



# User's Guide

CE



<http://www.omega.com>  
e-mail: [info@omega.com](mailto:info@omega.com)

## CCT-80 Strain Gage Signal Conditioners

M2218/1201

**omega.com™**

Ω OMEGA®

**OMEGAnet™ On-Line Service**  
<http://www.omega.com>

**Internet e-mail**  
[info@omega.com](mailto:info@omega.com)

### Servicing North America:

**USA:**

ISO 9001 Certified

One Omega Drive, Box 4047  
Stamford, CT 06907-0047  
Tel: (203) 359-1660  
e-mail: [info@omega.com](mailto:info@omega.com)

FAX: (203) 359-7700

**Canada:**

976 Bergar  
Laval (Quebec) H7L 5A1  
Tel: (514) 856-6928  
e-mail: [canada@omega.com](mailto:canada@omega.com)

FAX: (514) 856-6886

### For immediate technical or application assistance:

**USA and Canada:**

Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA<sup>SM</sup>  
Customer Service: 1-800-622-2378 / 1-800-622-BEST<sup>SM</sup>  
Engineering Service: 1-800-872-9436 / 1-800-USA-WHEN<sup>SM</sup>  
TELEX: 996404 EASYLINK: 62968934 CABLE: OMEGA

**Mexico and**

**Latin America:**

Tel: (95) 800-TC-OMEGA<sup>SM</sup> FAX: (95) 203-359-7807  
En Español: (203) 359-1660 ext: 2203 e-mail: [espanol@omega.com](mailto: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](mailto:nl@omega.com)

**Czech Republic:**

Ostravska 767, 733 01 Karvina  
Tel: 42 (69) 6311899 FAX: 42 (69) 6311114  
e-mail: [czech@omega.com](mailto: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](mailto:france@omega.com)

**Germany/Austria:**

Daimlerstrasse 26, D-75392 Deckenpfronn, Germany  
Tel: 49 (07056) 3017 FAX: 49 (07056) 8540  
Toll Free in Germany: 0130 11 21 66  
e-mail: [germany@omega.com](mailto:germany@omega.com)

**United Kingdom:**

ISO 9002 Certified

25 Swannington Road, P.O. Box 7, Omega Drive,  
Broughton Astley, Leicestershire, Irlam, Manchester,  
LE9 6TU, England M44 5EX, England  
Tel: 44 (1455) 285520 Tel: 44 (161) 777-6611  
FAX: 44 (1455) 283912 FAX: 44 (161) 777-6622

Toll Free in England: 0800-488-488  
e-mail: [uk@omega.com](mailto:uk@omega.com)

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 applications.

# TABLE OF CONTENTS

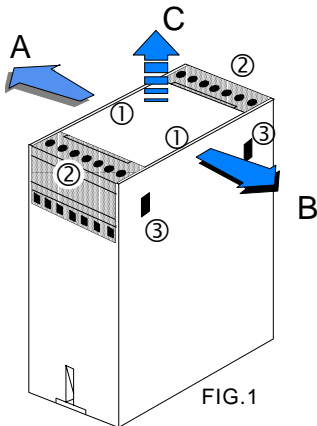
	PAGE
Open the Housing . . . . .	3
Internal Overview . . . . .	3
Power Supply module MA . . . . .	4
Changing the Power Supply . . . . .	4
Signal Output module MS . . . . .	5
Changing the Signal Output . . . . .	5
Signal Input, module ME Overview . . . . .	6
CCT-80, Electrical Features (Specifications) . . .	7
Signal Input Range Selection . . . . .	8
Adjustment and Calibration Procedure . . . . .	8
Connections . . . . .	9
Mechanical Specifications . . . . .	10
Notes . . . . .	11

# OPEN THE HOUSING

## PROCEDURE

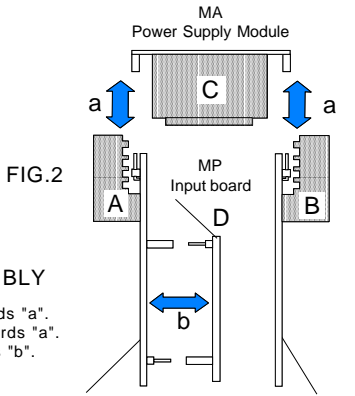
1. Insert a screwdriver or similar tool in the points marked ①.
2. Turn the screwdriver until the case walls begin to separate towards **A** and **B**, so the two side lugs ③, are free.
3. Grab the Signal Conditioner body, at the points marked ②, and pull it towards **C**, until the two side lugs ③ are out of their housing and the internal circuits are visible. See the sketch below for the disassembly of the circuit boards.
4. Before reinserting the Signal Conditioner into the case, the following must be checked :

- The front label (blue color) must be in its correct position, with terminals 1 and 7 (power supply) separated from the other terminals.
- The three internal modules must be inserted correctly in their internal case guides.



