

GageWay ProTM **Interfaces**

User's Guide

GageWay Pro Interfaces

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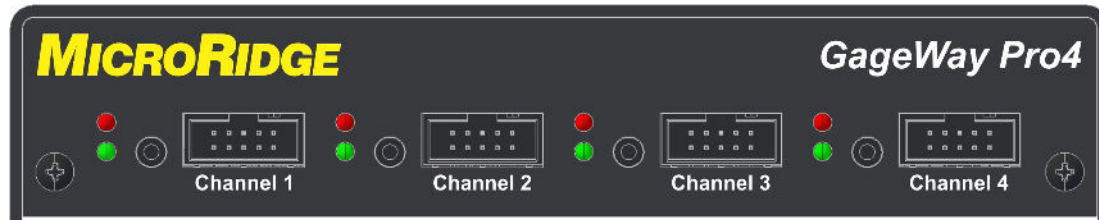
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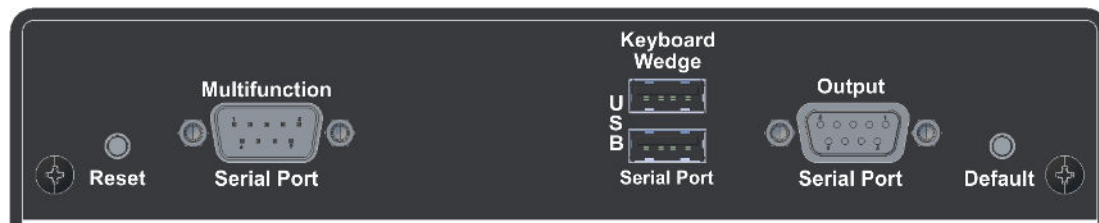
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1 Introduction



GageWay Pro4 Front Panel



GageWay Pro4 Back Panel

The GageWay Pro interfaces are the most advanced and feature rich gage interfaces available today. The current GageWay Pro models consist of the following:

- GageWay Pro2, 2-Port interface
- GageWay Pro4, 4-Port interface
- GageWay Pro8, 8-Port interface

The GageWay Pro interfaces replace the GageWay Series (GageWay3 and GageWay5) and GageWay Mx (Mx4 and Mx8) interfaces previously available from MicroRidge Systems. The GageWay Pro computer commands are, in most cases, identical to the commands used by the previous GageWay interfaces. If you need to configure a GageWay Pro, this can be done via the easy-to-use Windows based [GageWay Pro Setup Program](#).

Key Features

The key features of the GageWay Pro interfaces are as follows:

- All front panel input ports support Mitutoyo (also gages with Mitutoyo compatible output), Federal Maxum, Ono Sokki, INSIZE indicators and RS-232 serial devices.
- RS-232 devices are connected via a low cost Level Converter cable (P/N: GW-LC) and your gage cable.
- The AutoBaud feature can automatically determine the RS-232 baud rate and communication parameters for any of the front panel input ports.

- GageWay Pro4 and Pro8 interfaces can be chained to increase the available number of channels.
- USB Keyboard Wedge and USB Serial Ports are built into the GageWay Pro interfaces.
- No driver installation required for the keyboard wedge function (driver installation required for the USB serial port).
- Powered by the USB connection to your PC (can also be powered by a separate USB AC adapter).
- Supports baud rates from 1200 to 57.6K
- Includes 6' USB cable.
- Get a gage reading by pressing a foot switch (or hand switch), a computer command or the read button on the gage cable.
- Configure via an easy-to-use Windows based Setup Program. You do not have to open the interface to configure it.
- To maximize the measurement collection speed, each gage channel has a dedicated processor and there is a communications processor to manage the communications with the gage channel and the host computer. For example, the Pro8 interface contains 8 gage processors and 1 communications processor for a total of 9 processors.
- High speed continuous read operation. Test run with 8 Mitutoyo gages in a continuous read mode for 60 seconds gave the following results:
 - Previous Mx8 interface captured 984 measurement in 60 seconds.
 - Current Pro8 interface captured 5,230 measurements in 60 seconds. The total number of readings was actually limited by how many times/second the gage could send a measurement.
- Communications Test Program ([ComTestSerial](#)³⁷) included to assist you in understanding what is actually being sent from your gages and the GageWay Pro interface.
- Firmware updates available at no charge from the [MicroRidge web site](#).

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](#)⁴⁷ 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.



Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 is commonly referred to as REACH. REACH stands for the Regulation for Registration, Evaluation, Authorization, and Restriction of Chemicals. The REACH Regulation entered into force on 1st June 2007 to streamline and improve the former legislative framework for chemicals of the European Union (EU) and European Economic Area (EEA) countries.

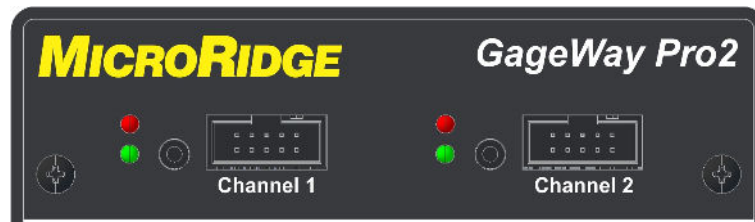
REACH compliance is only mandatory on products produced in or shipped into the European Union (EU) and member countries. However, since many other jurisdictions have similar or pending legislation and manufacturers' products may eventually find their way into the EU, REACH compliance is having a global effect.

All current MicroRidge produced products are in compliance with REACH and do not contain any of the currently listed SVHC (substance of very high concern) in concentrations of 0.1% or above. For more information review the [REACH Declaration of Compliance](#) document on the MicroRidge web.

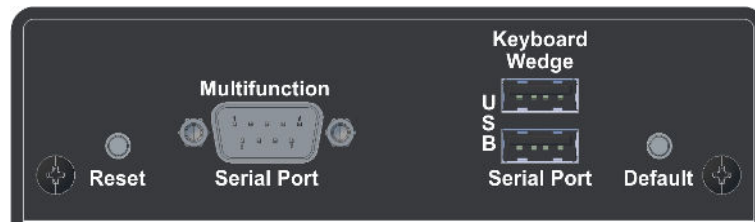
2 GageWay Pro Interfaces

The GageWay Pro interfaces are currently available in 3 different models. The GageWay Pro2, GageWay Pro4 and GageWay Pro8. The only difference between the Pro4 and Pro8 is the number of input ports. The Pro2 does not contain the DB9 Output Serial Port on the back of the interface. The capabilities of the front panel inputs are the same on the Pro2, Pro4 and Pro8 interfaces.

2.1 GageWay Pro2



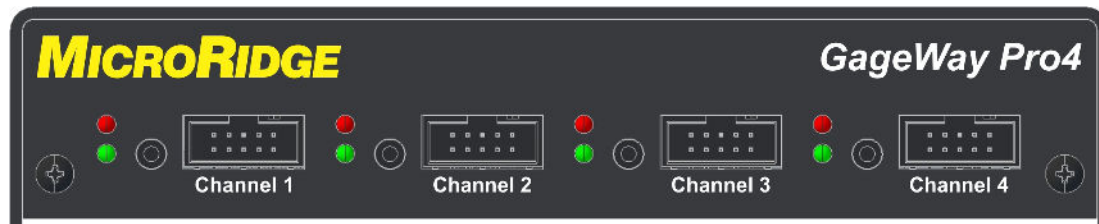
GageWay Pro2 Front Panel



GageWay Pro2 Back Panel

The GageWay Pro2 interface supports 2 gage inputs on the front panel. The outputs for the Pro2 can be sent to the USB Serial Port or the USB Keyboard Wedge Port. Power to the interface is supplied via the USB Keyboard Wedge port or the USB Serial Port. The Multifunction Serial Port can be used to connect an additional serial device to the interface.

2.2 GageWay Pro4



GageWay Pro4 Front Panel

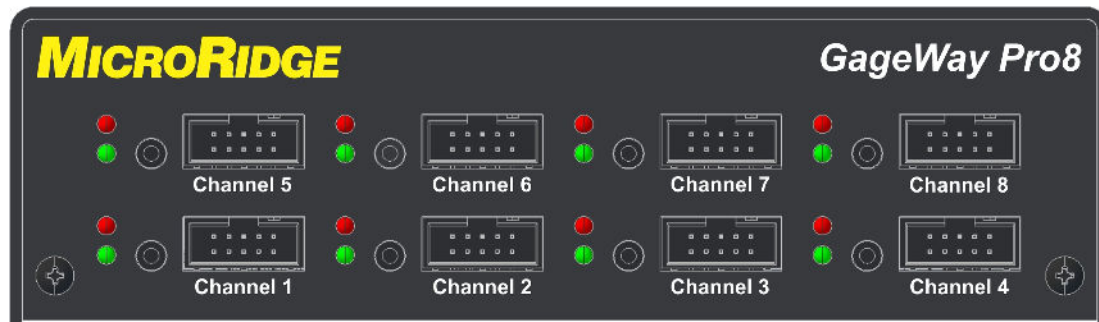


GageWay Pro4 Back Panel

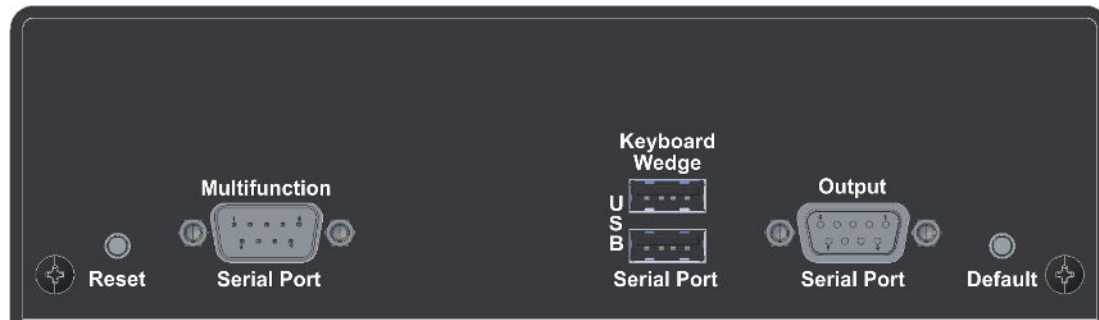
The GageWay Pro4 interface is identical to the GageWay Pro2 with the following additional features:

- Number of front panel input ports = 4.
- Back panel contains a DB9 Output Serial Port that allows for sending data to a device that does not support USB.
- The Multifunction Serial Port can be used to connect an additional serial device to the interface and to chain Pro4 and Pro8 interfaces.

