

# Railroad Bearing Gage with PC Manual

A pdf version of this document is accessible from the desktop of the touch panel PC.



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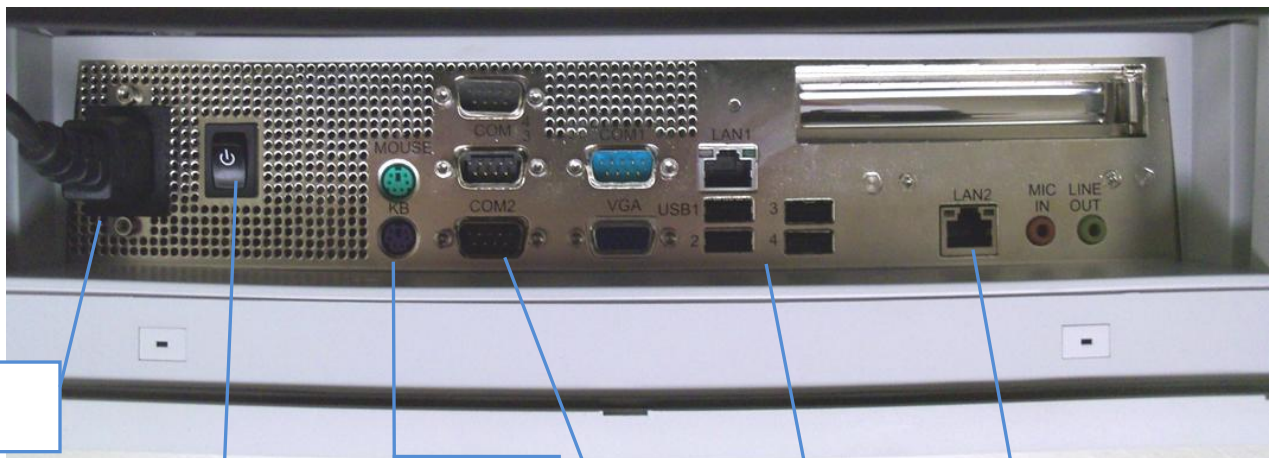
## Hardware

The 2012 version of Albion's railroad bearing gage is equipped with a touch screen PC and stand, gaging hardware, temperature sensors, remote Stop/Start and Zero buttons, USB hub and optional mouse and keyboard. The sensors, remote buttons and measuring probes interface to the PC through Albion's USB "Fireball" connectors.



### Controls and connectors

The following diagram shows the controls and connectors that can be found on the underside of the touch screen PC:



Power connector

ON/Off button (push and release for "On", push and release again for "Off")

Keyboard connector

COM ports

USB ports

LAN ports

Connect hardware, temperature sensors, remote Stop/Start and Zero buttons into USB hub or directly into a USB port on the PC, and connect USB hub to any USB connector on the PC. Optionally, connect mouse and keyboard also.



USB hub

The remote button box has two commonly used buttons for convenience. The red button on top is the Start/Stop button. It performs the same function as the Start/Stop button on the Digigage "Bearing Cones" screen (see page 3). The silver button on the side is the Zero button. It performs the same function as the Zero button on the Digigage "Bearing Cones" screen (see page 3).



Remote button box

Turn on the PC.

**NOTE: If transducers are not correctly allocated to their respective fields in the measurement screen incorrect readings will occur:**

**Try disconnecting the USB connectors from the hub, AND the hub from the computer. Then, reconnect the hub. Next, reconnect the top measurement probe to the hub, then the bottom probe to the hub, then the workpiece temperature sensor, then the gage temperature sensor, in that order. The software should automatically assign USB connections correctly according to this sequence.**

## Helpful notes:

### Start up

Touch DG shortcut on Windows opening screen.  
Touch “set up channel” tab  
Touch the “QUERY” tab  
Allow a few seconds for the “com fields” to populate  
Touch “bearing cones” tab  
Select part # in use from drop down, eg 6.5x12

### Operation

Install master gauge and touch “zero” on screen or silver button on front of remote box  
Place cone on gauge fixture  
Touch start/stop button or the red remote button  
Rotate cone 360 degree, press the start /stop button again to stop measuring  
The “not running” display will appear  
Repeat steps 3-5 for each cone

