



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 bus where measurement fiber will be put around the bus
Measurement Fiber: fixed to compensation module (not installed around the bus bar yet)
Trunk Cables: Electrical and Fiber Optic (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
If the SUT is not a DynAmp system, identify measurement signal and DMM connection method
"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 (utilize signal converter or reference shunt if needed)
- 4) CUSTOMER : Restart rectifier / bus current if needed
- 5) Record series of comparative measurements (Opti-Cal and SUT) and evaluate data in data worksheet.
- 6) If SUT is performing to specification, continue to step 7 (no adjustments)
If SUT is not a DynAmp system, complete/store data for subsequent reporting and continue to step 7
If SUT is a DynAmp system and calibration needs to be adjusted...
Make LKAT or LKP adjustment at metering unit.
Make LKCO adjustment at Compensation Module or in some cases, at metering unit
Repeat step 5 to confirm adjustment
- 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 signal converter or 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.