

# **GageWay SM<sup>TM</sup>**

**Single Mitutoyo Interface**

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## **User's Guide**

# GageWay SM

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# 1 Introduction



**GageWay SM  
with RS-232 Output**



**GageWay SM  
with USB Output**

The GageWay SM is an easy-to-use interface designed to connect a Mitutoyo or Mitutoyo compatible gage to a serial or USB port. A serial communications test program (ComTestSerial) is included so that you can test and become familiar with the operation of the GageWay SM. When using the USB version of the GageWay SM, the USB connection looks like a standard RS-232 serial port to your PC application.

## Features of the GageWay SM

- No baud rate or communication parameters setup required. The GageWay SM is pre-configured to operate at 9600-N-8-1.
- Read switch connector located along the edge of the GageWay SM. This connector is located along the edge that is not visible in the above photos.
- Initiate single and continuous readings with the read button on the gage, an optional foot or hand switch, or a simple computer command.
- An LED flashes when a gage reading has been obtained.
- Plugs directly into a standard 9-pin PC serial port or USB port.
- Powered by the serial port or USB port. No external AC adapter is required.
- Firmware (software program in the GageWay SM) can be upgraded via the serial or USB port. Check the MicroRidge web site for [firmware updates](#).
- [ComTestSerial](#)<sup>7</sup> communications test program included with the GageWay SM.
- Available with cable lengths of 18 and 72 inches.
- Supports Mitutoyo gages and any gage that provides a standard Mitutoyo output. Companies such as CDI, Mahr Federal, LMI, etc. manufacture gages and gage cables that provide a Mitutoyo compatible output.

- Standard Mitutoyo cables can be used without modification. These Mitutoyo gage cables can be purchased from any Mitutoyo dealer or can be purchased from MicroRidge.
- If you are using a CDI, Federal or LMI gages with a Mitutoyo output, you may need to purchase the gage cables from MicroRidge.

## User's Guide Organization

This User's Guide covers the GageWay Pro operation and setup program. This document has been designed for double-sided printing on a color printer. If you print this document single sided, there will be several blank pages included in the printout.

If you are viewing the PDF version of this User's Guide, you will see page numbers to the right of the links within the PDF document. For example the number to the right of the [Contact MicroRidge Systems](#)<sup>10</sup> link indicates the actual page number this link is directed to.



The GageWay Pro Interfaces are in compliance with the European Union Directive on the restricted use of certain hazardous substances (RoHS/RoHS2 Directive). For more information review the [RoHS Declaration of Compliance](#) document on the MicroRidge web.

## 1.1 Why do I Need an Interface?

We often get asked “Why do I need to purchase a gage interface to connect my gage to a PC?” The Mitutoyo compatible gages use a signaling method referred to as clocked serial.

The clocked serial data is not sent at a constant rate like RS-232 data; therefore, the Mitutoyo signals require special signal processing to convert them into a standard RS-232 format. Remember that when using the USB version of the GageWay SM, the USB drivers that you install make the GageWay SM output look like a regular RS-232 serial port to your PC application.

There are a few calipers and digital indicators that have an RS-232 output; however, one should carefully analyze the cost before purchasing the RS-232 ready devices.

You must consider the gage cables to be a consumable item, and factor gage cable replacement into the cost of your measurement system. People have reported that gage cable consumable rates may be measured in days, weeks or months. Another limitation with RS-232 ready devices is that the range of products available is small when compared to the products with a Mitutoyo compatible output.

## 1.2 My Computer Does Not Have a Serial Port

This topic is only pertinent if you are trying to connect an RS-232 version of the GageWay SM to your PC. If you have purchased the RS-232 version and really need the USB version, contact your dealer or [MicroRidge Systems](#)<sup>10</sup>.

Many of the computers that are being sold today do not contain any RS-232 serial ports. If your computer does not have any serial ports, it will have several USB ports. You will need to obtain a USB to serial converter cable in order to connect the RS-232 version of the GageWay SM to your PC. This cable will convert one of your USB ports to a serial port. These USB to serial cables are available directly from MicroRidge Systems.

## 2 Driver Installation for USB Version

Before you connect the USB version of the GageWay SM to your PC, you must install the USB and virtual serial port drivers. These drivers are located on the CD that you received with the GageWay SM. After installing the drivers, connect the GageWay SM to a USB port. Once the GageWay SM is connected, you will get a message about new hardware found.

