AMR-350 PERFORMANCE TEST RESULTS 2023

AMR-350 PERFORMANCE TEST RESULTS 2

Document Reference: TR-2023-AMR350-PT

Classification: CONFIDENTIAL

Date of Testing: September 15-30, 2023

Testing Facility: NaviFloor Advanced Robotics Laboratory

Location: Dover, Delaware

1. EXECUTIVE SUMMARY

This document presents the comprehensive performance test results

AMR-350 autonomous mobile robot platform, conducted in accordanc
Robotics' Standard Testing Protocol NF-STP-2023-05 and ISO/TS 15
guidelines for collaborative robots. The AMR-350 demonstrated comp
all critical performance metrics and exceeded baseline requirements i
operational parameters.

2. TEST CONFIGURATION

2.1 Hardware Specifications

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Model: AMR-350 (Serial: PRE-350-2023-089)

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Firmware Version: 3.5.2

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Navigation System: NaviCore(TM) v4.2

Sensor Configuration:

- Primary LiDAR: NF-LiDAR-8500 (360 coverage)
- Secondary Sensors: 8x depth cameras (Intel RealSense D455)
- Terrain Mapping Module: TMM-350-A2

2.2 Test Environment

- Indoor facility: 50,000 sq ft
- Temperature range: 18-24 C
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Humidity: 45-55%

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Lighting conditions: 300-800 lux

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Floor surfaces: Concrete, epoxy, steel plate, aluminum grating

3. PERFORMANCE RESULTS

3.1 Navigation Accuracy

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Static Position Accuracy: 3.2mm (exceeds requirement of 5mm)

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Dynamic Path Deviation: 8.4mm at 1.5 m/s

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Rotational Accuracy: 0.12 (exceeds requirement of 0.25)

3.2 Obstacle Detection

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Detection Range: 0.05m - 25m

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Angular Resolution: 0.13

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Response Time: 12ms

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False Positive Rate: 0.002%

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False Negative Rate: 0.001%

3.3 Load Handling

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Maximum Tested Load: 350kg

- Speed Under Max Load: 1.2 m/s
- Acceleration: 0.5 m/s
- Deceleration: 0.8 m/s
- Emergency Stop Distance: 0.45m at 1.5 m/s

3.4 Battery Performance

- Runtime (Full Load): 12.4 hours
- Runtime (No Load): 14.8 hours
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Charging Time: 45 minutes (to 80%)

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Battery Cycles Tested: 100

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Capacity Retention: 98.5%

4. SURFACE NAVIGATION PERFORMANCE

4.1 Multi-Surface Testing Results

| Surface Type | Navigation Accuracy | Max Speed | Success Rate |

|---|---|---|---|

| Concrete | 2.8mm | 2.0 m/s | 99.98% |

| Epoxy | 3.0mm | 1.8 m/s | 99.95% |

| Steel Plate | 3.5mm | 1.5 m/s | 99.90% |

| Al. Grating | 4.0mm | 1.2 m/s | 99.85% |

4.2 Transition Performance

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Surface-to-Surface Transition Time: 0.8s

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Recalibration Time: <100ms

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Terrain Mapping Accuracy: 1.2mm

5. SAFETY SYSTEMS VALIDATION

5.1 Emergency Systems

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E-Stop Response Time: 8ms

- Safety Zone Configuration: Passed
- Collision Avoidance: Passed
- Fail-Safe Behaviors: Passed

5.2 Compliance Verification

- ISO/TS 15066:2016: Compliant
- CE Safety Requirements: Compliant
- ANSI/RIA R15.06-2012: Compliant

6. TEST CERTIFICATION

The undersigned hereby certify that all tests were conducted in accord
NaviFloor Robotics' Standard Testing Protocol and applicable industry
The AMR-350 platform has successfully met or exceeded all performa
requirements.

Test Engineers:

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Primary: Dr. Michael Chang, P.E.

NaviFloor Robotics, Inc.

Certification #PE-2458-DE

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Secondary: Sarah Martinez, P.E.

7. LEGAL DISCLAIMER

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Approved By: Dr. Elena Kovacs

Chief Research Officer

NaviFloor Robotics, Inc.