

CAMLab for Windows™

CALIBRATION, ATTENUATION MEASUREMENT LAB (P/N 189-22)



The TEGAM Calibration, Attenuation Measurement Lab (CAMLab) is application specific software that runs in the Microsoft Windows™ environment on IBM compatible PC's. The CAMLab program significantly enhances the operation of the Model 8850 Attenuation Measurement system by providing the technician with automated measurement, data collection, data display and analysis capability. The capability to save and recall complicated system instrumentation and test configurations coupled with the graphical environment of windows makes CAMLab easy to use by any level of personnel. The CAMLab software can be configured to operate and control all system instrumentation to perform automated measurements of fixed, or step attenuators (manual or programmable). Binary attenuators may be measured vertically or horizontally across any number of frequencies. During the measurement process the data is plotted in real-time in a graph window with attenuation vs. frequency and numerically displayed in a spreadsheet style window (shown below). Measurement data and an instrumentation list may be saved in an ASCII text file after completion of a measurement. Multiple data files may be recalled and displayed side by side for comparison of past data. In addition, past and present calibration data files may be combined either numerically or graphically to allow comparison of attenuator performance. Basic statistical functions are included to help the technician analyze the data and evaluate the performance of the attenuator or device under test.

MENU BAR: Across the top of the CAMLab main window below the title bar and above the toolbar is the menu bar. The menu bar consists of eight (8) drop down menus that are used to select most of the functions necessary to perform measurements and manipulate data. The following is a list of the menu bar captions and their menu item functions.

File: The File menu allows the operator to create new Frequency Files; Edit/Open previously saved data files; and Save a new or updated data file. This menu also contains all of the Printer functions such as Printer Setup, Print Preview, and Print Data.

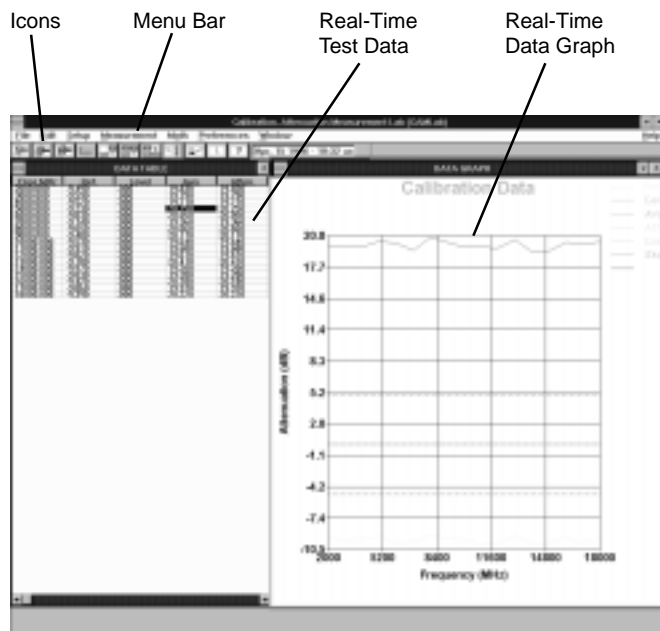
Edit: This menu contains functions that are common to most windows programs such as the ability to copy selected data from a calibration data grid to the clipboard, Cut/Copy selected fields of data, and the ability to Insert or Append Data from the clipboard into an open Data file Calibration Grid.

Setup: This menu allows the user to create and define a particular System Setup. Once configured this setup can be easily saved to a file and reloaded when needed using this menu.

Measurement: This menu allows the operator to define the measurement parameters and type of measurement run to be performed. The operator can select from two types of measurement runs. Selecting Auto will perform automatic measurement across a selected frequency range. Single Step will stop and prompt the operator before each measurement is performed.

Math: This menu contains all of the CAMLab Math functions to calculate Standard Deviation, Mean, Median, Calibration Deviation, SWR within a calibration data file.

Preferences: This menu allows the operator to select certain preferences that can be used when operating CAMLab.



ICONS: The CAMLab program has a horizontal toolbar that contains the program Icons which is always present at the top of the main window. These icons in this toolbar are representative of some of the more commonly used menu functions such as program information, Help, Open/Save Files, and quick exiting from the program. The CAMLab toolbar also contains program specific Icons, as follows;



Graph calibration data, plots calibration data in a graph window.



VM-7 mode configuration setup for configuring the VM-7 and signal source in a 30 MHz calibration System



VM-7/8852 mode configuration setup for configuring the VM-7/8852 and signal source for a 0.01-18 GHz calibration System (8850 operation)



VM-7/Mixer mode configuration setup for configuring the VM-7, user selected mixer and two signal sources to perform custom calibrations.



Auto measurement run mode allows the operator to set up and perform automatic measurements across a defined frequency range.



Single Step measurement run mode allows the operator to set up CAMLab to stop before each measurement performed.

The graph window also contains a vertical toolbar which contains the graph window icons. These icons are used to quickly perform such functions as printing the graph, changing the printer setup, copy page/graph to windows clipboard, zoom controls, copy/paste individual plot(s), and change X-Y axis scale of the graph.

DEFINE GENERATOR DRIVERS EASILY: The CAMLab program is capable of automatically controlling the RF generator via the GPIB IEEE-488 interface bus. As with other programs generator drivers may or may not work with all makes and models. To combat this problem CAMLab utilizes an alternative approach. The RF generator drivers are ASCII text files containing a particular RF generator IEEE-488 commands arranged in a specific format. The CAMLab

program reads the information from these driver files and builds the IEEE-488 commands necessary to operate the RF generator. The advantage here is to customers who may now create their own RF generator drivers for the particular generator being used.

MANY COMPATIBLE BUS CONTROLLERS: CAMLab requires a Windows based or compatible computer in addition to a National Instruments GPIB interface. Contact TEGAM for further information on requirements, or to order a compatible computer system

USE ANY WINDOWS COMPATIBLE PRINTER: CAMLab makes use of the Windows printer functions to select and set up each printer to meet the specific needs of the user. Windows is supplied with many printer drivers but not all are covered. In this case the user should consult the printer manufacturer for Windows drivers specific to a user's make and model of printer.

APPLICATIONS

ATTENUATION MEASUREMENTS: The primary function of the Model 8850 and the CAMLab software program is to perform wide dynamic range attenuation measurements across the 0.01 - 18 GHz frequency band. The addition of a TEGAM Model 8853 Frequency Converter will also allow the Model 8850 to perform measurements over the 18 to 40 GHz frequency range in a coaxial transmission line using this program.

RETURN LOSS (SWR) MEASUREMENTS: CAMLab can perform these measurements using an SWR bridge or the Weinschel SWR Measurement Kit (P/N 187-4003) with the Model 8850 and the CAMLab Software Program. Once the measurements have been taken, the CAMLab program will display/graph or printout both return loss and the VSWR conversion.

RF SUBSTITUTION MEASUREMENTS: The Model 8850 can also perform measurements on attenuators with very high attenuation levels, 90 dB and above, by using the RF substitution capability of the CAMLab software.