### Stack Gauge settings

Resolution .0000  
Range .010

upper

Upper Tolerance.001  
Lower tolerance .0000  
Upper approach Tolerance.0015  
Lower approach Tolerance .0000  
TIR .003  
Nominal 6.1870 for 6.5x9&12, 5.6870 for 6x11 , 6.9995 for 7x12  
Preset .0015  
Set OD/ID to ID

Work 6.8  
Gauge 6.8  
Master 6.8

Lower  
Upper Tolerance.001  
Lower tolerance .0000  
Upper approach Tolerance.0015  
Lower approach Tolerance .0000  
TIR .003  
Nominal 6.1870 for 6.5x9&12, 5.6870 for 6x11 , 6.9995 for 7x12  
Preset .0015  
Set OD/ID to ID

Work 6.8  
Gauge 6.8  
Master 6.8



Center the shuttle using the Probe Balance screen... with a bearing in place. This screen looks at the raw numbers coming in from the probe. The green line should be halfway up the scale, meaning the LVDT measuring probe is in the middle of its range. This is good because it can then go plus and minus an equal amount. You don't want the green line near the bottom or top of the scale on Probe Balance. The LVDT probe could have had shipping or other damage after it left here that pushed it inward. If this did happen, expect the LVDT to read at the bottom of the Probe Balance scale.

Check the other shuttle to see if it does read in the middle of the Probe Balance scale. If there is problem with that first shuttle you can move its position yourself by taking the shuttle out of the gage and put it and a master or bearing on the table. Put the shuttle into the master or bearing and center it by moving the master/bearing side-to-side quickly. Loosen the very small 4-40 setscrews holding the LVDT. Use a large screwdriver or rod and insert it into the brass shuttle behind the LVDT and try to push the LVDT out slowly while looking at the Probe Balance menu. Get the green bar to the middle of the scale and tighten one setscrew. Shake the master/bearing side-to-side to re-center the shuttle.

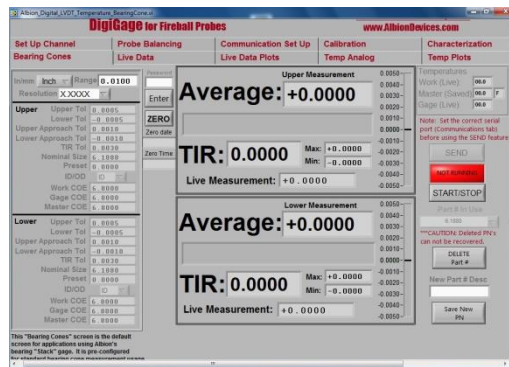
See above photo of a shuttle.

