

OMEGA

HHM18
Digital Capacitance Meter



OMEGAnetSM On-Line Service
<http://www.omega.com>

Internet e-mail
info@omega.com

Servicing North America:

USA: ISO 9001 Certified
One Omega Drive, Box 4047
Stamford, CT 06907-0047
Tel: (203) 359-1660
FAX: (203)359-7700
e-mail: info@omega.com

Canada:
976 Bergar
Laval (Quebec) H7L5A1
Tel: (514) 856-6928
FAX: (514) 856-6886
e-mail: info@omega.com

For immediate technical or application assistance:

USA and Canada:
Sales Service: 1-800-826-6342 / 1-800-TC-OMEGASM
Customer Service: 1-800-622-2378 / 1-800-622-BESTSM
Engineering Service: 1-800-872-9436 / 1-800-USA-WHENSM
TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

Mexico and Latin America:
Tel: (95) 800-TC-OMEGASM
FAX: (95) 203-359-7807
En Español: (203) 359-7803
e-mail: espanol@omega.com

Servicing Europe:

Benelux:
Postbus 8034, 1180 LA Amstelveen,
The Netherlands
Tel: (31) 20 6418405 FAX: (31) 20 6434643
Toll Free in Benelux: 06 0993344
e-mail: nl@omega.com

Czech Republic:
ul. Rude armady 1868, 733 01 Karvina-
Hranice, Czech Republic
Tel: 420 (69) 6311627 FAX: 420 (69) 6311114
e-mail: czech@omega.com

France:
9, rue Denis Papin, 78190 Trappes
Tel: (33) 130-621-400 FAX: (33)130-699-120
Toll Free in France: 0800-4-06342
e-mail: france@omega.com

Germany/Austria:
Daimlerstrasse 26, D-75392
Deckenpfronn, Germany
Tel: 49 (07056) 3017 FAX: 49 (07056) 8540
Toll Free in Germany: 0800 82 66342
e-mail: germany@omega.com

United Kingdom: ISO 9002 Certified
One Omega Drive
Riverbend Technology Centre Northbank, Irlam,
Manchester, M44 5EX, England
Tel: 44 (161) 777-6611 FAX: 44 (161) 777-6622

Toll Free in England: 0800-488-488
e-mail: sales@omega.com.uk

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification. The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient connected application.

SPECIFICATIONS

Display: 3½ digit liquid crystal display (LCD) with a maximum reading of 1999.

Polarity: Automatic, positive implied, negative polarity indication.

Overrange: (OL) or (-OL) is displayed.

Zero: Automatic.

Low battery indication: the "⚡" is displayed when the battery voltage drops below the operating level.

Measurement rate: 2.5 times per second, nominal.

Operating Environment: 0°C to 40°C at < 70% relative humidity.

Storage Temperature: -20°C to 60°C, 0 to 80% R.H. with battery removed from meter.

Accuracy: Stated accuracy at 23°C ± 5°C, <75% relative humidity.

Power: single standard 9-volt battery.

Battery life: 200 hours typical.

Dimensions: 192mm (H) x 91mm (W) x 52.5mm (D).

Weight: 365g including battery.

Accessories: One pair test leads, 9V battery (installed), one spare fuse and Operating Instructions.

CAPACITANCE

Range	Resolution	Accuracy	Test Frequency
200pF	0.1pF	$\pm(0.5\%rdg+1dgt+0.5pF)$	820Hz
2nF	1pF	$\pm(0.5\%rdg+1dgt)$	
20nF	10pF		
200nF	100pF		
2 μ F	1nF		
20 μ F	10nF		82Hz
200 μ F	100nF	$\pm(2.0\%rdg+1dgt)$	8.2Hz
2000 μ F	1 μ F		
20mF	10 μ F		

Test voltage: <3.5V

Input protection: 0.1A/250V fast acting fuse

Zero adjust limited: $\pm 20pF$ approx

CONTINUITY

Audible indication: less than 30 Ω

Overload protection: 24VDC or AC rms

DIODE TEST

Test current: 1.0mA \pm 0.6mA

Accuracy: \pm (10.0%rdg + 3dgts)

