### MOTOR CONTROLLER INTEGRATION SPECIFICATION

# **MOTOR CONTROLLER INTEGRATION SPEC**

Document No.: NF-MCS-2023-114

Effective Date: January 15, 2024

Version: 2.1

### 1. PURPOSE AND SCOPE

1 This Motor Controller Integration Specification ("Specification") esta

2 This Specification applies to all Series X-300 and X-400 AMR units

#### 2. DEFINITIONS

1 "Control System" means the integrated hardware and software com

2 "Motor Assembly" refers to the complete motor unit, including brush

3 "Integration Protocol" means the standardized procedures and spec

#### 3. TECHNICAL REQUIREMENTS

1 Motor Controller Specifications

Operating Voltage: 24V DC 0.5V

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Maximum Current Draw: 15A continuous, 25A peak

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Communication Protocol: CAN-FD 2.0B

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Response Time: 2ms

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Position Accuracy: 0.02 degrees

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Temperature Range: -10 C to 50 C

2 Safety Features

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Overcurrent Protection: Automatic shutdown at >27A

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Thermal Protection: Progressive derating above 75 C

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Emergency Stop Integration: Response time <100ms

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Watchdog Timer: 250ms maximum reset interval

#### 4. INTEGRATION PROTOCOLS

- 1 Hardware Integration
- a) All motor controller installations must utilize NaviFloor-approved mobrackets (Part No. NF-MCB-2024).
- b) Cooling systems must maintain controller temperature below 65 C load.
- c) Power distribution must comply with NaviFloor Power Distribution Specification NF-PDS-2023-089.
- 2 Software Integration

- a) Controller firmware must be NaviFloor version 7.2.4 or higher.
- b) Communication stack must implement NaviFloor's proprietary terra protocols.
- c) All parameter updates must be logged to non-volatile memory.

#### **5. QUALITY ASSURANCE**

1 Testing Requirements

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Full load testing for minimum 4 hours

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Temperature cycling: -5 C to 45 C, 5 cycles

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Vibration testing per IEC 60068-2-6

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EMC compliance testing per EN 61000-6-2

2 Documentation Requirements

Test results for each controller unit

Calibration certificates

Integration verification checklist

Quality control signoff documentation

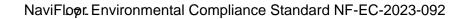
## 6. COMPLIANCE AND CERTIFICATION

1 Regulatory Standards

- - 6 UL 1004-1 for rotating electrical machines
CE marking requirements
RoHS compliance
ISO 13849-1 Performance Level D
2 Internal Standards

NaviFloor Quality Management System (QMS-2023)

NaviFloor Safety Protocol NF-SP-2023-118



#### 7. MAINTENANCE AND SUPPORT

1 Preventive Maintenance

Quarterly controller diagnostics

Annual firmware updates

Biannual calibration verification

Monthly performance data analysis

2 Technical Support

- 8 24/7 emergency support availability
 Remote diagnostics capability
 Maximum 4-hour response time for critical issues
 Quarterly performance review meetings

#### **8. PROPRIETARY RIGHTS**

- 1 All specifications, designs, and integration protocols contained here
- 2 This document contains confidential and proprietary information and

#### 9. REVISION HISTORY

Version 2.1 - January 15, 2024

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Updated voltage specifications

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Added new safety protocols

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Revised testing requirements

Version 2.0 - July 1, 2023

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Initial release of unified specification

#### 10. APPROVAL AND AUTHORIZATION

7	This Specification has been reviewed and approved by
_	_
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