This driver is developed by FTDI and supports the FTDI USB chip used in the USB version of the GageWay SM. You can also obtain a copy of this driver from the following web sites.

- MicroRidge web site at [www.microridge.com/downloads.htm](http://www.microridge.com/downloads.htm). The driver on the MicroRidge web site is only for use with Windows.
- FTDI web site at [www.ftdichip.com/Drivers/VCP.htm](http://www.ftdichip.com/Drivers/VCP.htm). The Virtual COM Port (VCP) drivers on the FTDI site reflect the currently supported VCP drivers.

### USB Driver Installation

To install the USB drivers, run the USB Driver installation on the GageWay SM CD. If you are not sure if you have previously installed the USB drivers, it is OK to reinstall the drivers.

## 3 Operation

To become familiar with the operation of the GageWay SM, we suggest you follow the steps outlined below. You can check communications with the GageWay SM even if you do not have a gage connected to the interface.

- Connect the GageWay SM to a serial or USB port. If you have purchased a GageWay SM with an RS-232 connector and do not have a serial port on your PC, refer to [My Computer Does Not Have a Serial Port](#)<sup>2</sup>.
- Start the [ComTestSerial](#)<sup>7</sup> communications program.
- Press the Setup button and select the GageWay SM command set.
- If necessary, change the serial port number by pressing the Serial Port button. The Registry Description in the Select & Configure Serial Port dialog for the USB version will have a description similar to \Device\VCP0. In order to use the USB version, you must select the virtual serial port that was created for the currently connected GageWay SM. The baud rate and communication parameters must be set to 9600-N-8-1.
- Use the [Computer Commands](#)<sup>6</sup> or the command buttons at the bottom of the ComTestSerial window to test the communications with the GageWay SM.
- When the GageWay SM is powered up, the LED will blink about 6 times. When the blinking stops, the GageWay SM is ready to receive commands and send data to the PC.

The RS-232 version of the GageWay SM is powered by the serial port handshake lines. Power up and power down of the GageWay SM is performed by the application controlling the serial port handshake lines. Refer to [How the GageWay SM is Powered](#)<sup>5</sup> for more details.

The USB version of the GageWay SM is powered by the USB port and will be powered up when the GageWay SM is connected to a USB port.

### 3.1 How the GageWay SM is Powered

The RS-232 version of the GageWay SM is designed to draw its power from the serial port and does not require an external AC adapter. On the standard serial port there are 2 handshake lines that can be used to supply power to devices that have very low power needs. On the standard 9-pin PC serial port, the 2 pins that are used are pin 4 (DTR) and pin 7 (RTS). In order for your application to use the GageWay SM-R, one or both of these pins must be high. Typically when an application opens a serial port, the application sets both of these lines to the high state. You can manually set these handshake lines high and low when testing the GageWay SM with the [ComTestSerial](#)<sup>7</sup> communications program.

The USB version of the GageWay SM is powered directly by the USB port and it does not matter whether the handshake lines are high or low.

### 3.2 Read Switch Connector

The GageWay SM contains a read switch connector along the edge of the unit. Gages such as calipers and micrometers will have a read switch on the gage cable and a separate read switch is typically not required. If you are using a digital indicator with the GageWay SM, you will need to use an external read switch or send a [computer command](#)<sup>6</sup> from your PC.



The read switch provides a contact closure to tell the GageWay SM to get a gage reading. You can purchase a read switch from MicroRidge (see [Accessories](#)<sup>8</sup>) or build your own. The required read switch connector is a 2.5 mm mono phone plug.

### 3.3 Computer Commands

The GageWay SM can be controlled with a set of computer commands. You should test these commands with [ComTestSerial](#)<sup>7</sup> so that you fully understand the response and the format of the response.

The user commands that consist of a letter can be upper or lower case. To request a reading you can send R or r. A carriage return (enter key) is not required at the end of any of the commands. If you send an invalid command, the command will be discarded by the GageWay SM.