## Software

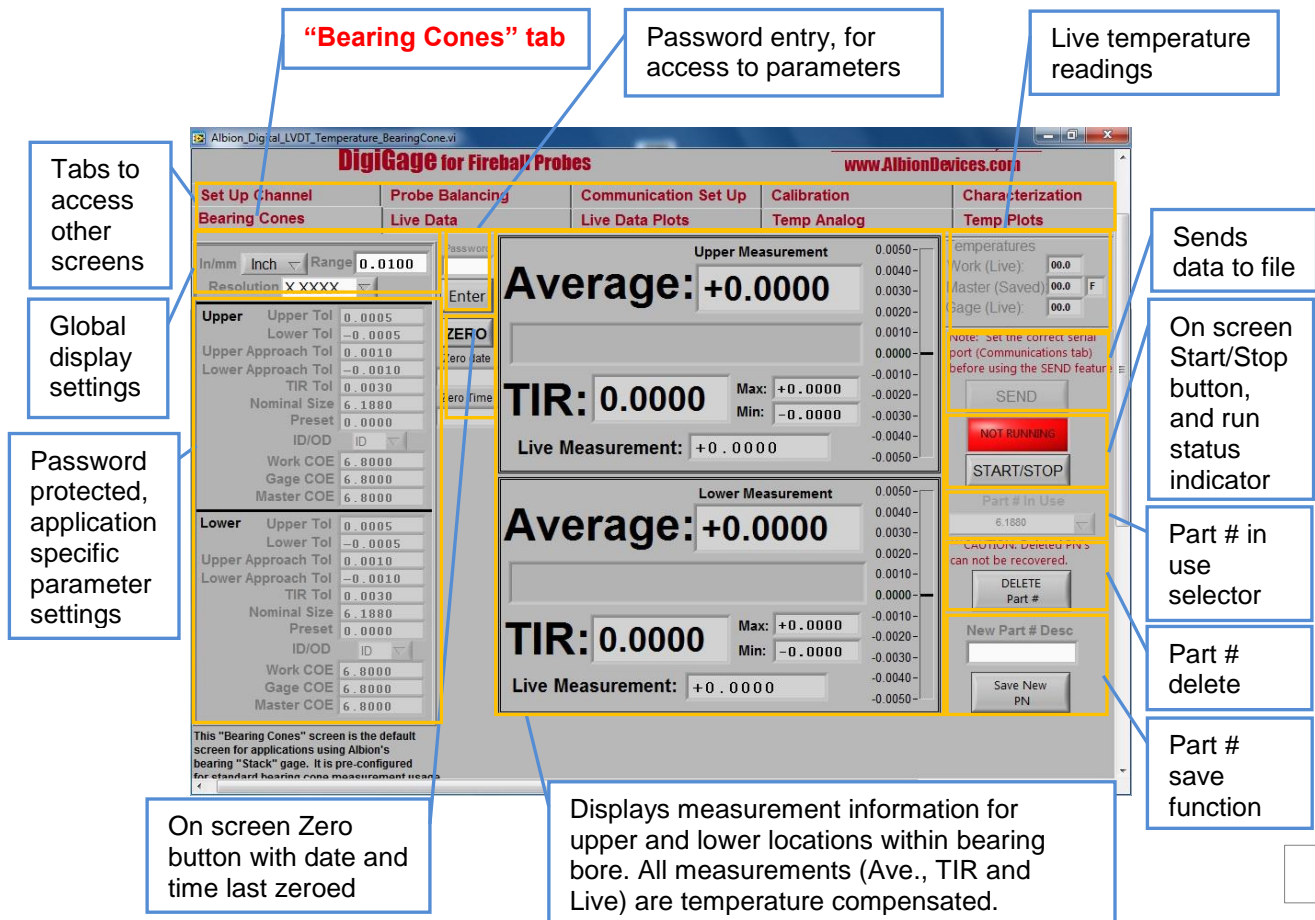
On the touch screen PC Double click or touch on the icon (copied below) to access the included special bearing cone gaging version of Albion's DigiGage software:



The "Bearing Cones" screen (below) will appear. Several tabs appear at the top of the screen. For this application only a few of these will be used. The rest may be ignored.



The following diagram outlines the functions of the Bearing Cones screen:





## Start Up

When software opens, click or touch Set Up Channel tab and then the “Query” button.

