EZ-DAQ™

User Manual

Version 1.4

DGSI
DURHAM GEO SLOPE INDICATOR

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IMPORTANT
Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

Information Record

Model #:   _____

Serial #: _____

Sold By: _____

Date Purchased: _____

Table of Contents

SOFTWARE CODE

The software code is copyrighted 2008 by Durham Geo Slope Indicator. All rights reserved.

SOFTWARE LICENSE AND REGISTRATION

The purchase of one EZ-DAQ-Soft™ software program gives the purchaser the right to install the program on multiple machines, however only one (1) EZ-DAQ can be run at a time.

INTRODUCTION

1.0 Overview

The EZ-DAQ is a USB-Ethernet data acquisition system used in conjunction with EZ-DAQ-Soft software. The software is formulated for communication with only the EZ-DAQ data acquisition system for recording readings and storing them in user defined directories.

EZ-DAQ has provisions for 8 sensor inputs. It gives the user the convenience of digital indicators at the test stand with the ability of transferring test data to the EZ-DAQ-Soft software via standard Ethernet protocol. The EZ-DAQ can enable 1-to-8 industry-standard analog sensors with multiple input ranges. With multiple input channels and ranges, the channels can have different input ranges simultaneously, For example, Channel 1 can be configured for a 200 mV input signal while Channel 8 can be configured for 4-20 mA signal. These readings will be displayed on the screen and uploaded to the software.

All calibrations are held in the EZ-DAQ and are password protected.

Sensor Input Type: mV, V, mA.
Sensor Input range: 150 mV, 500 mV, 1 V, 5 V, 10 V, 20 V, 4-20 mA
EZ-DAQ is configured for either SI or US customary units. At present, the internal software does NOT allow the user to switch between the two units.

The EZ-DAQ-Soft™ software is user friendly, displaying all sensors on the PC screen. The screen allows information from up to six sensors to be saved on 6 individual files with 6 different sampling rates to be setup before the test begins. Files are saved as delimited text which may be easily imported into a spread sheet program, or can be opened as a simple text file.

Communication from the EZ-DAQ to the customers PC is accomplished using standard Ethernet protocol with a USB to Ethernet adaptor. Setup is easy because it uses a static IP address.

2.0   System Requirements

‣   Microsoft Windows 98, 2000,NT or XP

> *Note: This software is not compatible with Windows 95 or Windows ME. Not recommended for XP-Home Edition.*

‣   500 MHz processor --- (Faster processor recommended)
‣   64 MB RAM --- (128 MB(+) recommended)
‣   Approximately 12 MB free disk space
‣   CD drive to load program
‣   VGA display
‣   USB 2.0 port

I M P O R T A N T   N O T E

▱ *The use of a UPS (Uninterruptible Power Supply is highly recommended for both the EZ-DAQ and corresponding PC. Without battery backup, loss of data, and loss of test could occur in the event of a power failure.*

3.0   Summary of Installation instructions — Software for PC (details on p.14)

Insert CD into computer. Open the PC DAQ Software Installation folder, and double-click setup.exe **-or-** Select Start/Run/ (CD Drive letter):/ PC DAQ Software Installation /Setup.exe.

Follow instructions. Default installation is on C: drive, but the user can define the installation directory.

I M P O R T A N T   N O T E

▱ *To un-install the software, simply double-click the setup.exe again from the CD drive and software will unload automatically.*

*(*Some files will not remove automatically and will need to be removed manually.)

4.0   Summary of Installation Instructions — Ethernet Adaptor (details on p.16)

Plug the Belkin adaptor into a USB port on the host computer.

Windows will begin the installation process and ask for the driver information for the adaptor.

Browse the CD and select the Belkin ethernet adaptor.

Windows will search the directory and load the correct driver for your machines.

I M P O R T A N T   N O T E

▱ *Installation on WinNT, Win2000, or WinXP requires Administrator privileges.*

EZ-DAQ PANEL

1.0   Screen Description

Sensor Display Panel — Home Screen

A sensor is not a channel. A sensor may be plugged into different channels. Channels are numbered on the back of the EZ-DAQ panel. (Sensor 2 can be plugged into channel 8).

Press "Monitor" to go to the next page

MONITOR

Main screen of touch panel (Up to 8 inputs in real-time display of sensors).

LDT column with a 0.000 precision display

LOAD CELL column with a 0.0 precision display

PORE pressure column with a 0.0 precision display

PSI column with a .0.0 precision display
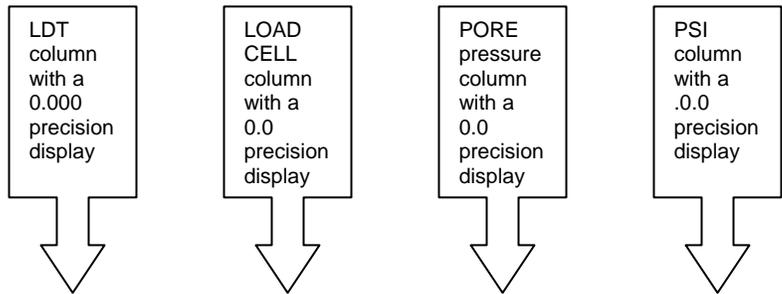
Sensor configuration screen:

Different Sensors

Frame 1 or machine 1 with a total of 4 sensors.

Different Tests

FRAME	INCH	LBS	PSI	PSI
1	0.000	0.0	0.0	0.0
2	0.000	0.0	0.0	0.0
3	0.000	0.0	0.0	0.0
4	0.000	0.0	0.0	0.0
5	0.000	0.0	0.0	0.0
6	0.000	0.0	0.0	0.0

PRESS VALUE FOR OPTIONS

Touch in CENTER of block to bring up "Sensor Configuration Block" –SCB-
"TARE" (Zero) sensor reading
"CONFIG" calibration of sensor
"Home" start-up screen
"Cancel" turns off -SCB-

Remember, touching in a sensor box applies to configurations for that particular sensor only.

FRAME	IN	LBS	PSI	PSI
1	0.000	0.0	0.0	0.0
2	0.000			0.0
3	0.000			0.0
4	0.000			0.0
5	0.000			0.0
6	0.000	0.0	0.0	0.0

SENSOR 0

TARE   CONFIG

HOME   CANCEL

PRESS VALUE FOR OPTIONS

Note: A single sensor may be set-up for different test scenarios. For Example, you could have two sensors and run five tests with them.

EZ-DAQ-Soft™ SOFTWARE

1.0   Communications

Connect the ethernet cable (①) to the Belkin adaptor (②).Plug Belkin USB Ethernet Adaptor into the computer's USB port (③).