## INTERNAL OVERVIEW

- A. "ME" Input module.
- B. "MS" Output module.
- C. "MA" Power supply module.
- D. "MP" Input Board.



## PROCEDURE FOR DISASSEMBLY

1. Pull out the "ME" input module towards "a".
2. Pull out the "MS" output module towards "a".
3. Pull out the "MP" input board towards "b".
4. To assemble reverse the procedure.

# POWER SUPPLY

## RECOMMENDED WIRING

The power supply must be connected to terminals 1 and 7. The characteristics of the power supply are shown on the side label.

**WARNING.**- If the power supply is dc voltage, be careful with the polarity indicated for each terminal.

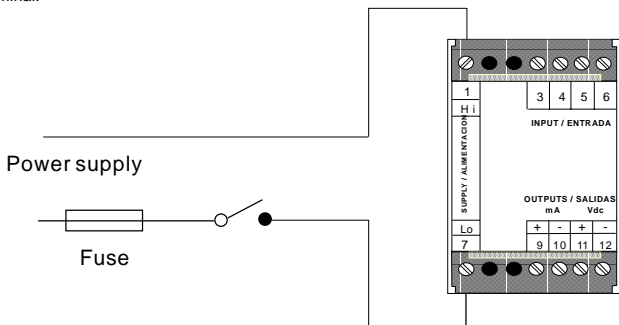


FIG. 3

## PRECAUTIONS

The installation must incorporate safety devices to protect the operator and the process when using the Transmitter to control a machine or process where injury to personnel or damage to equipment or process, may occur as a result of failure of the Transmitter.

## PROTECTIONS

See on table 1 the recommended value of the fuse for the different power supply availables.

Power supply	Fuse value
230 Vac	50 mA
115 Vac	100 mA
48 Vac	150 mA
24 Vac	300 mA
24 Vdc	300 mA

TABLE 1

## CHANGING THE POWER SUPPLY

The unit is not provided with a system to change the power supply. Therefore if the power supply must be modified to other value, please replace the module MA for another one appropriate to the new characteristics. Contact your local distributor for instructions.

# SIGNAL OUTPUT module MS

The signal conditioner provides two different analog output signals, both proportional to the signal input.

Output in Current: 4 to 20 mA, terminals 9 - 10

Output in Voltage: 0 to 10 Vdc, terminals 11 - 12

Do not use both outputs simultaneously. Only one selection can be made.

The side label shows which one is selected.



FIG.5

## CHANGING THE SIGNAL OUTPUT

All signal conditioners are delivered as a standard version, with the analog output selected as 4 to 20 mA, unless specified otherwise. To select a 0 to 10 V output, remove jumpers E and F as shown in Figure 6. Other non-standard output voltage and current ranges may be obtained by adding and/or replacing resistors given in Tables 2 and 3.

### NON STANDARD OUTPUT VOLTAGES

TABLE 2

Output in V.	Value in K $\Omega$ for :			
	R29	R30	R31	R32
$\pm 10$	49.9	----	200	----
0 to 1	----	----	11	100
0 to 5	----	----	100	100
1 to 5	----	100	66.5	100

### NON STANDARD OUTPUT CURRENTS

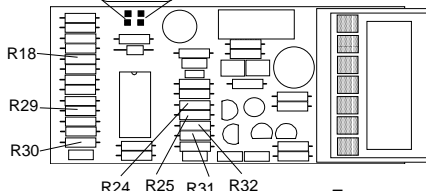
TABLE 3

Output in mA.	Value in $\Omega$ for :		
	R18	R24	R25
0 to 5	----	100	----
0 to 10	----	49.9	----
1 to 5	100 K	124	----
0 to 20	----	-----	24.9

"-----" means "Resistor must not be installed"



Jumpers E and F : Closed only if the output is 4 to 20 mA.



