OMEGA®

User's Guide

OM-SGD-24-M-IP SERIES

Waterproof Smart Graphics Display

ΩE OMEGA®

Servicing North America:

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e-mail: info@omega.com

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OM-SGD-24-M-IP
Waterproof Smart Graphics Display

FEATURES

- 2.4" color TFT screen
- IP-67 and NEMA 6 rated
- Rugged and scratch resistant Corning® Gorilla® Glass window
- Supplied with free Windows design software, to setup and customize the display. Compatible with Windows XP, Vista 7 and 8
- Download meter applications from the ever expanding online library
- Programmable with the USB interface
- Simple and easy panel mounting solution
- IP-67 12-way connection
- Wide operating voltage of 4V – 30V d.c.
- 0 – 40V d.c. measurement range
- 2 analog inputs & 2 alarm outputs
- SPI and I²C
- 4-20mA version available (OM-SGD-24-M-IP420)

ORDERING INFORMATION

Standard Display (Panel meter, fixing kit, IP-67 connector, quick start guide)	OM-SGD-24-M-IP
Current Loop Display (Panel meter, fixing kit, IP-67 connector, quick start guide)	OM-SGD-24-M-IP420
USB Cable (Type A to mini-B)	OM-CABLE-USB A-MF
2m Rightangle cable with IP-67 connector	OM-CABLE-IP-12W-RA

The OM-SGD-24-M-IP is a smart IP-67 graphics display with a 320 x 240 pixel (QVGA) color display and USB programming interface.

Using the PanelPilot software (available for Windows XP, 2000, Vista and Windows 7), users are able to choose from an ever-increasing number of configurations which can then be customized to their needs. The additional voltmeter types and other functions are available through www.omega.com.

Colors, text labels, splash screen and input voltage scaling can all be customized by the user through the software and then uploaded to the OM-SGD-24-M-IP through the USB connection. When setup is complete, the settings can be saved and then uploaded to the meter using the supplied USB cable. Panel or enclosure installation of the finished module is simple, using the 32mm nut and the IP67 connector supplied with the unit.

Specifications	Minimum	Typical	Maximum	Unit
Accuracy		0.05	0.1	%
Linearity			±1*	Count
Sample rate		3		Samples/second
Operating temperature range	0 (+32)		+40 (+104)	°C (°F)
Supply voltage	4		30	V d.c.
Measurement voltage (single ended only) **	0		40	V d.c.
Measurement current (4-20mA version)	4		20	mA
Supply current ***	35		190	mA

*   Depending on user calibration settings
**   The OM-SGD-24-M-IP uses a programmable gain amplifier. There are 8 different voltage ranges, to optimise the resolution. See page 2 for details.
***   Voltage dependent. See graph on Page 2.

www.omega.com

OM-SGD-24-M-IP
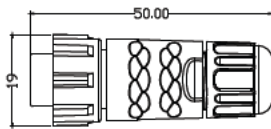## Waterproof Smart Graphics Display

IP67 CONNECTION

Connector Pin Functions

|		
1	ESPI-CS2	-SPI chip select
2	ESPI-MISO	- SPI master input, slave output
3	ESPI-CLK	- SPI serial clock
4	ESPI-MOSI	- SPI master output, slave input
5	SDA	- Serial data
6	SCL	- Serial clock
7	ALM2	- Alarm output 2
8	ALM1	- Alarm output 1
9	IN1	- Analog voltage input 1 (maximum of 40V d.c. w.r.t 0v)
10	IN2	- Analog voltage input 2 (maximum of 40V d.c. w.r.t 0v)
11	0V	- 0V power supply input
12	V+	- Positive power supply input (4V – 30V d.c.)
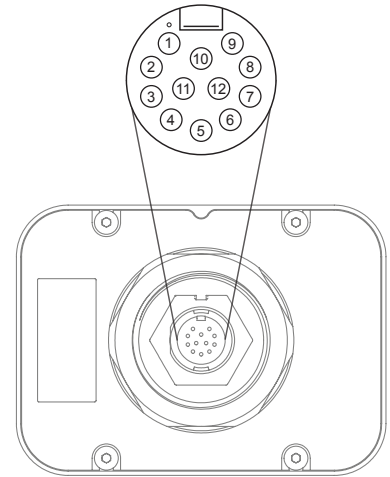
Connector plug options

Twist lock, field installable connector with solder bucket pins.
Seals for Cable OD=4.5mm~7.0mm

Twist lock connector with right angle overmoulded strain relief.
Cable length 2m.

