

# Model VM-7

RF ATTENUATION MEASUREMENT

- **Dynamic range in excess of 100 dB (127 dB when using synthesized signal sources)**
- **Rack mount kit available**
- **Resolution down to 0.001 dB**
- **+/- 0.060 dB accuracy**
- **Built-in diagnostic software**
- **Very fast and easy to use**
- **Optional A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration**

The TEGAM Model VM-7 offers users great flexibility in configuring a measuring system cost-effectively. Since the VM-7 is a 30 MHz receiver, it may be easily adapted to any frequency range with the addition of an appropriate external mixer and local oscillator.

#### **FEATURES INCLUDE:**

##### **Advanced Techniques**

The Model VM-7 uses advanced digital and analog techniques in a series IF substitution configuration, offering a dynamic range in excess of 100 dB. The unit is also fully bus controllable.

A combination of switched gain and attenuation stages are distributed throughout the receiver. An A/D is used in place of the classic piston attenuator to provide the receiver's unique linearity and accuracy.

The unit is configured as a dual-conversion receiver. A digitally-controlled phase lock loop at the first conversion allows the receiver to deal effectively with less desirable signals, as well as clean, synthesized signals.

Final synchronous detection is handled digitally allowing the receiver to achieve resolution down to 0.001 dB. Variations in signal-to-noise ratio are not handled by injection of noise as in previous receivers of this type. This is now handled in the post detection signal processing using a noise algorithm.

## Advanced 30 MHz Receiver

#### **Reliability**

The VM-7 has undergone extensive testing on production units so that customers will be ensured excellent reliability in service. Special attention has been paid to cooling requirements, significantly extending component life.

#### **User Friendly**

Through the use of "soft key" user interface, the operator is guided through the use of the instrument. A "Help" function provides information on key operation, precluding the need to refer to the manual in most cases.

#### **Performance**

The VM-7 offers dynamic range of 127 dB when using the synthesized signal sources. Single step measurements are possible over the full dynamic range because the receiver is not encumbered by mechanically switched range changes. The excellent accuracy built into the receiver translates into an accuracy of  $\pm 0.060$  dB for a single-step 100 dB measurement.

#### **Speed of Operation**

Advanced digital detection and processing techniques means that measurements are available instantaneously, no matter what the dynamic range or resolution.

#### **Self Calibration**

A built-in self calibration routine allows for automatic calibration of the switched gain and attenuator stages in order to maintain the exceptional accuracy of the instrument.

#### **Diagnostics and Service**

Complete diagnostic software has been built into the instrument to allow a technician to easily find a fault. Should repair become necessary, every module can be easily removed through the rear panel.

#### **Rack Mounting**

This instrument can be stacked easily with other TEGAM instruments or mounted in any cabinet or rack designed according to MIL-STD-189 or EIA RS-310 using the appropriate rack mounting kit.

#### **System Configuration**

The Model VM-7 is easily configured into an attenuation measuring system with the addition of the Model 8852 Frequency Converter and an RF signal source. This system is capable of performing attenuation measurements from 0.01 to 18 GHz. The Frequency range can be extended even further to 40 GHz with the addition of the Model 8853 Frequency Converter. For detailed specifications and a block diagram of such a system refer to the Model 8850 Attenuation Measurement System data sheet.



Prices and specifications subject to change without notice.

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AND MEASUREMENT SOLUTIONS

# Model VM-7

ADVANCED 30 MHz RECEIVER

## Specifications

Input Frequency	30 +/- 2 MHz	
Sensitivity	110 dBm wideband	127 dBm narrow band
Dynamic Range	110 dB wideband	127 dB narrow band
Incremental Accuracy @ 30 MHz*	<u>RANGE</u>	<u>ACCURACY*</u>
Wide Band	0 to -90 dBm	±0.02 dB per 10 dB
	-90 to -100 dBm	±0.04 dB per 10 dB
Narrow Band	0 to -100 dBm	±0.02 dB per 10 dB
	-100 to -110 dBm	±0.04 dB per 10 dB
	-110 to -120 dB	±0.12 dB per 10 dB
Incremental Linearity @ 30 MHz*	<u>RANGE</u>	<u>LINEARITY*</u>
	(Repeatability)	± 0.005 dB
	0 to -10	± 0.01 dB/10 dB
	-10 to -100	± 0.005 dB/10 dB
	-100 to -110	± 0.02 dB/10 dB
	-110 to -120	± 0.08 dB/10 dB
	* Exclusive of Signal Source effects	
Automatic Frequency Control	Output level ±10 V maximum	
Calibration Source	Internal or External, 30 MHz, at -55 dBm typical	
Int. 10 MHz Reference Oscillator	Frequency Accuracy 0.0025 %	
Ext. 10 MHz Reference Oscillator Requirements	Frequency Accuracy 0.0050 % (0 dBm Input level)	
Input Connectors	30 MHz Input Type N Female 10 MHz Reference Input/Output BNC Female	
Remote Operation	All front panel functions except powerline operation can be programmed on the IEEE-488 interface bus	
Power Requirements	100, 120, 220, 240 VAC ±10 % @ 50 to 60 Hz	
Power Consumption	90 Watts	
Remote Programmability	Compatible with IEEE-488 STD-1987.1	
EMI	Designed to meet MIL-STD-461 for radiated emission and susceptibility	
Design and Construction	Designed to meet requirements of MIL-STD-28800D TYPE III, CLASS 5, STYLE E	
Environmental	Operating	0 °C to +50 °C (+32 °F to +122 °F)
	Storage	-40 °C to +75 °C (-40 °F to +167 °F)
	Humidity	95 %
Physical Dimensions	Height	133.4 mm (5.25 in)
	Width	425.5 mm (16.75 in)
	Depth	444.5 mm (17.5 in)
	Weight	12.7 kg (28 lb)
Included Accessories	Power Cord P/N 068-21 Manual P/N IM180	
Optional Accessories	Rack Mounting	
	This instrument can be rack mounted in any cabinet or rack designed according to MIL-STD-189 or EIA RS-310 using rack mounting kit P/N 187-1007 (adapter ears only) or 187-1008 (contains chassis slides for racks up to 18-24 inches deep).	
Maintenance Extender Cards	To make it easier to verify the performance of the VM-7, TEGAM offers two maintenance extender cards as follows: <u>Type</u>	
	Digital	P/N 187-1020-000
	Analog	P/N 187-1020-000
Spare Module Kit	This kit includes all replaceable module assemblies that can be easily replaced at any location	
		P/N 187-1030
SureCAL Software	P/N 8850-SURECAL	
Z540 Compliant Calibration with Certificate and Data for VM-7	P/N OPT-Z540	
A2LA Accredited ISO/IEC 17025:1999 Compliant Calibration for VM-7	P/N OPT-A2LA	



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