5 YEAR WARRANTY

MADE IN USA

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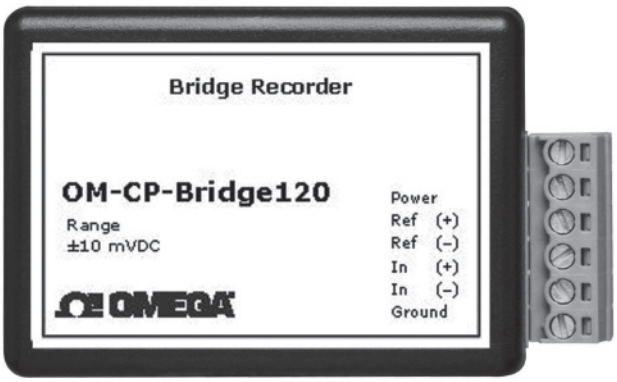
QUICK START

OMEGA®

User's Guide



OM-CP-Bridge120
Bridge/Strain Gauge Data Logger

OM-CP-Bridge120

Product Notes

The OM-CP- Bridge120 data logger is designed to interface with and measure strain gauges and load cells. The device provides an excitation voltage of 2.5V's and is available in the following millivolt input ranges: ±10mV, ±25mV, ±100mV, ±1000mV. The Bridge120 features a sampling rate of up to 20Hz.

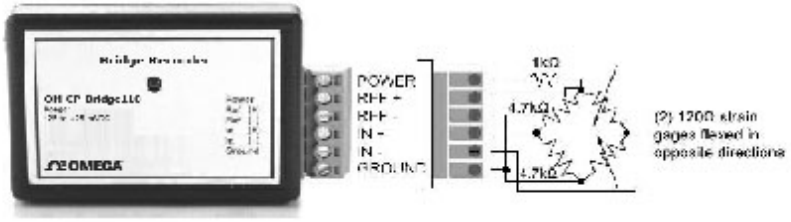
LEDs

Once started, the LED will flash at the selected reading rate to indicate the device is running.

Wheatstone Bridge Configuration

If it is desired to make strain gage measurements with better signal integrity and not requiring matching the thermal expansion coefficient to the material, then a Wheatstone Bridge configuration ought to be considered. While there are several versions of the Wheatstone Bridge, the least complex configuration that has these desirable qualities is the One-half bridge.

ONE-HALF WHEATSTONE BRIDGE



Note 1: The two strain gages need to bend in the opposite direction when stressed. Under this arrangement, the non-linear error is nulled out and temperature coefficients between the sensors and the material do not have to match.

Note 2: The tolerance of the 120Ω resistors and the "matched" values of the strain gages affect the "null" reading which theoretically ought to be 0V. It is recommended to use 1% or better resistors and identical strain gages.

$$microstrains(\mu\varepsilon) = \left(\frac{\Delta R}{R}\right) \times 1{,}000{,}000 \Big/ GageFactor$$

EXAMPLE:

A common unit of strain gage measurement is microstrains (μ). Microstrain is mathematically expressed as such: Where R/R is the ratio between the change in strain gage resistance (under stress) and the nominal strain gage resistance. The Gage Factor (GF) is specified by the manufacturer or vendor of the particular gage. Typically, GF values are 2 to 4.5 for metal and 50 to 200 for semiconductor strain gages. A 120Ω strain gage measures, under stress, 120.1Ω. The GF is 2,1. Convert to microstrains:

$$\left(\frac{0.1}{120}\right) \times 1{,}000{,}000 \Big/ 2.1 = 397\mu\varepsilon$$

If you wish to convert to microstrains from the differential bridge voltage, you can use the following equation (assumes you are using the one-half Wheatstone Bridge as shown previously)

$$microstrains(\mu\varepsilon) = \frac{\left(\frac{2\times\Delta v}{V_p}\right)\times 1{,}000{,}000}{GF}$$

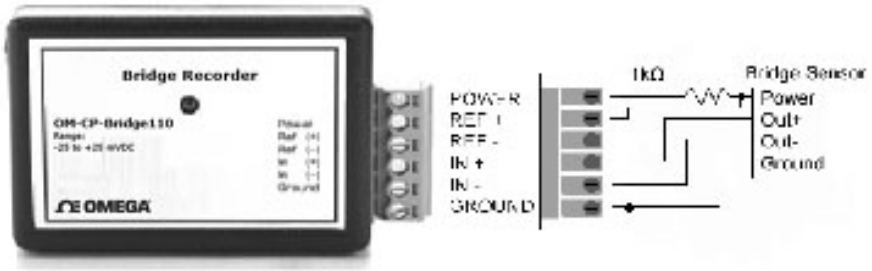
Where:

V = measured differential bridge voltage
Vp = bridge excitation voltage
GF = Gage Factor provided by the gage manufacturer

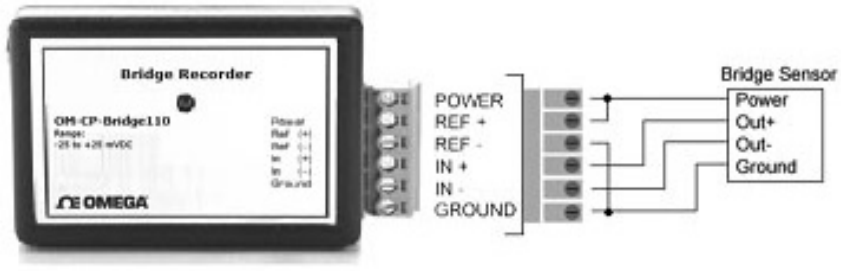
In some circumstances you may wish to plug in a packaged Wheatstone Bridge sensor such as the Omega® PX170 differential pressure gage or Omega® LCGC series Load Cell gages. In these circumstances, the internal resistive bridge cannot be altered.

When using a packaged Bridge sensor, check the specified bridge resistance. If it is less than 1kΩ then add a 1kΩ resistor between the power and bridge. You may use values higher than 1kΩ to conserve battery power, but it will diminish the signal to noise ratio. If the bridge resistance is greater than 1kΩ then no additional resistor is required.

PACKAGED WHEATSTONE BRIDGE SENSOR LESS THAN 1KΩ RESISTANCE



PACKAGED WHEATSTONE BRIDGE SENSOR GREATER THAN 1KΩ RESISTANCE



OM-CP-Bridge120

Installation Guide

Installing the Interface cable

- OM-CP-IFC200
  Insert the device into a USB port. The drivers will install automatically.
- OM-CP-IFC110
  Plug the serial cable into the port and verify it is secure.

Installing the software

Insert the Software CD in the CD-ROM Drive. If the autorun does not appear, locate the drive on the computer and double click on Autorun.exe. Follow the onscreen instructions.

Connecting the data logger

- Once the software is installed and running, plug the interface cable into the data logger.
- Click the Communication Menu, then Auto Configure Port.
- After a moment, a box will appear stating a device has been found.
- Click **OK**. The **Device Status** box will appear. Click **OK**.
- At this point, communications have been configured for your logger. These settings can be found under the **Communication Menu**.

Device Operation

Starting the data logger

- Click **Device Menu** then **Start Device**.
- Choose the desired start method.
- Choose the start parameters by selecting a **Reading Rate** suitable for your application.
- Enter in any other desired parameters and click **Start**.
- A box will appear stating the data logger has been started. Click **OK**.
- Disconnect the data logger from the interface cable and place it in the environment.

Downloading data from a data logger

- Connect the data logger to the interface cable.
- Click the **Device Menu** then **Read Device Data**. This will offload recorded data onto the PC.

Part Number	OM-CP-Bridge120
Range	See Table Below*
Resolution	
Accuracy	
Memory	32,767
Sample Rate	20Hz to 12 hours
Units	V, mV, µV, Engineering Units specified through software
Required Interface Package	OM-CP-IFC110 or OM-CP-IFC200
Baud rate	57,600
Typical Battery Life	25 days
Operating Environment	–40°C to +80°C (-40°F to 176°F), 0%RH to 95%RH (non-condensing)
Material	ABS plastic
Dimensions	0.8" x 1.7" x 2.7" (20mm x 43mm x 69mm)
Approvals	CE Pending

Nominal Range	±10mV	±25mV	±100mV	±1000mV
Measurement Range	±15mV	±37.5mV	±120mV	±1200mV
Resolution	1µV	2.5µV	5µV	50µV
Accuracy	±0.25%FSR	±0.10%FSR	±0.05%FSR	±0.01%FSR
Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V	0 to 2.5V
Reference Voltage	2.5V	2.5V	2.5V	2.5V

Battery Warning

WARNING: FIRE, EXPLOSION, AND SEVERE BURN HAZARD. DO NOT SHORT CIRCUIT, CHARGE, FORCE OVER DISCHARGE, DISASSEMBLE, CRUSH, PENETRATE OR INCINERATE. BATTERY MAY LEAK OR EXPLODE IF HEATED ABOVE 80˚C (176˚F).

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It is the policy of OMEGA Engineering, Inc. 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 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, human applications.

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **61 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **five (5) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, 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 having been 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 in which wear is not warranted, include but are 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 the company 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. Purchase Order 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. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the 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.

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