2.3 GageWay Pro8



GageWay Pro8 Front Panel



GageWay Pro8 Back Panel

The GageWay Pro8 interface is identical to the GageWay Pro4 with the following additional features:

- Number of front panel input ports = 8.

2.4 Acquiring Gage Readings

It is important to understand how to initiate a gage reading and what type of reading can be obtained from the various input ports. To configure some of the gage read options requires the use of the [GageWay Pro Setup Program](#)¹⁹.

How to Initiate Gage Readings

Gage readings can be initiated by any of the following methods:

- Press a foot or hand switch (external read switch).
- Press the read button on the gage cable.
- Send a command from the host computer.

If your gage is a digital indicator, you typically would use a computer command or an external read switch to initiate the reading. If you press the read button on an indicator gage cable, you will normally cause the indicator reading to change.

Reading Types

There are 3 types of readings that can be obtained from a GageWay Pro interface.

- Single reading from a gage.
- Continuous readings from a gage. You can specify the number of readings to be obtained or tell the gage when to start and stop taking readings.
- TIR readings from a gage. You can specify the number of readings to be obtained or tell the gage when to start and stop taking readings. The data sent from a TIR reading consists of the following 4 fields. The default field separator is a comma.
 - Number of readings
 - Minimum gage reading
 - Maximum gage reading
 - Range

Readings from Gages Connected to the Front Panel Connectors

All of the reading types shown above can be obtained from gages connected to the front panel connectors. If you are using an external read switch to get readings from more than one channel, you will need to use the Setup Program to configure the read switch. If you have a serial device connected via a Level Converter cable, you will have to use the Setup Program to identify the method used to request a reading from your serial device.

Readings from Gages Connected to a Multifunction Serial Port

The only reading type available from the Multifunction Serial Port is a single reading from a gage. If you try to do continuous reads or TIR, the read commands will be ignored. If you use an external read switch or a computer command to get a reading from a gage connected to the Multifunction Serial Port, you will have to use the Setup Program to identify the method used to request a reading from your serial device.

Readings from Chained Interfaces

GageWay Pro4 and Pro8 interfaces can be chained by connecting a serial cable between the Multifunction Serial Port on an interface to the Output Serial Port on the next interface. When chaining interfaces, you must use the GageWay Pro Setup Program to configure the Master interface in the chain. Once the interfaces are chained, most of the read commands and features that can be used with a single interface can be used with the chained interfaces. Refer to the [Chaining Interfaces](#)¹⁴ section for more detail.

2.5 Connecting to a Computer

Typically a GageWay Pro interface is connected to a PC via a USB cable. This USB connection supplies power to the interface and data transfer to the PC. If you are connecting the GageWay Pro interface to something other than a PC, you may need to use the Output Serial Port (DB9-F) on the back of the interface. The Pro2 does not contain a DB9 Output Serial Port and can only be connected to a computer via a USB port.

USB Serial Port

Most people will connect the interface to a computer via this port. If you are using the Setup Program to configure a GageWay Pro, you must connect the GageWay Pro to your PC via this port. Before this port can be accessed by your computer, you must install the USB Serial Port driver on your computer. The driver is located on the GageWay Pro CD that came with your interface. This driver is developed by FTDI and supports the FTDI USB chip used in the GageWay Pro. You can also obtain a copy of this driver from the following web sites.

- MicroRidge web site at 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. The Virtual COM Port (VCP) drivers on the FTDI site reflect the currently supported VCP drivers.

When the USB cable is connected between your PC and the USB Serial Port, the GageWay Pro interface will detect that the USB cable is connected to the USB Serial Port. The GageWay Pro interface will communicate via the USB Serial Port and the Output Serial Port. What is sent out the USB Serial Port will also be sent out the Output Serial Port.

When the interface is connected via this port you can send commands to the interface and receive data from the interface.

Keyboard Wedge

If you want to use the keyboard wedge feature of the interface, connect the USB cable between your PC and the USB Keyboard Wedge port. You do not need to install any drivers to use the keyboard wedge feature. When the interface is connected via the USB Keyboard Wedge port, the GageWay Pro interface will look like a USB keyboard to your PC.

You cannot use this keyboard connection with the GageWay Pro setup program. When the interface is connected via this port you cannot send commands to the interface; however, you can receive keyboard data from the interface.

Output Serial Port (DB9-F)

The output sent to this serial port is the same that is sent to the USB Serial Port. This Output Serial Port is only available on the Pro4 and Pro8 interfaces. This port would typically only be used when connecting the interface to a device that did not have a USB port or the FTDI USB drivers did not support the device. An example of when you might need this connection is when sending data to a Programmable Logic Controller (PLC) or a printer.

If you are using this port as your communications port, you must use a USB AC adapter and a USB cable to power the GageWay Pro interface. A USB AC adapter is not included with the standard interface purchase. A USB AC adapter along with connecting cables can be purchased from MicroRidge. The part number for this adapter and cables for North America is ADT-USB-NA-KIT. [Contact MicroRidge](#) for foreign installations.

2.6 Back Panel Buttons

There are 2 buttons accessible on the back panel. When facing the back panel the button on the left side is the Reset button and the button on the right is the Default button.

Reset Button

Pressing and releasing the reset button will restart the GageWay Pro interface. None of the parameters stored in the non-volatile memory (EEPROM) will be changed by pressing the Reset button.

Default Button

This button performs several different functions based on what is connected to the interface, how long the button is pressed and when the button is pressed. The functions supported by this button can be disabled on the [Home Tab](#)²³ in the Setup Program.

The following functions are supported by this button:

- | | |
|------------------|---|
| AutoBaud | Automatic baud rate and communication parameters detection. This feature will only be enabled if you have 1 or more Level Converter cables connected to the interface. To activate this feature, press and hold the Default button for 5 seconds. Refer to the AutoBaud Detect ¹² section for more details. |
| Reset Parameters | To reset the parameters in the GageWay Pro to the factory defaults, press and hold the Default and then press and release the Reset button. Continue pressing the Default until the gage channel LEDs start flashing between red and green. This flashing will start about 10 seconds after you release the Reset button. Once the LEDs start flashing, release the Default button. |
| Copyright Info | Pressing this button for 10 seconds (about 16 seconds if a Level Converter cable is connected) will tell the interface to send the copyright information out the serial or keyboard wedge port. The output port is based on what port is connected to the USB cable. This feature is useful to verify that the GageWay Pro interface is properly sending data. |

2.7 Front Panel LEDs

Each front panel input has a red and green LED to the left of the connector. The on/off state and flashes are used to let the user know what the GageWay Pro is doing and the state of data received.

Startup

When the GageWay Pro is restarted both the red and green LEDs will be turned on. Once the communications processor has completed its initialization, each gage processor will be told to check for a connected device. If a device is found, the green LED will flash several times. If a device is not found, the red LED will flash several times.

Digital Gage Read

When a request is made to get a measurement from a gage, the green LED will be turned on. If a reading is obtained, the green LED is turned off after a preset period of time. If the read attempt fails, the green LED is turned off and the red LED flashes several times.

RS-232 Device Read

When a channel is receiving RS-232 data, the green LED will be turned on when you receive data from your serial device. If the serial device stops sending data before an end-of packet condition is detected, the green LED will turn off and the red LED will be turned on. If an end-of packet condition is detected after the red LED is turned on, the packet will be processed and the LEDs will be turned off. The red LED is turned on after a data reception gap of 250 msec (.250 seconds).

Using <Lc and <Mc Commands

The [computer commands](#)³⁹ <Lc and <Mc allow you to turn on and off LEDs for specific channels. These commands must be sent by a PC application and may be useful in telling an operator what gage to use for the next measurement.

2.8 AutoBaud Detect

AutoBaud (automatic baud rate and communication parameter detection) is built into the front panel gage channels. AutoBaud is only used when you are connecting a serial device to the GageWay Pro via a Level Converter cable. The back panel Multifunction Serial Port does not support AutoBaud. In order to use the AutoBaud feature, you must be able to initiate a reading from your serial device by pressing a print or send button on the serial device.

AutoBaud is not needed for digital gages such as Mitutoyo calipers and indicators, INSIZE indicators, Federal Maxum indicators and Ono Sokki indicators. Gages from companies such as Fowler, Starrett and Sylvac that use the Opto or Proximity interface and are connected to the GageWay Pro via a Level Converter cable can use the AutoBaud feature.

Supported Baud Rates

The following baud rates can be used with and detected by a GageWay Pro interface. If none of these baud rates match the setting of your serial device, you must change the baud rate setting for your serial device.