NOTE: Standard cat-5 ethernet cable, not a cross-over cable.
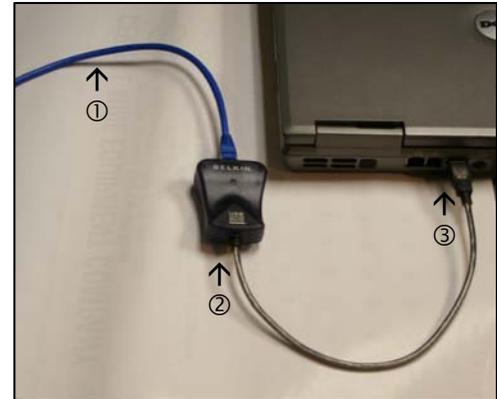
The computer will recognize the new hardware and will start loading software and drivers automatically.

On a new installation, the computer will ask for drivers to be loaded.

Browse to D:\EZ-Daq Belkin Ethernet Adapter. Left-click on this directory. Drivers for your operating system will automatically load.
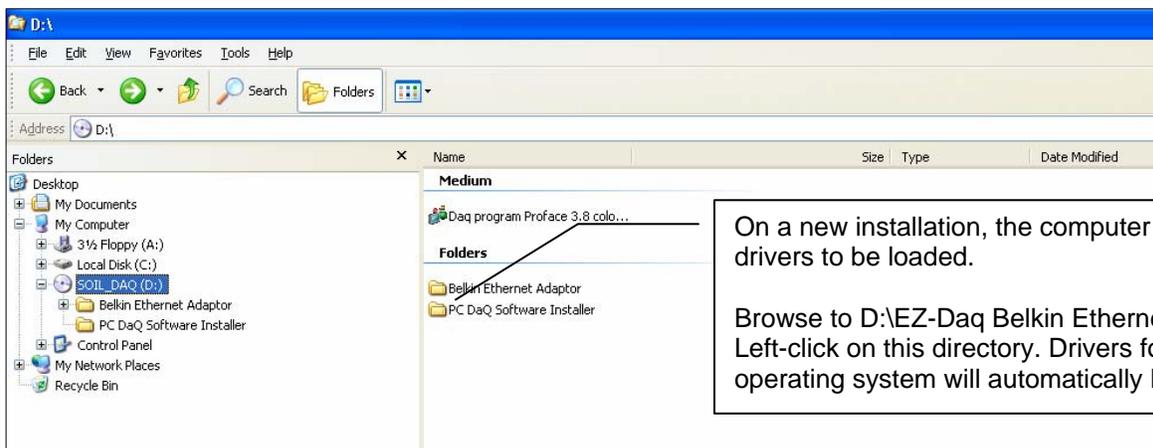
I M P O R T A N T   N O T E

🖥️ *The next few pages describe how to configure the IP address on the Belkin adaptor. Please read carefully for a trouble-free installation.*

After installation of USB software, the IP address must be changed to enable communications between the EZ-DAQ unit and EZ-DAQ-Soft software.

① Left-click on "Start".
② Right-click on "My Network Places".

③ Left-click on "Properties".

Right-click on the newly-installed USB device. Left-click on "Properties". "**BELKIN USB Ethernet Adaptor**" will be the device name.

① Left-click on "Internet Protocol" (TCP-IP).
② Left-click on "Properties".

