

System IIA

RF CALIBRATION AND MEASUREMENT PRODUCTS

- **Total system accuracy for the transfer of calibration factors 1.2% to 2.5% (RSS) in the 0.01 to 18 GHz range.**
- **5 seconds/measurement includes signal averaging and meter settling time.**
- **Manual or automated operation**
- **IEEE-488 bus**
- **SYSIIA-SureCal calibration software included**
- **Substituted power levels 0.5 mW and 1.0 to 10 mW in 1 mW steps $\pm 0.1\% + 1 \mu\text{W}$.**
- **Calibration factor transfer repeatability 0.1%**
- **Calibrates power sensors from 100 kHz to 40 GHz.**
- **Transfer Standards include NIST traceable calibration data with as many as 141 calibration points.**
- **Optional A2LA Accredited Calibrations**

System IIA is used primarily for the transfer of calibration factors to thermistor, thermocouple, and diode-type RF power meter sensors. Accurate measurement of signal source output level can also be performed. Using power ratio methods, variable & step attenuators and attenuation measuring equipment can be calibrated. Receiver, amplifier, or attenuator linearity can also be measured.

Calibration of RF power sensors is faster and more accurate than any other system with the TEGAM System IIA. This IEEE-488 bus controlled product transforms a slow and costly task into a quick and accurate procedure. The calibration speed of the System IIA is typically 5 seconds per measurement frequency. The settling time of the power sensor/meter under test determines actual speed. Total accuracy is less than 1.2 to 2.5% (RSS). Accuracy is dependent on the frequency and VSWR of the device under test.

Automatic RF Power Sensor Calibration System



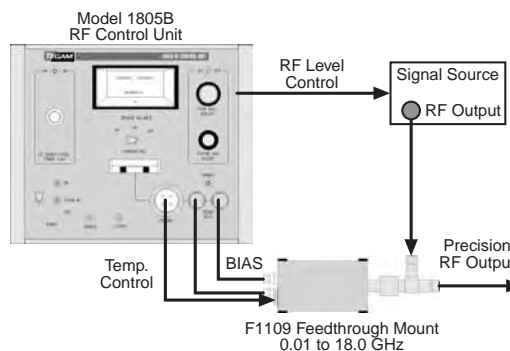
The System IIA can be used manually via front panel controls. The task of calibrating power sensors is fully automated by the SureCal calibration software. **Precision RF Power Source**

In its most elementary form, System IIA consists of an RF Control Unit (Model 1805B) and a temperature stabilized RF Power Transfer Standard (e.g. Model F1109). Add a customer-supplied RF source and a power meter compatible with the sensor being tested, and you are ready to accurately transfer calibration factors for a wide range of power sensors. Add a customer-supplied PC with GPIB and SureCal software and you have a fast, automatic, precision

power sensor calibration system.

The RF power Transfer Standard permits the accurate transfer of calibration data traceable to NIST. The 1805B uses highly accurate dc power substitution in a precision RF leveling loop. Power levels are established by precision resistor networks at dc, and are verifiable by an accurate dc voltmeter. Use your stable synthesized signal source to step through the calibration frequency points. When used in conjunction with SureCal software, this process is performed automatically via the IEEE-488 bus.

Eleven precision power levels of 0.5, and 1 to 10 mW in 1 mW steps permit the



YOUR GLOBAL SOURCE FOR TEST
AND MEASUREMENT SOLUTIONS

System IIA

AUTOMATIC RF POWER SENSOR CALIBRATION

verification and/or calibration of the linearity of measurement devices such as power meters (meter scales), power meter/mount combinations, spectrum analyzers, and receivers (to achieve a 10 mW power level, a signal source with an output of 100 mW is generally necessary).

Precision RF Power Meter

With the addition of a Primary RF Power Transfer Standard (e.g. Model M1110) and a Model 1806 Dual Type IV Power Meter, System IIA capability is expanded so that the working RF Power Transfer Standard can be re-certified on-site. This avoids removing the system from service for recalibration. Also, several working RF Power Transfer Standards can be re-certified using one Primary RF Power Transfer Standard. Re-certification can be accomplished automatically in less than 2 hours. The Model M1110 becomes the certifying element and must be periodically (annual calibration recommended) sent to a calibration facility such as TEGAM, the National Institute of Standards and Technology (NIST), or any equivalent service outside the USA.

