PDR-OPS-014 CALIBRATION STANDARDS FOR ARCTIC-GRADE SENSORS

PDR-OPS-014 CALIBRATION STANDARDS F

Version 3.2 | Effective Date: January 15, 2024

Document Classification: CONFIDENTIAL

Document Owner: Engineering Operations

1. PURPOSE AND SCOPE

1. This document establishes the mandatory calibration standards and

2. These standards apply to all BlueCore(TM)-enabled sensors, includ

Temperature sensors (Series AT-2000 and newer)

- Proximity detection arrays (Arctic Series)

- LiDAR systems (ColdSight(TM) Platform)

- Inertial measurement units (IMU-X Cold Series)

- Pressure sensors (P-Series Arctic)

2. DEFINITIONS

1. "Arctic-Grade Sensor" means any sensor certified for continuous op

2. "Calibration Cycle" refers to the complete process of sensor verifica

3. "Reference Standard" means PDR-approved calibration equipment

4. "Critical Deviation" means any variance exceeding the thresholds s

3. REGULATORY COMPLIANCE

1. All calibration procedures shall comply with:

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ISO/IEC 17025:2017

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ANSI/NCSL Z540.3

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PDR Quality Management System (QMS-001)

Applicable regional cold storage safety standards

4. CALIBRATION PROCEDURES

1. Pre-Calibration Requirements

a) All calibration equipment must be maintained at the target temperat

minimum 4 hours

b) Humidity levels must be controlled to 45% 5%

c) Personnel must be certified in Arctic Sensor Calibration (ASC-II or

2. Primary Calibration Steps

a) Initial baseline measurement at room temperature (20 C 2 C)

b) Staged temperature reduction (5 C intervals)

c) Full functional testing at target temperature

d) Drift analysis over 24-hour period

e) Cross-verification with redundant reference standards

3. Documentation Requirements

a) Calibration date and technician identification

b) Environmental conditions throughout procedure

c) Reference standard certification numbers

d) Raw measurement data

e) Adjustment parameters

f) Uncertainty calculations

5. CALIBRATION INTERVALS

1. Standard Intervals

Temperature Sensors: 6 months

- Proximity Arrays: 3 months

- LiDAR Systems: 4 months

- IMUs: 6 months

- Pressure Sensors: 6 months

2. Accelerated Recalibration Triggers

a) Post-impact events

b) Following software updates affecting sensor interfaces

c) After exposure to temperatures below -50 C

d) Upon detection of drift exceeding 2% of specified range

6. QUALITY ASSURANCE

1. All calibration activities must be overseen by a Quality Assurance R

2. Records Retention

- Calibration records shall be maintained for 5 years
- Electronic backup required within 24 hours
- Monthly audit of calibration database required

3. Non-Conformance Handling

a) Immediate notification to Quality Control

b) Root cause analysis within 48 hours

c) Corrective action plan development

d) Impact assessment on deployed units

7. SAFETY PROTOCOLS

1. Personnel Safety Requirements

- Minimum two technicians present during calibration

- Cold-environment PPE mandatory

- Maximum 4-hour shifts in sub-zero conditions

2. Emergency Procedures

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Equipment shutdown protocols

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Emergency communication procedures

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First aid and medical response guidelines

8. PROPRIETARY INFORMATION

1. This document contains confidential and proprietary information of

9. REVISION HISTORY

Version 3.2 - January 15, 2024

Updated calibration intervals for LiDAR systems

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Added new safety protocols

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Revised drift parameters

Version 3.1 - July 1, 2023

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Added BlueCore(TM) specific procedures

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Updated regulatory compliance references

10. APPROVAL

APPROVED BY:

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Date: January 15, 2024

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Date: January 15, 2024