User commands (commands can be upper or lower case):

- R Read gage.
- B Begin continuous gage read.
- S Stop continuous gage read.
- C Begin continuous gage read when read switch (foot switch, hand switch, read button on gage, etc.) is pressed and held.
- D Stop (disable) continuous gage read when the read switch is released.
- H Display a list of the computer commands.
- L Turn the LED on for 50 milliseconds (msec).
- V Version information.
- Z Reset to power up configuration. This will also disable the continuous read that was controlled by a remote read switch. The LED will flash 4 times when this command is received.
- ★ Copyright information.

### 3.4 Output Data Format

The data format of a reading from a Mitutoyo device is fixed and cannot be modified by the user. The GageWay SM sends the measurement left justified and the measurement is terminated with a carriage return. There are no leading, trailing or embedded blanks in the measurement string.

The length of the measurement string will vary based on the number of digits in the measurement. A few examples are shown below.

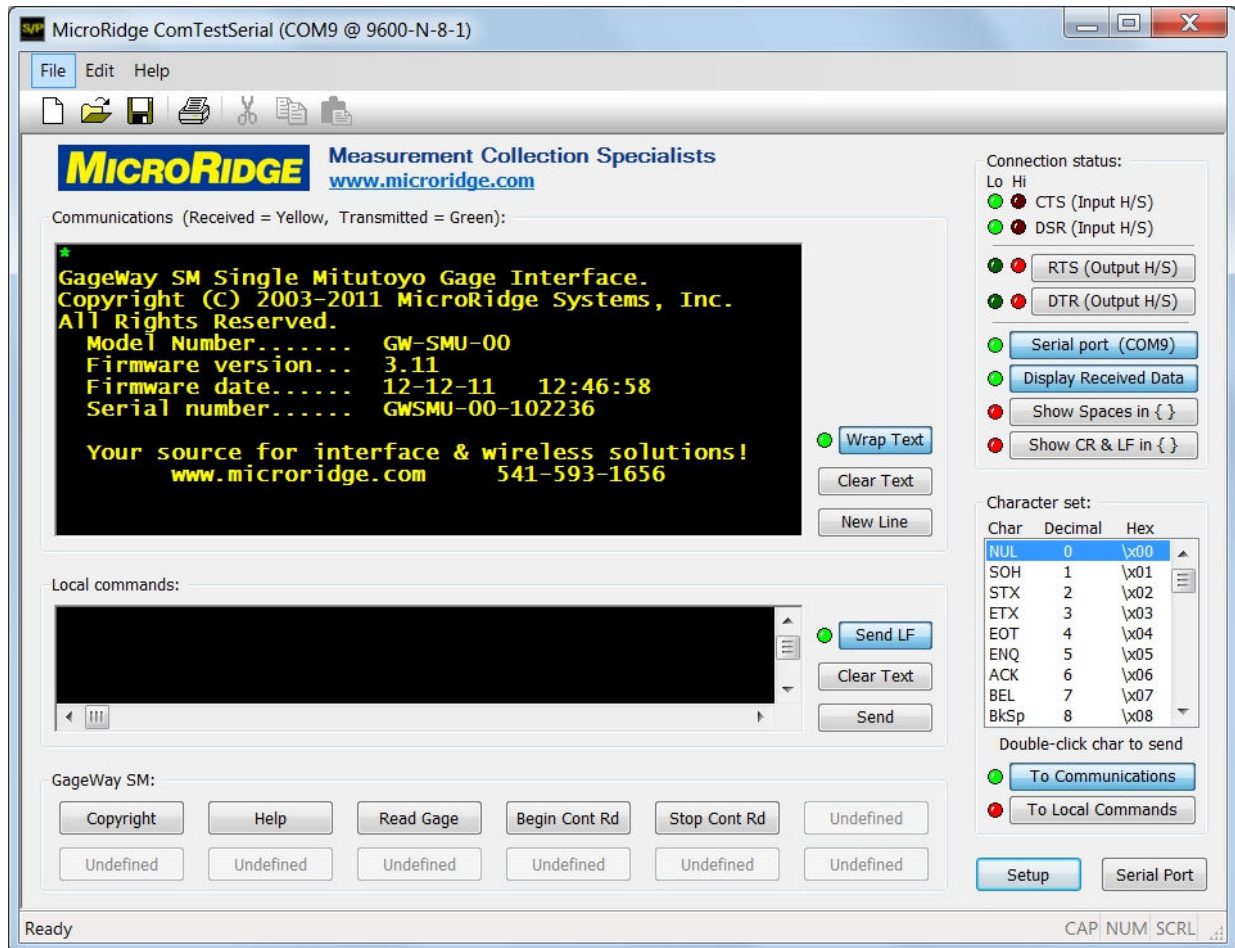
1.3265

.1455

-.5725

13.26

## 4 ComTestSerial



ComTestSerial is a serial communications test program that is included on a CD with the GageWay SM. This test program is much easier to use than the HyperTerminal program included with some versions of Windows. The default communication parameters in ComTestSerial match those of the GageWay SM. The only setting you may have to change is the serial port selection. By default, COM1 is selected. If your GageWay SM is connected to a different serial port, press the Serial Port button in the lower right corner and select the appropriate port.

You can select predefined buttons for the GageWay SM by pressing the Setup button. Select the GageWay SM command set when the Parameter Setup dialog is displayed.

ComTestSerial can be loaded on as many computers as required. To install this test program, select the ComTestSerial installation option on the CD included with your GageWay SM. ComTestSerial is designed for use on XP and later. Refer to [ComTestSerial on the MicroRidge web site](#) for more information.

## 5 Accessories

Several accessories are available for use with GageWay SM.

### Purchase On the Web

These items are available for purchase directly from the MicroRidge web site at the [GageWay Interface Store](#).

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### Hand Switch



P/N: HNDSW-MPLG

The hand switch is connected to the read switch connector on the side of GageWay SM. If you are using GageWay SM with a gage that does not have a read button (i.e., digital indicator, etc.), you must connect a read switch to the GageWay SM or send a command from the PC in order to get a gage reading. Gages such as calipers and micrometers, will have a read button on the gage or on the gage cable.

The cable length on the hand switch is 6'

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### Foot Switch



P/N: FTSW-MPLG

The foot switch is used for the same functions as the hand switch.

The cable length on the foot switch is 6'

