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ACC-CD-51-01

Criteria For the Accreditation of Surveying Equipment Calibration Laboratories

Table of Contents

1 Background Information 2
1.1 Introduction 2
1.2 Purpose 2
1.3 Scope 2
1.4 Role(s) and Responsibility 2
2 Terms and Definitions 3
2.1 Definition of Terms 3
3 Acronyms and Abbreviations 4
4 Criteria 5
4.1 Requirements of Accreditation 5
4.2 Determination of Accreditation Scope 5
4.3 Human Resource Requirements 6
4.4 Equipment and Metrological Traceability requirements 6
4.5 Environmental Conditions: 7
4.6 Calibration Methods and Procedures 7
4.7 Measurement Uncertainty: 7
4.8 On-site Assessment 7
4.9 Maintenance of Accreditation 8
4.10 Appeals Handling 8
4.11 General remarks on witnessing 9
4.12 Quality Management system: 9
4.13 Accreditation Standards and normative documents 9
4.14 Review of Criteria Document 9
5 Associated Documents 9
6 Revision/ Amendment Record 10

Approved Version

1 Background Information

1.1 Introduction

This document provides guidance for the evaluation of technical competence of calibration laboratories performing calibration of surveying equipment such as Total Stations, EDM (Electronic Distance Measurement) components, angular measurement systems, levels and Cameras, LIDAR (Light Detection and Ranging) and acoustic systems, GNSS (Global Navigation Satellite Systems) including but not limited to manned or remotely piloted terrestrial, airborne or marine systems.

1.2 Purpose

This document supports the delivery of consistent, impartial, and technically valid assessments in accordance with ISO/IEC 17025 for calibration laboratories dealing with surveying equipment. It also incorporates relevant KENAS policies, procedures, and guidance documents to promote the comprehensive and consistent application of best practices in the calibration of surveying equipment.

1.3 Scope

This document applies to the following scopes:

- Calibration laboratories performing distance calibration, angular calibration, and level/tilt calibration, camera calibration and calibration of GNSS, LIDAR(LADAR)/RADAR and SONAR measurement systems.
- Both laboratory-based calibration and field calibration (where permitted by national regulations).
- Use of reference baselines, collimation lines, precise theodolites, EDM comparators, and optical/mechanical standards.
- Inspection and maintenance of surveying equipment accessories to assure integrity of measurements.

The criteria outlined herein will be utilized alongside the Assessor Guide and Terms of Reference ACC-CD-02-01, the Procedure for Management and Reporting of Assessments ACC-PR-07-01, the Procedure for Sampling during Assessment and Internal Audits ACC-PR-03-01, the Policy for Management of Extraordinary Events PL-13-01, the Policy for Handling Objections to Assessors/Experts PL-30-01, and applicable International Laboratory Accreditation Cooperation (ILAC) policies and guidance documents. Accreditation shall be granted based on the Calibration Laboratory's demonstrated competence.

1.4 Role(s) and Responsibility

Role	Responsibility
Manager Calibration	Process owner

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Role	Responsibility
Principal Accreditation Officer Calibration	Reviewer
Chief Manager Laboratories	Recommender
Chief Executive Officer	Approval
Calibration Laboratories	Compliance

2 Terms and Definitions

For this guidance document, the following terms and definitions shall apply in addition to those given in ISO/IEC 17000 and the Kenya Accreditation Service Act 2019. The definitions as captured by FIG / British Ordnance Survey shall apply.

2.1 Definition of Terms

2.1.1 Accreditation

Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks.

2.1.2 Scope of accreditation

The specific conformity assessment services for which accreditation is sought or has been granted.

2.1.3 Measurement

The process of experimentally obtaining one or more values that can reasonably be attributed to a size.

2.1.4 Metrological traceability

Refers to the ownership of a measurement result referenced through an uninterrupted and documented calibration chain, each contributing to the measurement uncertainty.

2.1.5 Surveying equipment

An instrument used for measuring distance and angles

2.1.6 Remote piloted Aircraft (RpA)

An unmanned aircraft which is pilotable from a remote pilot station

2.1.7 Calibration

The set of operations that establishes the relationship between quantity values provided by surveying equipment (e.g., distance, angle, tilt) and corresponding reference values with stated uncertainties, under specified conditions. Calibration does not modify the instrument's internal parameters or physical adjustments.

