Tektronix®

DM 504A

Auto Ranging
Digital
Multimeter

INSTRUCTION MANUAL

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DM 504A
Auto Ranging Digital Multimeter

INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

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Product Group 75

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TABLE OF CONTENTS

		Page
LIST OF ILLUSTRATIONS		**ii**
LIST OF TABLES		**iii**
OPERATOR SAFETY SUMMARY		**iv**
Section 1	**SPECIFICATION**	**1-1**
	Instrument Description	1-1
	Performance Conditions	1-1
	Electrical Characteristics	1-1
	Environmental Characteristics	1-8
	Physical Characteristics	1-10
Section 2	**OPERATING INSTRUCTIONS**	**2-1**
	Installation and Removal	2-1
	Controls, Connectors, and Indicators	2-2
	Input Connections	2-4
	Making Measurements	2-4
	DC Voltage Measurements	2-4
	AC Voltage Measurements	2-4
	Resistance Measurements	2-4
	Current Measurements	2-5
	Temperature Measurements	2-5
	Repackaging Information	2-5
Section 3	**MAINTENANCE**	**3-1**
Section 4	**OPTIONS AND ACCESSORIES**	**4-1**

LIST OF ILLUSTRATIONS

Figure		Page
2-1	Installation and Removal	2-1
2-2	Front Panel Controls and Connectors	2-2

LIST OF TABLES

Table		Page
1-1	DC VOLTMETER	1-1
1-2	AC VOLTMETER (TRUE RMS)	1-2
1-3	OHMMETER	1-4
1-4	DC AMMETER	1-5
1-5	AC AMMETER	1-6
1-6	TEMPERATURE	1-7
1-7	MISCELLANEOUS	1-7
1-8	DM 504A ENVIRONMENTAL SPECIFICATIONS	1-8
1-9	TM 500 SYSTEMS ENVIRONMENTAL SPECIFICATIONS	1-9
1-10	PHYSICAL CHARACTERISTICS	1-10

OPERATOR SAFETY SUMMARY

The general safety information in this summary is for operating personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In this Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in damage to the equipment or other property.

As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

In this Manual

This symbol indicates where applicable cautionary or other information is to be found.

As Marked on Equipment

DANGER — High voltage.

Protective ground (earth) terminal.

ATTENTION — refer to manual.

Power Source

This product is intended to operate in a power module connected to a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Grounding the Product

When installed in the power module, this product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. Upon loss of the protective ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

Use the Proper Fuse

To avoid fire hazard, use only the fuse specified in the parts list for your product, and which is identical in type, voltage rating, and current rating.

Refer fuse replacement to qualified service personnel.

Do Not Operate In Explosive Atmospheres

To avoid explosion, do not operate this product in an atmosphere of explosive gases unless it has been specifically certified for such operation.

Do Not Remove Covers or Panels

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

Do Not Operate Without Covers

To avoid personal injury, do not operate this product without covers or panels installed. Do not apply power to the plug-in via a plug-in extender.

SPECIFICATION

Instrument Description

The DM504A Digital Multimeter measures dc and ac voltage and current, resistance, and temperature. Temperature measurements are made using a Tektronix P6602 temperature probe or equivalent platinum resistance temperature probe. The ac functions are true rms responding. In the 20M ohm, 200K ohms and 2K ohms ranges a "diode measurement indicator" illuminates indicating that V_{max} is adequate for diode testing. In the 200 ohms range a "beeper indicator" illuminates indicating that a beeper will sound for measurements of less than 10 ohms. All measurement ranges, except temperature, diode measurement and beeper, can be automatically or manually selected.

The readout is a 4-1/2-digit display in all ranges except temperature and beeper. The decimal point is automatically adjusted according to the operating range of the instrument. Polarity indication is automatic.

Performance Conditions

The electrical characteristics are valid only if the DM 504A has been calibrated at a temperature between +21 °C and +25 °C and is operating at an ambient temperature between 0 °C and +50 °C. Items listed in the Performance Requirements column of the Electrical Characteristics are verified by completing the Performance Check in the Calibration Section of the *DM 504A Service Manual*. Items listed in the Supplemental Information column are not verified in the service manual. They are either explanatory notes or performance characteristics for which no limits are specified.

