

# AD7714 Evaluation Software User Manual

## INSTALLING THE SOFTWARE

The basic system requirements for running the software supplied with the AD7714 Evaluation Board are as follows.

- Microsoft Windows 3.0 or later, running in standard or enhanced mode.
- 80386 or higher microprocessor.
- CGA, EGA, VGA, 8514 Hercules, or other display compatible with Windows.
- At least 2MB of RAM.

The software is distributed on a single 1.44Mbyte diskette. The diskette contains 13 files, 11 of which are to be installed onto the users system. The files that may be found on the diskette are as follows:

1. AD7714.EXE
2. GRAPH.VBX
3. GSW.EXE
4. GSWDLL.DLL
5. PORT7714.DLL
6. READ.ME
7. SETUP.EXE
8. SETUP.LST
9. SETUPKIT.DLL
10. SETUP1.EXE
11. THREED.VBX
12. VBRUN300.DLL
13. VER.DL\_

The Evaluation Software is distributed with a setup program called SETUP.EXE. This program simplifies the installation procedure by copying the files on the distribution disk to the correct directories and making a new program group (called ANALOG DEVICES) in the PROGRAM MANAGER. The application icon may be found in this group. The setup program must be started from either the PROGRAM MANAGER or FILE MANAGER in Windows. To start from the PROGRAM MANAGER simply select the RUN option in the FILE menu and type A:\SETUP and click on OK. If you are using the FILE MANAGER you can simply double click on the SETUP.EXE file. The setup program will prompt you to select a directory in which to place the program. You can use the default selection or type in your own and click on CONTINUE to proceed with the installation. When the installation is complete the Evaluation Software can be started by double clicking on the application icon in the program group called ANALOG DEVICES.

## PARALLEL PORT SELECTION

The AD7714 evaluation software allows the user to program and gather samples from the AD7714 evaluation board via the printer port of a PC. When the program starts up a window called Parallel Port Selection appears (See Fig 1). The user selects the port they wish to use by clicking on the appropriate option button and then clicking OK. The hexadecimal numbers displayed here refer to the base address of the printer port being selected. The user may wish to consult the technical manual supplied with the PC to confirm the correct selection. The selection LPT1 will work in most cases.

When the printer port has been selected the Main Menu appears.

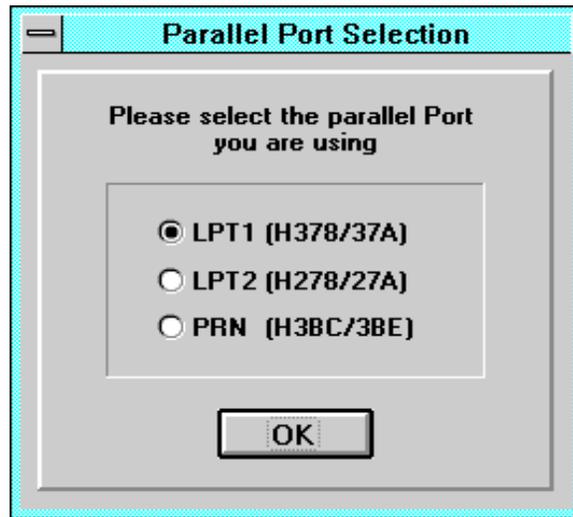


Fig. 1 - Parallel Port Selection

### 1.0 MAIN MENU WINDOW

From the Main Menu Window the user may:

- Program the AD7714.
- Read data from the AD7714.
- Perform a noise analysis on the data gathered.
- Write data gathered from AD7714 to a file.
- Read data from a file.
- Reset the AD7714 registers or interface.
- Select a different Parallel Port.
- Get version information about the software.

The Main Menu may be thought of as the "root directory" of this program. After selecting an option from the Main Menu (Fig. 2 below) the user must return to the Main Menu to select the next option. Each of these Main Menu Options will be explained in detail in the following sections.

