief Technology Officer

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Quality Assurance Director

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Safety Compliance Officer

AUTHORIZATION

APPROVED AND ADOPTED this 15th day of January, 2024.

NaviFloor Robotics, Inc.

By:

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By:

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ATTEST:

James Wilson

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