

# Model 1805B

## RF POWER LEVEL CONTROL UNIT

**0.5 to 10 mW**

## Ensures Accurate Transfer of Calibration Factors

The 1805B RF Control Unit provides fast, reliable, and accurate leveled RF power when used in a closed-loop feedback arrangement. The unit provides automatic dc substitution at 0.5 mW and 1 mW to 10 mW in 1 mW steps using local or IEEE-488 bus control for easy and accurate transfer of calibration factors.

When used with the TEGAM Model F1109 RF power standard, the 1805B permits the accurate transfer of up to 132 calibration frequencies traceable to NIST from 0.01 to 18.0 GHz. The 1805B is also compatible with other TEGAM System IIA components including the F1109H, F1116, F1117A, F1119, and F1119H series RF Transfer Standards (refer to applicable data sheets for mount specifications).

An internal temperature controller raises and maintains the temperature of the mount chamber above ambient. This minimizes the effects of changes in ambient temperature for all TEGAM RF Transfer Standards.

The 1805B operates in a closed loop configuration for leveling the RF output of compatible signal sources. They are controlled directly using an analog signal applied to a dc coupled AM input connector.

Ultra stable dc high precision metal film resistors provide dc power increments across a TEGAM patented self-balancing bridge. The front panel bridge meter provides visual indication that closed loop stabilization has been achieved and enables rapid system operation. Coarse and fine adjustments are provided to obtain a meter null reading with no RF applied.

In addition to the bridge balance and temperature indicator, the 1805B contains several operational and performance checks. A front panel Mount Error indicator blinks if the voltage across the mount is not within a specified range. This alerts the operator of a mount fault such as open or shorted leads, or improper mount temperature. DC supply voltages are monitored by PCB-mounted LEDs which illuminate with an active power supply.

A standby mode switch allows mount heater circuit operation to maintain mount temperature at all times. This ensures full performance capability and long-term stability of the bolometer mount.

Other features of the 1805B are:

- **Automatic DC Level Control** - To within  $\pm 0.1\%$ ,  $+1\mu\text{W}$ , with an RF source variation of  $\pm 3\text{ dB}$  and an ambient temperature range of  $+12$  to  $+40^\circ\text{C}$ . The dc substitution level is held to an accuracy of  $+0.1\%$ ,  $+5\mu\text{W}$ .
- **DC Substitution and Bias Supply** - Maximum accuracy is achieved by using DC power for both bias and substitution signals.
- **Quick Visual Indication of Operation and Performance** - The unit employs LEDs to inform the user of RF power on/off condition, ac power on/standby, mount error, and remote/listen functions. Easy-to-read meters are used to monitor temperature stability and bridge balance.

# SPECIFICATIONS

## DC POWER SUBSTITUTION:

<b>Level Range:</b> 0.5, 1, through 10 mW
<b>Accuracy</b> (@ 30 ± 7 mW bias power): ± 0.1% + 5 µW
<b>Bias Power Range:</b> 29 - 31 mW, automatic with error indication for out-of-range balance condition.
<b>Power Level Control Range:</b> 3 - 23 dB minimum
<b>Leveled RF Power (referenced to DC substituted power) Dynamic Range:</b> ± 3 dB
<b>Unbalanced Detector:</b> Sensitivity: 2 µW/division Resolution: 0.2 µW
<b>Leveler Loop Gain:</b> 80 dB

## TEMPERATURE CONTROLLER:

<b>Bias Power Temperature Sensitivity:</b> 2 µW/°C per hour
<b>Ambient Temperature Dynamic Range:</b> + 12°C to +40°C
<b>Mount Warm-up Time:</b> 2 hours nominal
<b>Internal Temperature:</b> +46°C nominal
<b>Loop Gain:</b> 80 dB minimum
<b>Open Loop Frequency Response:</b> 0.1 Hz
<b>Warm-up Drive (saturated):</b> 8-10 V @ 200 mA minimum
<b>Indicator:</b> Voltmeter with marked operating range

## OPERATING MODES:

<b>Local:</b> Manual front panel control of all unit functions.
<b>Remote:</b> IEEE-488 full function Bus Control RF ON/OFF and substituted DC output power levels (0.5 and 1 - 10 mW in 1 mW steps) using any PC Compatible Controller.

## TEMPERATURE RANGE:

Operating: +10 to +40°C (+25 to +104°F)  
Storage: -40°C to +75°C (-67° to +167°F)

**CONNECTORS:** Binding Post, standard 0.75" spacing for Banana plugs.

**POWER REQUIREMENTS:** 110/120/220/240 Vac ±10%, 48 to 62 Hz, 40 Watts

**WEIGHT:** Net: 5.9 kg (13 lb)

**PHYSICAL DIMENSIONS:** approximately 444.5 x 215.9 x 117mm (17.5x8.5x7.0in)

**RACK MOUNTING:** The Model 1805B is a half rack instrument that can be mounted in any cabinet or rack designed according to EIA RS-310 and MIL-STD-189 using the Rack Adapter Kit (P/N 1919). This kit allows the Model 1805B to be mounted with the Model 1807A or another 1805B in the same rack-mount configuration.