3D LIDAR INTEGRATION TECHNICAL GUIDE

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NaviFloor Robotics, Inc.

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Classification: CONFIDENTIAL - Internal Use Only

1. INTRODUCTION AND SCOPE

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1. This Technical Guide ("Guide") governs the integration requirements and

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2. DEFINITIONS

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1. "LIDAR System" refers to NaviFloor's MS-350X terrain mapping system

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2. "Integration Protocol" means the prescribed sequence of hardware installa

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3. "Calibration Parameters" refers to the specific operational settings and tole

3. TECHNICAL SPECIFICATIONS

1. Hardware Requirements

- Processing Unit: NaviCore X12 or later
- Minimum RAM: 32GB ECC DDR4
- Storage: 512GB NVMe SSD
- Power Supply: 48V DC, 15A continuous

2. LIDAR Sensor Specifications

- Range: 0.1m to 350m

Accuracy: ±2cm at 100m

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Field of View: 360° horizontal, 40° vertical

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Scan Rate: 20Hz nominal

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Point Cloud Density: 2.0M points/second

4. INTEGRATION PROCEDURES

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1. Physical Installation

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Mount LIDAR unit at specified height of 1.2m ±0.05m

Maintain 15° forward tilt angle

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Secure using M8 bolts torqued to 25Nm

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Install vibration dampeners per Drawing LID-001-V2

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2. Software Configuration

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Install NaviFloor LIDAR Driver Package v4.2.1

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Configure IP addressing per Section 4.2.1

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Initialize sensor fusion parameters

Validate point cloud registration

5. CALIBRATION PROTOCOL

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1. Initial Calibration

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Execute geometric calibration routine

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Perform temporal synchronization

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Validate sensor alignment

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Document baseline measurements

2. Operational Calibration

- Conduct daily zero-point calibration
- Weekly full-range verification
- Monthly accuracy assessment
- Quarterly complete recalibration

6. SAFETY AND COMPLIANCE

- 1. Safety Requirements

Class 1 laser safety compliance

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Emergency shutdown capability

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Redundant power monitoring

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Fault detection systems

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2. Regulatory Compliance

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IEC 60825-1:2014 laser safety

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ISO 10218-1:2011 robot safety

CE marking requirements

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FCC Part 15 emissions

7. MAINTENANCE AND SUPPORT

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1. Preventive Maintenance

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Clean optical surfaces weekly

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Inspect mounting hardware monthly

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Verify calibration quarterly

Update firmware as released

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2. Troubleshooting

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Follow diagnostic flowchart TD-350-1

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Log all error codes

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Document corrective actions

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Maintain service records

8. PROPRIETARY RIGHTS AND CONFIDENTIALIT

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9. DOCUMENT CONTROL

1. Revision History

v2.4: January 2024 - Updated calibration protocols

v2.3: October 2023 - Added new safety requirements

v2.2: July 2023 - Updated software specifications

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v2.1: April 2023 - Initial release

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2. Distribution Control

This document is controlled and maintained by NaviFloor Technical Docume
Department.

10. CERTIFICATION

The undersigned hereby certifies that this Technical Guide has been reviewe
approved for release.

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Dr. Elena Kovacs

Chief Research Officer

NaviFloor Robotics, Inc.

Date: January 11, 2024

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