Type in the
following IP
Address:
10.11.12 46
255.255.255.0

Click "OK"
to accept.
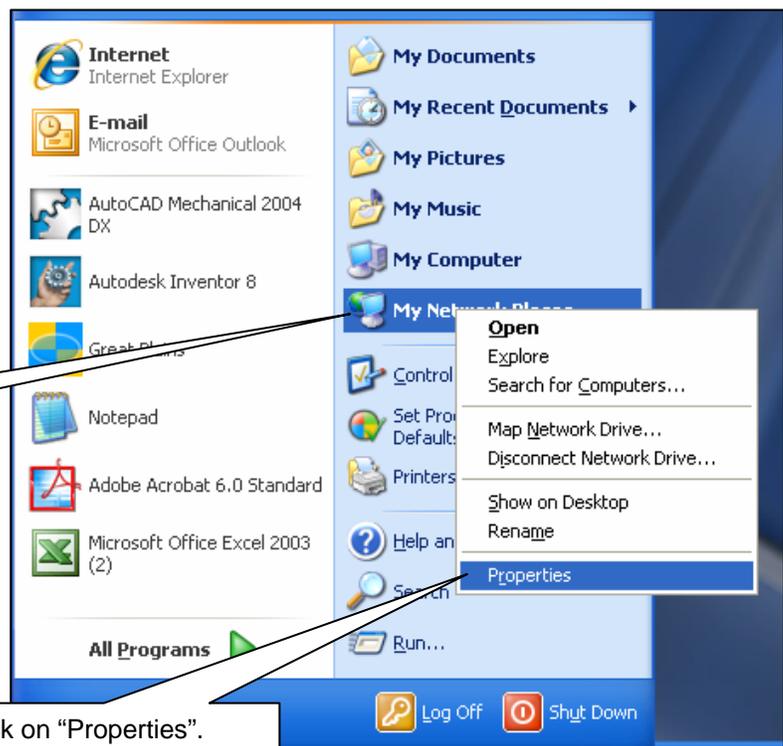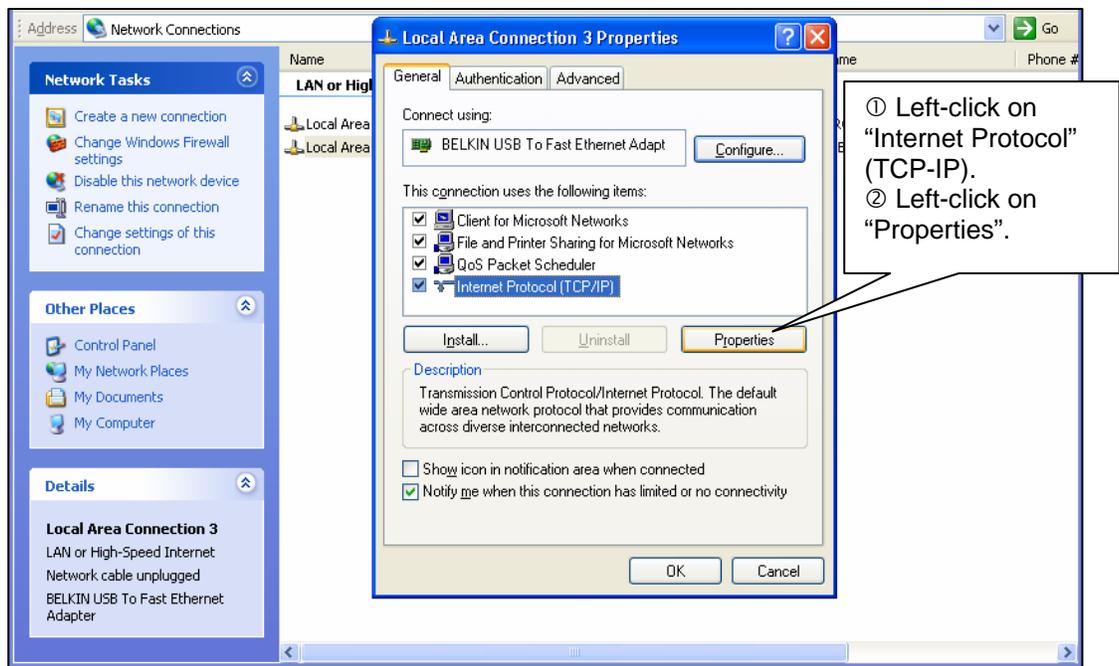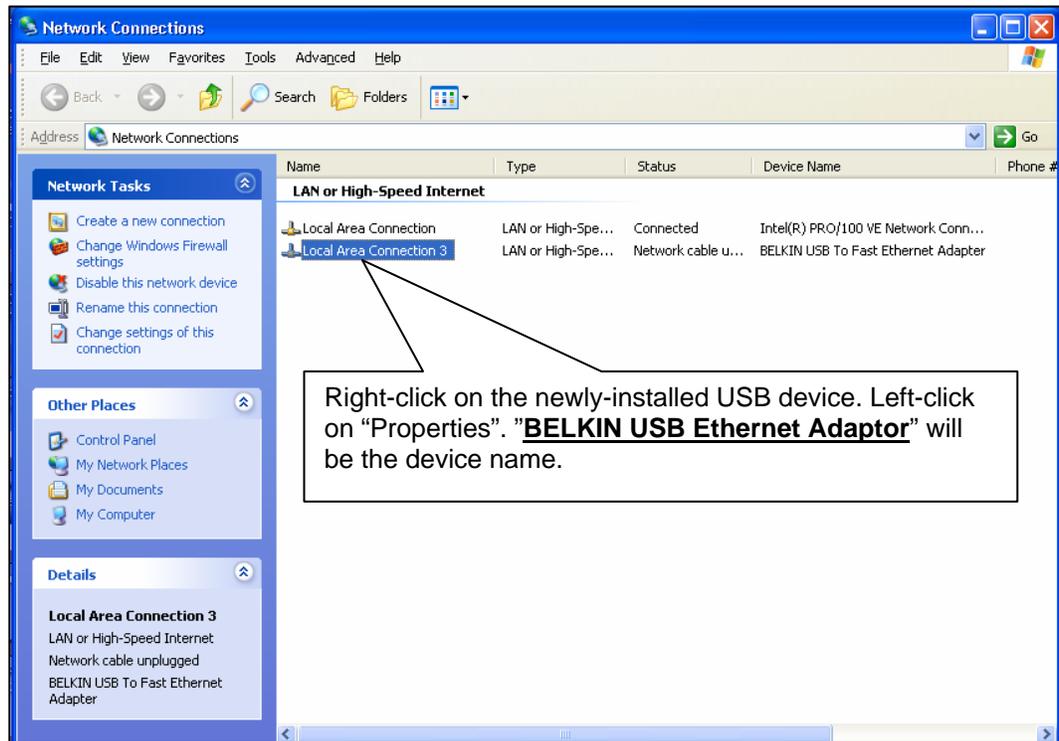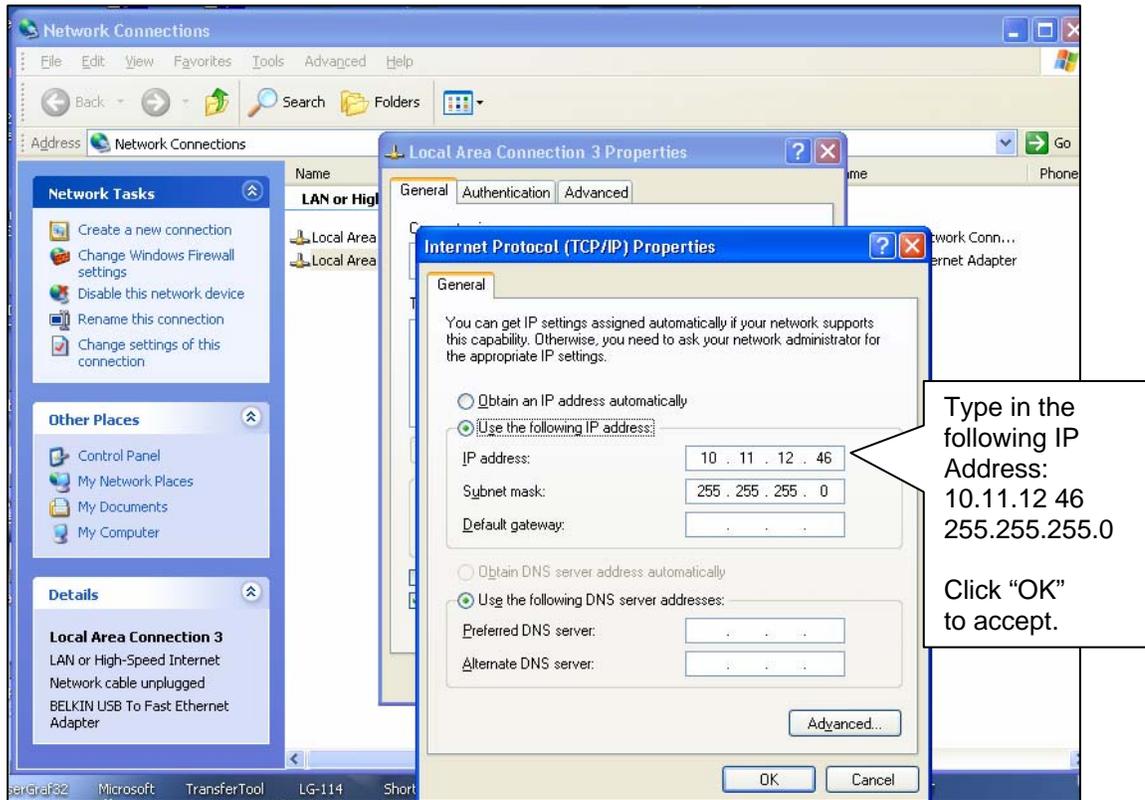
IMPORTANT NOTE

If the static IP address in the software must be changed, then the EZ-DAQ panel IP static address must also be changed. The EZ-DAQ box is set at 10.11.12.42 as a default. Contact your IT dept-or-DGSI for instructions if address must be changed.

