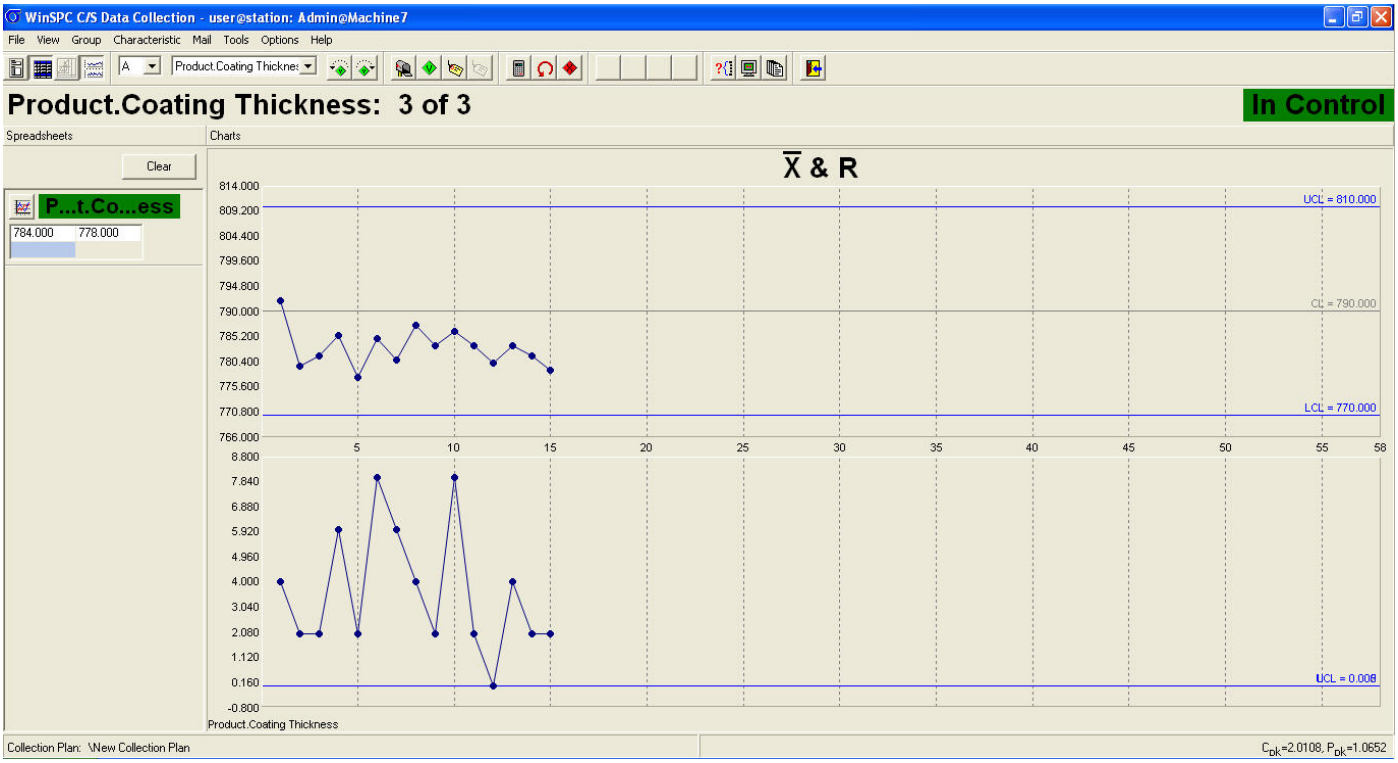
Using *Bluetooth*-Enabled PosiTector 6000 with Statistical Process Control Software

SPC programs are available from third party vendors that enhance the measurement capabilities of the PosiTector 6000. With ***Bluetooth*** enabled, measurement results are immediately transferred wirelessly from the PosiTector 6000 to the SPC using a virtual serial port. This means that any program with a serial interface can use readings from the PosiTector using a ***Bluetooth*** connection. This below technical article details how to connect and receive the PosiTector 6000 with two Statistical Process Control software packages: This article details how to connect and use the PosiTector 6000 with two Statistical Process Control software packages: Proficient by InfinityQS, and WinSPC by DataNet systems. Although this article deals specifically with the above programs, the methods used apply to any other program.

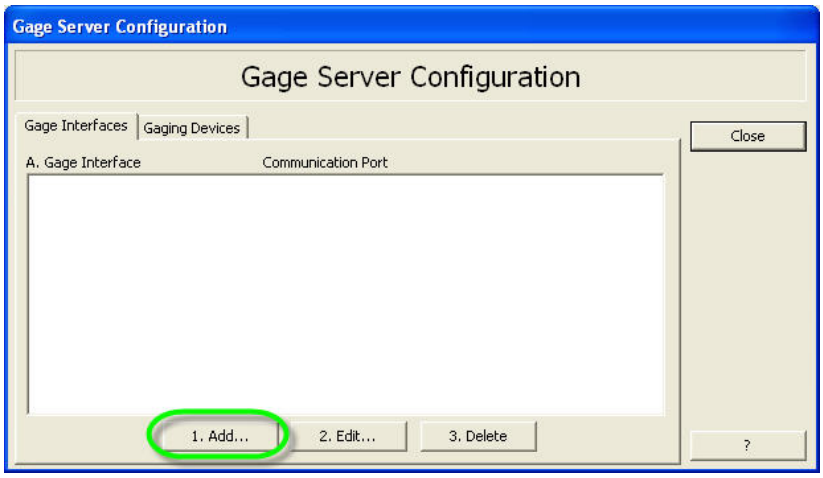


The PosiTector 6000 can be used as an input device for SPC programs.
The measurements can be used to create control charts like this.

This article assumes that the gage has already been paired with the computer. For instructions on the pairing process, please see the ***Bluetooth*** Pairing instructions (www.defelsko.com/bluetooth/).