The Model 1806 is a Dual Type IV Power Meter and Power Transfer Standard temperature controller combination. Metering circuits indicate the status of both the power meters and the temperature of the Standard. Resistance is front panel switch selectable to accommodate either 100 or 200 ohm thermistor Standards. The 1806

measures dc power levels from 0.01 to 30 mW.

Used in conjunction with a TEGAM RF Power Transfer Standard and an external digital voltmeter, the Model 1806 serves as a precision power meter for measuring RF power levels and for transferring calibration factors between feedthrough Standards or thermistor type sensors. Additionally, the Model 1806 is ideal for performing insertion loss measurements up to 20 dB.

Regardless of the application, all measurements can be directly traced to primary NIST standards. The 1806 can be used with all TEGAM RF Power Transfer Standards and can also be used in place of an HP (Agilent) Model 432 with HP (Agilent) thermistor power sensor Models 478A, 8478A, and 486A (TEGAM cable 138-652 required).

The TEGAM Primary RF Power Transfer Standard is a terminating thermistor mount that can be used to calibrate the reference output found on many power meters which serve thermocouple and diode power sensors.

Operating Flexibility

TEGAM Coaxial RF Power Transfer Standards are available for a wide variety of frequency ranges from 100 KHz to 26.5 GHz. Waveguide RF Power Transfer Standards are available in the 26.5 to 40 GHz range. See the individual Transfer Standards' datasheets for details.

The TEGAM Model 1806 fits a 19-inch rack. It may also be used on the bench. All of the TEGAM feedthrough

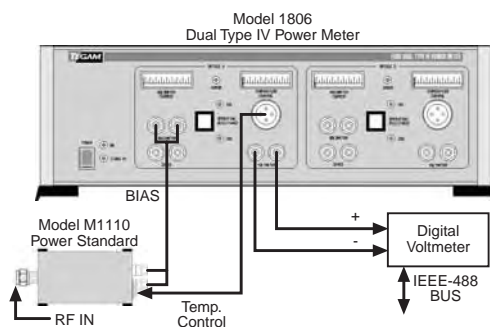
RF Power Transfer Standards and the Model 1805B may be used in a bench or rack mount configuration. All of these models are half-rack instruments and can be mounted side-by-side or individually using rack mount kit number 1919.

NIST Traceability

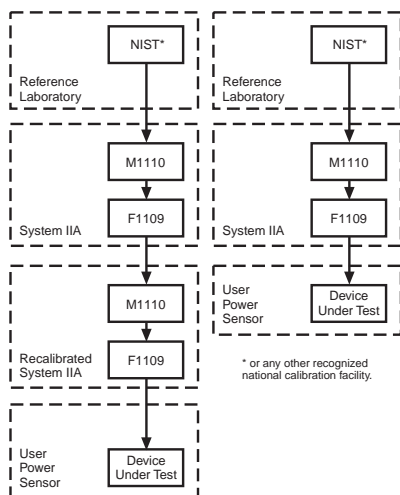
The figure below shows the traceability to NIST of the System IIA. The M1110 is a Primary RF Power Transfer Standard, and the F1109 is a working RF Transfer Standard. The working or feedthrough RF Transfer Standard can be returned to TEGAM for calibration using a NIST-calibrated Primary RF Power Transfer Standard as shown by the path on the right.

To keep the working RF Power Transfer Standard in your lab, a Primary RF Power Transfer Standard can be purchased to re-calibrate it. The Primary RF Power Transfer Standard can be sent directly to NIST for annual calibration as depicted by the path on the right. It can also be sent to TEGAM as depicted by the path on the left. Cost and turnaround times are significantly reduced by sending the Primary RF Power Transfer Standard to TEGAM.

The System IIA comes in a variety of packages. Contact TEGAM for more information.



This data sheet was current when it was produced. However, products are constantly being updated and improved. Because of this some differences may occur between the descriptions herein and the current product. Prices and specifications may be changed without notice.



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