Press upper-left corner, release, and quickly press lower- right corner to activate panel configuration screen.

PROFACE
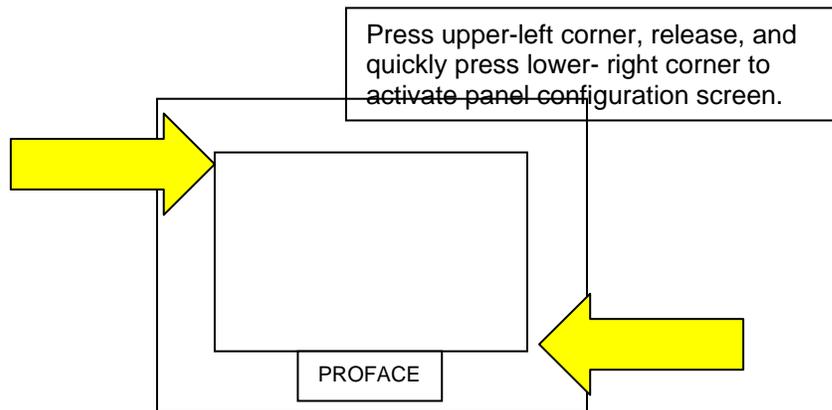
2.0   EZ-DAQ-Soft™ Software Installation

Insert CD into computer, open the EZ-DAQ software installation folder and double-click "Setup.exe".

Setup will create a directory labeled "DGSI\EZ-DAQ\".

Computer must have administrative rights for software to create files and directories required for installation.

The EZ-DAQ-Soft main screen will appear.

Notice "Frame 6" is highlighted for values to be entered for test sampling intervals.

Select a frame (or machine).

Columns and headers can be user customized. (See page 23).

Area will be shaded out until a "frame" is selected. See page 20 for details.

File Help

	inch	lbs	psi	psi	Test Time
Frame 1					000:00:00
Frame 2					000:00:00
Frame 3					000:00:00
Frame 4					000:00:00
Frame 5					000:00:00
Frame 6					000:00:00

Data File Name:

Test Comments:

Sampling Intervals:

Interval	Number of Samples	Sampling Interval
1	10	00:00:01
2	10	00:00:02
3	10	00:02:00
4	10	00:03:00
5	10	01:00:00

Insert

Delete

Number of Samples: 10

Interval: 0 : 0 : 1

Modify

Start Collection

3.0   EZ-DAQ-Soft™ — Individual Test Setup

The heart of EZ-DAQ-Soft™ is the test screen, which allows the user to select the "Frame" on which the data will be captured.
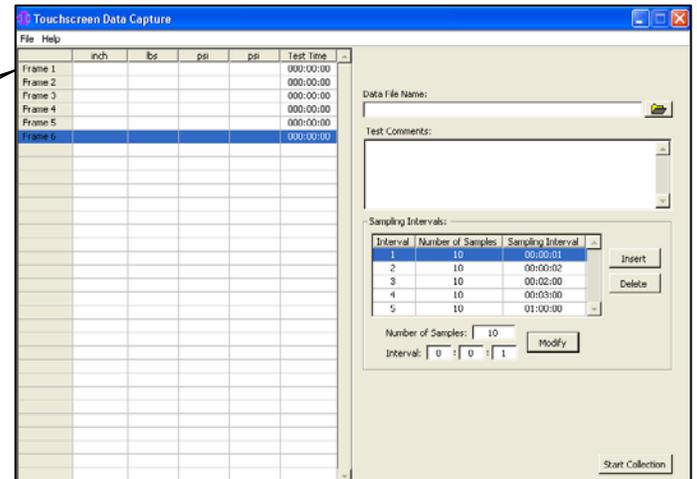
Select the frame first.

The user first selects the "Frame" which corresponds to the machine with the sensors for the particular test.

Then, the frame highlights the fields which the user alters for defining each test.

Data File Name: Creates the file name where data from each frame will be stored on. A Windows tab on the far-right allows navigation thru the directory structure for the required area for data to be stored.

Test Comments: User defined comments that will be on the top of the test printout.

Sampling Intervals: Select the interval to change the sampling rate.
Intervals can be added with the "insert" button and removed with the "delete" button.

> **Note:** When changing "Number of Samples" and "Sampling Interval", be sure to click the "Modify" button to save the changes.

Start Collection: Allows collection to take place on the highlighted frame only. Each frame must be highlighted and the "Start Collection" must be clicked for data collection to begin.

All the area on the right side of the screen will be greyed-out when the "Start Collection" button is pressed for that particular frame and no modifications can be made. It will lighten back to normal when the test sampling period is complete.

Helpful Tip: Write your defaults on paper so you have them in case of power loss.

4.0   How to customize your PC screen

Customize for your particular machine names.

Descriptions can be changed in the EZ-DAQ.ini file.

C:\DGSI\EZ-DAQ\EZ-DAQ configuration settings

[Proface Setup]
IPAddress=10.11.12.42
UDPPort=1024
ReadingStartMemAddress=100
RangesStartMemAddress=200
NumSensors=24
ColHeader0=""
ColHeader1="Travel"
ColHeader2="Load"
ColHeader3="PSI"
ColHeader4="Grapes"
ColHeader5="Test Time"
RowHeader0="Consol"
RowHeader1="Triaxial"
RowHeader2="CBR"
RowHeader3="LBR"
RowHeader4="Test 5"
RowHeader5="Test 6"

The above illustrates how the PC software can be customized to match your company's particular machine names you might have in your lab. This is the EZ-DAQ.ini file and it is located in the C:\DGSI\EZ-DAQ\ directory with the name "configuration settings.ini" It is a simple .txt file that can be opened with a text editor such as notepad.

IMPORTANT NOTE

It is always a good idea when dealing with .ini files to make a backup copy *before* making changes to the file.