Adding the PosiTector 6000 as a Device in the Software

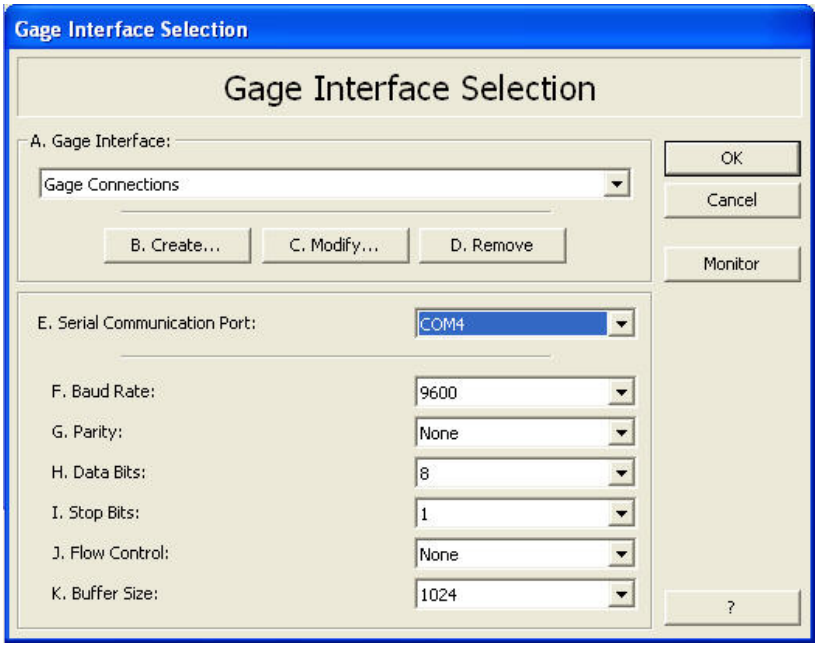
The first step is to create the PosiTector 6000 as a gage in the software. In Proficient, the serial devices are configured in the Gage Server program. In WinSPC, the PosiTector is configured by adding it as a “Device” from the Administrator screen.



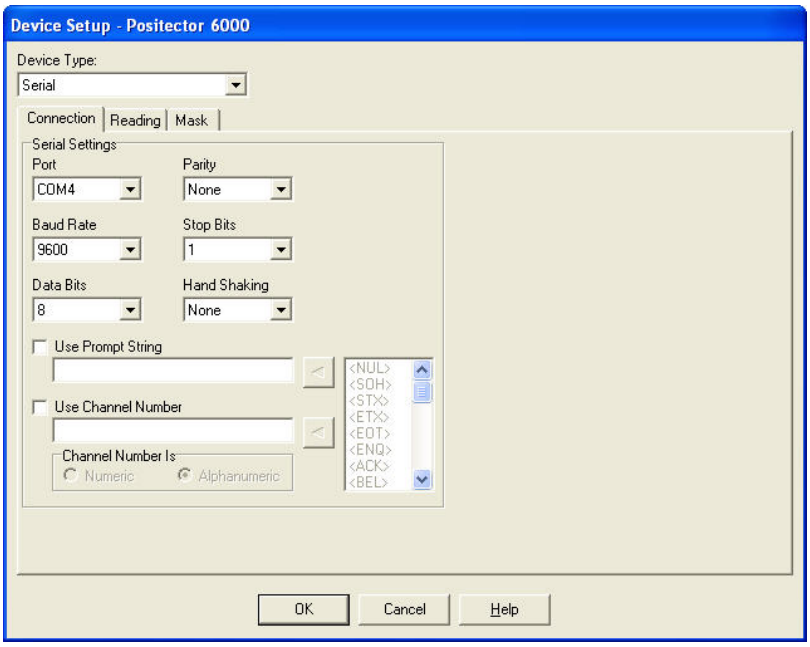
The Gage Server Configuration Window in Proficient

Adding a Device in WinSPC

To add the PosiTector 6000 as a device in Proficient, click “Add…” in the Gage Interfaces Tab, to open the Gage Interface Selection. In WinSPC, double click on the new device, to open the Device Setup.



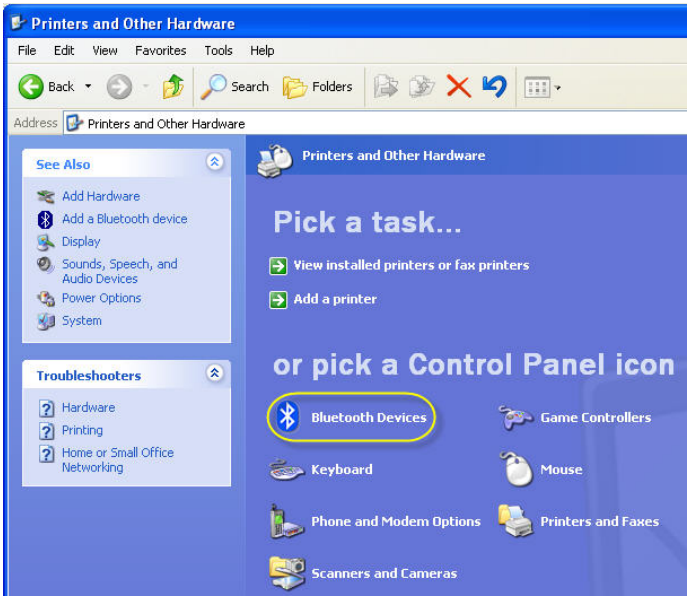
The Gage Interface Selection Window in Proficient



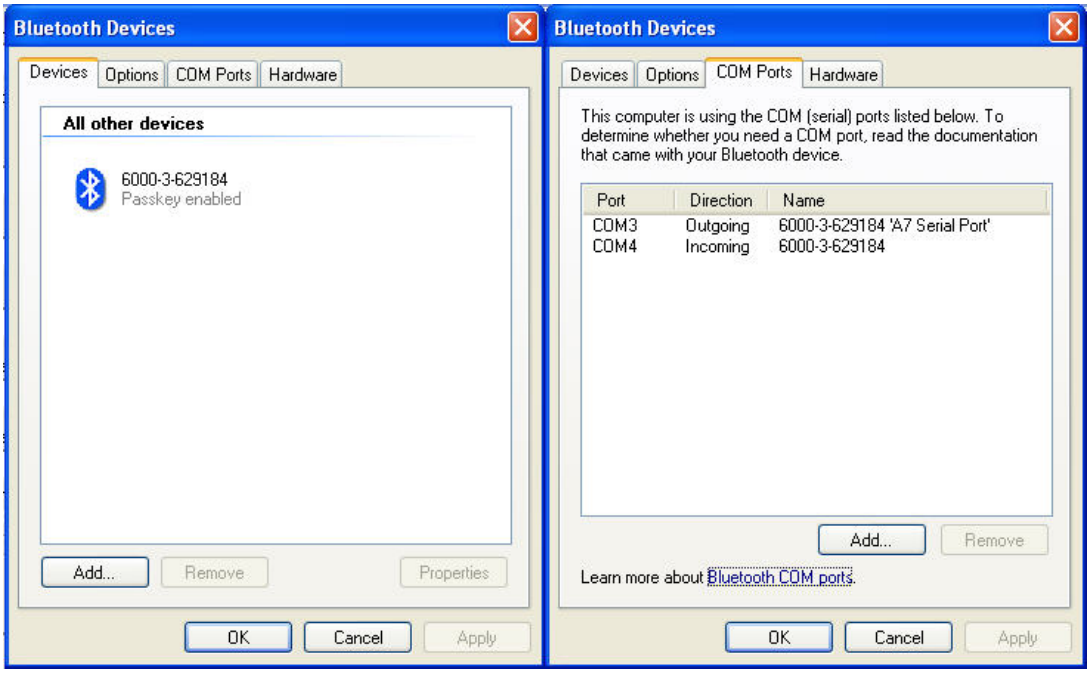
The Device Setup Window in WinSPC

In Proficient, select “Gage Connections” under Gage Interface. In WinSPC, select “Serial” as the Device type. The “Port” setting also must then be configured. This setting varies by computer:

To find the port setting needed for your computer, open “***Bluetooth*** Devices” in the Control Panel, under Printers and Other Hardware.