ELECTRICAL CHARACTERISTICS

Table 1-1
DC VOLTMETER

Characteristics	Performance Requirements	Supplemental Information
Accuracy for 200 mV, 2V, 20V, 200V, and 1000V ranges		Automatic or manual ranging
+18 °C to 28 °C		
200 mV range	+/-(0.05% of reading +0.02% of full scale)	
2V range	+/-(0.05% of reading +0.01% of full scale)	
20V range	+/-(0.05% of reading +0.02% of full scale)	
200V range	+/-(0.05% of reading +0.01% of full scale)	
1000V range	+/-(0.05% of reading +0.02% of full scale)	

Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
0 °C to 18 °C, 28 °C to 50 °C		
200 mV range	+/-(0.15% of reading +0.06% of full scale)	
2V range	+/-(0.15% of reading +0.02% of full scale)	
20V range	+/-(0.15% of reading +0.04% of full scale)	
200V range	+/- (0.15% of reading +0.02% of full scale)	
1000V range	+/-(0.15% of reading +0.02% of full scale)	
Common Mode Rejection Ratio	≥100 dB at DC ≥80 dB at 50/60 Hz	With a 1 kΩ unbalance
Normal Mode Rejection Ratio	≥60 dB at 50/60 Hz (+/-0.2 Hz)	
Maximum Resolution		10 μV
Step Response Time		<1 second
Input Resistance		10 MΩ +/-0.5% in all ranges. 200 kΩ in 200 mV range and 2V range if V_{in}> 12V
Maximum Input Voltage		
VOLTS/Ω/TEMP to LOW		1000V peak
VOLTS/Ω/TEMP to GND		1000V peak
LOW to GND		1000V peak

Table 1-2
AC VOLTMETER (TRUE RMS)

Characteristics	Performance Requirements	Supplemental Information
Accuracy for 200 mV, 2V, 20V, 200V, and 500V ranges		Automatic or manual ranging
+18 °C to +28 °C		
200 mV to 200V range 30 Hz to 20 kHz	+/-(0.6% of reading +0.06% of full scale)	Input signal must be between 10% and 100% of full scale.
For signals <25% and 10 kHz-20 kHz add 4.1% additional error		
500V range		
60 Hz to 20 kHz	+/-(0.6% of reading +0.1% of full scale)	Input signal must be between 100V and 500V
40 Hz to 60 Hz	+/-(1% of reading +0.1% of full scale)	

Table1-2(cont)

Characteristics	Performance Requirements	Supplemental Information
0 °C to 18 °C, 28 °C to 50 °C	+/-(0.8% of reading +0.11% of full scale)	
200 mV to 200V range		
30 Hz to 20 kHz		Input signal must be between 10% and 100% of full scale. For signals <25% and 10 kHz-20 kHz add 4.1% additional error
500V range		
60 Hz to 20 kHz	+/-(0.9% of reading +0.1% of full scale)	Input signal must be between 100V and 500V
40 Hz to 60 Hz	+/-(1.3% of reading +0.1% of full scale)	
Common Mode Rejection Ratio	≥+60 dB at 50 or 60 Hz	With a 1 kΩ unbalance
Maximum Resolution		10 μV
Response Time		<2 seconds
Input Impedance		10 MΩ +/-0.5% paralleled by <100 pF
Maximum Input Voltage		
VOLTS/Ω/TEMP to LOW		500V AC RMS or 600V DC, not to exceed 1000V peak
VOLTS/Ω/TEMP to GND		1000V peak
LOW to GND		1000V peak
Crest Factor		5 at full scale on all ranges except 500V (500V = 2)

