## REQUIRED SETUP ✳

- Laptop or PC with XpertLog software installed;
- Loggers or XSens devices equipped with PT100 sensors or thermocouples;
- Reference Temperature Probe (calibrated Standard);
- LN2 Calibration kit

## 1 HARDWARE SETUP

### 1. SYSTEM SETUP
Insert each sensor (PT100 or thermocouple) individually into the thermal equilibrium insert, ensuring that the stainless steel protective tip is in direct contact with the bottom of the insert. Adjust the locking ring gradually to accommodate sensor cables through the guide lid. Secure cables in place, and position the reference probe in the central port.

### 2. LN2 PREPARATION
Half-fill the Dewar vessel with liquid nitrogen using the provided funnel. Always wear cryogenic gloves and safety goggles. Wait ~2 minutes for the nitrogen boil to subside before proceeding.

### 3. SENSOR INSERTION
Gradually immerse the insert assembly (with sensors and reference probe) into the Dewar. As LN2 starts boiling again, ensure the silicone plug is removed from the lid to allow vapor to escape safely.

### 4. FINAL LN2 FILL
After initial boiling subsides, insert the funnel into the refill port and top up LN2 until it reaches ~0.5 cm below the lid.

### 5. FINAL SETUP AFTER CALIBRATION
Remove sensors and reference probe one by one. Carefully store them on a clean surface. Extract the copper insert and allow it to dry.

### 6. LN2 DISPOSAL
Pour any remaining liquid nitrogen back into the long-term storage Dewar using the provided funnel.

## 2 SOFTWARE SETUP

### 1. USER CALIBRATION VIA XPERTLOG
In XpertLog, select User Calibration for LN2
**Set the following conditions:**
- Calibration: -196°C / ±1.5°C / 3-minute check
- Verification: -196°C / ±0.4°C / 3-minute check
- RTD & Block: Drift ±0.5°C / Deviation from Reference ±2°C / 2-minute check

Start the acquisition by following step-by-step instructions in the software.

### 2. AUTOMATED PROCESS & PASS CRITERIA
The software guides the entire user calibration process, automatically logging sensor response and verifying against set criteria. Calibration ends with a status report — each sensor marked PASS indicates successful calibration and verification.