- 1200
- 2400
- 4800
- 9600
- 14.4K
- 19.2K

- 38.4K
- 57.6K

Supported Communication Parameters

The following communication parameters are supported by the GageWay Pro.

- N-8-1
- N-8-2
- E-8-1
- E-8-2
- O-8-1
- O-8-2
- N-7-1
- N-7-2
- E-7-1
- E-7-2
- O-7-1
- O-7-2

Input Requirements

In order for AutoBaud to detect the baud and communication parameters, at least 5 characters must be received from the serial device while the AutoBaud detection process is active. The data received from the serial device should be human readable characters that are found on a standard US keyboard. If the data packet contains non-keyboard control characters (less than ASCII 32) or extended characters (greater than ASCII 126), the AutoBaud process may not be able to detect the baud rate and/or communication parameters.

Starting the AutoBaud Process

Before starting the AutoBaud process, be sure your serial device is connected via a Level Converter cable and your gage cable to the GageWay Pro. You should also verify that the serial device is turned on and ready to send a data string.

To start the AutoBaud process, press and hold the Default button on the GageWay Pro back panel. After about 5 seconds, the red and green LEDs will turn on for the channels where Level Converter cables were detected. At this point you have 10 seconds to send a data packet to the GageWay Pro. When the AutoBaud detection process has finished, the LEDs will do one of the following:

- | | |
|---------------|--|
| LEDs turn off | No data was received. The baud rate and communication parameters remain unchanged. |
|---------------|--|

Green LED flashes	Baud rate and communication parameters detected. The detected values were saved in non-volatile memory.
Red LED flashes	Could not determine baud rate and/or communication parameters. The baud rate and communication parameters remain unchanged.

Since you only have 10 seconds to do an AutoBaud detection process, if you have multiple Level Converter cables, you may need to repeat the above process for the other Level Converter cables.

What Did AutoBaud Find?

If you want to see what the serial port parameters were set to after the AutoBaud process is complete, you can run [ComTestSerial](#)³⁷ and send the [<T](#)³⁹ command. The <T command provides 1 line of information about each channel. A sample of one of these lines is shown below.

```
Chan 2 (B) = Level Converter Cable @ 1200-N-7-1 (Auto Detect)
```

2.9 Configuring the GageWay Pro

If you need to configure a GageWay Pro interface you will need to use the [GageWay Pro Setup Program](#)¹⁹. If you are controlling the GageWay Pro via commands from a computer or just taking single gage measurements, you may not need to use the setup program. Remember the GageWay Pro will automatically determine the type of gage connected to a front panel input and you can have the GageWay Pro automatically determine the baud rate and communication parameters for serial devices.

2.10 Chaining Interfaces

GageWay Pro4 and Pro8 interfaces can be chained to increase the number of channels available in an interface setup. The first interface in a chain is called the Master. The other interfaces in the chain are called Slaves. An interface chain consists of a single Master and up to 8 Slaves. Most of the commands available for use with a stand-alone interface can also be used with an interface chain. There are a few additional commands that can only be used with an interface chain. Refer to the [Computer Commands](#)³⁹ section for more information about the commands.

Chaining Features

- The Master interface is configured by the Setup Program and contains all of the setup information for the Slaves.
- You can have up to 8 Slaves in a chain.
- The starting channel for the Master interface is always 1.
- A standard straight through DB9 serial cable is used to connect the Multifunction Serial Port on one interface to the Output Serial Port on the next interface.
- Each interface in the chain must be powered via the USB port. [Power kits](#)⁴³ with connecting cables are available from MicroRidge for powering the Slaves.

- You can use any combination of GageWay Pro4 and Pro8 interfaces in the chain.
- The Master interface automatically determines what Slave interfaces are connected in the chain and uploads the channel configuration information to the Slaves.
- There is no need to configure the Slaves with the Setup Program.
- Up to 36 channels can be uniquely configured in a chain.
- If you have more than 36 channels in a chain, the additional channels will be configured with the factory defaults.
- To get a gage reading from all of the gages connected in the chain, send the command <R*.
- To get a reading from channel 3 and 24, you can send <RC and <RX or <R03 and <R24. To get a reading from channel 27 and above, you must use <R followed by the 2 digit channel number.

Setup Program

The Master interface must be set up with the Setup Program. After the interface is found by the Setup Program, select the interface tab (Pro4 or Pro8) and check the *Chain interfaces* check box in the lower right corner of the window. Next specify the *Number of channels* that you want to chain. The number of channels you specify does not have to match the total number of channels on the chained interfaces. Configure the channels as necessary and press the *Send Setup to GageWay Pro* button.

Transferring Setup Information to the Slaves

After you have connected the Master and the Slaves with the DB9 cables and the USB power supplies, press and release the Reset button on the back of the Master interface. The Master will begin communicating with the Slaves to determine what is connected and what order they are connected in. Next, the Master will upload the configuration parameters to the Slaves and issue a warm start. When all of the LEDs turn off, the interface chain is ready to use.

Master and Slave Baud Rates

When the Master establishes communications with the Slaves, the baud rate for the Slaves and the Multifunction Serial Ports gets set to 115.2K baud. The good news is that this high baud rate enables very rapid communications between the Master and the Slaves. The bad news is that if the Master baud rate is left at the factory default of 9600, you may lose data if you are sending a lot of information from the Slaves to the Master. If you are taking just a single reading from all of your gages, 9600 is probably an acceptable baud rate. If you are doing continuous reads from many channels, you should increase the Master communications baud rate. The Master communications baud rate is set from the *USB & Output serial ports* radio buttons on the Home Tab of the Setup Program.

To be safe, when chaining interfaces set the Master communications baud rate to 57.6K or 115.2K whenever possible.

2.11 Testing Your Serial Device

When trying to determine the correct baud rate and communications parameters or understanding the output of your serial device, it is very helpful if you are able to connect the serial device directly to a PC's serial port. If you have a DB9 serial port on your PC, you are all set to use ComTestSerial to send commands and receive data from your serial device.

If you only have USB ports on your PC and need to determine the correct baud rate and communications parameters or understand the output of your device, you can use the RS-232 Gage Test Mode built into the GageWay Pro interfaces. This will allow direct communications between your serial device and ComTestSerial. When the RS-232 Gage Test Mode is active in the GageWay Pro, communications only occur between the Multifunction Serial Port and the USB Serial Port. The front panel channels are all disabled.

Follow the procedures below to enable the RS-232 Gage Test Mode:

1. Connect the GageWay Interface to your PC via the USB Serial Port.
2. Connect your serial device to the Multifunction Serial Port on the back of the GageWay Pro interface.
3. Run the ComTestSerial application. If you start ComTestSerial from the Setup Program after the GageWay Pro has been found, ComTestSerial will be ready to communicate with your GageWay Pro interface.
4. Click the button in the lower right-hand corner of ComTestSerial that is labeled RS-232 Gage Test.
5. The command, <\$232Test will be sent to the GageWay Pro interface and the GageWay Pro will ask you for the baud rate and communication parameters you want to use to communicate with your serial device.
6. Follow the instructions displayed in ComTestSerial.
7. When you have completed the 2 required inputs, the last message you will receive is shown below:
Press the Default or Reset button to exit the RS-232 Gage Test Mode.
8. At this point what you enter into ComTestSerial will be sent to your serial device and ComTestSerial will display what is being sent from your serial device. If the baud rate and/or communication parameters you have selected do not match those set in your serial device, you will receive a lot of garbage.

When the RS-232 Gage Test Mode is active, the GageWay Pro interface is acting like a Serial to USB Adapter cable. The baud rate and communication parameters that ComTestSerial is set to may be different than the settings being used by the Multifunction Serial Port. Do not be concerned about these differences, the GageWay Pro handles any necessary baud rate and/or communication parameters conversion.

2.12 Firmware Updates

Firmware updates for a GageWay Pro are available on the MicroRidge web site at www.microridge.com/downloads.htm. You will need to download and install the firmware update

utility on your PC. The firmware updates are done via the USB cable connected to the USB Serial Port and it is not necessary for you to open the interface. The same update is used for the Pro2, Pro4 and Pro8 interfaces.

3 Setup Program

The GageWay Pro Setup Program is used to configure the interface options and transfer these options to and from the GageWay Pro. The setup program contains a Home Tab that has options used by all of the GageWay Pro models. The setup program also includes a tab for each of the GageWay Pro models. When a GageWay Pro is found by the setup program, the only tabs that will be displayed are the Home Tab and the tab for the GageWay Pro that was found.


[Home Tab](#) ²³

This tab is used to locate the GageWay Pro connected to your computer and to transfer the setup information to and from the GageWay Pro. Additionally, the GageWay Pro to PC baud rate and the available Default button functions are set on this tab.

GageWay Pro2 Tab	This tab is used to configure the Pro2. The configuration grid contains 3 rows of data.
GageWay Pro4 Tab	This tab is used to configure the Pro4. The configuration grid contains 5 rows of data.
GageWay Pro8 Tab	This tab is used to configure the Pro8. The configuration grid contains 9 rows of data.

Menu, Toolbar & Tabs



The menu and toolbar provide access to the File New, Open and Save functions, Communications Test Program (**S/P**) and Set Default Values (). The File New function is only enabled when a GageWay Pro has not been found by the setup program.

The Communications Test Program (ComTestSerial) is a serial communications test program that is useful in determining what information is actually being sent from your GageWay Pro. Refer to the [ComTestSerial section](#) ³⁷ for more detail.