Table 1-3
OHMMETER

Characteristics	Performance Requirements	Supplemental Information	
Accuracy for 200 Ω, 2 kΩ 20 kΩ, 200 kΩ, 2 MΩ and 20 MΩ ranges		Automatic or manual ranging	
+18 °C to 28 °C		Source	Vmax at full scale
200 Ω beeper range	+/-(0.05% of reading +0.05% of full scale)	1.0 mA	0.2V
200 Ω range	+/-(0.05% of reading +0.02% of full scale)	1.0 mA	0.2V
2 kΩ range	+/-(0.05% of reading +0.01% of full scale)	1.0 mA	2.0V
20 kΩ range	+/-(0.05% of reading +0.02% of full scale)	10 µA	0.2V
200 kΩ range	+/-(0.05% of reading +0.01% of full scale)	10 µA	2.0V
2 MΩ range	+/-(0.1% of reading +0.02% of full scale)	0.1 µA	0.2V
20 MΩ range	+/-(0.1% of reading +0.01% of full scale)	0.1 µA	2.0V
0 °C to 18 °C, 28 °C to 50 °C			
200 Ω beeper range	+/-(0.25% of reading +0.1% of full scale)	1.0 mA	0.2V
200 Ω range	+/-(0.25% of reading +0.04% of full scale)	1.0 mA	0.2V
2 kΩ range	+/-(0.25% of reading +0.03% of full scale)	1.0 mA	2.0V
20 kΩ range	+/-(0.25% of reading +0.04% of full scale)	10 µA	0.2V
200 kΩ range	+/-(0.25% of reading +0.03% of full scale)	10 µA	2.0V
2 MΩ range	+/-(1% of reading +0.04% of full scale)	0.1 µA	0.2V
20 MΩ range	+/-(1% of reading +0.03% of full scale)	0.1 µA	2.0V
Response Time		<2 seconds on 200 Ω to 2 MΩ range <15 seconds on 20 MΩ range	
Maximum input volts (any range)		300V peak	
Maximum Resolution		10 mΩ	
Maximum open circuit voltage		<11V	

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Table 1-4
DC AMMETER

Characteristics	Performance Requirements	Supplemental Information
Accuracy for 200 µA, 2 mA, 20 mA, 200 mA, and 2000 mA ranges		Automatic or manual ranging
+18 °C to 28 °C	+/-(0.1% of reading +0.01% of full scale)	
0 °C to 18 °C, 28 °C to 50 °C	+/-(0.3% of reading +0.025% of full scale)	
Response Time		<1 second
Input resistance		Range / Resistance 200 µA / 1.0 kΩ 2 mA / 100.0Ω 20 mA / 10.2Ω 200 mA / 1.2Ω 2000 mA / 0.26Ω
Maximum open circuit input voltage (mA to LOW)		250V peak
Maximum input current		2A any range
Maximum floating voltage		
mA to GND		1000V peak
LOW to GND		1000V peak
Maximum Resolution		10 nA

Table1-5
ACAMMETER

Characteristics	Performance Requirements	Supplemental Information
Accuracy for 200 µA, 2 mA, 20 mA, 200 mA, and 2000 mA ranges		Automatic or manual ranging
Sinewave 30 Hz to 10 kHz		
+18 °C to 28 °C	+/-(0.6% of reading +0.06 of full scale)	Input current must be between 10% and 100% of full scale
0 °C to 18 °C, 28 °C to 50 °C	+/-(0.9% of reading +0.11% of full scale)	Input current must be between 10% and 100% of full scale
Response Time		<2 seconds
Input Impedance		Range / Impedance: 200 µA / 1.0 kΩ; 2 mA / 100.0Ω; 20 mA / 10.2Ω; 200 mA / 1.2Ω; 2000 mA / 0.26Ω
Maximum Open Circuit Input Voltage (mA to LOW)		250V peak
Maximum input current		2A any range
Maximum floating voltage		
mA to GND		1000V peak
LOW to GND		1000V peak
Maximum Resolution		10 nA

Table 1-6
TEMPERATURE

Characteristics	Performance Required	Supplemental Information
Accuracy -62 °C +230 °C		Using a Tektronix P6602 temperature probe.
+18 °C to +28 °C ambient		
Probe calibrated to instrument	+/-0.6 °C from -62 °C to +150 °C +/-1.6 °C from +150 °C to +230 °C	Probe/DMM calibration performed at 0°C and 100°C.
Any probe	+/-3.5 °C from -62 °C to +150 °C +/-6 °C from +150 °C to +230 °C	
0 °C to + 18 °C, +28 °C to +50 °C ambient		
Probe calibrated to instrument	+/-1.5 °C from -62 °C to +150 °C +/-2.5 °C from +150 °C to +230 °C	Probe/DMM Calibration performed at 0°C and 100°C.
Any Probe	+/-4.5 °C from -62 °C to +150 °C +/-7 °C from 150 °C to +230 °C	

Table 1-7
MISCELLANEOUS

Characteristics	Performance Requirement	Supplemental Information
Power consumption		Less than 8W
Reading rate		>2.0 times per second.
Over-range indication		Flashing display
Warm-up time		30 minutes (60 minutes after storage in high humidity environment)

ENVIRONMENTAL CHARACTERISTICS

Table 1-8
DM504A ENVIRONMENTAL SPECIFICATIONS[1]