Bluetooth **Devices in the Control Panel, under Printers and Other Hardware**



The *Bluetooth* Devices Window. Devices tab (left). COM Ports tab (right)

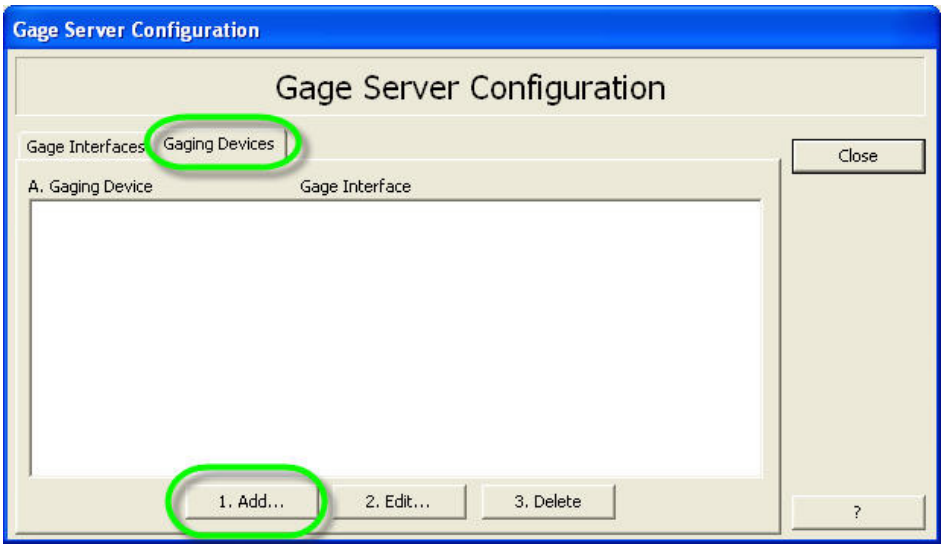
The ***Bluetooth*** Devices window will open. Your PosiTector should appear in the Devices tab. Click on the "COM Ports" Tab.

In the "COM Ports" Tab, there should be two listings for your PosiTector. We are interested in the "Incoming" port. In this case, it is COM4.

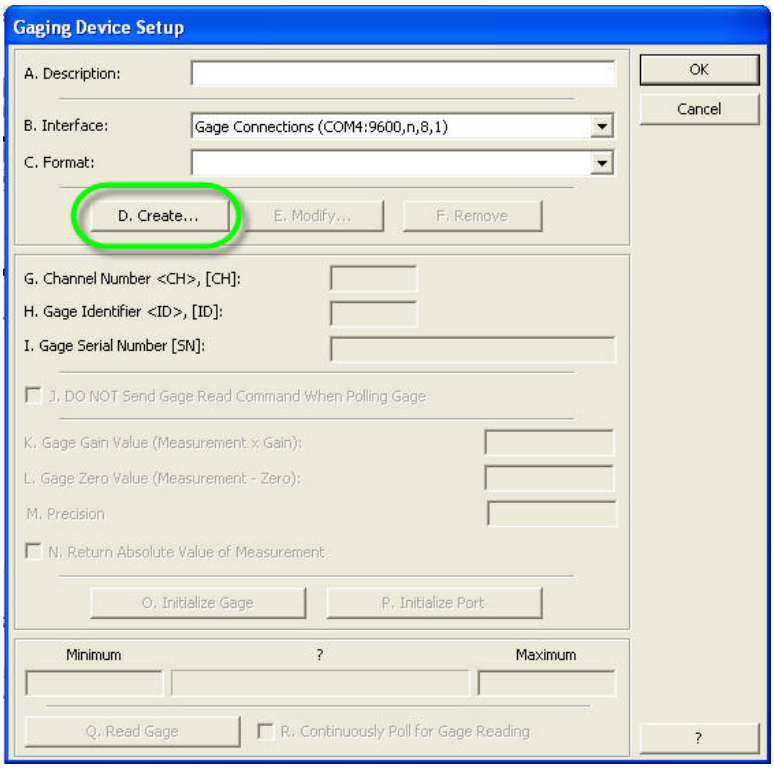
In Proficient, select the port identified in the previous step under "Serial Communication Port". In WinSPC, select your port in the "Port" dialogue box. Leave other settings such as Baud Rate, Parity, etc. at default settings.

Formatting the PosiTector 6000 Output for Use With the Software

After setting up the connection between the PosiTector 6000 and the ***Bluetooth*** programs, the gage output must be conditioned.

