



Technical Bulletin 180101

---System Calibration at Site by Opti-Cal---

(Outline for Customer Planning)

The following steps are performed by the qualified DynAmp technician except when noted as "CUSTOMER"
"SUT" refers to the System Under Test (the system being calibrated)

PREPARE OPTI-CAL

- A) Position and interconnect the Opti-Cal components.
 - Compensation Module (a few meters from the bus bar where the measurement fiber will be put around the bus)
 - Measurement Fiber (same place as compensation module, but not around the bus bar yet)
 - Electrical and Fiber Optic interconnection cables (between Compensation Module and Subracks)
 - Subracks and DMMs. (best location is next to the metering electronics of the SUT)
 - This is where the technician will be working during the actual calibration ---
 - 1st 'reference' DMM is connected to the Opti-Cal measurement output at this point in time
 - 2nd 'SUT' DMM will be connected to the SUT measurement output later
- B) Stabilize Opti-Cal
 - After in position, Opti-Cal should be allowed to adapt to ambient temperature for about 1 hour.
 - Then, the Opti-Cal should be energized for about 20 minutes to stabilize internal temperatures before use.

CALIBRATION PROCESS OUTLINE

- 1) If the SUT is an LKAT or LKP, measure and record "as found" channel voltages etc.
If the SUT is an LKCO, download and review data report from LKCO to verify "as found" internal condition
Our technician uses his laptop and serial cable to connect to the LKCO Metering Unit
"As found" can be completed during normal operation (it does not impact the measurement signal)
- 2) CUSTOMER : Make the work area around bus bar safe so Opti-Cal measurement fiber can be installed
Typically, this is realized using one of the following methods.
 - a) Mainline or Rectifier : utilize a grounding cart to create zero potential between the bus and ground
 - b) Rectifier : shutdown rectifier and isolate rectifier from Input AC and output DC Process voltagesPlace control and protection systems which use SUT measurement signal under manual or backup control
- 3) Once work area is safe, install and position the measurement fiber around the bus bar to be measured
Connect the 2nd DMM to the SUT (install reference shunt if needed)
- 4) CUSTOMER : Restart rectifier / bus current if needed
- 5) Record comparative measurements (Opti-Cal and SUT) and evaluate data
- 6) If SUT is performing to specification, continue to step 7
If calibration needs to be adjusted...
 - If SUT is LKAT, make adjustment at metering unit while LKAT is powered up.
 - If SUT is LKCO or LKP, determine adjustment to be made and then power SUT down
 - Make adjustment at metering unit (if LKCO, could include adjustment at Compensation Module)
 - Power SUT back up
 - Finally, record comparative measurements again and evaluate data
 - If adjustment is successful, continue to step 7, otherwise repeat this step 6
- 7) CUSTOMER : Shutdown Rectifier again to make work area safe (no shutdown on mainline bus bar)
- 8) Remove Opti-Cal sensor fiber from bus bar.
Disconnect 2nd DMM from the SUT (and uninstall reference shunt if used)
Restore connections / measurement chain to as-found / operating configuration
- 9) CUSTOMER : Return control and protection systems back to automatic control
Restart rectifier / bus current if needed.