

Microwave Technology Training System with LVDAM-MW 8091

FESTO

LabVolt Series

Datasheet



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11/2024

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General Description

The Computer-Assisted Microwave Technology Training System is a complete, state-of-the-art microwave training program that includes data acquisition and instrumentation.

Specifically designed for hands-on training, this integrated package of software, hardware, and courseware contains all power supplies, high-quality microwave components, and accessories required to perform the experiments.

The experiments are performed using the Data Acquisition and Management for Microwave Systems software (LVDAM-MW[®]). This modern software is built around a Data Acquisition Interface (DAI) that performs 12-bit A/D acquisition on four channels. The software uses the acquired data received from the interface to calculate and display the values of power and SWR measurements on a computer screen. This approach eliminates the need for a separate power meter and standing-wave ratio (SWR) meter, thereby providing high flexibility at a reduced cost.

The software allows the display of a dual-trace oscilloscope, as well as the automatic computation of the line parameters on a Smith Chart. The Smith Chart is used to teach how to perform impedance matching by measuring the impedance of an unmatched load, and then finding the impedance and the location where the matching device must be placed to match the load.

The software also displays a data table that allows the automatic recording of the displayed power and standing-wave ratio at the click of one button. The recorded data can be saved and all the measured parameters can be plotted on the screen in the XY plane by using the included graph function. Furthermore, the software provides control and modulation of the PIN Diode and optional Voltage-Controlled RF Oscillator.

The courseware is based on the Student Manual Microwave Fundamentals, which covers the basic principles of microwave signals (X-band), propagation, components, and measurements. The courseware further expands on microwave technologies with the studying of microwave tees, PIN diodes, and applications. Students can then implement and test a wireless video transmission system, using the provided PIN diode as a microwave AM modulator and additional video Equipment.



Wireless transmission of a microwave signal [typical distance between the antennas: 40 cm (16 in)].

Features & Benefits

- Provides hands-on, system-level training in microwave technologies in the classroom
- Uses rugged, high-quality components designed for educational purposes
- Each component is identified with standard micro-wave symbol
- Microwave devices and components fabricated from electroless-plated brass to standard X-band waveguide dimensions
- Waveguide flanges joined by patented, precision quick fasteners, allowing rapid assembly and disassembly of system configurations
- USB Data Acquisition Interface (DAI) providing the following virtual instrumentation for the LVDAM[®]-MW software: Power Meter, SWR Meter, Oscilloscope, Ammeter, and Voltmeter
- The DAI is "stackable" and powered by the Gunn Oscillator Power Supply, Model 9501
- Comprehensive manuals with theory, step-by-step laboratory exercises, and review questions
- Meets a variety of needs and budgets because of subsystems and options
- Highly safe: low-power operation levels
- Estimated Program Duration: 55 hours

List of Available Training Systems

| Qty | Description | Model number |
|-----|--|--------------|
| 1 | Variable RF Oscillator and Resonant-Cavity Frequency Meter (add-on to microwaves with LVDAM) (8091-10) | 582073 |

Additional Equipment Required to Perform the Exercises (Purchased separately)

| Qty | Description | Model number |
|-----|-------------------|-------------------------------|
| 1 | Personal Computer | 579785 (8990-00) ¹ |

Available Training Systems

Variable RF Oscillator and Resonant-Cavity Frequency Meter (add-on to microwaves with LVDAM) 582073 (8091-10)



The Variable RF Oscillator and Resonant-Cavity Frequency Meter package is an add-on to the Computer-Assisted Microwave Technology Training System that contains a variable RF oscillator and a resonant-cavity frequency meter.

This add-on allows the study of variable-frequency microwave measurements and applications. It also includes the Student

Manual Microwave Variable-Frequency Measurements and Applications through which students learn how to convey information over a microwave link using frequency modulation and demodulation.

List of Equipment

| Qty | Description | Model number |
|-----|---|-------------------|
| 1 | Microwave Variable-Frequency Measurements and Applications (Student Manual) | 580507 (85896-00) |
| 1 | Microwave Variable-Frequency Measurements and Applications (Instructor Guide) | 580508 (85896-10) |
| 1 | Voltage-Controlled RF Oscillator | 8098726 (9511-10) |

¹ Refer to the Computer Requirements in the System Specifications section of this datasheet if the computer is to be provided by the end-user.

| Qty | Description | Model number |
|-----|---|------------------|
| 1 | Resonant-Cavity Frequency Meter _____ | 581840 (9524-00) |
| 1 | Storage for Frequency Measurement Devices _____ | 581921 (9599-B0) |