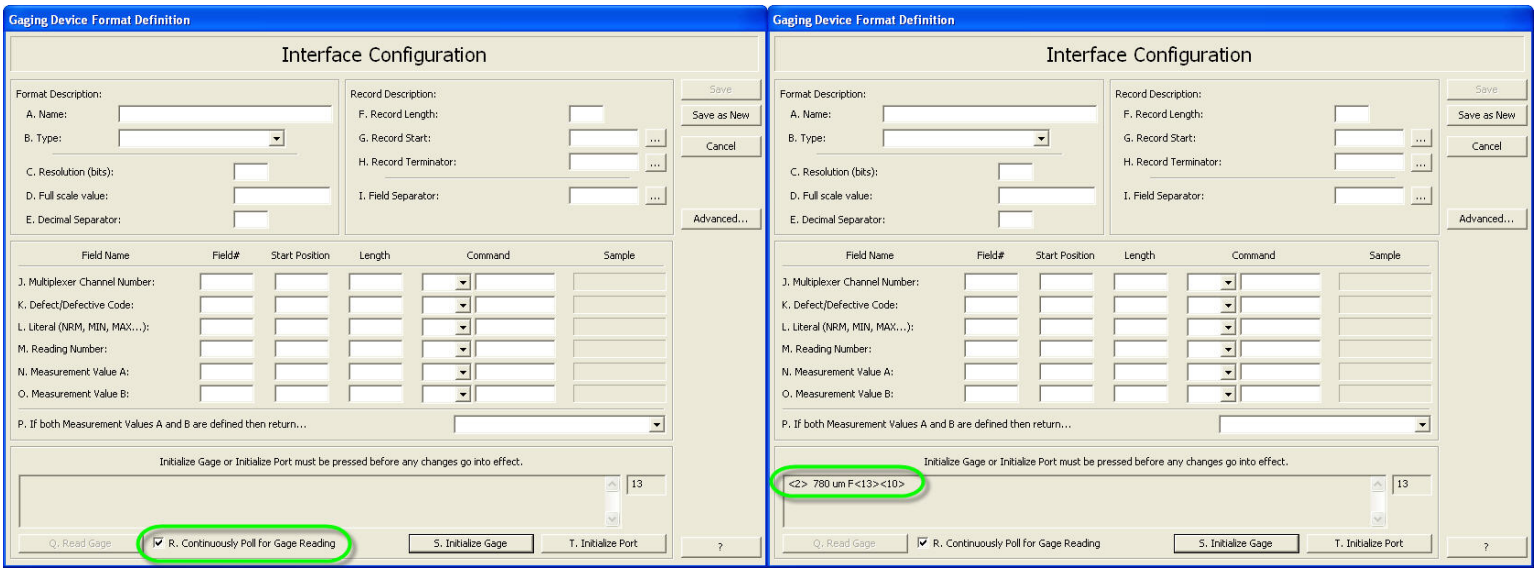


The Gaging Devices tab under Gage Server Configuration



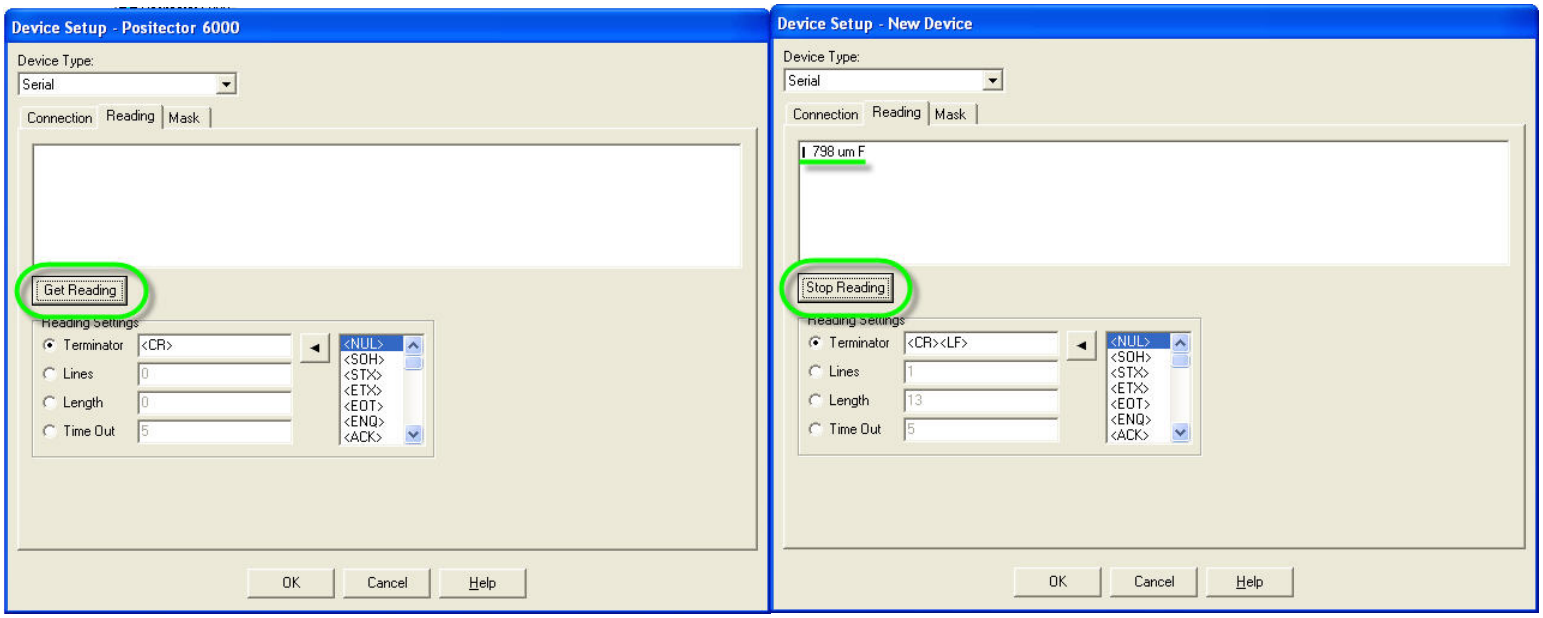
The Gaging Device Setup window

In Proficient, cluck OK in the Gage Interface Selection window. You are returned to the Gage Server Configuration window. Click the “Gaging Devices” tab and click “Add…” Name the Gage (“PosiTector 6000”, in this example) and click the “D. Create” button.



The Gaging Device Format Definition Window

This opens the “Gaging Device Format Definition” window. Select “**R. Continuously Poll For Gage Reading**”. Take a reading with the PosiTector 6000. At this point, the gage will attempt to connect to Proficient, and the ***Bluetooth*** icon on the gage will blink. When the connection is established, the gage will beep, and the icon will become a black symbol on a white background. Take another reading. The reading will display in the box at the bottom of the window.



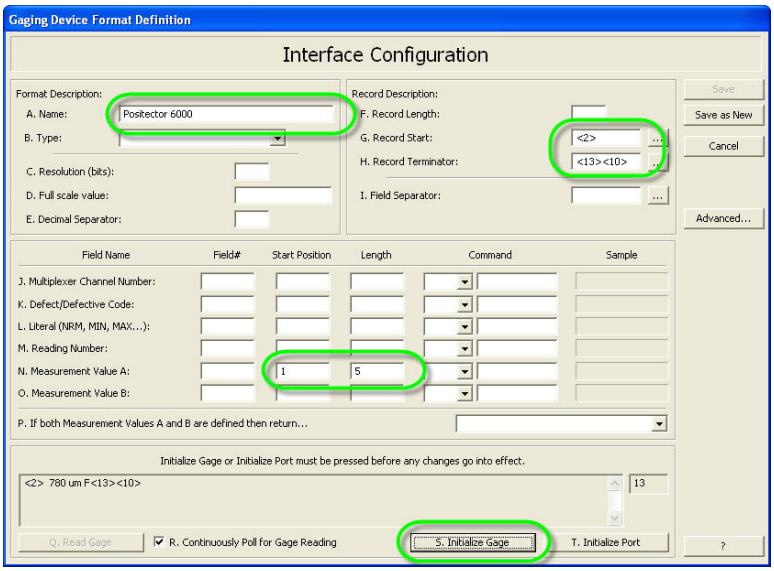
In WinSPC, select the “Reading” Tab in the Device Setup Window. Click the “Get Reading” button. Take a reading with the PosiTector 6000. At this point, the gage will attempt to connect to WinSPC, and the ***Bluetooth*** icon on the gage will blink. When the connection is established the gage will beep, and the icon will become a black symbol on a white background. Take another reading. This reading will appear, along with some other characters. Click “Stop Reading” to save the reading.