Open circuit volts: 3.0Vdc typical

Overload protection: 24VDC or AC rms

RESISTANCE

Ranges: 20 Ω , 200 Ω , 2K Ω , 20K Ω , 200K Ω , 2M Ω , 20M Ω

Accuracy: \pm (0.3%rdg + 10dgts) on 20 Ω range

\pm (0.3%rdg + 1dgt) on 200 Ω to 2M Ω ranges

\pm (3.0%rdg + 4dgts) on 20M Ω range

Open circuit volts: 0.3Vdc (3.0Vdc on 20 Ω and 200 Ω ranges)

Overload protection: 24VDC or AC rms

FREQUENCY (Autoranging)

Ranges: 2KHz, 20KHz, 200KHz, 2000KHz, 15MHz

Accuracy: \pm (0.1%rdg + 1dgt)

Sensitivity: 1.0Vrms min

Overload protection: 24VDC or AC rms

Effect Reading: 10 - 1999

OPERATION

MAX-HOLD Feature

Press "MAX-HOLD" to toggle in and out of the Maximun Hold mode.(holding the highest reading.) In the MAX mode, the MAX annunciator is displayed and maximun reading are stored in display register, If the new reading is higher than the reading being displayed, the higher reading is transferred to the display register. A "higher" reading is defined as the reading with the higher absolute value. The MAX hold function is disable in the frequency count mode, but the MAX annunciator is still displayed.

DATA-Button:

Press " DATA-HOLD" button to toggle in and out of DATA Hold mode, In the DATA Hold mode, the "**H**" annunciator is displayed. (The DATA Hold mode may be exited when changing function.)

Capacitance Measurements

1. Set the Function/Range switch to the desired capacitance range.
2. Never apply an external voltage to the **←|→** sockets. Damage to the meter may result.
3. Insert the capacitor leads directly into the **←|→** socket.
4. Read the capacitance directly from the display.

Diode Tests and Continuity

1. Connect the red test lead to the "V \bar{w} " jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the " \blacktriangleright " position.
3. Turn off power to the circuit under test.
4. Touch probes to the diode. A forward-voltage drop is about 0.6V (typical for a silicon diode).
5. Reverse probes. If the diode is good, "OL" is displayed. If the diode is shorted, ".000" or another number is displayed.
6. If the diode is open, "OL" is displayed in both directions.
7. If the junction is measured in a circuit and a low reading is obtained with both lead connections, the junction may be shunted by a resistance of less than 1k \bar{w} . In this case the diode must be disconnected from the circuit for accurate testing.

Resistance Measurements

1. Set the Function/Range switch to the desired resistance range or continuity position.
2. Remove power from the equipment under test.
3. Connect the red test lead to the "V \bar{w} " jack and the black test lead to the "COM" jack.
4. Touch the probes to the test points. In ohms, the value indicated in the display is the measured value of resistance. In continuity test, the beeper sounds continuously, if the resistance is less than 30 \bar{w} .

WARNING

The accuracy of the functions might be slightly affected, when exposed to a radiated electromagnetic field environment, eg, radio, telephone or similar.

Frequency Measurements

1. Set the Function/Range switch to the Hz position.
2. Connect the red test lead to the "V ω " jack and the black test lead to the "COM" jack.
3. Connect the test leads to the point of measurement and read the frequency from the display.

MAINTENANCE

WARNING

Remove test leads before changing battery or fuse or performing any servicing.

Battery Replacement

Power is supplied by a 9 volt "transistor" battery. (NEDA 1604 IEC 6F22). The "🔋" appears on the LCD display when replacement is needed. To replace the battery, remove the two screws from the back of the meter and lift off the battery case. Remove the battery from battery contacts.

Fuse Replacement

If no capacitance measurements are possible, check for a blown overload protection fuse. For access to fuses, remove the four screws from the back of the meter and lift off the battery cover and case. Replace F1 only with the original type 0.1A/250V, fast acting ceramic fuse.

Cleaning

Periodically wipe the case with a damp cloth and detergent, do not use abrasives or solvents.

WARRANTY / DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY / DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED.
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair.
2. Model and serial number of product , and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering. OMEGA is a registered trademark of OMEGA ENGINEERING, INC. © Copyright 1999 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without prior written consent of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

TEMPERATURE

- Thermocouple, RTD & Thermistor
Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE/STRAIN AND FORCE

- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters
& Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators
& Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION

- Data Acquisition &
Engineering Software
- Communications-Based
Acquisition Systems
- Plug-in Cards for Apple, IBM
& Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater
Treatment
- pH, Conductivity & Dissolved Oxygen
Instruments