Parameters Update Notice

If you make changes to any of the configuration parameters, you must transfer the updated parameters to the connected GageWay Pro. The transfer is accomplished by clicking the "Send Setup to GageWay Pro" button on the [Home Tab](#) ²³ or the model tab. To make it apparent that the GageWay Pro needs to be updated with the parameters modified in the setup program, a message in **red text** or **green text** is displayed on each of the tabs.

3.1 Keyboards

The keyboard wedge port on the GageWay Pro is set at the factory to emulate the United States keyboard. A total of 5 keyboards are currently emulated by the GageWay Pro. The emulated keyboards are as follows:

- English (United States, QWERTY). Supports all of the keyboard characters that generate an ASCII character code.
- French (Belgium, AZERTY). No support for characters that require multiple key presses to produce a single character.
- French (France, AZERTY). No support for characters that require multiple key presses to produce a single character.
- German (Germany, QWERTZ). No support for characters that require multiple key presses to produce a single character.
- Spanish (Mexico, QWERTY). No support for characters that require multiple key presses to produce a single character.

Since keys such as F1, F2, etc. are not represented by an ASCII character code, these keys are not supported. In order for your PC to properly receive characters from a GageWay Pro, the keyboard selected via your PC Control Panel must match the keyboard selected in the GageWay Pro.

Selecting a GageWay Pro Keyboard Type

The keyboard type can be changed by sending one of the following commands from [ComTestSerial](#)³⁷ to the GageWay Pro. Each command is 4 characters long (<\$KU, etc.). All characters in the command should be upper case. A carriage return (Enter key) is not required at the end of the command. In order to use the following commands, the GageWay Pro must be connected to a PC USB port via the USB Serial Port connector on the GageWay Pro.

<\$KU English (United States, QWERTY)

<\$KB French (Belgium, AZERTY)

<\$KF French (France, AZERTY)

<\$KG German (Germany, QWERTZ)

<\$KM Spanish (Mexico, QWERTY)

When one of the keyboard type commands is sent to a GageWay Pro, a response from the GageWay Pro shows what the previous keyboard type was and what the new keyboard type is. An example of entering the <\$KF command to switch to the France keyboard is shown below.

<\$KF

Previous keyboard type = English (United States, QWERTY)

New keyboard type = French (France, AZERTY)

GageWay Pro Help Text

When the GageWay Pro is connected to ComTestSerial via the USB Serial Port, you can send the command <\$CK from ComTestSerial to get a summary of the keyboard change commands.

3.2 Keyboard Wedge Transfer Rate

The rate the keyboard characters are sent to your PC when the GageWay Pro is connected to your PC via the USB Keyboard Wedge port can be adjusted by the user with [ComTestSerial](#)³⁷.

The commands used to adjust the transfer rate and the approximate transfer rates are show below. The transfer rate numbers shown are for unshifted characters such as a, b, c, 1, 2,3 , etc. The transfer rates for shifted characters (A, B, C, etc.) will be slightly less since it take multiple key strokes to send shifted characters.

- <TF Fast transfer rate. This rate is the factory default and sends approximately 72 characters/second. This rate works for nearly every application.
- <TM Medium transfer rate. This rate sends approximately 30 characters/second. Try using this rate if your computer and/or application will not support the fast rate.
- <TS Slow transfer rate. This rate sends approximately 8 characters/second. Try using this rate if your computer and/or application will not support the fast or medium rates.

Once you set a new transfer rate, you must use one of the <T commands described above to change the rate. Doing a Reset, cold start (<Z) or updating firmware will not modify the transfer rate.

To view the current transfer rate setting you can send the Copyright command (<*) from ComTestSerial. The current Wedge transfer rate value is shown as part of the output from this command.

3.3 Entering Special Characters

Some of the tabs allow you to enter special characters such as carriage returns, tabs, etc. These special characters are entered by including the character code within brackets. For example, to enter a carriage return or enter key you can enter any of the following strings: {\x0d}, {\x0D}, {cr} or {CR}. The {\x0d} and {\x0D} represent the hex code for a carriage return. If you enter one of these hex codes or {cr}, the entered string will be changed to {CR} when you leave the input field. These same rules apply to other special characters such as Tab and Esc.

Remember that the GageWay Pro in the wedge mode will only send normal keyboard characters to your PC. If you enter characters such as {LF}, {\x0a}, {\xa2}, etc., the GageWay Pro will not send these characters to the wedge port. If you are sending the data out the RS-232 port, the GageWay Pro will send these special characters.

Following is a list of the more common special characters that you may need to use:

Carriage return	{CR}
Line feed	{LF}
Tab	{Tab}
Esc	{Esc}

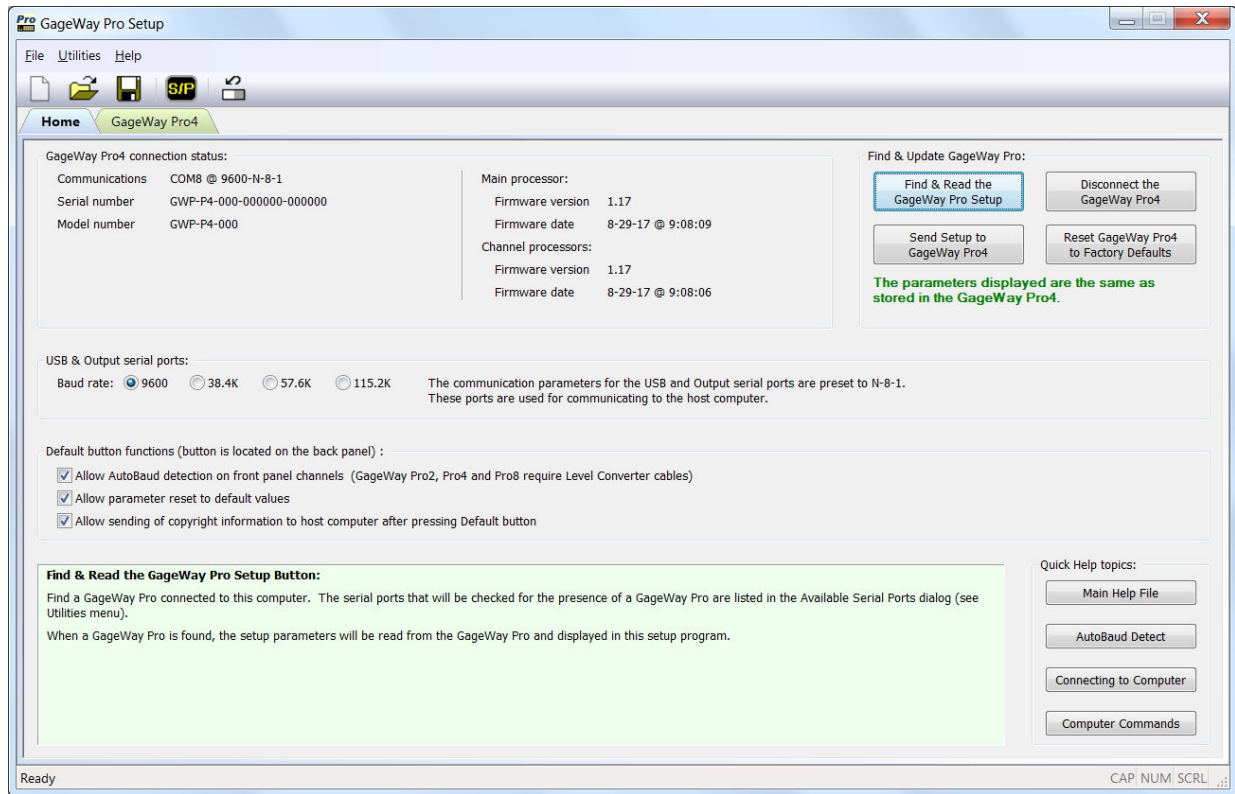
3.4 Program Tabs

The GageWay Pro Setup Program consists of a series of tabs for the various models. The only difference between the GageWay Pro2, Pro4 and Pro8 tabs is the number of rows in the configuration grid. If you want to set up the parameters for a GageWay Pro model without the particular model being found by the setup program, select the tab for the model you want to configure and enter the appropriate information. When you are done entering the information you can save the parameters to a file. You can later find the GageWay Pro model and load this file into the GageWay Pro.

Help Information

The help text in this User's Guide for the setup program is intentionally brief. A text box at the bottom of every tab and several of the dialogs display help information for the control that currently has the focus. By displaying information about the active control, you have quick and easy access to information about the control.

