# **AERI and E-AERI Systems**

## **AERI Agilent Resistance Validation procedure**



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### **AERI Agilent Resistance Validation Procedure**

### Requirements

To perform the Agilent Resistance Validation procedure, you will need the following hardware:

- AERI system with laptop computer
- Calibrated resistor kit (2 boxes):
  - AERI Ambient Blackbody Verification Resistors box.
  - AERI Hot Blackbody Verification Resistors box.
- AERI Agilent Resistor Validation CD (including the **txt2hkspc.py** file and **AERI Resistance Validation Template.xls**)
- Computer with Microsoft Excel

#### Procedure

Follow the steps below to perform the Agilent Resistance Validation:

- 1. Stop any running AERI ingest or FTSW software on the AERI laptop.
- 2. Find and remove EAERIHousekeeping.hk file in the c:\E-AERI\Data\ folder.
- 3. Disconnect the AERI ABB and HBB connectors at each Blackbody.



4. Hang the calibration resistor box "AERI Ambient Blackbody Verification Resistors" on the handle of the ABB and connect the ABB cable to the box.

5. Hang the calibration resistor box "AERI Hot Blackbody Verification Resistors" on the handle of the HBB and connect the HBB cable to the box.



- 6. Run (double click) FTSW\_EAERI\_GUI.bat without the AERI ingest software. There is a link to the correct version on the desktop.
- 7. Enter "9999" into the "# of coadded scans:" text box.
- 8. Click "Start acquistion".
- 9. Click "stop acquisition" after 15 minutes of data collection.
- 10. Copy "txt2hkspc.py" to c:\E-AERI\Data\ on the AERI laptop.
- 11. Open a cygwin window. (link on AERI laptop desktop)
- 12. Type "cd /cygdrive/c/E-AERI/Data" in the cygwin window.
- 13. Type "python txt2hkspc.py EAERIHousekeeping.hk --resistance" to collect 20 samples of data.(Record file name and date/time in the appropriate instrument logbook.)
- 14. Transfer the created EAERIHousekeeping\_YYYYMMDD\_HHMMSS.csv file to a computer with Microsoft Excel and the Analysis spreadsheet.
- 15. OPEN EAERIHousekeeping\_YYMMDD\_HHMMSS.csv in Microsoft Excel.
- 16. OPEN the Analysis spreadsheet: <AERI\_Resistance\_Validation\_Template.xls>

- 17. COPY all cells in the collected file and PASTE into the analysis spreadsheet, using Worksheet titled: <Bring in AERI HK File>, starting in cell [A1].
- Remame the analysis spreadsheet:
  <AERI\_Resistance\_Check\_SNxxx\_yymmdd.xls>. Record test specifics in appropriate logbook. Email file to appropriate individuals.
- 19. The analysis will be processed automatically with the results summarized in the Worksheet titled: <Resistance Check Summary>. See example below.

#### ABB Bomem AERI Agilent Meter Resistance Measurement Check

	ABB top	ABB apex ABB bottom		HBB top	HBB apex HBB bottom	
Calibration R Value [ohm]	99,000.00	125,000.00	800,000.00	2,760.00	9,900.00	12,500.00
Nominal T [°C]	-24	-29	-59	60	25	20
dT/dR [K/ohm]	-1.88E-04	-1.45E-04	-1.87E-05	-1.08E-02	-2.51E-03	-1.93E-03
1	98,999.18	124,998.29	799,981.70	2,759.93	9,899.89	12,499.95
2	98,998.63	124,998.67	799,979.94	2,759.91	9,899.91	12,499.98
3	98,999.57	124,998.51	799,983.60	2,760.00	9,899.93	12,499.86
4	98,998.59	124,998.84	799,982.90	2,759.89	9,900.03	12,499.85
5	98,999.02	124,998.14	799,984.44	2,759.89	9,899.87	12,499.91
6	98,999.71	124,998.67	799,983.06	2,759.84	9,899.89	12,499.86
7	98,999.16	124,998.45	799,985.10	2,759.85	9,899.85	12,499.85
8	98,998.59	124,999.14	799,987.40	2,759.82	9,899.91	12,499.90
9	98,999.02	124,999.06	799,985.94	2,759.91	9,899.83	12,499.81
10	98,998.80	124,998.76	799,984.90	2,759.89	9,899.97	12,499.85
11	98,998.88	124,999.75	799,983.90	2,759.84	9,899.94	12,499.88
12	98,999.49	124,999.27	799,988.20	2,759.86	9,899.87	12,499.82
13	98,999.02	124,999.58	799,986.25	2,759.83	9,899.85	12,499.91
14	98,999.55	124,999.31	799,989.20	2,759.82	9,899.87	12,499.90
15	98,998.72	124,998.76	799,986.70	2,759.81	9,899.80	12,499.94
16	98,999.23	124,999.24	799,986.00	2,759.94	9,899.78	12,499.86
17	98,999.70	125,000.06	799,988.60	2,759.88	9,899.71	12,499.72
18	98,999.84	124,998.90	799,986.80	2,759.83	9,899.77	12,499.90
19	98,999.10	124,999.41	799,990.06	2,759.74	9,899.81	12,499.84
20	98,999.71	124,999.37	799,980.50	2,759.82	9,899.81	12,499.73
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Rave [ohm]	98,999.18	124,999.01	799,985.26	2,759.87	9,899.86	12,499.86
Rsd [ohm]	0.41	0.50	2.80	0.06	0.07	0.06
∆R=Rave-Rcal [ohm]	-0.82	-0.99	-14.74	-0.13	-0.14	-0.14
$\Delta Teq = \Delta R^*(dT/dR) [mK]$	0.16	0.14	0.27	1.46	0.34	0.26
Under 10 mK Allowable?	IN Spec	IN Spec	IN Spec	IN Spec	IN Spec	IN Spec

20. Remove the Blackbody Verification Resistor boxes and reconfigure the AERI for normal operation.