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2.1.8 Adjustment

A subsequent operation, performed after calibration if needed, to reduce the measurement error by physically or digitally altering the instrument's internal settings (e.g., zero-point, scale factor, collimation corrections). After adjustment, the instrument must be re calibrated to verify that the errors are within acceptable limits;

2.1.9 Camera

A lightproof chamber or box in which the image of an exterior object is projected upon a sensitized plate or film, through an opening usually equipped with a lens or lenses, shutter, and variable aperture.

3 Acronyms and Abbreviations

AB	Accreditation Body
CL	Calibration Laboratory
CEO	Chief Executive Officer
CML	Chief Manager, Laboratories
MCAL	Manager Calibration
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
KENAS	Kenya Accreditation Service
TS	Technical Specifications
NMI	National Metrology Institute
FIG	International Federation of Surveyors
ILC	Interlaboratory Comparison
GNSS	Global Navigation Satellite Systems
EDM	Electronic Distance Measurement
LIDAR/LADAR	Light Detection and Ranging
RADAR	Radio Detection and Ranging
SONAR	Sound Navigation and Ranging

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4 Criteria

4.1 Requirements of Accreditation

4.1.1 General requirements:

4.1.1.1 A Calibration laboratory applying for accreditation in the scope of survey equipment shall provide:

a) A definition of the competency required related to the survey equipment methods being applied
b) Information about the availability of this competency (competence evaluation of personnel undertaking calibration activities).
c) A client who has made an application for calibration for the scope under review.

4.1.2 Application Package:

4.1.2.1 The application package includes the following:

a) Duly filled application form
b) Corporate Profile
c) Copy of documents demonstrating legal status
d) Organizational chart
e) Geographic activity details including specification of calibration activities carried out at each location.
f) Cross reference matrix identifying the Calibration Laboratory's system documentation where accreditation requirements are met.
g) Management System Documents such as procedures and supporting documents that demonstrate conformity to accreditation criteria or sector-specific requirements.
h) CV's / Resumes of technical personnel

4.2 Determination of Accreditation Scope

This document applies to:

a) Calibration laboratories performing distance calibration, angular calibration, and level/tilt calibration, camera calibration and calibration of GNSS, LIDAR(LADAR)/RADAR and SONAR measurement systems.
b) Both laboratory-based calibration and field calibration (where permitted by national regulations).
c) Use of reference baselines, collimation lines, precise theodolites, EDM comparators, and optical/mechanical standards.

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4.3 Human Resource Requirements

4.3.1 The Calibration Laboratories shall determine their competence criteria for personnel involved in the management and performance of calibration methods.

4.3.2 Personnel shall have a minimum of a Diploma in Physics or any other survey related field and qualifications in metrology, geomatics, surveying or engineering.

4.3.3 The calibration laboratory shall demonstrate engagement of at least one full member of the Institution of Surveyors of Kenya, Land Surveyors Chapter/Engineering Surveyors Chapter.

4.3.4 The Calibration laboratory shall demonstrate that the personnel have demonstrated competence as applicable in

a) Optical and EDM metrology
b) Angular measurement principles,
c) Photogrammetry
d) GNSS;
e) Hydrography
f) Environnemental compensation principles
g) Uncertainty of Measurement evaluation

4.3.5 The personnel in the calibration laboratory shall have a minimum of 2-year hands on experience calibrating survey equipment (or supervised equivalent) or relevant manufacturer training and certification

4.3.6 The technical signatories shall have demonstrated ability to interpret calibration results, uncertainty budgets, specification limits and measurement decision rules for surveying equipment.

4.3.7 Records of ongoing competence evaluation and training as required shall be maintained.

4.4 Equipment and Metrological Traceability requirements

4.4.1 Reference equipment:

The calibration laboratory shall have the following reference equipment as applicable but not limited to;

a) Laser interferometer or reference EDM comparator with traceable calibration.
b) High-precision collimators or autocollimators.
c) Precision angle measurement system (e.g., universal theodolite, indexing table).
d) Certified reference targets/prisms.
e) Level/tilt calibration setup (tilting stage or precision inclinometer calibration

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f) Precision Antenna for GNSS calibration
g) Relevant equipment for camera calibration
h) Relevant equipment for SONAR Calibration
i) Environmental monitoring instruments (temperature, humidity, pressure)

4.5 Environmental Conditions:

Calibration laboratories shall monitor and control the environmental conditions including temperature, pressure, and humidity.