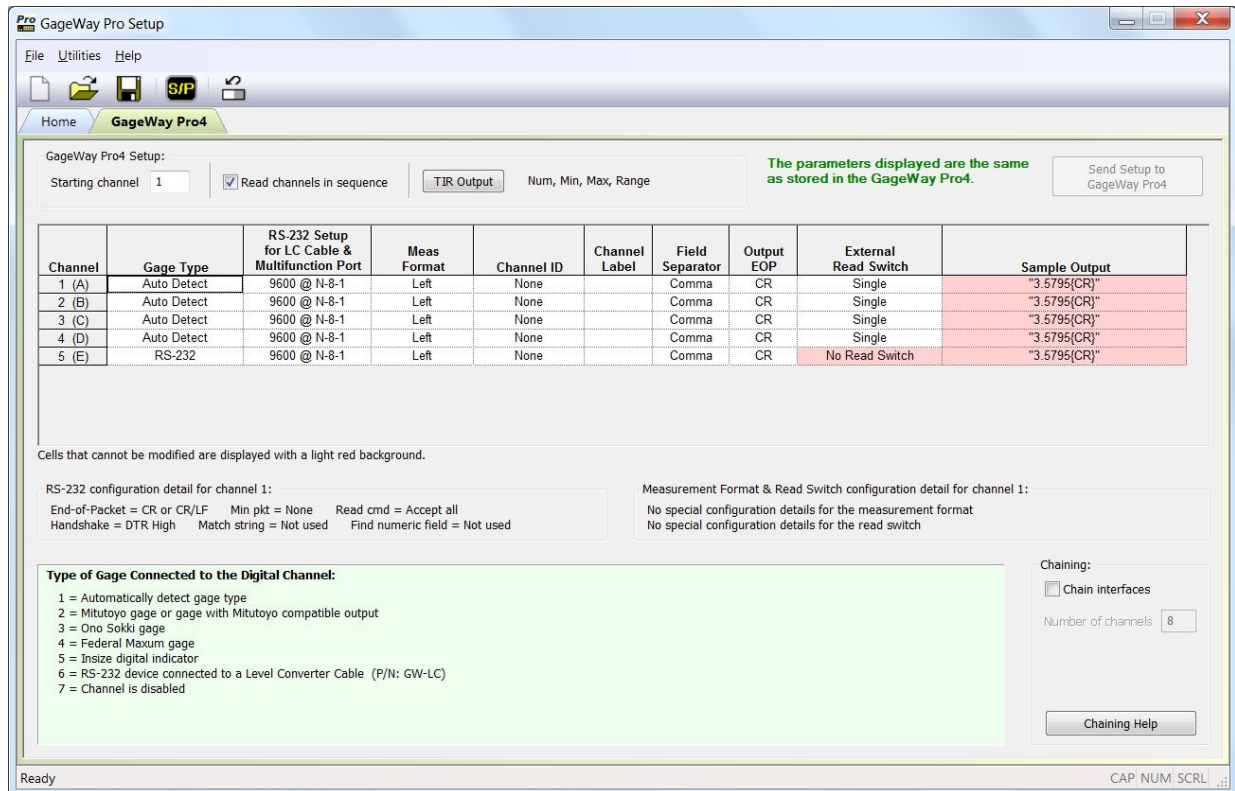
3.4.1 Home Tab



Home Tab When a GageWay Pro4 Interface Has Been Found

The Home Tab shown above is what would be displayed when you have found a GageWay Pro4. The **green text** in the upper right portion of the tab indicates that the parameters in the Setup Program match the parameters stored in the Pro4. If this **text was red**, it would mean that you need to send the revised parameters to the GageWay Pro.

3.4.2 Pro2, Pro4 & Pro8 Tabs



GageWay Pro4 Tab After the Interface Has Been Found

The only difference between the GageWay Pro2, Pro4 and Pro8 tabs is the number rows in the grid and the chaining option available with the GageWay Pro4 and Pro8 interfaces. Cells with a light red background, cannot be modified. To access the RS-232 Setup dialog (column3), double-click the cell you want to modify.

There are a few External Read Switch (column 9) options that have a dialog where you can enter additional information. If the text in the External Read Switch cell contains the string (setup), you can double-click the cell to view the setup dialog.

3.5 Setup Dialogs

There are a few setup dialogs that can be accessed from the model grids. These dialogs are accessed from the following columns.

RS-232 Setup	RS-232 Channel Parameters (double-click cell to access)
Meas Format	Custom Measurement Format (press A on the keyboard for first access, double-click for future access)
External Read Switch	Custom Read Switch Sequence (press A on the keyboard for first access, double-click for future access)
External Read Switch	Send Commands to Host (press B on the keyboard for first access, double-click for future access)

3.5.1 RS-232 Channel Parameters

RS-232 Channel Parameters Dialog

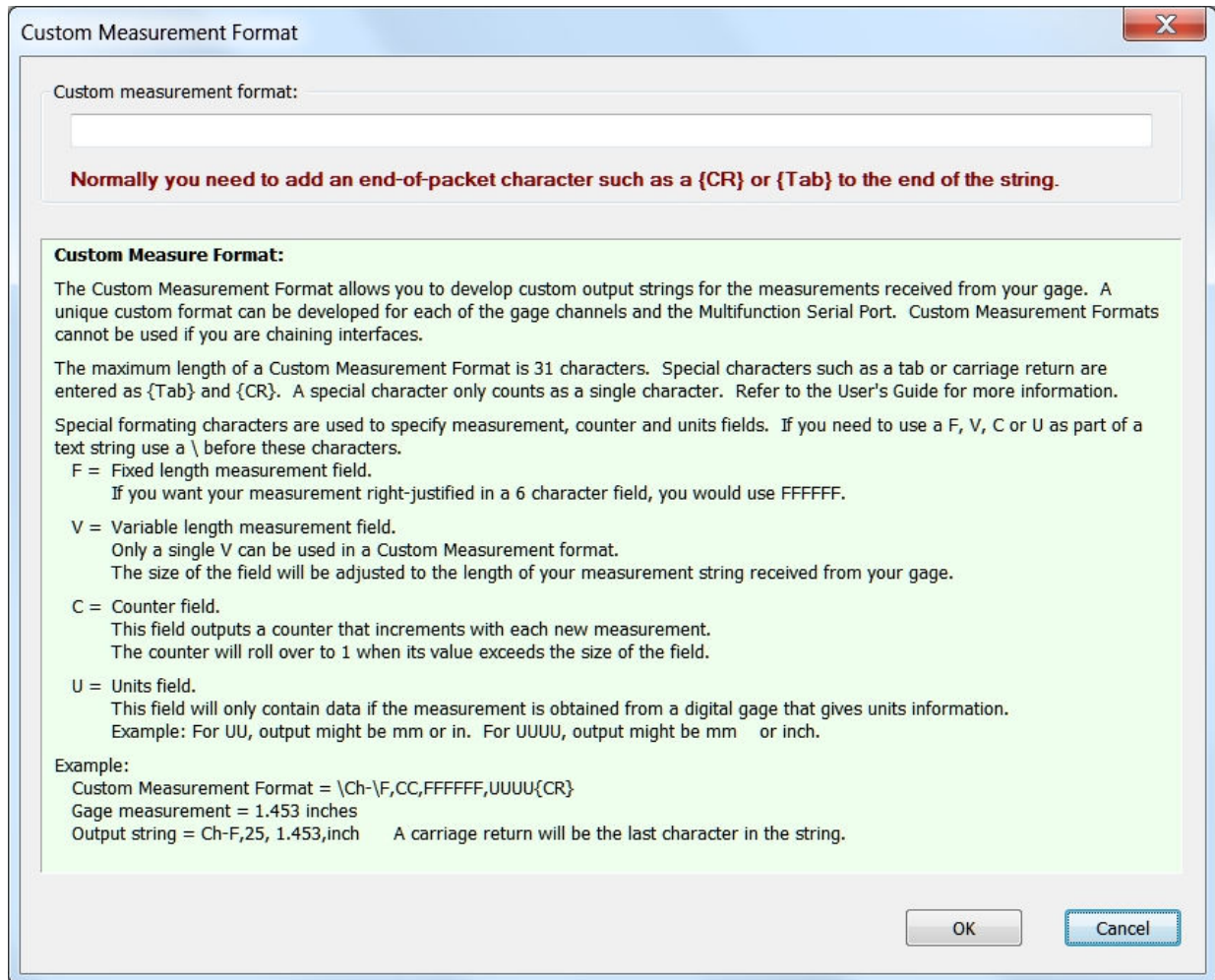
This dialog is accessed by double-clicking a cell in the RS-232 Setup Column. If the cell you are trying to double-click has a light red background, this means that the Gage Type selected does

not need an RS-232 setup. If the Gage Type is Auto Detect, The RS-232 Setup Dialog would only be used if a Level Converter was detected by the input port.

When connecting a serial device to a GageWay Pro interface there are several configuration parameters that can be set. Unlike the output from a Mitutoyo caliper, which is only a single number, the output from a serial device can vary widely from device to device. If you want to get a reading from a serial device by sending a command, you will have to figure out what the command needs to be.

If you need to use this dialog for your serial device, it is suggested that you review the help text in the Setup Program for each of the controls in the dialog. You may also want to use [ComTestSerial](#)³⁹ to view what is actually being sent from your serial device. It is amazing how many people try to configure a serial device setup when they have no idea what the serial device is actually sending. Configuring the dialog for the serial device can be very easy if you know what you are trying to do.

3.5.2 Custom Measurement Format



Create a Custom Measurement Format for the Data Output

This dialog allows you to create a custom measurement format for the gage data received from a channel. The formatting characters that can be used consist of the following. All formatting characters must be uppercase.:

- F Fixed length measurement field. If you want your measurement right-justified in a 6 character field, you would use FFFFFFFF.
- V Variable length measurement field. Only a single V can be used in a Custom Measurement format. The size of the field will be adjusted to the length of your measurement string received from your gage.
- C Counter field. This field outputs a counter that increments with each new measurement. The counter will roll over to 1 when its value exceeds the size of the field.

U Units field. This field will only contain data if the measurement is obtained from a digital gage that gives units information.