Characteristics	Description	Supplemental Information
Operating	0 °C to + 50 °C[2]	Meets or exceeds MIL-T-28800D, class 5 with exceptions[3]
Non-operating	-55 °C to +75 °C	
Humidity	95% to 100% for 5 days (derated above 25 °C)	Meets or exceeds MIL-T-28800D, class 5.
Altitude		
Operating	4.6 km (15,000 ft)[2]	Meets or exceeds MIL-T-28800D, class 3.
Non-operating	15 km (50,000 ft)	
Vibration 75 minutes total	0.64 mm (0.025 inch) displacement, 5-55-5 Hz (sine wave),	Meets or exceeds MIL-T-28800D, class 3.
Shock	30 g's (half sine), 11 ms, 18 shocks.[1,4]	Meets or exceeds MIL-T-28800D, class 3.
Bench Handling		
Operating	45° or 4 inches or equilibrium module. whichever occurs first.,[4]	Meets or exceeds MIL-T-28800B, class 3.

1 See Table 1-9 for system modifiers.

2 With power module.

3 Temperature: During low temperature test MIL-T-28800D paragraph 4.5.5.1.3 (b) for class 5, steps 4 and 5 shall be performed before step 2. Also, the instrument shall not be operating during step 6, paragraph 4.5.5.1.3 (e), class 5. While operating, condensed moisture shall not be present on class 5 instruments. Drying of the instrument for this class may be performed in a suitable chamber, if necessary.

4 Without power

Table 1-8 (cont)

Characteristics	Description	Supplemental Information
E.M.C.		
Operating	30 Hz to 1 GHz[5]	Meets or exceeds MIL-T-28800D, class 3.
Electrical Discharge		
Operating	20 kV maximum[5]	No MIL-T-28800D equivalent. Charge applied to each protruding area of the front panel except the input connectors.
Transportation	Package Vibration 1 inch (25 mm) peak to peak at 270 RPM for 1 hour. Package Drop 10 drops from 3 feet (91 cm).	Qualified under National Safe Transit Association Preshipment Test Procedures project: 1A-B-1 and 1A-B-2.

Table 1-9
TM 500 Systems
ENVIRONMENTAL SPECIFICATIONS

Characteristics	TM 501	TM 503(A)	TM 504	TM506(A)	TM 515
Temperature	Meets same test standards as plug-in.				
Operating					
Non-operating					
Humidity	Meets same test standards as plug-in.				
Operating					
Non-operating					
Altitude	Meets same test standards as plug-in.				
Operating					
Non-operating					
Vibration					
Operating	0.26 mm (0.010 inch) displacement, 10-55 Hz (sine wave). 75 minutes total				0.38 mm (0.015 inch) displacement, 10-55 Hz (sine wave). 75 minutes total.

5 With power module.

Table 1-9 (cont)

Characteristics	TM 501 TM 503(A) TM 504 TM506(A) TM 515
Shock	
Operating	20 g's (half sine), 11 ms, 18 shocks 30 g's (half sine), 11 ms, 18 shocks
Bench Handling	
Operating	Meets same test standards as plug-in.
Electrical Discharge	
Operating	Meets same test standards as plug-in.
Transportation	Meets same test standards as plug-in.

PHYSICAL CHARACTERISTICS

Table 1-10
PHYSICAL CHARACTERISTICS

Characteristics	Description
Finish	Lexan panel and aluminum chassis
Net Weight	0.93 kg
Overall Dimensions	2.633 in. (66.8 mm) W x 11.240 in. (285.3 mm) D x 4.961in. (125.9 mm) H.

OPERATING INSTRUCTIONS

Installation and Removal

The DM 504A is calibrated and ready for use when received. It operates in any compartment of a TM 500 series power module. See the power module instruction manual for line voltage requirements and power module operation. Figure 2-1 shows the DM 504A installation and removal procedure.

CAUTION

Turn the power off before inserting the DM 504A. Otherwise, arcing may occur at the rear interface connectors, reducing their useful life and damage may be done to the plug-in circuitry.

Before installing the DM 504A in the power module, check to see that the plastic barriers on the interconnecting jack of the selected power module compartment match the cutouts in the DM 504A circuit board edge connector.

Align the DM 504A chassis with the upper and lower guides of the selected compartment. Press the DM 504A in and firmly seat the circuit board in the interconnecting jack.