5.0　Displaying Your Results.
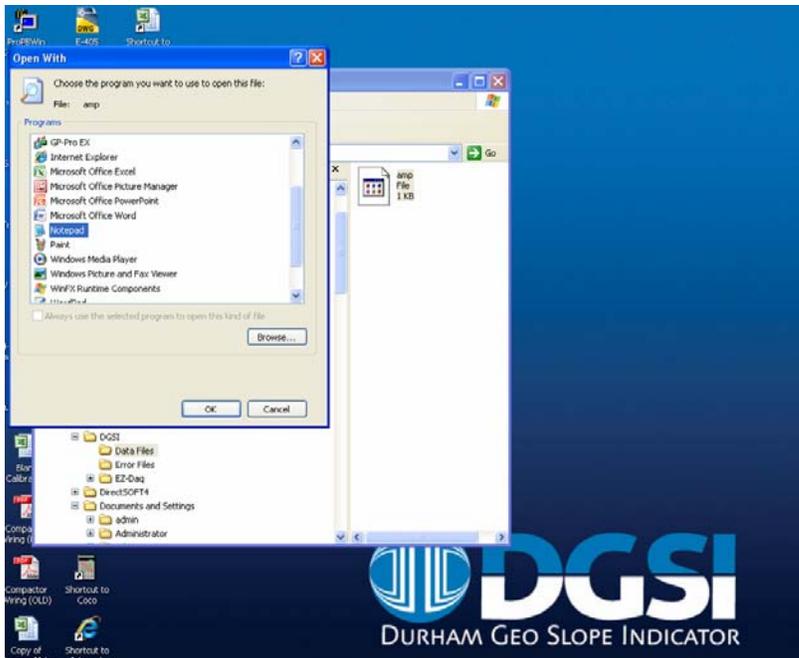
When "Start Test" begins, EZ-DAQ-Soft™ creates a file in the C:DGSI\EZ-DAQ\Data\ Directory. To open the file simply click on It. The computer will ask for a program to associate with. Select "Notepad" from the list.

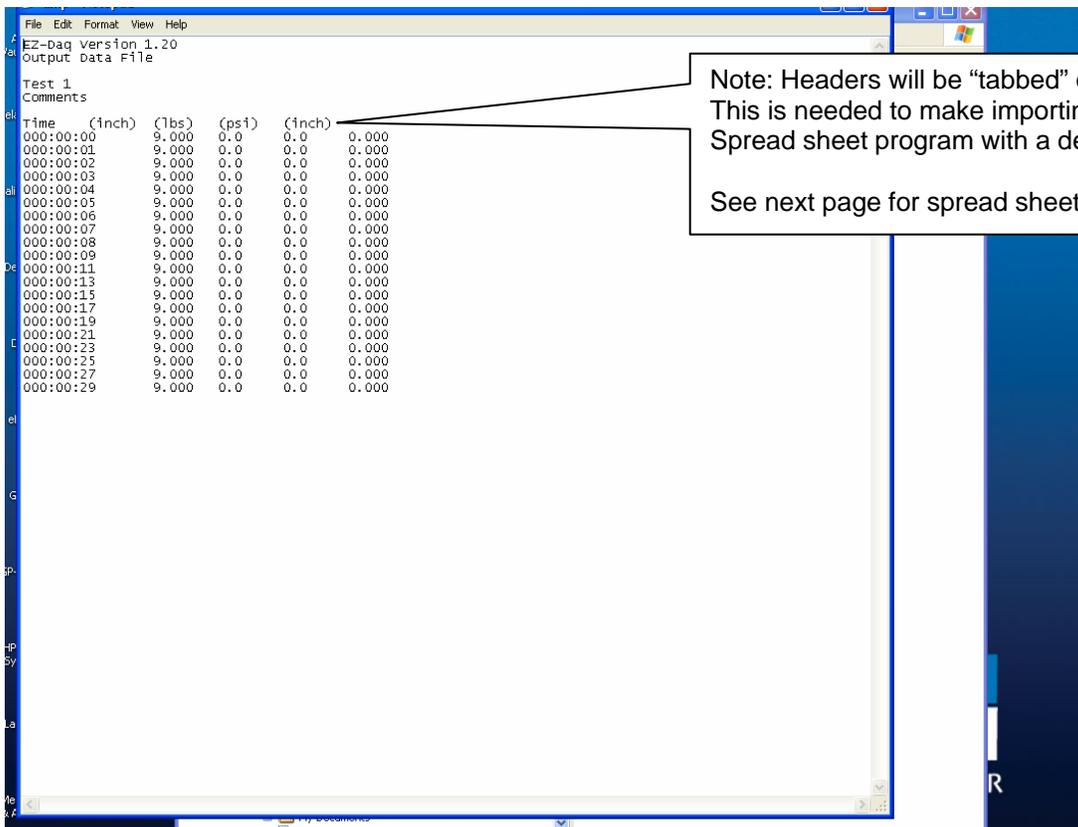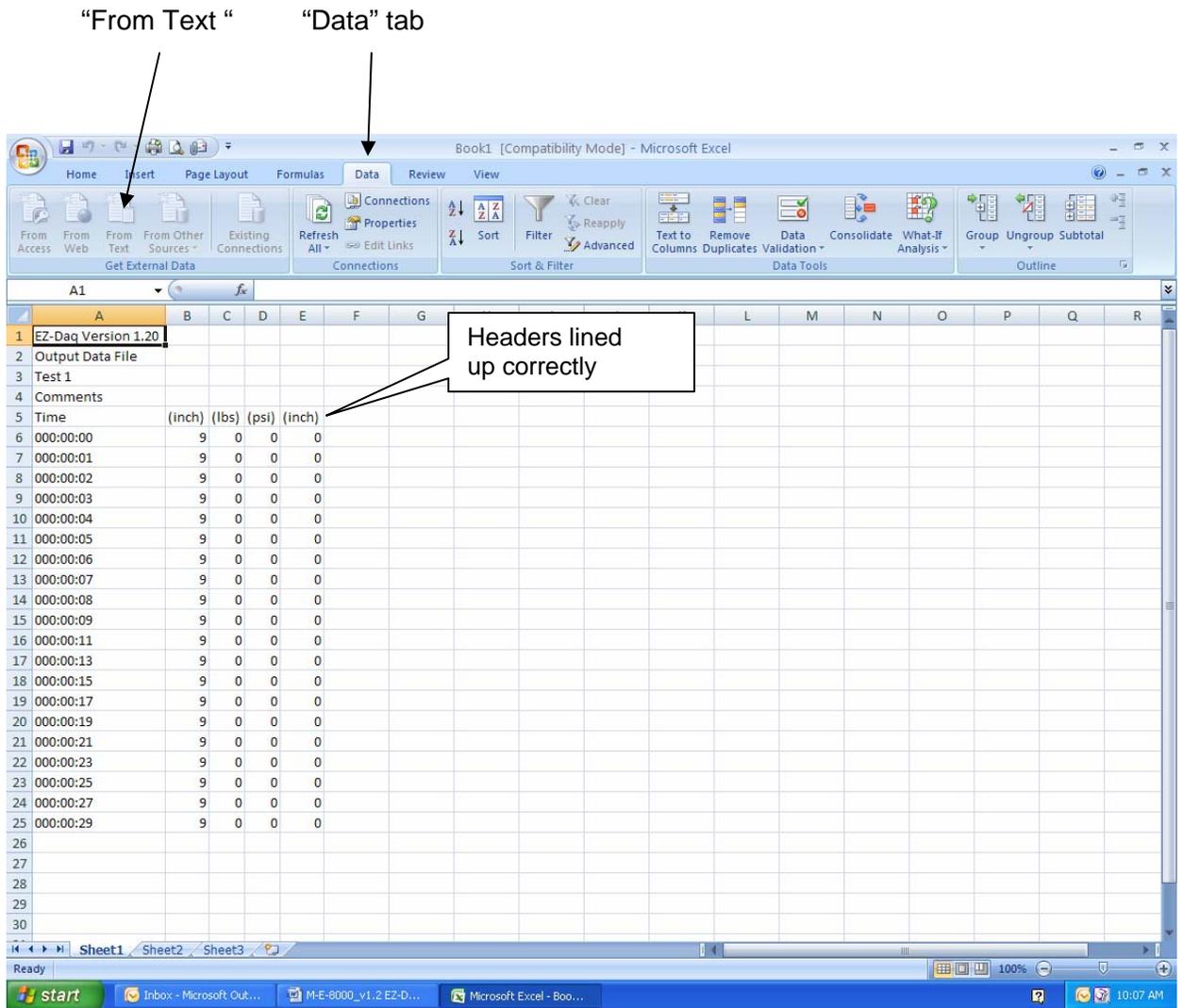Note: Headers will be "tabbed" over 1 space. This is needed to make importing into your Spread sheet program with a delimited import.