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## 6 Warranty Information

The standard MicroRidge warranty for products it manufactures and resells is described below:

- MicroRidge warrants that equipment manufactured by MicroRidge to be free from defects in material and workmanship, when properly maintained under normal use, for a period of twelve (12) months from date of purchase of the product (the “warranty period”). Some products sold and distributed by MicroRidge are warranted by the manufacturer of the products.
- Warranty for gage and RS-232 interface cables is 30 days from date of shipment.
- Products which do not conform to their description or which are defective in material or workmanship will, by MicroRidge decision, be replaced or repaired, or, at MicroRidge’s option, credit for the original purchase price may be allowed provided that customer notifies MicroRidge in writing of such defect within thirty (30) days of discovery and returns such products in accordance with the MicroRidge instructions. No products may be returned without MicroRidge prior written authorization.
- This warranty does not apply to any product which has been subjected to misuse, abuse, negligence or accident by the customer.
- MicroRidge makes no other warranty or representation of any kind with respect to the products, either express or implied, including without limitation, that of merchantability or fitness for a particular use. Failure to make any claim in writing, or within the thirty (30) day period set forth above, shall constitute an irrevocable acceptance of the products and an admission by the customer that the products fully comply with all terms, conditions and specifications of customer’s purchase order. MicroRidge shall not be liable for direct, indirect, incidental, special or consequential damages, under any circumstances, including, but not limited to, damage or loss resulting from inability to use the products, increased operating costs or loss of sales, or any other damages. To make a claim under this warranty, customer must notify MicroRidge in writing within the warranty period.
- Customer will pay all shipping charges (and duty and taxes) for equipment returned to MicroRidge for warranty service. MicroRidge will pay shipping charges for equipment returned to customer in North America. Customers outside the USA are responsible for duty and taxes on equipment returned to them.
- Software developed by MicroRidge is warranted to operate in accordance with the software documentation on the hardware specified in such documentation, for a period of six (6) months from date of shipment. During the warranty period, MicroRidge will at no charge correct any programming error in the software that interferes with normal operation of the software provided that MicroRidge is able to reproduce such error on MicroRidge computer.

## 7 Contact MicroRidge

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Note: There is no mail delivery to this address. This address should only be used for package delivery services such as UPS, FedEx, etc.

**Web:** [www.microridge.com](http://www.microridge.com)