To remove the DM 504A, pull the release latch (located in the lower left corner of the front panel) until the interconnecting jack disengages and the DM 504A slides out.

Check that the DM 504A is fully inserted in the power module. Pull the power switch on the power module. One or more characters in the LED display should now be visible.

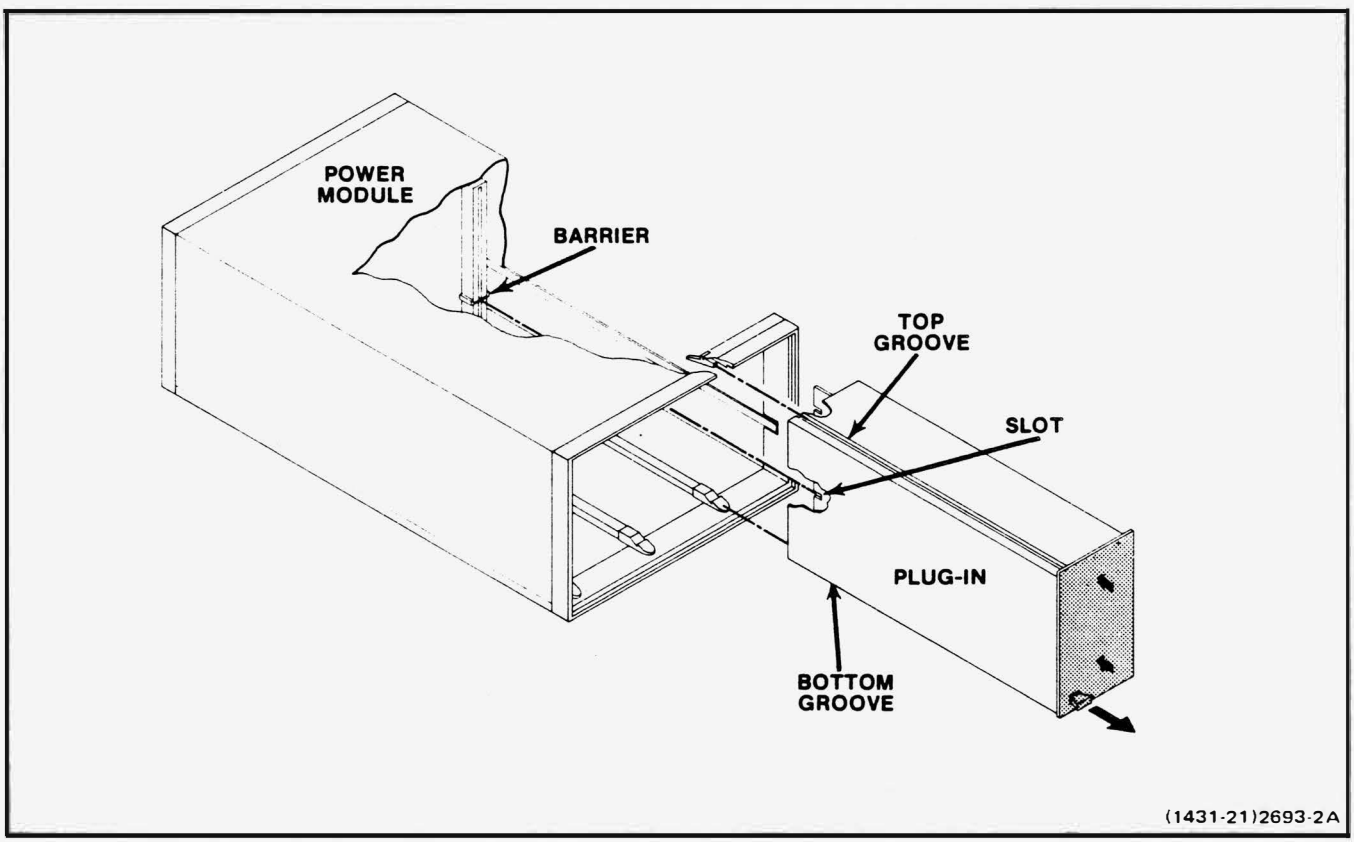

Fig. 2-1. Installation and removal.

Controls, Connectors, and Indicators

All controls, connectors, and indicators required for operation of the DM 504A are located on the front panel. Figure 2-2 shows the location of all the controls, connectors, and indicators.

(1) **Polarity**

LED readout indicating the polarity in the DC mode and the temperature mode.