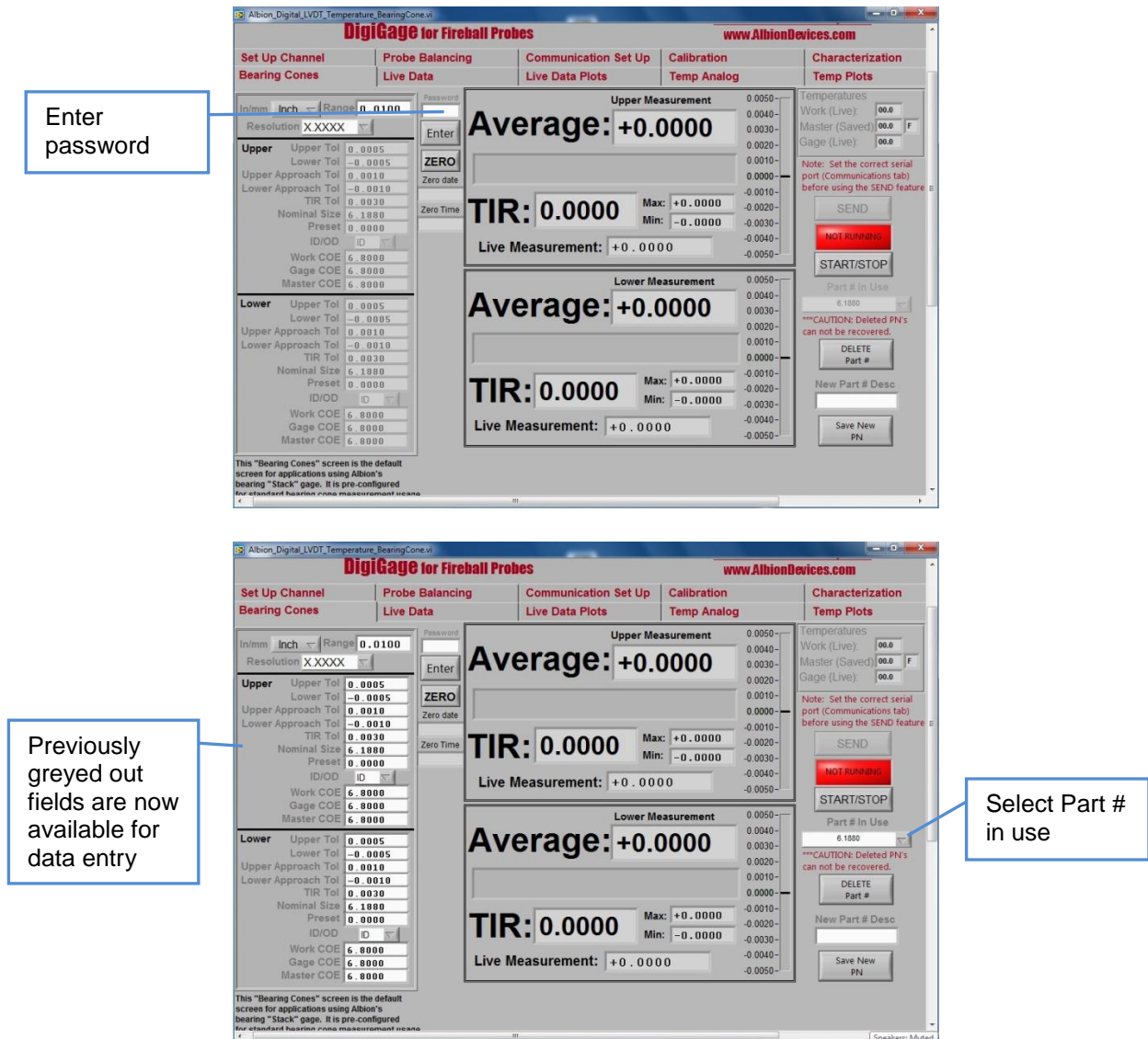
**NOTE: This must be done every time Digigage software is closed and re-opened** so as to connect the Fireball hardware to the Digigage software.

Wait for several seconds until the six COM fields shown below are automatically filled by the software. The measurement probes, temperature sensors and remote buttons interface with the PC via USB “Fireball” connectors. The PC allocates COM ports to each one and indicates in these fields that they have been recognized and assigned. It may take the PC and software some time to do this, particularly on a complete start up.

Click or touch Bearing Cones tab to return to the Bearing Cones screen.

## Select, Create or Delete Part #

To Select a previously saved Part #: Enter password in password field and press “Enter”. Use the down arrow on the “Part # in use” field to select a part to be measured. This will be determined by the gaging hardware that is positioned on the fixture.



**Close access to the parameter fields to protect settings:** Press “Enter” again.

If you need to create a new part or change one (you will need to connect a key board):

- 1) Enter password to access parameters. Click or touch “Enter” button.
- 2) Enter parameters for the part.
- 3) Enter a part number in the Save New PN entry field.
- 4) Click or touch “Save New PN” button and give it a name. Part files are saved in the same directory as the Digigage software.
- 5) Repeat as necessary to create more parts.
- 6) **Close access to editable fields to protect settings:** Press “Enter”.



Password field, with "Enter" button below

Previously greyed out fields are now available for data entry

Save New PN entry field

Save New PN entry button

**Close access to the parameter fields** click press "Enter" again or click on any tab to change screens, then return to Bearing Cones screen.

To Delete a Part:

- 1) Enter password.
- 2) Select Part # to be deleted.
- 3) Press "Delete Part #" button.
- 4) A warning requires that you confirm that you wish to delete (there is no "undo" after confirmation).

Enter password then press "Enter" button

Select Part # to be deleted

Press Delete Part # button

**Remember to close access to parameter fields** by pressing "Enter" again or click on any tab to change screens, then return to Bearing Cones screen.

## Operation

To measure a bearing cone:

1) Make sure correct part # has been selected in Bearing Cones screen.

2) Place master(s) on gage and press zero or the remote zero button. Date and time will appear on the screen below the on-screen zero button. Remove masters(s). Repeat this step only as required by company internal operating instructions. Once mastered, then:

*Remote  
zero  
button*



3) Place cone on gage fixture.