See next page for spread sheet example.

```
EZ-Daq Version 1.20
Output Data File

Test 1
Comments

Time    (inch)   (lbs)   (psi)   (inch)
000:00:00   9.000   0.0   0.0   0.000
000:00:01   9.000   0.0   0.0   0.000
000:00:02   9.000   0.0   0.0   0.000
000:00:03   9.000   0.0   0.0   0.000
000:00:04   9.000   0.0   0.0   0.000
000:00:05   9.000   0.0   0.0   0.000
000:00:06   9.000   0.0   0.0   0.000
000:00:07   9.000   0.0   0.0   0.000
000:00:08   9.000   0.0   0.0   0.000
000:00:09   9.000   0.0   0.0   0.000
000:00:11   9.000   0.0   0.0   0.000
000:00:13   9.000   0.0   0.0   0.000
000:00:15   9.000   0.0   0.0   0.000
000:00:17   9.000   0.0   0.0   0.000
000:00:19   9.000   0.0   0.0   0.000
000:00:21   9.000   0.0   0.0   0.000
000:00:23   9.000   0.0   0.0   0.000
000:00:25   9.000   0.0   0.0   0.000
000:00:27   9.000   0.0   0.0   0.000
000:00:29   9.000   0.0   0.0   0.000
```

"From Text "   "Data" tab

Headers lined up correctly

The above spread sheet file imported the data file using the "Data" tab and "From Text" button to use the delimited setting.

CALIBRATION

## 1.0   Calibration of Sensors

I M P O R T A N T   N O T E

⌨ *To configure or calibrate sensors, EZ-DAQ need not be connected to a PC unless you want to collect data. This chapter is intended for <u>a certified calibration technician only.</u>*

Note: EZ-DAQ is configured for either SI or US customary units. At present, the internal software does NOT allow the user to switch between the two units.

Press the "CONFIG" button on the Sensor Configuration Block to enter the calibration configuration part of the screen software.
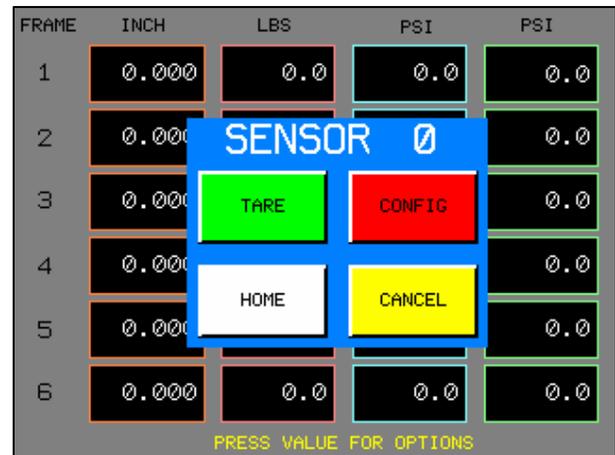
A window will open asking for a password. The factory default password is 1234. It is recommended the password is not changed to facilitate factory support.

**Password:
1234
\<enter\>**

Obtain the sensor(s) number(s). On the back of the the unit plugs are labeled 1-8.

These labels show the sensors' numbers which you input in the the corresponding box.

First box "INPUT CHL".

Touch the center of the numbered box.

Number on back of box that sensor is plugged into.
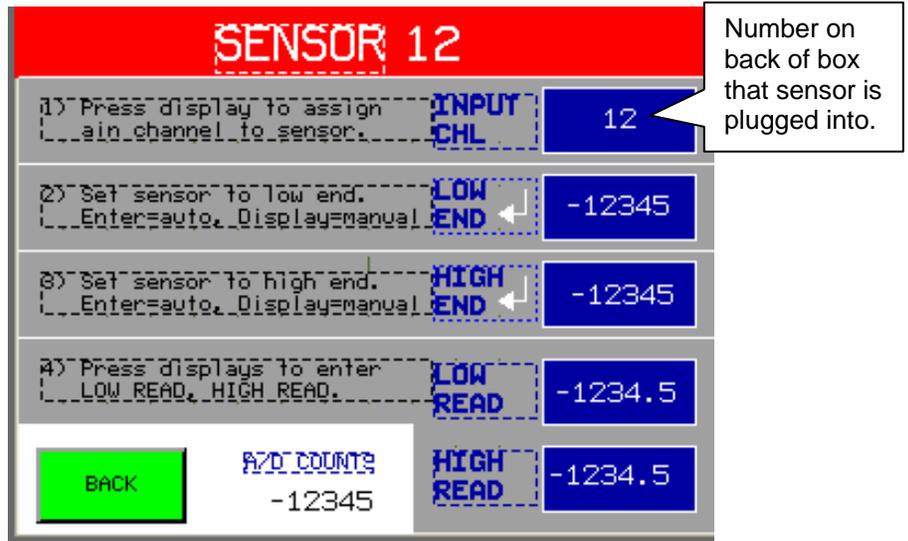
Now a pop-up box with a keypad will be displayed.

Pick the sensor to be calibrated and press "ENT".

Type sensor number on back of box into keypad.