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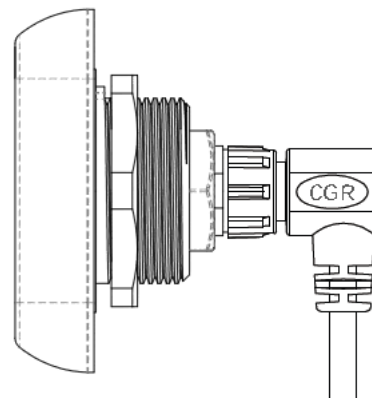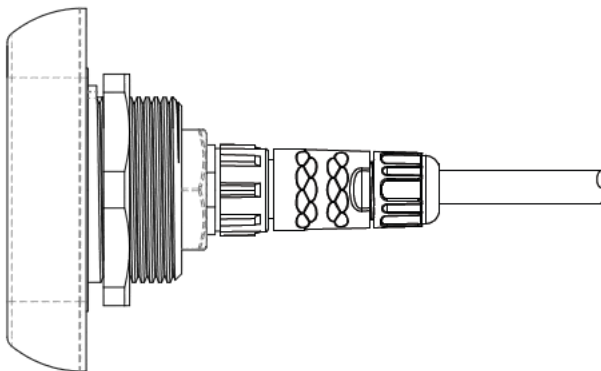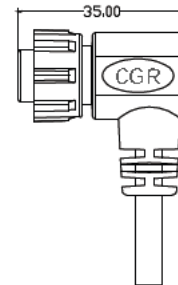
OM-SGD-24-M-IP
Waterproof Smart Graphics Display

VOLTAGE INPUT

The OM-SGD-24-M-IP features 2 voltage inputs, which use a Programmable Gain Amplifier (PGA) to make the best use of available resolution (the smallest voltage range offers the highest resolution)*. Each channel can be programmed independently, with the option of eight different input voltage ranges:

Voltage Range (V)	Resolution (mV)
0 - 1.25	0.3
0 - 2.5	0.6 (4-20mA)
0 - 4	1.0
0 - 5	1.2
0 - 8	2.0
0 - 10	2.4
0 - 20	4.9
0 - 40	9.8

The input voltage range is decided using the two voltages that the user enters in the scaling section of the Panel Pilot software. The software uses the smallest range available, which can accommodate both of the voltages entered by the user. The absolute maximum voltage input is 40V d.c.

For example:
Entering a voltage scale of 0 – 30V in the software will use the 0 – 40V range.
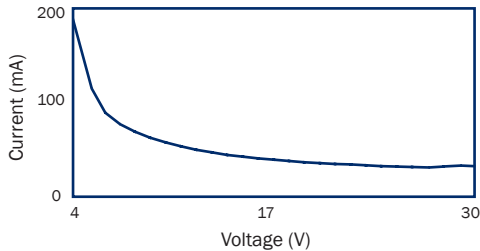Entering a voltage scale of 0 – 3V in the software will use the 0 – 4V range.
Entering a voltage scale of 5 – 15V in the software will use the 0 – 20V range.

Note: V+, IN1 and IN2 share a common ground (i.e. not floating or isolated from each other).

*For the 4-20mA model, the 0-2.5 range is used.

Typical Supply Current

USB Connection

A 'Type A to Mini-B' USB cable is required to program and customize the OM-SGD-24-M-IP by unscrewing the 4xM3 screws and removing the back cover. The packing tray supplied can be used as a jig to hold the module and to avoid disconnecting the 12 way connector from the PCB inside.

The device will be powered for programming via USB.

It typically takes between 10 and 30 seconds to send a configuration, with an additional 5 seconds needed for the hardware to reset.
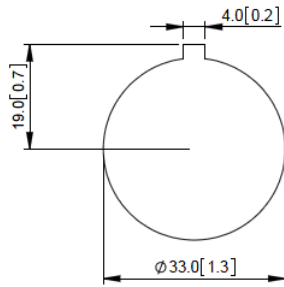
Display

The display is a 2.4" TFT panel, with a resolution of 320 x 240 pixels and a 16-bit color depth. Any graphics that are uploaded to the meter are automatically converted to this specification.
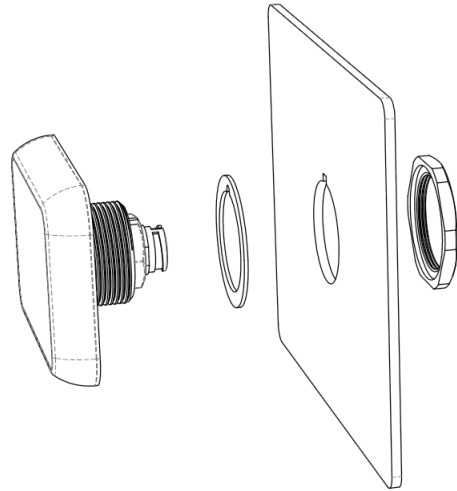
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PANEL MOUNTING