In each program, the data is unusable in its current state, with extra, unwanted characters:

Proficient: <2> 780 um F<13><10> **WinSPC:** 780 um F

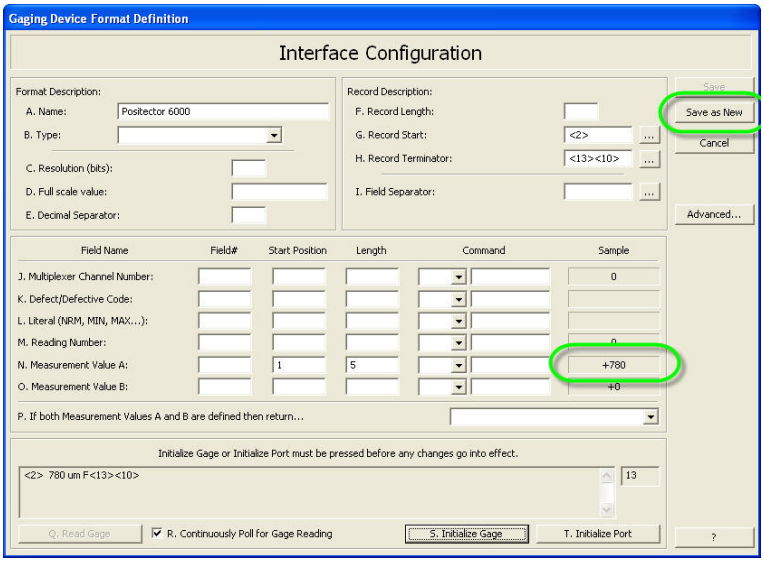
The goal is to extract the numerical measurement from this string; in this case we want to extract ‘780’. To do the extraction, we need to specify three things:

- The location of the beginning of the data – The data begins with a “start of text” character. It is represented by a hexadecimal value of <2> or a character value of <STX>
- The length of the numerical data – After the “start of text”, the numerical data will always reside in the first 5 characters.
- The location of the end of the data – The data ends with a “carriage return” and a “line feed” character. They are represented by hexadecimal values <13><10> or character values <CR><LF>

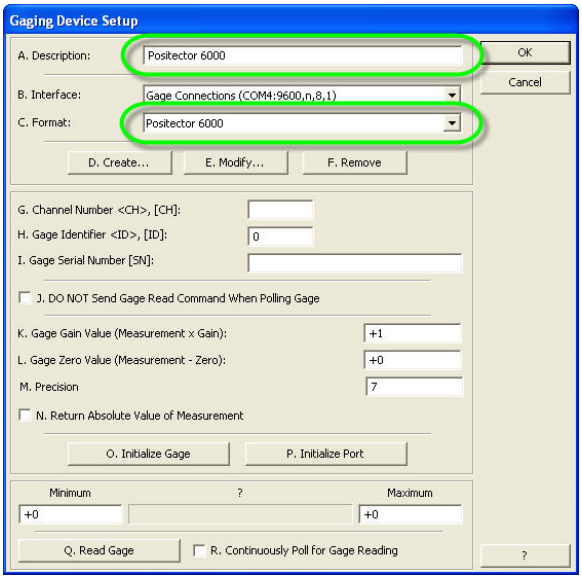


In Proficient, enter a name for the Device beside **A. Name:** (In this example, PosiTector 6000). Beside **G. Record Start:,** enter **<2> .** Beside **H. Record Terminator:,** enter **<13><10> .** Beside **N. Measurement**

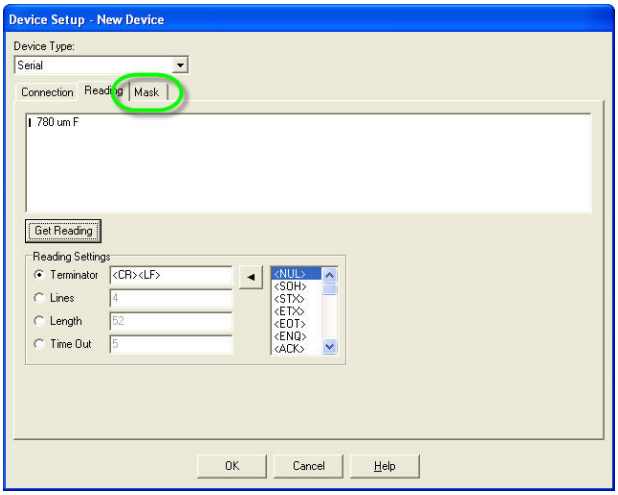
Value A:, enter 1 under **Start Position,** and enter **5** under **Length**. Your window should look the same as the window above. Press **S. Initialize Gage,** and take another reading.



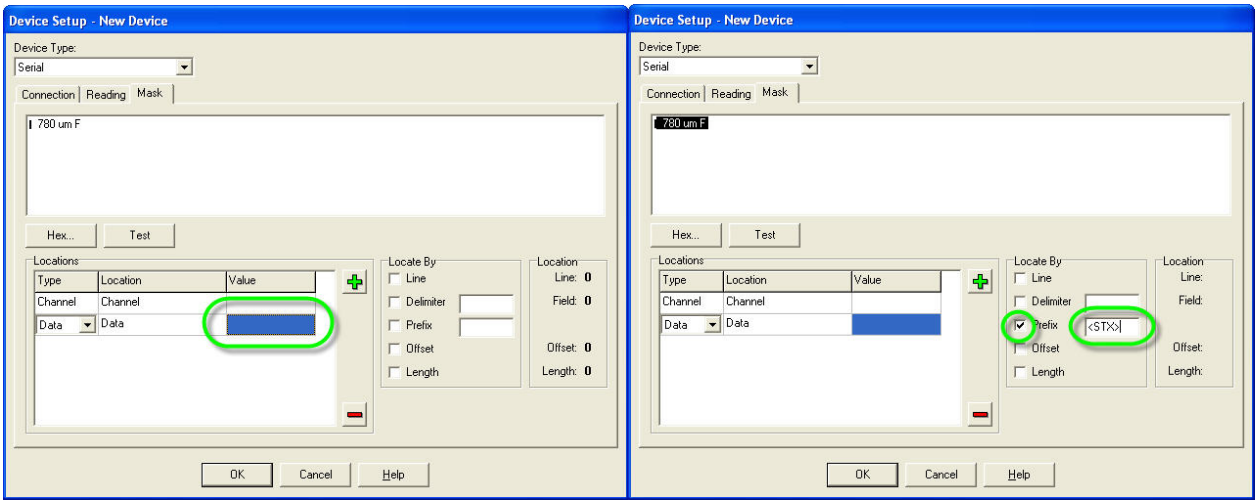
If the setup is correct, the reading on the gage should be the same as the value displayed beside **N. Measurement Value A:** and under **Sample.** Take another reading, and ensure that the value displayed reflects the new reading. If it does, click **Save as New.**