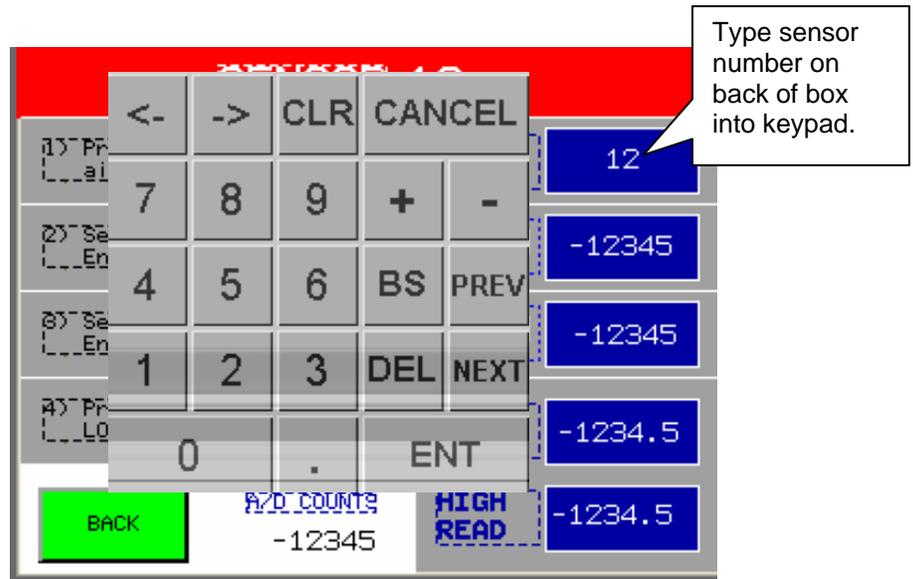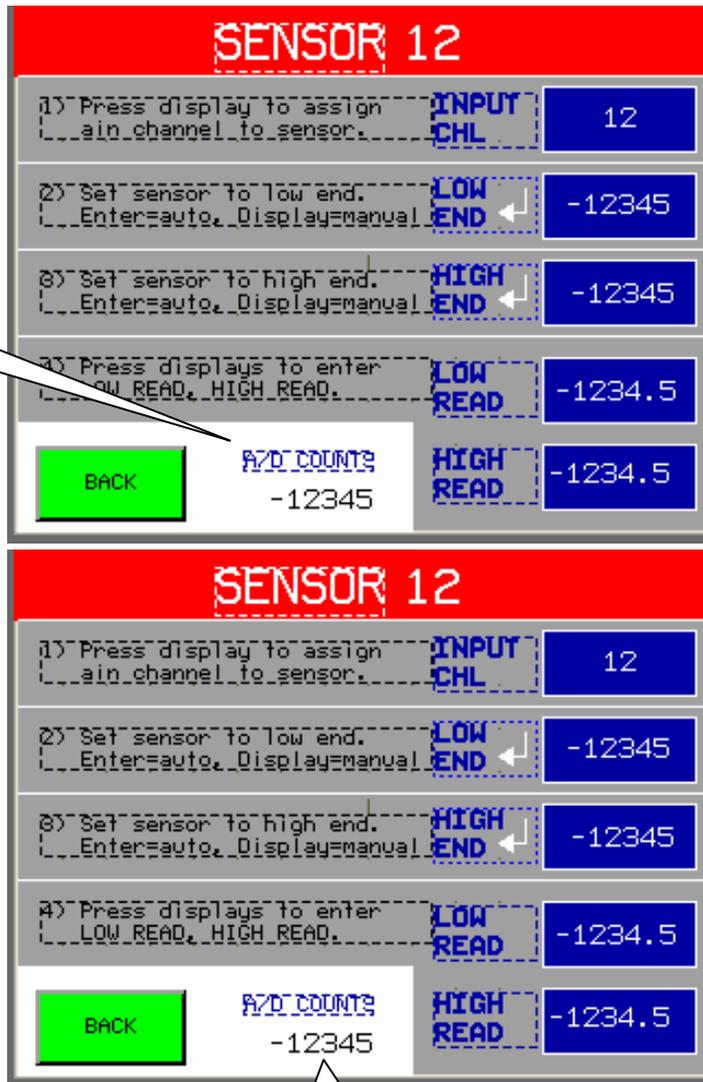Once a sensor has been selected, "A/D Counts" will display a steady showing of an analog signal input from the sensor.

A/D counts will go from random numbers, to a steady display showing the sensors output readings.

SENSOR 12

1) Press display to assign ain channel to sensor.	INPUT CHL	12
2) Set sensor to low end. Enter=auto, Display=manual	LOW END	-12345
3) Set sensor to high end. Enter=auto, Display=manual	HIGH END	-12345
4) Press displays to enter LOW READ, HIGH READ.	LOW READ	-1234.5
BACK	A/D COUNTS -12345	HIGH READ -1234.5

SENSOR 12

1) Press display to assign ain channel to sensor.	INPUT CHL	12
2) Set sensor to low end. Enter=auto, Display=manual	LOW END	-12345
3) Set sensor to high end. Enter=auto, Display=manual	HIGH END	-12345
4) Press displays to enter LOW READ, HIGH READ.	LOW READ	-1234.5
BACK	A/D COUNTS -12345	HIGH READ -1234.5

Sensor analog type mV/V or mA/A was coded into the unit before shipping to customer.

They do not interchange. Call DGSI for details.

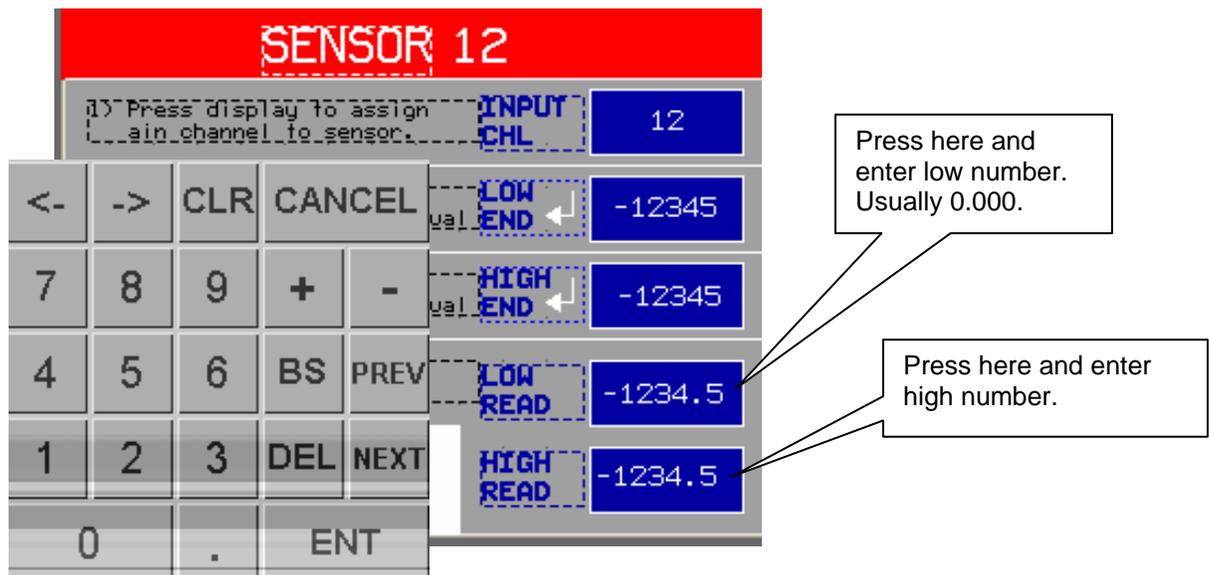Next, with sensor in no load (or zero state), press "Low End" This will load values from the sensor signals and store into the non-violatile memory of the unit.