The OM-SGD-24-M-IP can be fitted into panels of up to 10.5mm deep. A rubber seal is included to seal the mounting hole when the 32mm nut is fully tightened. Panel mounting hole cut-out is DIA 33mm.
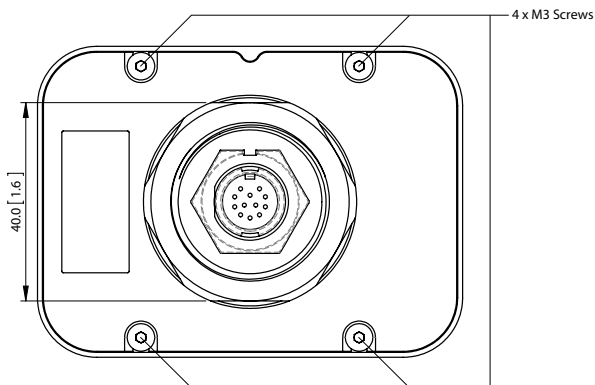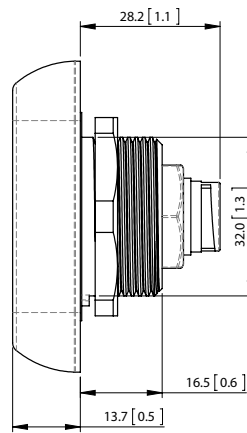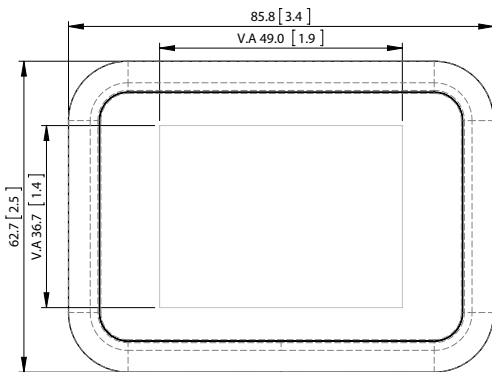
4.0[0.2]

19.0[0.7]

⌀33.0[1.3]

PANEL CUT OUT DIMENSIONS

DIMENSIONS

All dimensions in mm [inches]

85.8[3.4]

V.A 49.0 [1.9]

62.7[2.5]

V.A 36.7[1.4]

28.2[1.1]

32.0[1.3]

16.5[0.6]

13.7[0.5]

4 x M3 Screws

40.0[1.6]
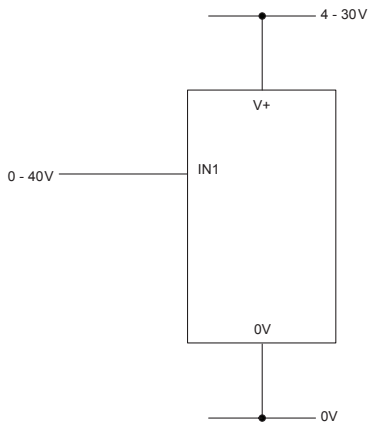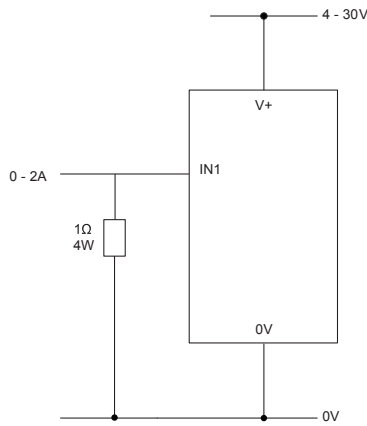
OM-SGD-24-M-IP
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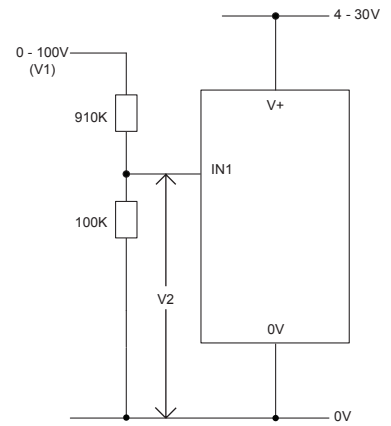
VARIOUS OPERATING MODES