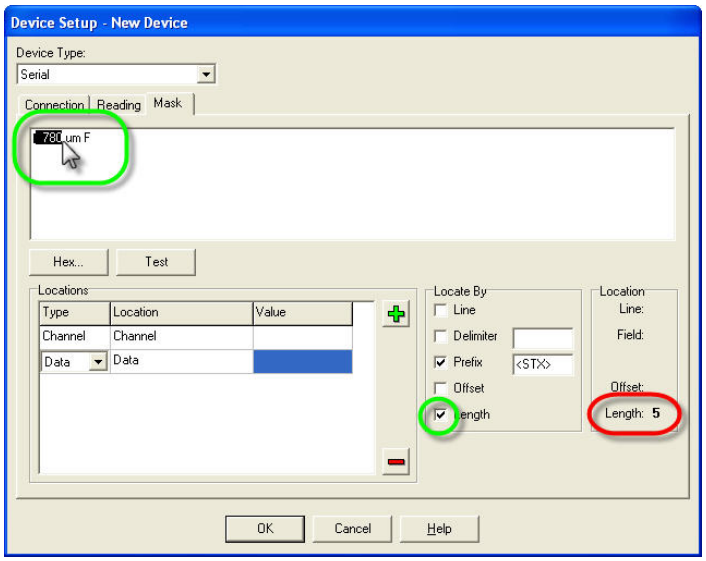
You are returned to the **Gaging Device Setup** window. Ensue that the Format you created in the last step (In this example, “PosiTector 6000”) is selected next to **C. Format**, and enter a description next to **A. Description.** (In this example, PosiTector 6000) The gage setup is complete!



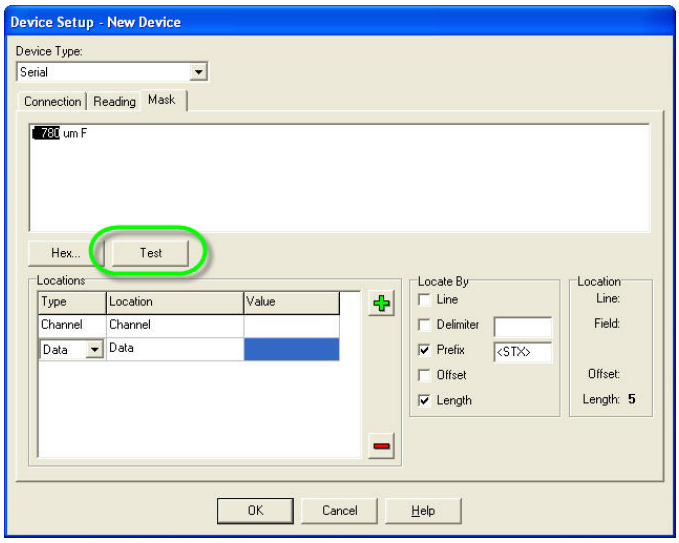
In WinSPC, select the **Mask** tab.



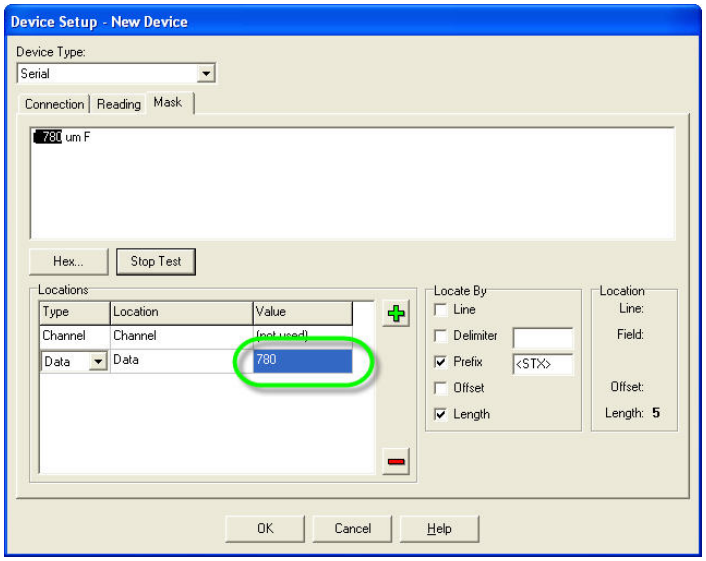
First, ensure that the cell next to **Data** and under **Value** is selected. The select the checkbox next to **Prefix** and enter **<STX>** in the text box next to **Prefix**.



Next, select the checkbox next to **Length**. Then, click on the reading, just after the last digit (see the cursor in the above image). The value next to **Length** (indicated by the red circle in the above picture) should read **5.** If it does not, keep clicking on the reading until the **Length** value is **5.**



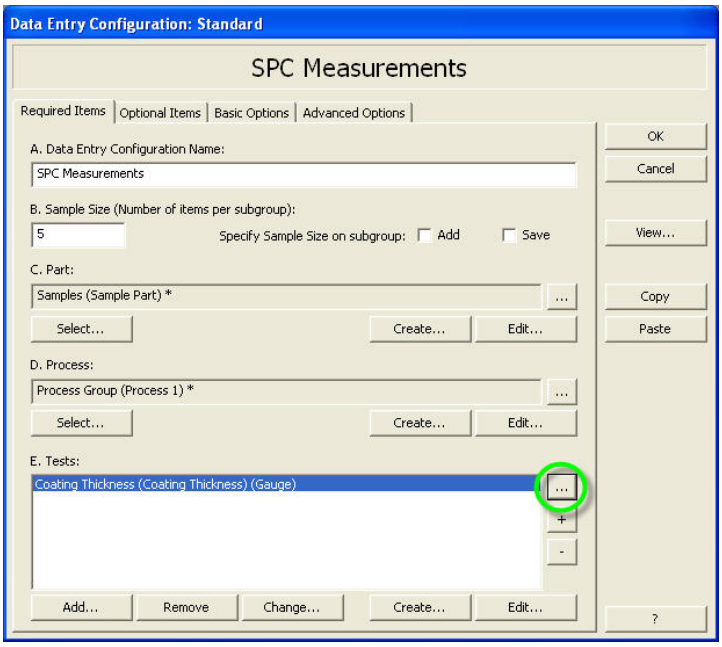
When your window looks like the above picture, click **Test**.



Take a few readings and wait for the gage to beep, signaling that it has re-established a connection. Then, take one reading. The value next to **Data** and below **Value** will reflect the reading that was taken. Click **OK.** The gage setup is now complete!