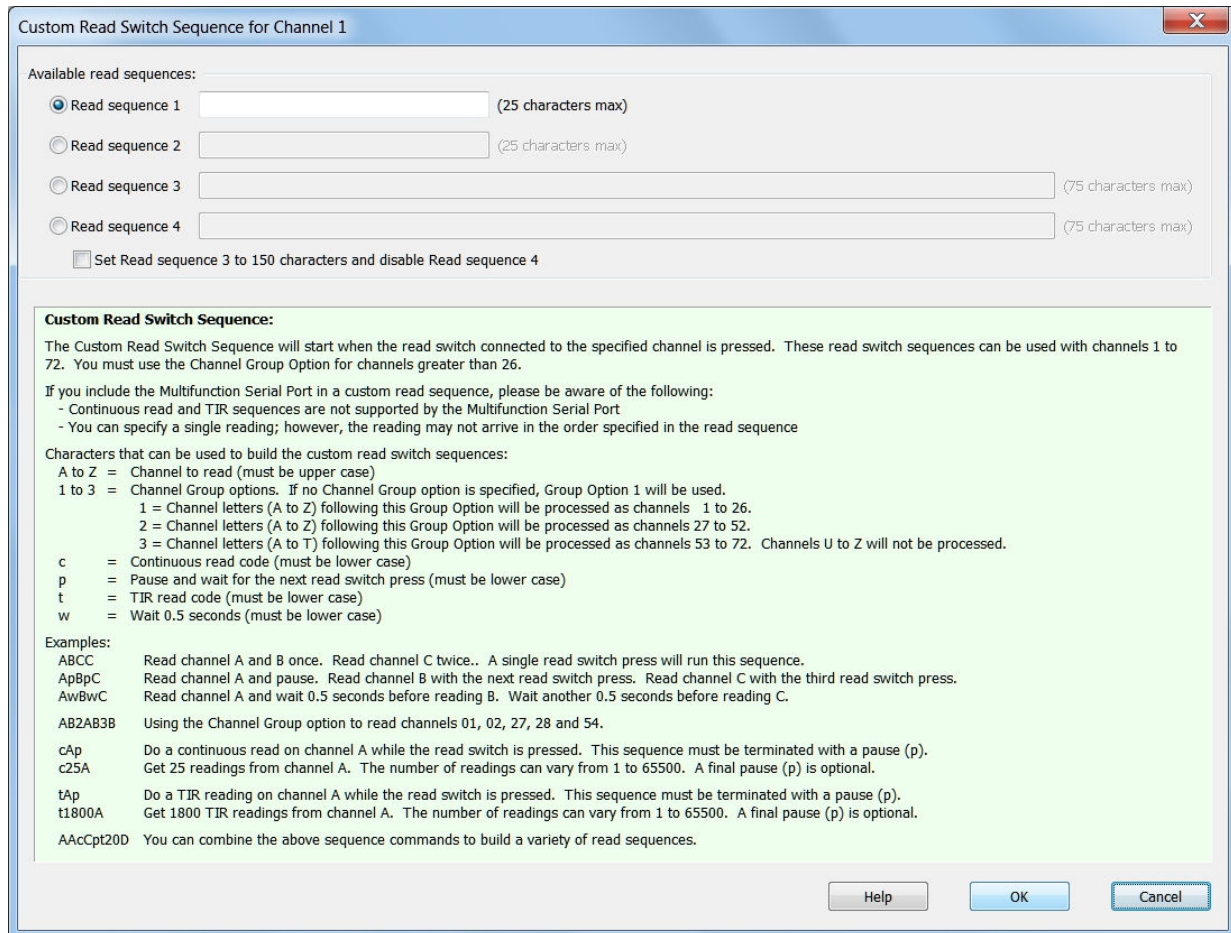
Example: For UU, the output might be mm or in. For UUUU, the output might be mm or inch.

You can also add text information to your output. If the text string you want to add contains one of the formatting characters, add a \ character before the character. The following shows 2 examples:

To add the text chan, you would enter chan.

To add the text Chan, you would enter \Chan.

3.5.3 Custom Read Switch Sequence



Custom Read Switch Sequence Dialog

The Custom Read Switch Sequence dialog allows you to develop up to 4 read switch sequences. These read switch sequences can be used with any of the external read switches. Try building some simple read sequences to help you understand how to configure the sequences. If you try to create an invalid sequence, you will get a message indicating an error in the sequence. All channels in a Custom Read Sequence are identified by a capital letter from A to Z. Channel numbers such as 01, 02, 1, 2, etc. cannot be used to specify a channel.

Setting a 150 Character Read Sequence

The default read sequences consists of 2 25-character sequence and 2 75-character sequences. If you check the "Set Read sequence 3 to 150 characters and disable Read sequence 4" check box, you combine Read sequences 3 and 4 to create a 150-character sequence. When this box is checked you have access to 2 25-character sequence and 1 150-character sequence.

Specifying Channels

Letters such as A, B, C, etc. are used to identify channels. If you want to get 2 reading from channel 1 and a single reading from channels 2 and 4, you would use the following Custom Read Sequence.

AABD.

If you need to get a reading from a channel greater than 26, you need to use the Channel Group Option. Typically, the only time you would use the Channel Group Option is when you are chaining interfaces. The Channel Group Option allows you to use the letters A to Z for channel ranges from 1 to 26, 27 to 51 and 52 to 72. The maximum channel that can be addressed is channel 72. The use of the Channel Group Option is best explained with an example. Let's assume you want to get a single reading from the following channels: 1, 2, 26, 27, 29, 52, 53, 3 and 4. The Custom Read Sequence for this example would be as follows:

ABZ2AC3AB1CD

An explanation of the characters in this Custom Read Sequence is as follows:

- A Read channel 1.
- B Read channel 2.
- Z Read channel 26.
- 2 Tell the interface to use the channel letters from A to Z to represent the second Channel Group from channels 27 to 51. The interface will continue to use the specified Channel Group until it gets a new Channel Group (1, 2 or 3) command. At the start of a Custom Read Sequence, Channel Group 1 will be used if you do not specify Channel Group 2 or 3.
- A Read channel 27.
- C Read channel 29.
- 3 Start using Channel Group 3. A to U now represents channels 52 to 72. Remember, the maximum channel that can be addressed is channel 72.
- A Read Channel 52.
- B Read Channel 53.
- 1 Start using Channel Group 1. A to Z now represents channels 1 to 26
- C Read channel 3.
- D Read channel 4.

Continuous Read

There are 2 forms of a continuous read.

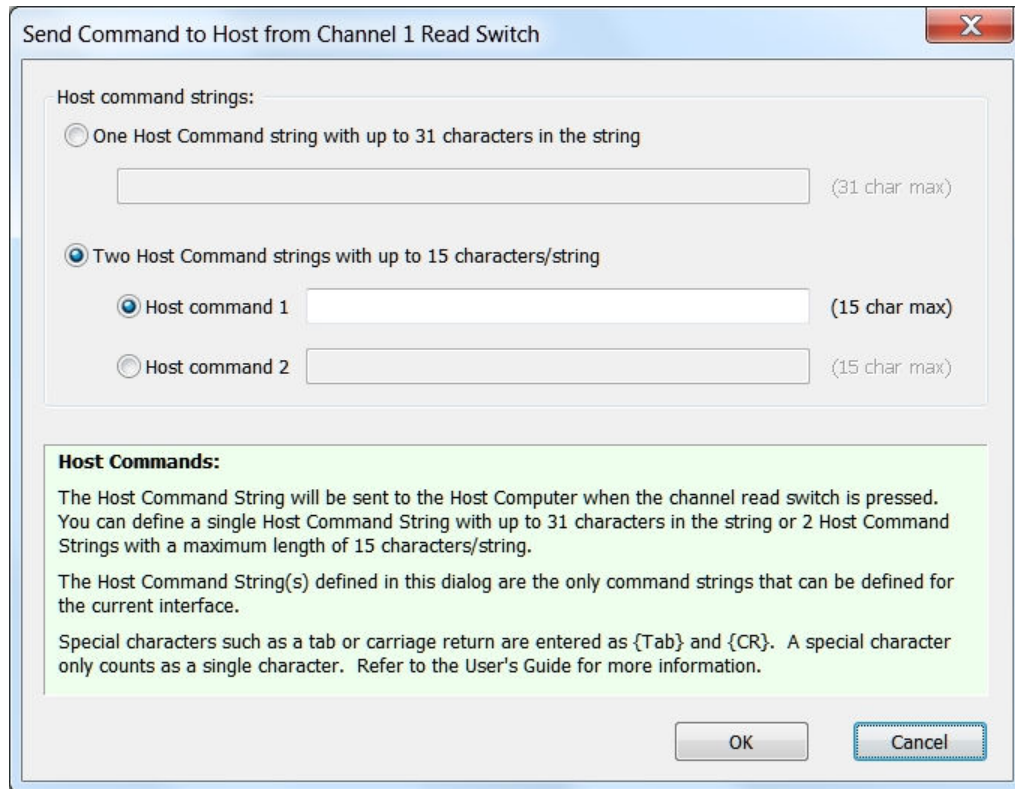
- Do a continuous read while the external read switch is pressed.
 cBp Do a continuous read on channel B.
- Get a specified number of continuous readings. The readings will stop when the specified number of readings have been obtained or the interface receives a <Sc stop continuous read command.
 c31D Get 31 readings from channel D.

TIR

There are 2 forms of a TIR reading.

- Do a TIR read while the external read switch is pressed.
 tBp Do a TIR read on channel B.
- Get a specified number of TIR readings. The readings will stop when the specified number of readings have been obtained or the interface receives a <Sc stop continuous read command.
 t155D Get 155 TIR readings from channel D.

3.5.4 Send Commands to Host



The dialog box is titled "Send Command to Host from Channel 1 Read Switch". It contains the following elements:

- Host command strings:**
 - One Host Command string with up to 31 characters in the string. Below this is a text input field with "(31 char max)" to its right.
 - Two Host Command strings with up to 15 characters/string.
 - Host command 1. Below this is a text input field with "(15 char max)" to its right.
 - Host command 2. Below this is a text input field with "(15 char max)" to its right.
- Host Commands:** A green-shaded text area containing the following text:

The Host Command String will be sent to the Host Computer when the channel read switch is pressed. You can define a single Host Command String with up to 31 characters in the string or 2 Host Command Strings with a maximum length of 15 characters/string.