Replace or add the indicated resistors with the values shown in Tables 2 and 3 for the desired output.

FIG.6

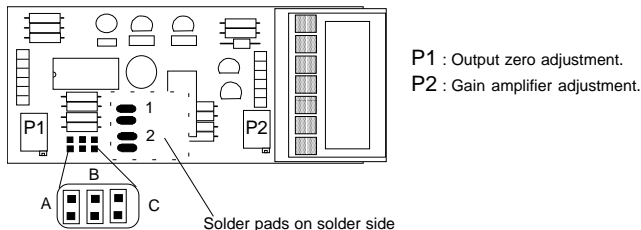
# SIGNAL INPUT, module ME

## OVERVIEW

This module together with the "MP" input board, performs the signal conditioning (see Fig. 2). This module contains the trimmers and jumpers for the amplifier gain and the low level output (offset).

The signal input connections are made at Terminals 3, 4, 5 and 6.

FIG.7



### OFFSET ADJUST

- Solder pad 1 if closed** : Adjust the low range level of the output (Offset positive coarse).
- Solder pad 2 if closed** : Adjust the low range level of the output (Offset negative coarse).
- Jumper A if closed** : Adjust the low range level of the output (Offset negative fine).

### AMPLIFIER GAIN

- Jumper B if closed** : Gain at maximum level
- Jumper C if closed** : Gain at medium level.
- Jumpers B and C opened** : Gain at minimum level.

# CCT-80, ELECTRICAL FEATURES

This signal conditioner provides connection to 4- or 6-wire strain-gages (load-cells), which provide a nominal of 2 mV/V or 3 mV/V output with 350  $\Omega$  impedance. See the Connections Section.

The signal conditioner does not provide the bridge excitation voltage, therefore it is necessary to use an external auxiliary power supply. It is advised that you use the model FAR-1 power supply, which senses the excitation voltage and compensates the errors due to lead resistance.

The FAR-1 provides a regulated 10 Vdc output.

The CCT-80 has an internal circuit which provides the user with tare adjust and compensation. See the tare paragraph.

## INPUT

STANDARD SIGNAL	20 mV
TARE	by internal trimmer PT1, located on the "MP" input board

## OUTPUT

0 to 20 mA or 4 to 20 mA	$R_L < 600 \Omega$ max. 22 mA $\pm 3\%$
0 to 10 Vdc	$R_L > 1000 \Omega$ max. 11 V $\pm 3\%$
ACCURACY	$\leq 0.2\%$ FS
RESPONSE TIME	$\leq 250$ mS
GALVANIC ISOLATION	Input, Output and Power Supply are all isolated to 2 kVeff. 50 Hz/1 m.

## GENERAL SPECIFICATIONS

RIPPLE	$\leq 0.5\%$
BAND PASS	1.5 Hz (-3 dB)
STORAGE TEMPERATURE	-30° to +80°C
OPERATING TEMPERATURE	-10° to +60°C
TEMPERATURE COEFFICIENT	$\leq 0.015\%/^{\circ}\text{C}$
STANDARD POWER SUPPLY	115 Vac ( $\pm 10\%$ ) 50/60 Hz
POWER CONSUMPTION	$\leq 1.5$ VA
TEST VOLTAGE	4 kVeff. 50 Hz/1m.



## SIGNAL INPUT RANGE SELECTION

The "MP" input board for this signal conditioner, does not have jumpers because it allows only one signal input (0 to 20 mV). To calibrate the signal conditioner, follow the adjustment and calibration procedure.

The user can field adjust the tare using the trimmer PT1, located on the "MP" input board. See Fig. 8.

The signal input 0 to 20 mV will be the standard range for all orders, unless specified otherwise.

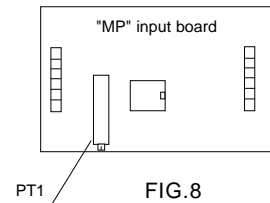


FIG.8

## ADJUSTMENT AND CALIBRATION PROCEDURE

To calibrate the signal conditioner, use a calibrator or Vdc source from 0 to 20 mVdc.