4) Press Start/Stop or the red remote button. "Running", in green, appears above Start/Stop button on screen. The system immediately begins taking measurements at a rate of approximately 10 per second.



*Red  
remote  
Start/Stop  
button*

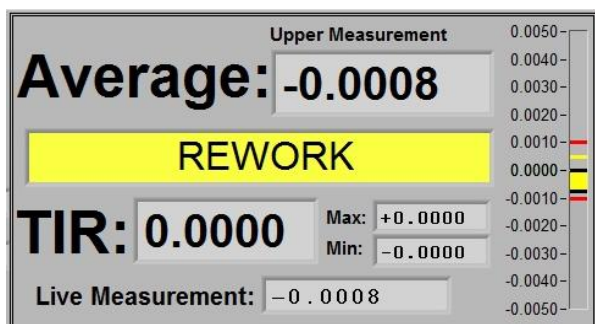
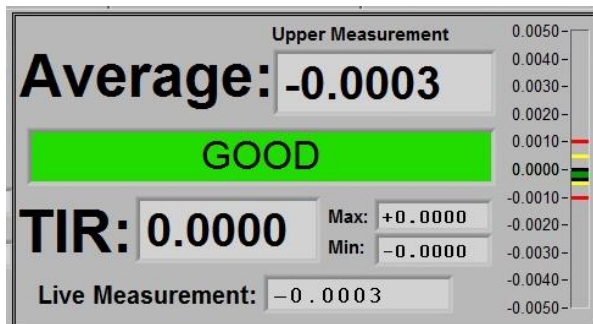


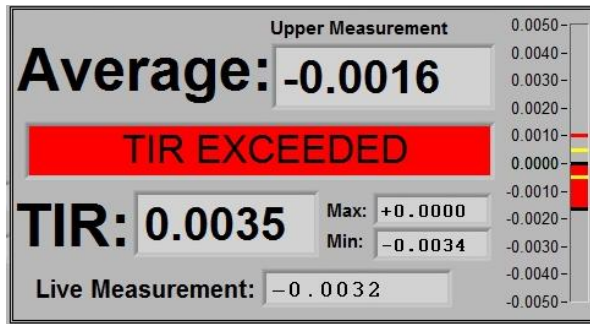
5) Without delay rotate bearing smoothly through 360 degrees, then press Start/Stop or the red remote button to stop taking measurements. The "Not running" display appears above the on screen Start/Stop button in red.



6) Repeat steps 3 to 5 for each bearing cone.

Depending on the parameters defined for this measurement, and the condition of the bearing cone being measured, one of the following self explanatory remarks (good, rework, scrap or TIR exceeded) may appear in either of the measurement displays:

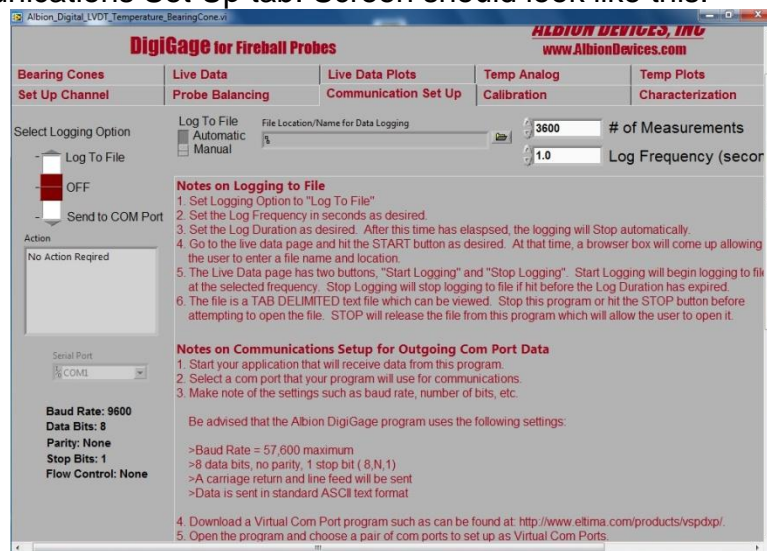




## Communications

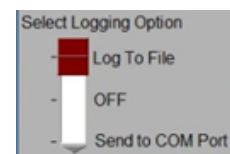
Data collected by the system can be saved to a file on the touch screen PC or transmitted externally.