(2) **Display**

4-1/2-digit LED readout with properly positioned decimal point.

(3) Ω

Illuminated when units are Ohms.

(4) **kΩ**

Illuminated when units are kilohms.

(5) **MΩ**

Illuminated when units are megohms

(6) **(BEEPER)**))))

Illuminated when in the 200 Ω BEEPER Range. BEEPER sounds when measurement is below 10 Ohms.

(7) **mV**

Illuminated when units are millivolts.

(8) **V**

Illuminated when units are volts.

(9) **μA**

Illuminated when units are microamperes.

(10) **mA**

Illuminated when units are milliamperes.

(11) **°C**

Illuminated when units are degrees Celsius.

(12) **AUTO**

Illuminated when autoranging is selected.

(13) **(DIODE)** —▷|

Illuminated in 20 MΩ, 200 kΩ, and 2 kΩ mode.

(14) **(SINEWAVE)** ~

Illuminated in AC measuring modes.

(15) **UP**

Selects the next higher measurement range. If UP is pressed at the same time as DOWN, autoranging is selected.

(16) **Ω – V/A**

Button in selects resistance measurement ranges; button out selects voltage and current measurement ranges.

(17) **AC – DC**

Button in selects AC voltage and current measurement ranges; button out selects DC voltage and current measurement ranges.

(18) **mA – VOLTS**

Button in selects current measurement ranges; button out selects voltage measurement ranges.

(19) **V/Ω/TEMP**

Terminal used in conjunction with the LOW input connector for voltage, resistance, and temperature measurements.

(20) **LOW**

Common terminal for all measurements.

(21) **Ground Terminal**

Chassis ground.