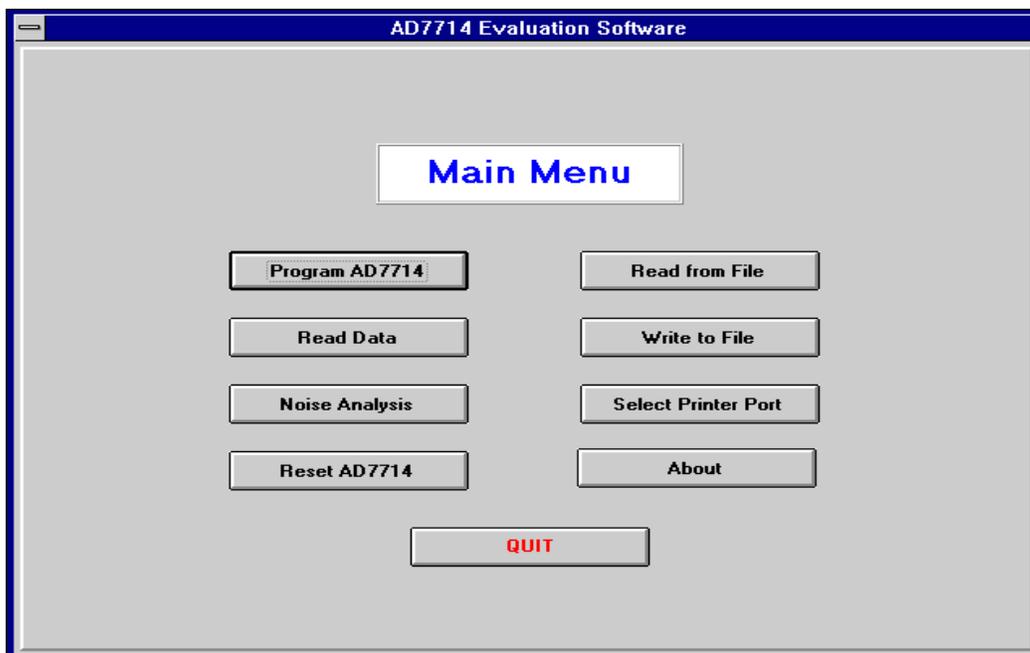


Fig. 2 - Main Menu

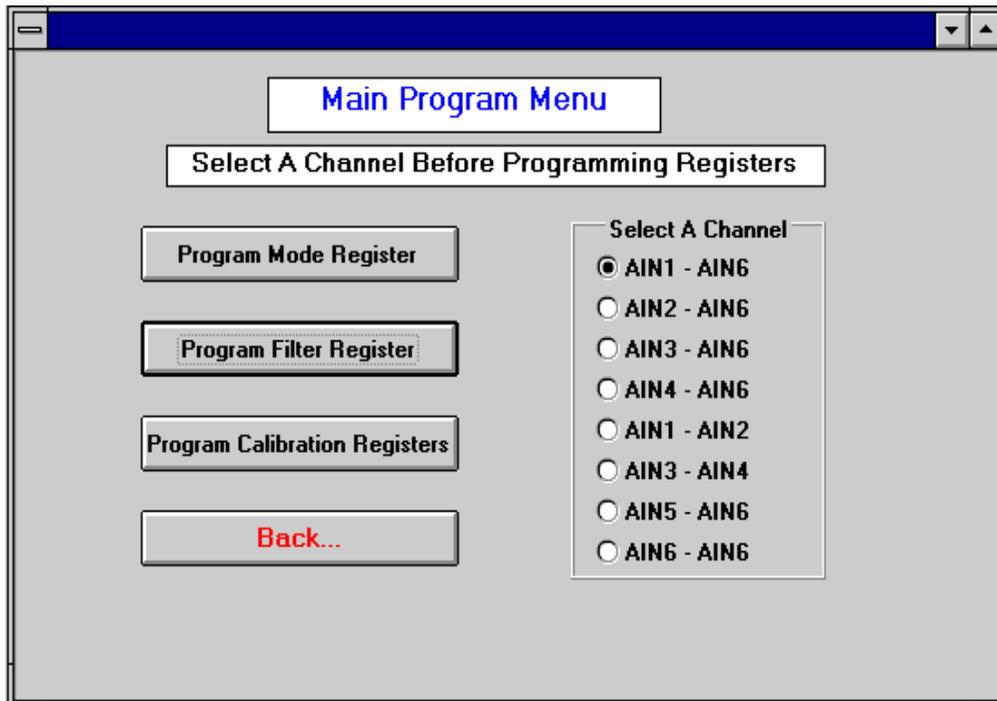


Fig. 3 - Program Menu

## 2.0 MAIN PROGRAM MENU

The Main Program Menu allows the user to select which of the registers is to be programmed in the next operation. The channel from which data will eventually be read should be selected here before attempting to program any of the registers. The registers available for programming on the AD7714 are the Mode, Filter and Calibration registers.

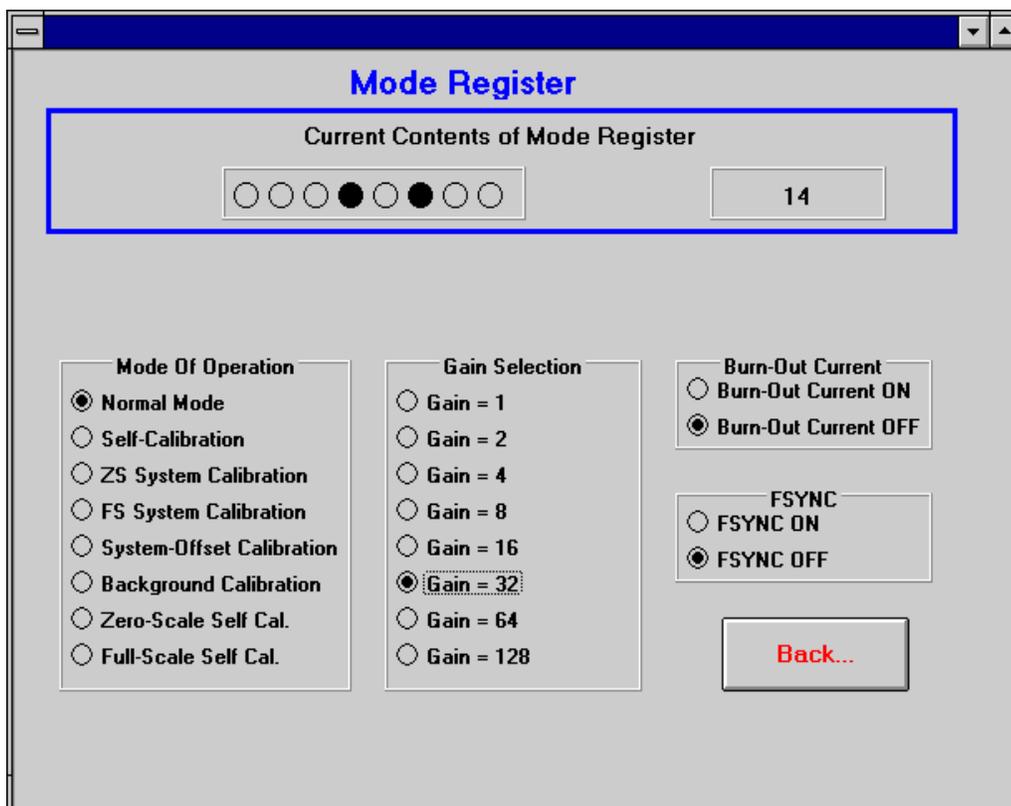


Fig. 4 - Mode Register

### 3.0 MODE REGISTER

The Mode Register window allows the user to program the different options in the mode register of the AD7714. As each option is selected the change is automatically programmed to the AD7714 and the bit indicators at the top of the screen change to reflect the contents of the register. The Mode Register allows the user to set the gain of the front end amplifier, turn the FSYNC and Burn-Out Current on or off. It also allows the part to be calibrated. When any of the self-calibration sequences are selected the program automatically writes to the mode register to start the desired calibration. If any of the system calibration sequences are required then the user is prompted to connect the relevant full or zero scale voltage to the analog input being used. The program will then complete the calibration sequence.