Click on the Communications Set Up tab. Screen should look like this:

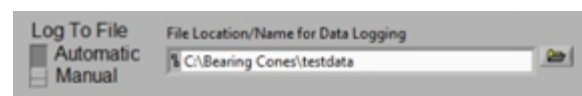


To manually save data to a file on the touch screen PC after each measurement cycle:

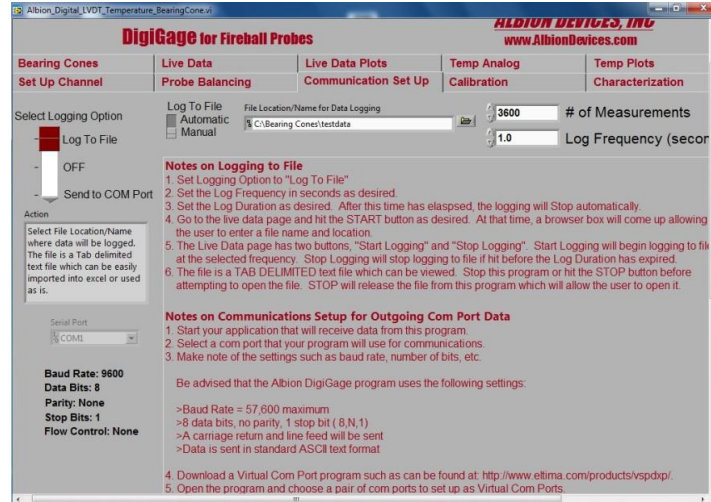
1. Move (drag) the selection switch to "Log to File" position.



2. Set Log To File switch to Manual, and
3. Use file location function to create or select a file for saving data.

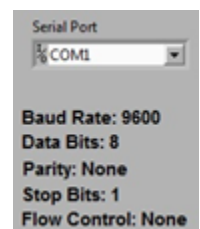
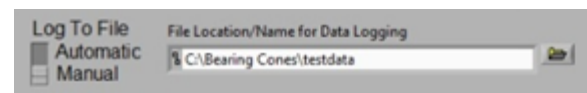
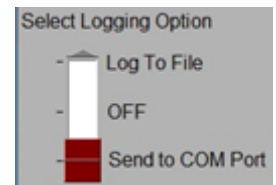


Screen should look like this:

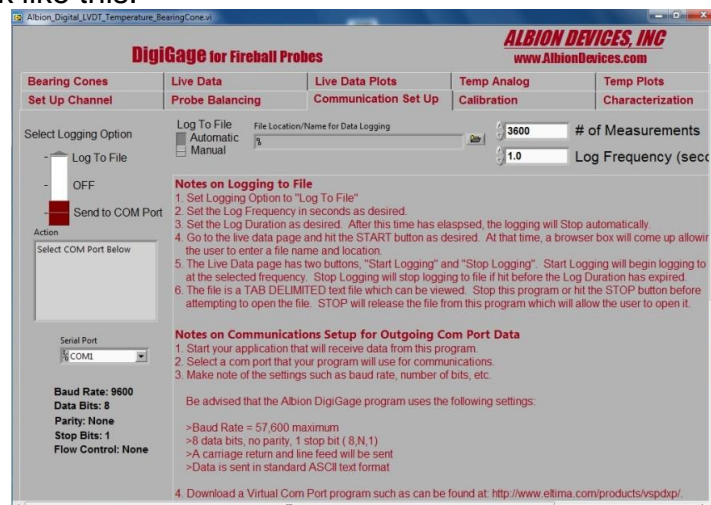


To manually send data externally:

1. Move (drag) the selection switch to “Send to COM Port”.
2. Set Automatic/Manual switch to Manual (automatic is not applicable for bearing cone measurements).
3. Select serial Port.



Screen should look like this:



## After setting up communication

On returning to the Bearing Cones screen the “Send” button, which was previously greyed out (inactive) will now be active.



Depressing the “Send” button will cause the Average measurement shown on each screen to be saved to a data file (which can be opened in word processing and spreadsheet programs) or transmitted externally, depending on how communications have been set up, in the following format, where the date and time precede collected data, and T = Top measurement and B = Bottom measurement:

```
7/26/2012 1:03 PM T=-0.0004 in,B=-0.0000 in
7/26/2012 1:04 PM T=+0.0009 in,B=-0.0000 in
7/26/2012 1:04 PM T=+0.0002 in,B=-0.0238 in
```