List of Manuals

| Description | Manual number |
|--|-------------------|
| Microwave Variable-Frequency Measurements and Applications (Workbook) _____ | 580507 (85896-00) |
| Microwave Variable-Frequency Measurements and Applications (Workbook (Instructor)) _____ | 580508 (85896-10) |

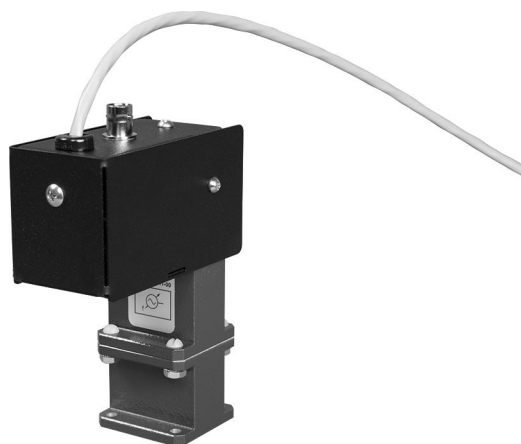
Table of Contents of the Manual(s)

Microwave Variable-Frequency Measurements and Applications (Workbook) (580507 (85896-00))

- 1 Microwave Frequency Measurements
- 2 Microwave Variable-Frequency Oscillators
- 3 Microwave Frequency Modulation and Demodulation

Equipment Description

Voltage-Controlled RF Oscillator 8098726 (9511-10)

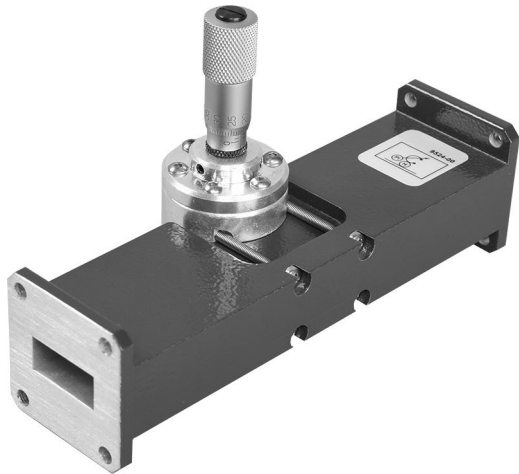


The Voltage-Controlled RF Oscillator is a module used in certain exercises of the Microwave Training System. A built-in prescaler facilitates frequency measurement of the microwave signal produced by the RF oscillator's voltage-controlled oscillator (VCO).

Specifications

| Parameter | Value |
|-------------------------------|--|
| Frequency Range | 9.6-10.6 GHz (typical) |
| Control Voltage | 0-10 V dc |
| Output Power | At least 8 dBm (6.3 mW) |
| Prescaler (BNC) Output | |
| Frequency | VCO output signal's frequency divided by 64 |
| Open-Circuit P-P Voltage | 500 mV |
| Impedance | 50 Ω |
| Modulation | Via a DB-9 connector used to apply a 1 kHz on/off modulation signal, or a frequency modulating signal. |

Resonant-Cavity Frequency Meter 581840 (9524-00)



The Resonant-Cavity Frequency Meter is a device used in the Microwave Training System to perform frequency measurements.

Specifications

| Parameter | Value |
|----------------------|-------------------|
| Power Absorption Dip | 0.25 dB (typical) |

Storage for Frequency Measurement Devices 581921 (9599-B0)



The Storage for Frequency Measurement Devices consists of a long storage box for storing the different frequency measurement devices included in the Microwave Technology Training System.

Optional Equipment Description

Personal Computer (Optional) 579785 (8990-00)



The Personal Computer consists of a desktop computer running under Windows[®] 10. A monitor, keyboard, and mouse are included.

Reflecting the commitment of Festo Didactic to high quality standards in product, design, development, production, installation, and service, our manufacturing and distribution facility has received the ISO 9001 certification.

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Festo Didactic SE

Rechbergstrasse 3
73770 Denkendorf
Germany

P. +49(0)711/3467-0
F. +49(0)711/347-54-88500

Festo Didactic Inc.

607 Industrial Way West
Eatontown, NJ 07724
United States

P. +1-732-938-2000
F. +1-732-774-8573

Festo Didactic Ltée/Ltd

675 rue du Carbone
Québec QC G2N 2K7
Canada

P. +1-418-849-1000
F. +1-418-849-1666

www.labvolt.com

www.festo-didactic.com