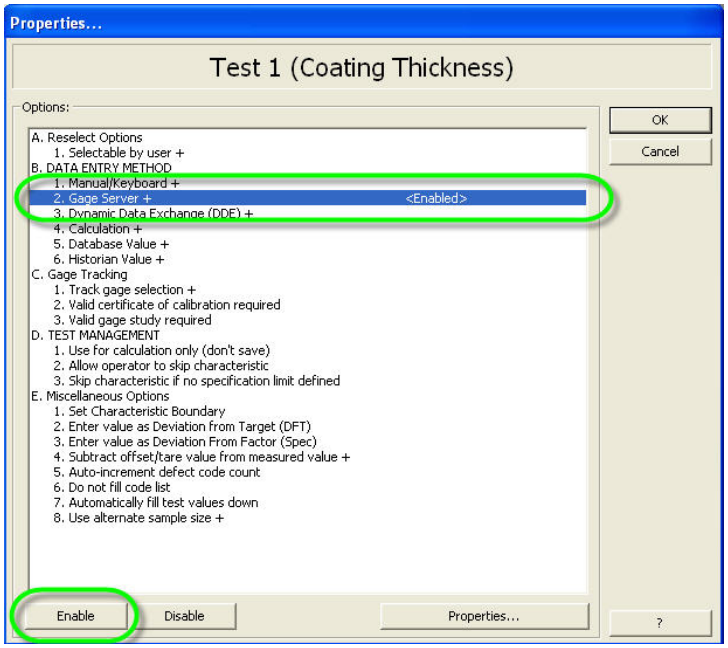
Configuring the Data entry Dialog to use Gage Measurements

After the gage is reading correctly into the software, the device is simply added into the collection plan.



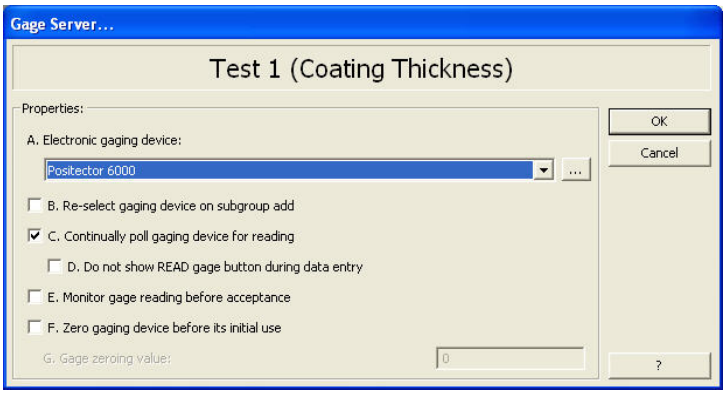
The data entry configuration screen.

In Proficient, under the Data entry Configuration window, create the data entry configuration as usual. Select the tests where PosiTector input is desired, and click the "…" button.



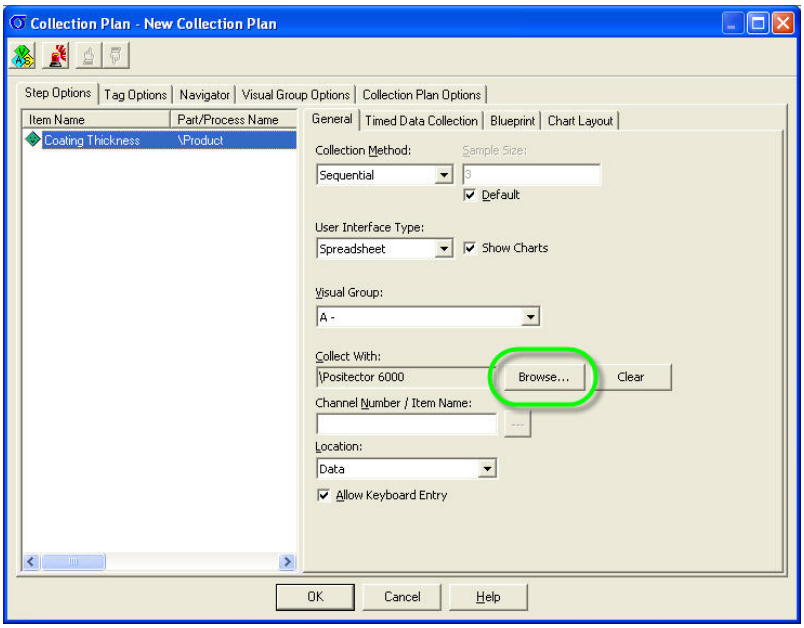
The Data Entry Configuration Properties Screen

In the Properties dialogue, select "Gage Server" under Data Entry Method" and click the "Enable" Button.



The Gage Server Properties Screen

In the Gage Server Properties Screen, select the gage created earlier (“PosiTector 6000” in this example) as the Electronic gaging device, and ensure “Continuously poll gaging device for reading” is checked. Proficient is now configured to poll the PosiTector 6000 for measurements during the specified tests.

