TECHNICAL REPORT

# Monitoring uncertainty in field measurements

Report number: TR-2026-014
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Date: 29 August 2026

## Abstract

This report demonstrates a reproducible field-measurement workflow. It defines the object of study, records the methods and uncertainty budget, summarises the observations, and states the conclusions separately from the recommendations.

## Keywords

field measurement; uncertainty; reproducibility; technical monitoring

# 1 Introduction

## 1.1 Purpose of the work

The purpose is to compare a lightweight calibration routine with the current manual check. The report is written so that another team can repeat the measurement without relying on undocumented decisions.

## 1.2 Tasks

1. Define the measurement object and acceptance threshold.
2. Collect paired observations under the same environmental conditions.
3. Estimate uncertainty and record deviations from the plan.

# 2 Methods and data

Four instruments were checked at three reference points. The data sheet records instrument identifier, operator, timestamp, reference value and observed value. No personal or proprietary data is needed for this starter.

Table 1: Example uncertainty budget.

| Source | Estimate | Unit | Note |
|---|---|---|---|
| Instrument resolution | 0.20 | units | Manufacturer display increment |
| Repeatability | 0.31 | units | Standard deviation of repeats |
| Environment | 0.18 | units | Temperature correction residual |

# 3 Results

The paired procedure reduced the median absolute deviation in the pilot sample. The result is compatible with the acceptance threshold, but the small sample does not establish performance across every field condition.

# 4 Conclusions and recommendations

The calibration routine is suitable for a controlled extension. Repeat the study with a second operator, publish the data dictionary with the results, and define a review trigger for measurements outside the uncertainty budget.