MEASURING A VOLTAGE SOURCE

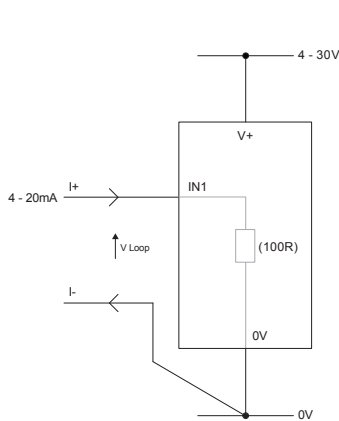MEASURING 0-2 AMPS CURRENT RANGE

Use a 1 Ω resistor, with a 4W rating.
Setup scaling in software: 0V = 0.00 and 2V = 2.00

MEASURING 0-100V (d.c. only)

Input a known voltage of between 0 and 100V (V1)
Measure the voltage between IN1 and 0V (V2)
Setup scaling in software: 0V = 0.0
V2 = V1 (Enter with the same number of decimal points, i.e 50.0)

VARIOUS OPERATING MODES (4-20mA version)

MEASURING 4-20mA

Power supply to meter must be fully floating
(isolated from the 4-20mA current loop)
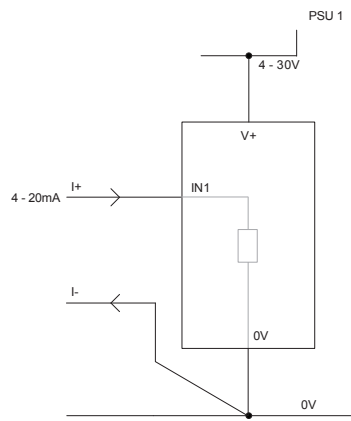
USING TWO OM-SGD DISPLAYS IN SAME INSTALLATION

Each OM-SGD must be powered from a seperate, fully
floating, power supply

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VARIOUS OPERATING MODES (4-20mA version) continued

**MEASURING 4-20mA
USING A USB POWER SUPPLY**

DIGITAL HOLD

DIGI1 will hold the display

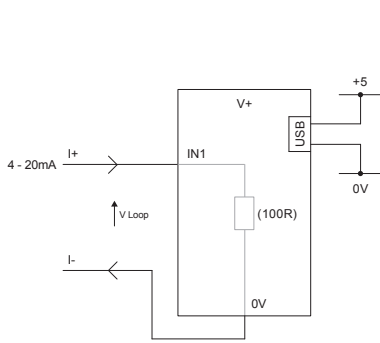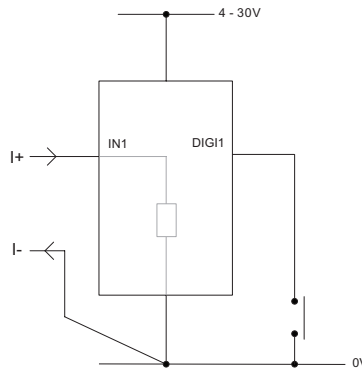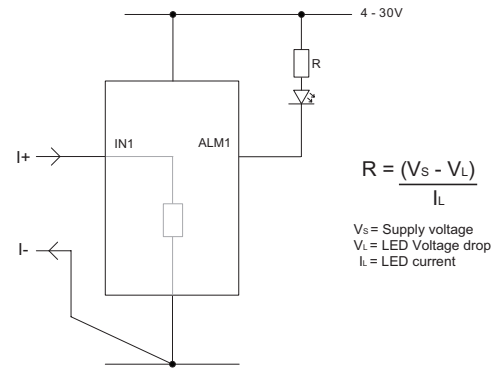$$R = \frac{(V_S - V_L)}{I_L}$$

V_S = Supply voltage
V_L = LED Voltage drop
I_L = LED current

ALARM OUTPUT

Applications that feature an alarm can be connected as above.
ALM1 must not sink more than 10mA maximum each. If supply
voltage varies, use an appropriate voltage regulator.

PANELPILOT SOFTWARE

Omega's PanelPilot software is available for download free of charge from www.omega.com. Easy to install and use, the control software runs under Windows XP, Vista and 7 and 8. The software is used to setup the appearance and operation of the meter and then upload these settings to the meter.

Multiple types of voltmeter are supplied with the software. See www.omega.com for details of available meters.

The software allows the following parameters to be configured:

• Meter type
• Text labels (including units and graph labels)
• Background, graph segment and text colors
• Input scaling / calibration (at two points)
• Decimal points (entered during scaling)
• Splashscreen image selection (to display a
   user image, such as a logo, when the meter is powered up)

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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's 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 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.

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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:	FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,	1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product under warranty, and	2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.	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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