The Host Command String(s) defined in this dialog are the only command strings that can be defined for the current interface.

Special characters such as a tab or carriage return are entered as {Tab} and {CR}. A special character only counts as a single character. Refer to the User's Guide for more information.
- Buttons:** "OK" and "Cancel" buttons are located at the bottom right of the dialog.

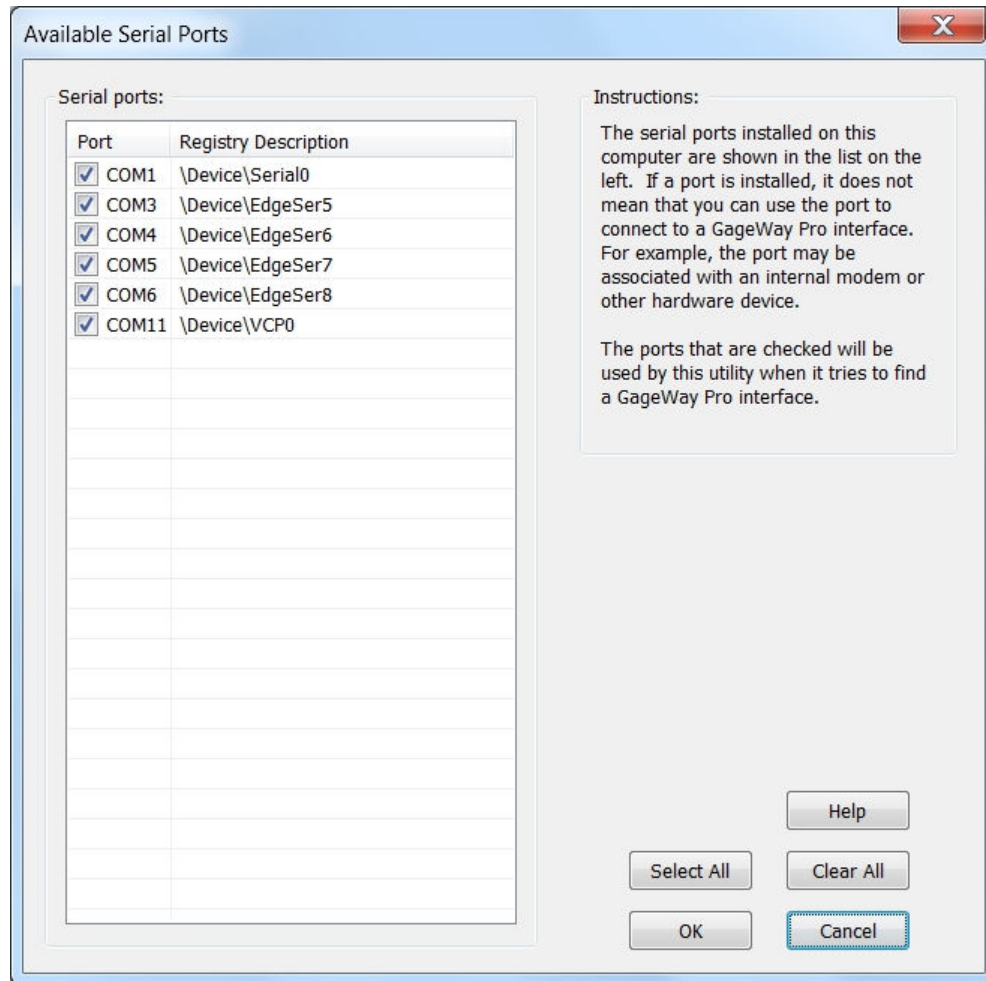
Send Command to Host Dialog

This dialog allows you to create a string(s) that will get sent to the host computer when the read switch is pressed. You can specify a single string up to 31 characters or 2 string up to 15 characters each. The string(s) that are created in this dialog, are the only Host Command strings that can be used for the interface.

3.6 Utilities Menu

The Utilities menu provides access to a few setup dialogs and [ComTestSerial](#)³⁷. ComTestSerial is also accessible from the  toolbar button.

3.6.1 Available Serial Ports



Available Serial Ports Dialog

When the GageWay Pro Setup Program searches for a connected GageWay Pro, the Setup Program will first check the serial port where a GageWay Pro was previously found. If a GageWay Pro is not found on the previous port, the Setup Program will search each of the checked serial ports shown in this dialog.

Virtual COM Ports (VCP)

The USB serial port on a PC that the GageWay Pro is connected to is called a virtual COM port (VCP). When you connect the GageWay Pro USB Serial Port to a PC USB port, a virtual port is created. When you disconnect the GageWay Pro from the PC, the virtual port is deleted from the PC. In the dialog shown above, COM11 is the virtual COM port that the GageWay Pro is connected to. The registry description for the virtual port is VCP0. If you were to connect an additional GageWay Pro to your PC via the USB Serial Port on the GageWay Pro, the registry description for this additional VCP would be VCP1.

Always Use the Same USB Port on Your PC

If possible you should always use the same physical USB port on your PC when connecting a GageWay Pro. In the example dialog, the GageWay Pro is connected to COM11. If you disconnect the GageWay Pro from the current USB port on the PC and connect it to a different USB Port on the PC, the VCP will be something other than COM11. On the PC used for this example, the new VCP is COM13. If your application software was using COM11 to communicate with the GageWay Pro and you change to a different USB port on the PC, you will need to tell your software that it needs to communicate on a different serial port.

Why Does the Serial Port Number Change with Different USB Ports?

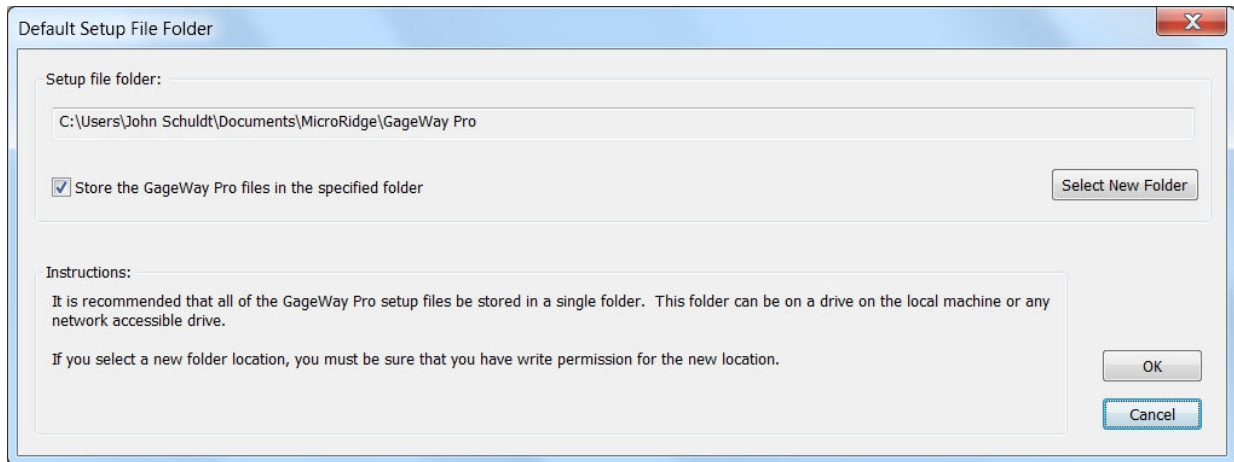
Don't blame the GageWay Pro for changing the serial port numbers. Microsoft Windows manages the port number assignment and this changing of port numbers is due to the operating system.

Recommendations

Here are a couple of recommendations:

- If possible, always use the same physical USB port on your PC to communicate with the GageWay Pro USB Serial Port.
- Be sure the GageWay Pro is connected to the appropriate USB port on your PC before starting your application. Remember, the serial port on your PC is not created until the GageWay Pro has been connected.