Maximize the sensors range then press the "High End" button on the touch screen. This will load values from the sensor signals and store into non-violatile memory of the unit.

With sensor in non-loaded or relaxed state.

Press here to automatically capture low end A/D counts.

SENSOR 12

1) Press display to assign _ain channel to sensor.	12
2) Set sensor to low end. _Enter=auto, Display=manual LOW END	-12345
3) Set sensor to high end. _Enter=auto, Display=manual HIGH END	-12345
4) Press displays to enter _LOW READ, HIGH READ.	-1234.5
BACK A/D COUNTS -12345 HIGH READ	1234.5

With sensor loaded to max pressure or moved to max position.

Press here to automatically capture high-end A/D counts.

Press here and enter low number. Usually 0.000.

Press here and enter high number.

LOW READ: Set low displayed reading for low signal (A/D).

HIGH READ: Set high displayed reading for high signal input.

For example, a 1" travel LVDT is actually a little longer, maybe 1.023; Input the actual true travel the indicator has in the "HIGH READ". Or for a pressue transducer you would input the master calibrated reading from the calibration tech's traceable certified instruments.

Manually Adjusting Calibration Data.

The system allows manual input of A/D readings for re-entering calibration data or for tweaking calibration data points to achieve proper calibration results.

Press here for keypad.

Press here for keypad.

Enter new desired A/D number from keypad.
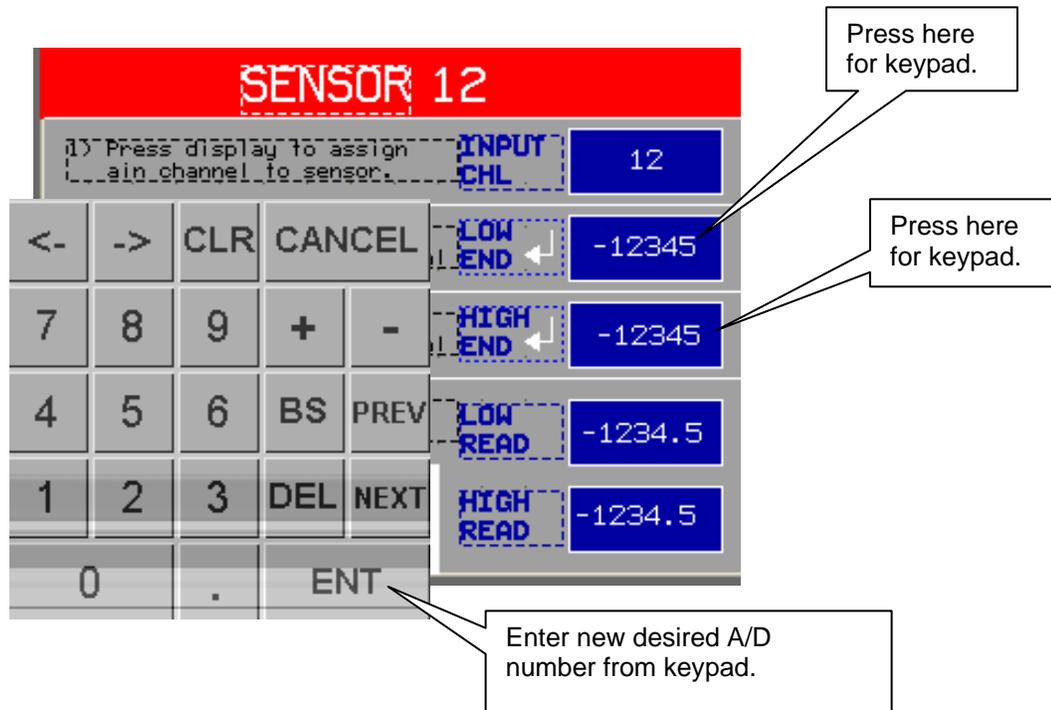
2.0   Important Information

The above calibration steps have been provided for a yearly calibration check on the DGSI EZ-DAQ touch screen.

Sensor types have been downloaded to the system by the factory before it shipped.

For example, sensor 1 is a 4-20 mA signal. This info has been coded into the touch screen at the factory. A 200 mV/v sensor can't be interchanged into this slot.

If a different sensor type is required, then factory recalibration is required.

TROUBLESHOOTING

1.0 Troubleshooting:

EZ-Daq panel shows values –but- no values are on PC software.	No communication between computer and EZ-DAQ panel. Network USB connection not working.	Check IP address: C:\DGSI\EZ-Daq\Config.ini and EZ-DAQ panel must match. Factory set for 10.11.12.42 Call DGSI for more details.
Belkin USB adaptor not working	Drivers not installed	Drivers located in EZ-DAQ CD Under Belkin directory.
EZ-DAQ Panel unit on, but shows **no** values in boxes.		Internal communication error. Call factory.
EZ-DAQ panel shows unstable values.	No sensor signal to panel. Unsteady A/D counts.	Sensor not plugged into back of panel. Sensor malfunction or cable damaged.

LIMITED WARRANTY

Durham Geo-Enterprises, Inc. / Slope Indicator ("DGSI") warrants the products manufactured by DGSI to be free of defects of workmanship and material on a product basis. The products accompanied by this Warranty Statement are warranted for a period of ONE (1) YEAR from the date of delivery to the customer. If the customer is an authorized distributor of DGSI's products, the warranty shall be for a period of ONE (1) YEAR from the date of delivery to the authorized distributor's customer.

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Any products, components or accessories that are not manufactured by DGSI and are supplied by other manufacturers are subject to their respective warranties. Certain products will carry their own warranties.

For further assistance:

  Call 1-800-837-0864 (toll free) or +1 (770) 465-7557
  e-mail info@durhamgeo.com