1. Open the signal conditioner case. (Fig. 2).
2. Check the "MA" module, if the selected power supply is correct. (Table 1).
3. Connect the calibrator to the signal conditioner terminals 5 - 6.
4. Connect a digital multimeter, to the signal output terminals to be used.
5. Power up the signal conditioner with the correct power supply.
6. Adjust the calibrator until it generates the low signal level (0 Vdc).
7. Turn the "ZERO" trimmer (P1), located on the "ME" input module, until the multimeter shows the desired low signal output level. (For example: 0 Vdc).
8. Adjust the calibrator until it generates the high signal level.
9. Turn the "GAIN" trimmer (P2), located on the "ME" input module, until the multimeter shows the desired high output level. (For example: 10 Vdc).
10. Repeat steps 6 to 9, until the two values are correct.

## TARE ADJUST PROCEDURE

After the connections between the signal conditioner, load cell and external power supply are made, connect a multimeter to the output terminals. Do not forget that the load cell must be free of load.

If the multimeter does not read 0 Vdc or 4 mA, then adjust the trimmer PT1, located on the "MP" input board.

Check that the high level of the output signal does not change. If it does adjust the GAIN trimmer (P2) located on the "ME" input module ( see Fig. 7).

# WIRING CONNECTIONS

## 6-WIRE BRIDGE

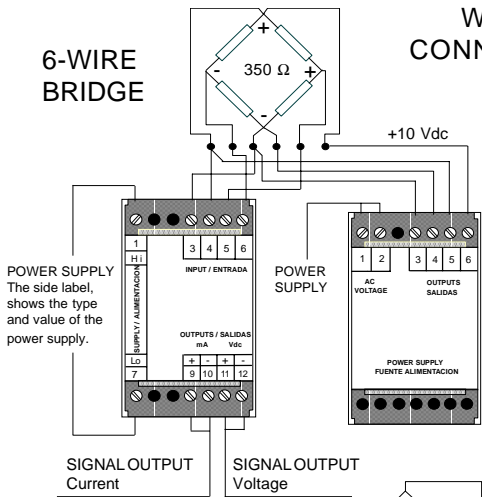


FIG.9

## TARE ADJUST

When internal tare adjust (on the "ME" input board ) is not used, the signal conditioner terminals 3 and 4, must not be connected.

## 4-WIRE BRIDGE

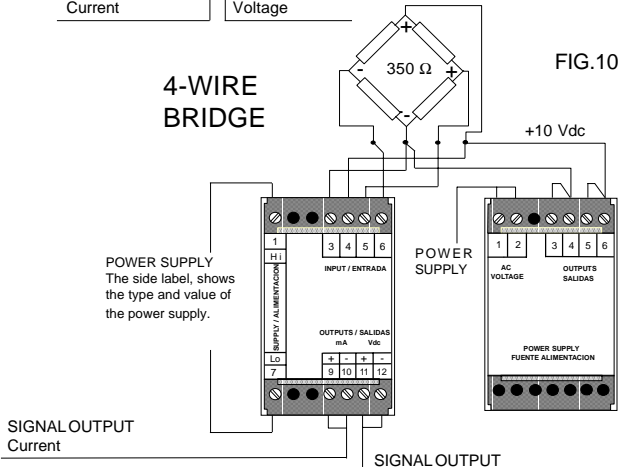
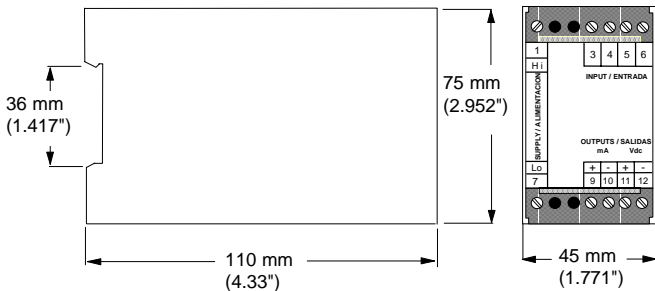


FIG.10

# MECHANICAL

## DIMENSIONS



## TECHNICAL DATA

WEIGHT ..... 270 g.

HOUSING BASE ..... Polycarbonate, RAL 7032, UL 94 V-1 light grey, IP-40  
TERMINAL HOUSING, COVER

AND BLIND PLUGS ..... Polycarbonate, UL 94 V-2 dark grey, IP-20

WIRE CROSS SECTION : ..... 4 mm<sup>2</sup>

Provided with a snap fastener for attaching to DIN 46277 and DIN EN 50022 (35 x 7.5 mm) assembly rails.

## NOTES



## 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 1996 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

## Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>