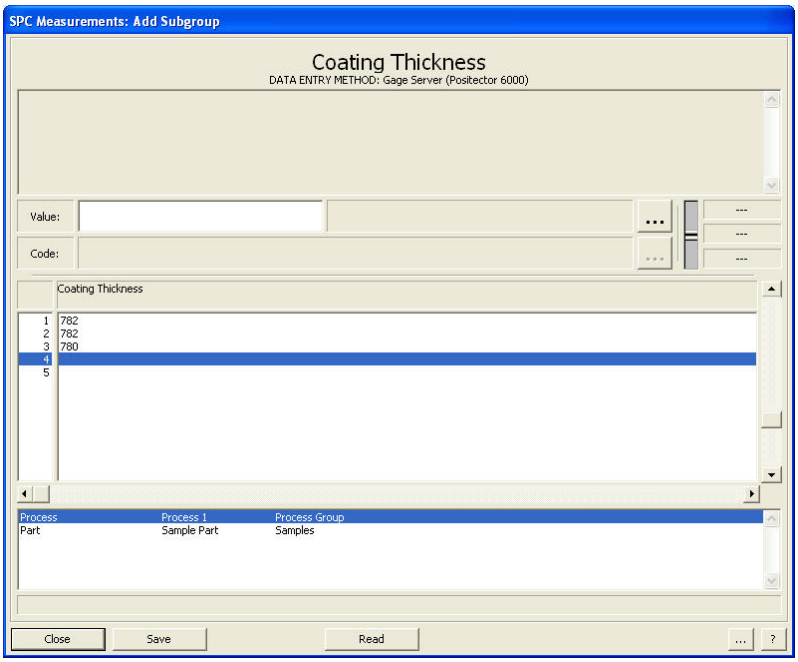


The Collection Plan Screen

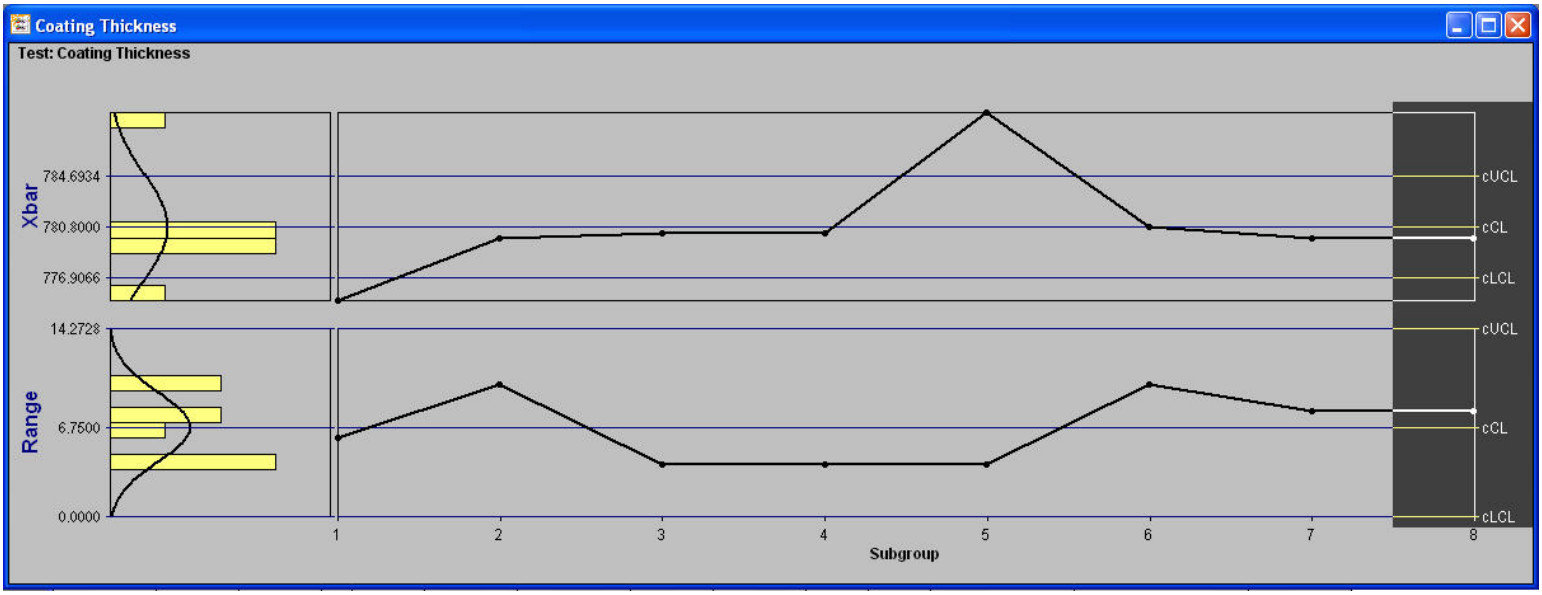
In WinSPC, when creating a Collection Plan, select the measurement variable, and click “Browse” next to the “Collect With” dialogue. Select the gage interface created earlier (PosiTector 6000 in this example).

Using PosiTector 6000 To Create SPC Measurements

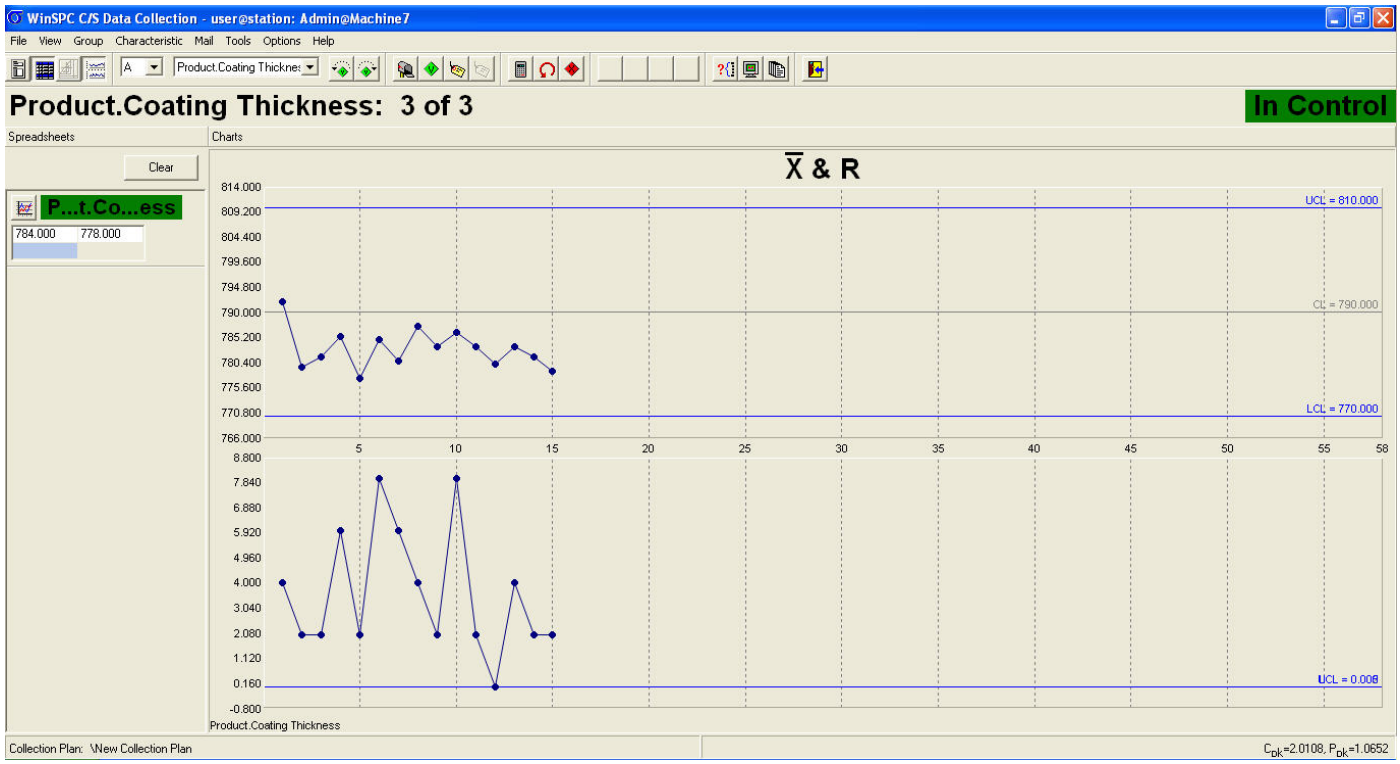
The gage configuration is now complete. Use the PosiTector 6000 instead of the keyboard to input data.



Proficient- Data Entry in Proficient using the PosiTector 6000



Proficient- Example SPC chart using readings from the PosiTector 6000



WinSPC- Example data entry and SPC chart using readings from the PosiTector 6000