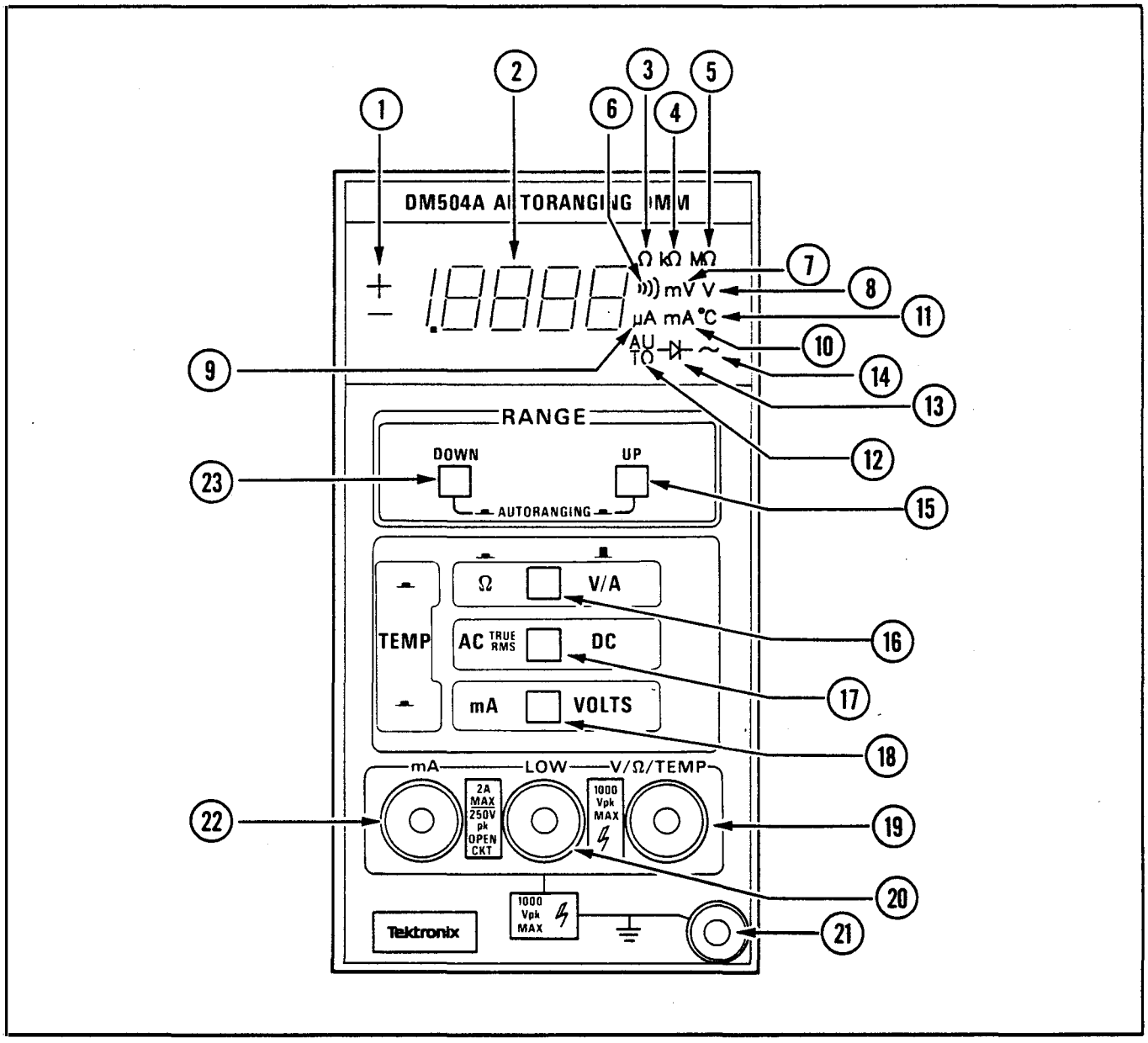

Fig. 2-2. Front Panel controls and connectors.

(22) mA - milliAmps

Terminal used in conjunction with the LOW input connector for current measurements.

(23) DOWN

Selects the next lower measurement range. If this button is pressed at the same time as the UP button, autoranging is selected.

Input Connections

Signal inputs are made via the front panel connectors.

CAUTION

The maximum input voltage is 1 kV peak at the front panel connectors. The front panel VOLTS/Ω/TEMP, LOW, and mA connectors may be floated 1 kV peak maximum above ground.

Three input jacks provide measurement connections. The VOLTS/Ω/TEMP and LOW input connectors are used for voltage, resistance, and temperature measurements. mA and LOW input connectors are used for current measurements. Normal measurement conditions will be with the LOW input ungrounded. A connection between the LOW and the ground input post may be made to reference the input against DM 504A chassis ground. Use caution, as the LOW input is then connected to earth ground through the three-wire power cord. False readings may be obtained due to ground loops.

Making Measurements

With the DM 504A properly installed in the power module, allow 30 minutes warmup time for operation to specified accuracy. After storage in an environment with high humidity, allow 60 minutes warmup time.

After the instrument has warmed up, select the desired measurement mode: voltage, resistance, current, or temperature. The measurement range can be selected manually or automatically with the UP and DOWN buttons. Manually, you can select a range by pressing the UP button for a higher range or pressing the DOWN button for a lower range. The automatic or autoranging mode can be selected by pressing the UP and DOWN buttons simultaneously. Autoranging does not function in the beeper and temperature modes.

When the value of the measurement is unknown, use the autoranging mode. Units of measurement are volts (V), milliVolts (mV), Ohms (Ω), kiloOhms (kΩ), MegaOhms (MΩ), μAmps (μA), milliAmps (mA) and degrees Celsius (°C). The decimal point is automatically positioned.

If the autoranging feature is not desired, use the UP and DOWN buttons to select the measurement range. The measurement units are read the same as in the autoranging mode of operation.

Over-range indication is shown by a flashing display. Polarity is displayed by a + or a – on the left side of the display. Polarity is measured with respect to the LOW input.

DC Voltage Measurements

Ω – V/A	Button out
AC - DC	Button out
mA - VOLTS	Button out

Use the UP and DOWN buttons to select the desired measurement range or autoranging. Apply the voltage to be measured to the VOLTS/Ω/TEMP and LOW connectors. The value of the voltage applied is displayed by the 4-1/2-digit readout.

AC Voltage Measurements

Ω – V/A	Button out
AC - DC	Button pushed in
mA - VOLTS	Button out

Use the UP and DOWN buttons to select the desired measurement range or autoranging to make true RMS ac voltage measurements. Be sure to observe the maximum voltage ratings. The RMS value of the ac voltage applied is displayed by the 4-1/2-digit readout.

Resistance Measurements

Ω – V/A	Button pushed in
AC - DC	Button pushed in or out
mA - VOLTS	Button out

Connect the resistance to be measured to the VOLTS/Ω/TEMP and LOW input connectors. Select the maximum resistance range desired by pressing the UP and DOWN buttons or selecting autoranging. The resistance value is displayed by the 4-1/2-digit readout.