4.6 Calibration Methods and Procedures

4.6.1 The calibration procedures shall include set up instructions, reference standards, step by step calibration, checks for instrument stability, data recording formats.

4.6.2 Demonstration of method validity shall be done through comparison with other labs, internal quality controls, repeatability/reproducibility studies, correlation with manufacturer specifications

4.7 Measurement Uncertainty:

4.7.1 The calibration laboratory shall have written procedures for the determination of measurement uncertainties for calibration activities performed.

4.7.2 The laboratory shall provide a full uncertainty budget as per the GUM and ISO 17123-1.

4.7.3 The laboratory shall participate in ILC. Where unavailable alternative validation such as baseline re observations and intercomparison with peer laboratories can be performed.

4.7.4 Control charts shall be used by the laboratory to track the drift of reference equipment and use of statistical trending for repeatability.

4.8 On-site Assessment

4.8.1 During the office assessment, the team shall sample the records of clients and personnel, representative of the scope for which accreditation is sought.

4.8.2 In case the Calibration Laboratory has any engagement with a consultancy body, KENAS shall verify records of this consultancy body to confirm the effectiveness of measures taken to mitigate any identified risks to impartiality.

4.8.3 During the initial assessment, the implementation of policies and procedures shall be assessed at the office(s) of the Calibration Laboratory.

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4.8.4 The on-site assessment shall be conducted at the head office and any other locations based on a risk evaluation.

4.8.5 The initial on-site assessment comprises of two mandatory components to determine if the calibration laboratory should be granted accreditation:

a) Assessment of the applicant's implementation of its management system in an office assessment.
b) Assessment of the applicant's calibration services – witnessed calibration activities

4.9 Maintenance of Accreditation

4.9.1 The implementation of the accredited calibration scope for survey equipment shall be verified during surveillance assessments by KENAS.

4.10 Appeals Handling

4.10.1 An accredited inspection body/testing laboratory that is aggrieved by a decision of KENAS may, by notice in writing to the Chief Executive Officer and upon payment of the prescribed fees, appeal against the decision within twenty-one days of being notified of the decision as outlined in the third schedule of the Kenya Accreditation Service Act CAP 496A.

4.10.2 A notice of appeal under this section shall set out the grounds of the appeal.

4.10.3 The Chief Executive Officer shall, within seven days of receipt of the notice under sub-section (2), forward the notice to the Accreditation Appeals Tribunal.

4.10.4 The Accreditation Appeals Tribunal shall consider the notice of appeal and the response of KENAS before making an award.

4.10.5 An award of the Accreditation Appeals Tribunal may —

a) confirm the decision of KENAS.

b) vary the decision of KENAS.

c) direct KENAS to carry out a fresh evaluation of the application or undertake a fresh assessment of the conformity assessment body; or

d) issue other orders it may consider necessary.

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4.11 General remarks on witnessing

4.11.1 In addition to the above-mentioned considerations for selection of calibration activities to be witnessed, the following will apply:

4.11.1.1 KENAS will not witness the same personnel more than once within the same scheme.

4.11.1.2 KENAS will not witness calibrations at the same organization repeatedly.

4.12 Quality Management system:

The quality system shall describe the general and specific arrangements for the conduct of all calibration activities under accreditation and should specifically incorporate:

4.12.1 the arrangements for managing calibration work including the organisational interface and controls between the permanent facilities and remote or site locations.

4.12.2 the control and authorisation of calibration specific procedures and methods.

4.12.3 the need to ensure that calibration procedures and methods are available at the point of calibration, whether in the laboratory or on site.

4.13 Accreditation Standards and normative documents

A calibration laboratory shall satisfy the following normative documents for the scope of accreditation of calibration of survey equipment.

4.14 Review of Criteria Document

This document shall be revised/amended after every four (4) years.

5 Associated Documents

Ref	Document Identifier	Document Title
1.	ISO/IEC 17025	Conformity assessment — General requirements for the competence of testing and calibration laboratories
2.	ILAC P10	ILAC Policy on Traceability of Measurement Results
3.	ILAC P14	ILAC Policy for Measurement Uncertainty in Calibration

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6 Revision/ Amendment Record

Date	Ver	Revised By	Reason for Revision
29/06/2026	01	SDE	New document

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