3.6.2 Default File Folder

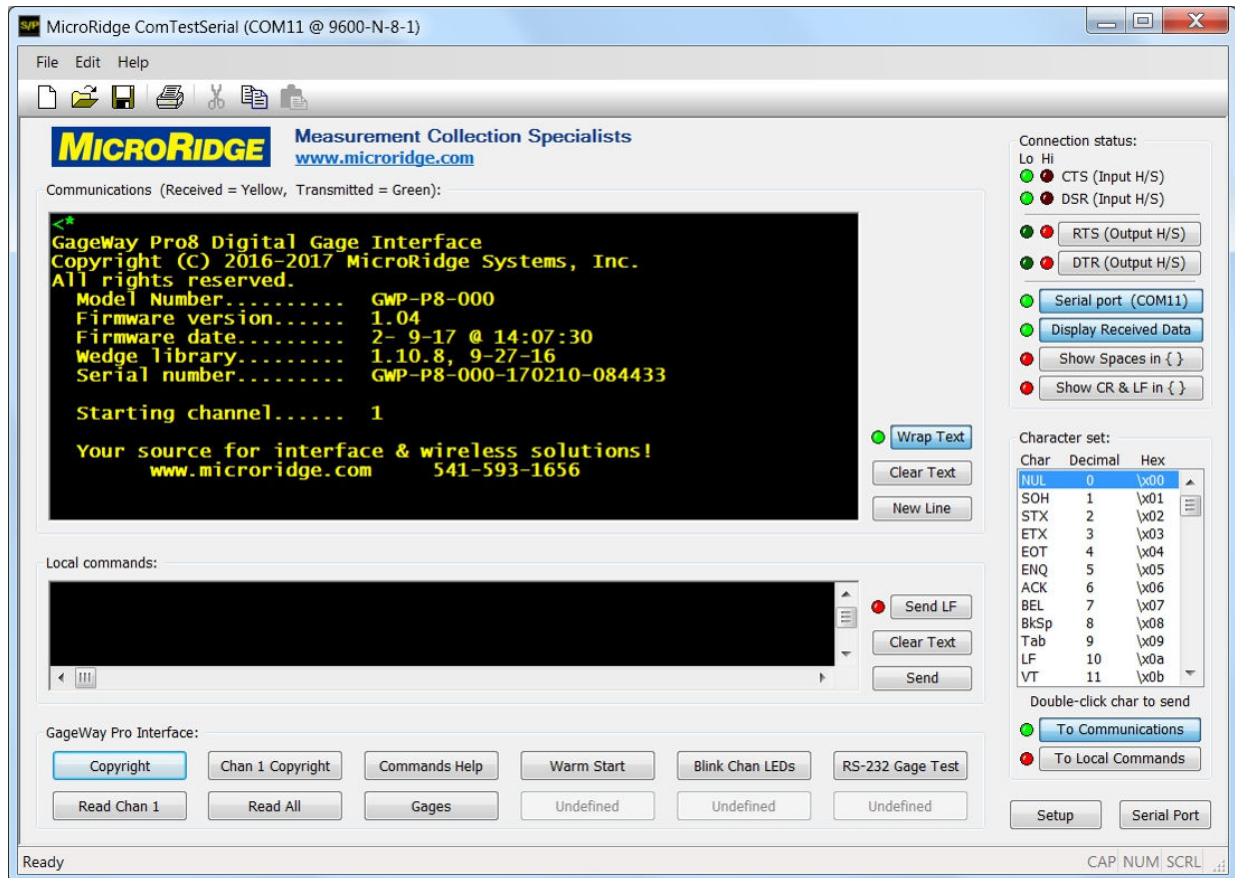


Default Setup File Folder Dialog

We strongly recommend that you keep your GageWay Pro setup files in a single location. It is also recommended that when you send a setup file to a GageWay Pro, you also save a copy of the file on your PC. When you send the setup file to a GageWay Pro, a copy of this file is not automatically saved on your PC. You must manually save the file to your PC.

If you contact technical support for assistance in setting up a GageWay Pro, you may be asked to email a copy of the setup file to technical support.

4 ComTestSerial



ComTestSerial is a Serial Communications Test Program and is included on the GageWay Pro CD. A copy of ComTestSerial is also installed on your PC when you install the GageWay Pro Setup Program. ComTestSerial is included so that you can test and verify the output coming from your GageWay Pro interface. You can also test commands and the output from a serial device. Refer to [Testing Your Serial Device](#)¹⁶ for more information. If you access ComTestSerial from the setup program after you have found a GageWay Pro, ComTestSerial will use the serial port that the GageWay Pro is connected to.

When ComTestSerial is loaded from the GageWay Pro Setup Program, there are several buttons that are predefined with commands for the GageWay Pro. The predefined buttons are shown below. The command for each of the buttons is shown in the parenthesis after the command button label.

Copyright (<*)	Get copyright and some setup information from the GageWay Pro.
Chan 1 Copyright (<G*01)	Get copyright and some setup information for channel 1.
Commands Help (<H)	Display computer commands help information.

Warm Start (<W)	Make the GageWay Pro do a warm start. This is the same as pressing the reset button on the back of the GageWay Pro.
Blink Chan LEDs (<GL*)	Blink all of the channel LEDs.
RS-232 Gage Test (<\$232Test)	Test communications with RS-232 gage connected to the Multifunction Serial Port.
Read All (<R*)	Read all of the gages.
Gages (<T)	Show a list of the gages connected to the GageWay Pro.

Additional copies of ComTestSerial can also be downloaded from the [ComTestSerial page on the MicroRidge web](#).

5 Computer Commands

The following is a listing of the computer commands available to the user. Each of the commands must start with a < or the Esc character. You do not need to send a carriage return or press the Enter key at the end of a command. The characters in a command must be upper case. If a command has a data portion, the characters can be upper or lower case. To better understand the commands, it is suggested that you use [ComTestSerial](#)³⁷ to help you understand the command and any response to the command.

Channel Number

Several of the commands require a channel number. When a channel number is required, it will be indicated by the letter c. For example, to get a reading from a channel, you could use the command <Rc. To get a reading from channel 1, this command could be <R01. Unless otherwise specified the channel letter c can take any of the following formats:

- A to Z Valid for channels 1 to 26.
- 01 to 37 Range of channels supported by the GageWay Pro.
- * All channels (this is the asterisk character).

Gage Read Commands

- <Bc Begin continuous read on channel c. Stop the continuous read with the <Sc command.
- <Ccnnnn Begin continuous read on channel c and get nnnnn readings (Example: <CA00125).
- <D1cnnnn Begin TIR read on channel c and get nnnnn readings (Example: <D1B00150).
- <I1c Begin TIR read on channel c. Stop the TIR read with the <Sc command.
- <Rc Read channel c.
- <Sc Stop continuous read on channel c.

Information Commands

- <* Get copyright information for the communications processor.
- <T List of gages attached to the interface.
- <V Get version information for the communications processor.
- <G*c Get copyright information for the channel c gage module.
- <GVc Get version information for the channel c gage module.

Interface Control

<Jc	Enable measurement input for channel c. This command would be used to enable the channel after it was disabled with the <Kc command.
<Kc	Disable (kill) measurement input for channel c.
<Lc	Turn on the green LED for channel c. The all channels character (*) is not supported for this command. The <L- will turn off all LEDs.
<Mc	Turn off the green LED for channel c. The all channels character (*) is not supported for this command. The <M- will turn off all LEDs.
<W	Warm start. Restart the GageWay Pro interface, but do not modify any of the configuration parameters.
<Z	Cold start. Restart the GageWay Pro interface and reset all of the configuration parameters back to factory defaults.
<GWc	Warm start gage module channel c. Do not modify any of the configuration parameters.

Chaining Information

The chaining information commands will only work when the command is sent to the Master interface in the chain. The Master or Slave in the command is identified by s. If s = 0, the command will be processed by the Master. If s = 1 to 8, the command will be processed by the appropriate Slave. If s = *, the command will be processed by all of the chained interfaces.

<QI	Display the GageWay Pro interface chain information. This is a table of all the interfaces in the chain and their channel numbers.
<QLs	Blink the all of gage module LEDs for Master or Slave s. The command <QL0 is the same as <GL*.
<QTs	List of gages attached to each channel for Master & Slave units. The command <QT0 is the same as <T.
<QWs	Warm start the Master or a Slave unit.
<Q*s	Get copyright information for the communications processor for a Master or a Slave. The * character (get copyright info from all interfaces) is not supported for this command. The command <Q*0 is the same as <*.

Testing Your Serial Device

<\$232Test	Establish direct communications between a serial device connected to the Multifunction Serial Port and ComTestSerial. This command can be used to verify communications with your serial device and to understand what data is being sent from your serial device. Refer to the Testing Your Serial Device section for more information.
------------	--

Serial Port

<Pccnddd Send the serial port command dd to channel identified by cc.
 cc = Channel number. Must be 2 digit number such as 01, 02, etc.
 nn = Number of bytes in the command. Maximum number of bytes = 10.
 dd = Command to be sent.

Example: <P0304#RAc

Note: In this example the final c is a carriage return (Enter character). Your serial device may or may not need a final carriage character. How you send a carriage return depends on the application you are using to send the command. If you are using ComTestSerial to send this command, you would send <P0304#RA\x0d

Advanced Commands

<\$AVca Convert individual channel measurement to an absolute value. TIR
 measurements cannot be converted to an absolute value.
 c = Channel number (1 to 8 or *), a = Action: 0 = Disable, 1 = Enable

Miscellaneous

<H Display the computer commands help information.
<GDc Show the data in the RS-232 buffer for channel c. This command will only
 output information if a Level Converter cable is connected to the channel.
<GLc Blink the gage module LEDs for channel c.
<T List of gages attached to the interface.

6 Accessories

Several accessories are available for use with the GageWay Pro interfaces. These items are available for purchase directly from the MicroRidge web site.

Level Converter Cable



P/N: GW-LC

24" cable that converts the RS-232 voltage levels to acceptable levels that can be used by the GageWay Pro interfaces.

To use the Level Converter Cable, the RS-232 setup (baud rate and communication parameters) need to be set in the GageWay Pro interface. The AutoBaud feature of the GageWay Pro can automatically determine these RS-232 setup parameters.

Hand Switch



P/N: HNSW-MPLG

The hand switch connects to the read switch ports on the front of the GageWay Pro interface.

The cable length on the hand switch is 6'.

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'.

Power Kit



P/N: ADT-USB-NA-KIT

Power Kit for North America. Power kits for Australia, Europe and United Kingdom are also available.

Includes 5 VDC USB AC adapter, 6' USB cable (Type A male/male USB connectors) and 6' 9-pin serial extension cable (DB9F to DB9M).

This item is required if you are not connecting the interface to a computer through one of the USB ports on the back of the interface. A Power Kit is required for Slave interface in a chained configuration.

7 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.

8 Contact MicroRidge

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Sales: sales@microridge.com

Information: info@microridge.com

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Support: 541.593.1656

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PO Box 3249
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Shipping Address:

MicroRidge Systems, Inc.
56888 Enterprise Drive
Sunriver, OR 97707

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

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