The beeper range can be selected by pressing the DOWN button when the instrument is in the 200Ω range. The readout is limited to 3-1/2 digits in the beeper range. When the DM 504A is in the beeper mode, it produces a continuous tone when it measures resistance values below 10Ω. This feature can be useful when making continuity measurements. The measurement rate is up to 8 readings/second in the beeper range.

In the 2 kΩ, 200 kΩ, and 20 MΩ ranges, the diode symbol in the display illuminates to indicate that you can make diode measurements. The source current is 1 mA in the 2 kΩ range, 10 μA in the 200 kΩ range, and 0.1 μA in the 20 MΩ range.

Current Measurements

Ω – V/A	Button out
AC - DC	Button pushed in (AC) or button out for (DC)
mA - VOLTS	Button in

In the ac mode, the RMS value of the ac current is measured. Connect the ac or dc current to be measured to the mA and LOW input connectors. Observe the maximum voltage ratings. Use the UP or DOWN buttons to select the current measurement range or autoranging. The current measured is displayed by the 4-1/2-digit readout. Polarity is measured with respect to the LOW input connector.

Temperature Measurements

Ω – V/A	Button in
AC - DC	Button pushed in or out
mA - VOLTS	Button in

NOTE

For best accuracy use a TEKTRONIX P6602 Temperature Probe that has been calibrated with the individual instrument.

Connect the TEKTRONIX P6602 Temperature Probe to the LOW and V/Ω/TEMP input connectors. The temperature is displayed by the 4-digit readout. The polarity of the readout indicates if the temperature is over 0 °C (+) or below 0 °C (–).

Apply the probe sensor tip to the device being measured. For the best temperature transfer, coat the surface of the device being measured with silicone grease and apply the probe tip squarely to the surface. Allow sufficient time for the probe tip to stabilize before taking a reading. The time required depends on several factors. Generally, when the tip is first applied to the device under test, readings change less rapidly and finally stabilize. Refer to Section 1 for more information on the specifications of the TEKTRONIX P6602 Temperature Probe.

Repackaging Information

If the DM 504A is to be shipped to a Tektronix Service Center for service or repair, attach a tag showing the owner (with address) and the name of an individual at your firm who can be contacted. Include the complete instrument serial number and a description of the service required.

Save and re-use the package in which your instrument was shipped. If the original packaging is unfit for use or not available, repackage the instrument as follows:

Surround the instrument with polyethylene sheeting to protect its finish. Obtain a carton of corrugated cardboard with a carton test strength of 200 pounds per square inch. the carton should have inside dimensions of no less than six inches more than the instrument's dimensions. Cushion the instrument by tightly packing three inches of dunnage or urethane foam between carton and instrument on all sides. Seal the carton with shipping tape or an industrial stapler.

WARNING

THE FOLLOWING SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. REFER TO OPERATORS SAFETY SUMMARY AND SERVICE SAFETY SUMMARY PRIOR TO PERFORMING ANY SERVICE.

MAINTENANCE

Introduction

This section provides general maintenance information.

Recalibration

To assure accurate measurements, check the calibration of this instrument after each 1000 hours of operation or every six months if used infrequently.

Cleaning Instructions

This instrument should be cleaned as often as operating conditions require. Accumulation of dirt on components may act as an insulating blanket and prevents efficient heat dissipation that can cause overheating and component breakdown.

Use a non-residue type of cleaner; preferable isopropyl alcohol or denatured ethyl alcohol. Before using any other type of cleaner consult your Tektronix Service Center or representative.

Exterior: Loose dust accumulated on the front can be removed by a soft cloth or a small brush. Dirt that remains can be removed with a soft cloth dampened with a mild detergent and water solution. Do not use abrasive cleaners.

Interior: It is recommended that in cleaning the interior that the accumulated dust be first blown off with dry low pressure air, then use a soft brush to remove any remaining dust.

If further cleaning is required, use a mild detergent and water solution.

OPTIONS AND ACCESSORIES

Option 2

Option 2 adds a TEKTRONIX P6602 Temperature Probe that has been calibrated with the DM 504A. Information concerning the TEKTRONIX P6602 Temperature Probe can be found in the instruction manual for that accessory.

Standard Accessories

The following items are standard accessories to the DM 504A:

DM 504A Instruction	070-6945-XX
Test Leads	196-3212-XX

Optional Accessories

P6602 Temperature Probe	
Service Manual	070-7135-XX

MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.