COLD ENVIRONMENT SENSOR CALIBRATION GUIDELINES

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Classification: Confidential & Proprietary

1. PURPOSE AND SCOPE

1. These Cold Environment Sensor Calibration Guidelines ("Guideline

2. These Guidelines apply to all BlueCore(TM)-enabled robots and as

a) LiDAR navigation sensors

b) Proximity detection arrays

c) Temperature monitoring systems

d) Humidity sensors

e) Surface friction detection modules

f) Battery thermal management sensors

2. DEFINITIONS

1. "Calibration Environment" means a controlled testing chamber capa

2. "Reference Standard" means Company-approved calibration equip

3. "Thermal Equilibrium" means the state where sensor temperature r

4. "Validation Protocol" means the Company's standardized testing pr

3. CALIBRATION REQUIREMENTS

1. Initial Calibration

a) All sensors must undergo initial calibration prior to deployment

b) Calibration must be performed at five temperature points: +20 C, 0
-25 C, and -40 C

c) Minimum stabilization period of 2 hours at each temperature point

d) Documentation of all calibration data in the BlueCore(TM) Sensor R

2. Periodic Recalibration

a) Mandatory recalibration every 2,000 operating hours or 6 months, v
occurs first

b) Additional calibration required following any sensor replacement or

update 3 -

c) Emergency recalibration if deviation exceeds 2% from reference va

4. CALIBRATION PROCEDURES

1. Pre-Calibration Requirements

a) Verify calibration environment meets specifications in Section 2.1

b) Ensure all reference standards are within certification period

c) Document pre-calibration sensor readings at room temperature

d) Verify BlueCore(TM) firmware version compatibility

2. Calibration Process

a) Initialize BlueCore(TM) Calibration Mode using secure authenticatio

b) Follow temperature point sequence specified in Section 3.1(b)

c) Record minimum of 100 measurement points at each temperature

d) Calculate deviation from reference standard

e) Apply compensation algorithms as specified in PDR-ALGO-2023-1

5. QUALITY CONTROL AND DOCUMENTATION

1. All calibration activities must be:

a) Performed by certified technicians (Level II minimum)

b) Documented in the Company's Quality Management System

c) Traceable to specific sensor serial numbers and robot units

d) Verified by Quality Assurance personnel

2. Required Documentation:

a) Calibration certificates

b) Raw measurement data

c) Environmental condition logs

d) Technician certification records

e) Reference standard certificates

6. COMPLIANCE AND LIABILITY

1. Compliance with these Guidelines is mandatory for all Company pe

2. Failure to follow these Guidelines may result in:

a) Voiding of product warranties

b) Non-compliance with safety certifications

c) Potential liability for resulting damages

d) Disciplinary action for responsible personnel

7. PROPRIETARY INFORMATION

1. These Guidelines contain confidential and proprietary information o

8. REVISION HISTORY

Version 3.2 - January 15, 2024

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Updated temperature point specifications

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Added firmware validation requirements

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Revised calibration intervals

Version 3.1 - July 1, 2023

Added BlueCore(TM) 2.0 compatibility requirements

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Updated reference standard specifications

Version 3.0 - January 1, 2023

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Initial release of consolidated guidelines

AUTHORIZATION

APPROVED BY:

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