### 4.0 FILTER REGISTER

Fig 5 shows the Filter Register section. This window will allow the user to program all the functions contained in the Filter Register of the AD7714. The AD7714 actually contains two Filter registers ( Filter High and Filter Low). Certain operations for the AD7714 will require that the two registers are programmed (e.g. setting the output update rate) and the software will take care of this automatically.

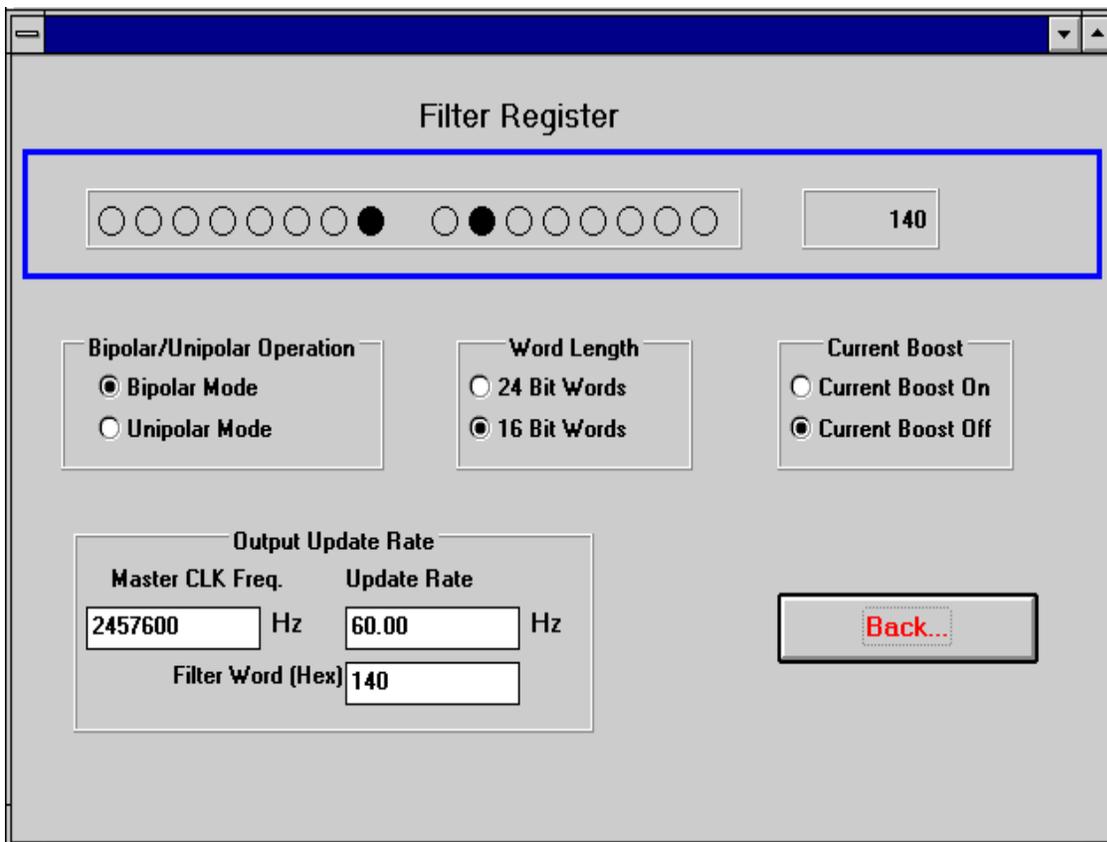


Fig. 5 - Filter Register

The Filter Register window will allow the user to select a bipolar or unipolar input range with data being returned in either 24 bit or 16 bit words. The Current Boost can also be set as required.

The output update rate can be changed either by typing the frequency in directly or by typing in the hexadecimal value required. In the event that the frequency typed in cannot be programmed exactly, the closest available frequency will be chosen.

## 5.0 CALIBRATION REGISTERS

The Calibration Register window displays the current contents of the Full Scale and Zero Scale Calibration registers. It is possible to change the contents of each of these registers if required. Each register has a text box which contains the current value of the register displayed in hexadecimal. The new value should be typed in here and it will be loaded to the AD7714 when the Return key is pressed. The bit indicators change to display the new contents.

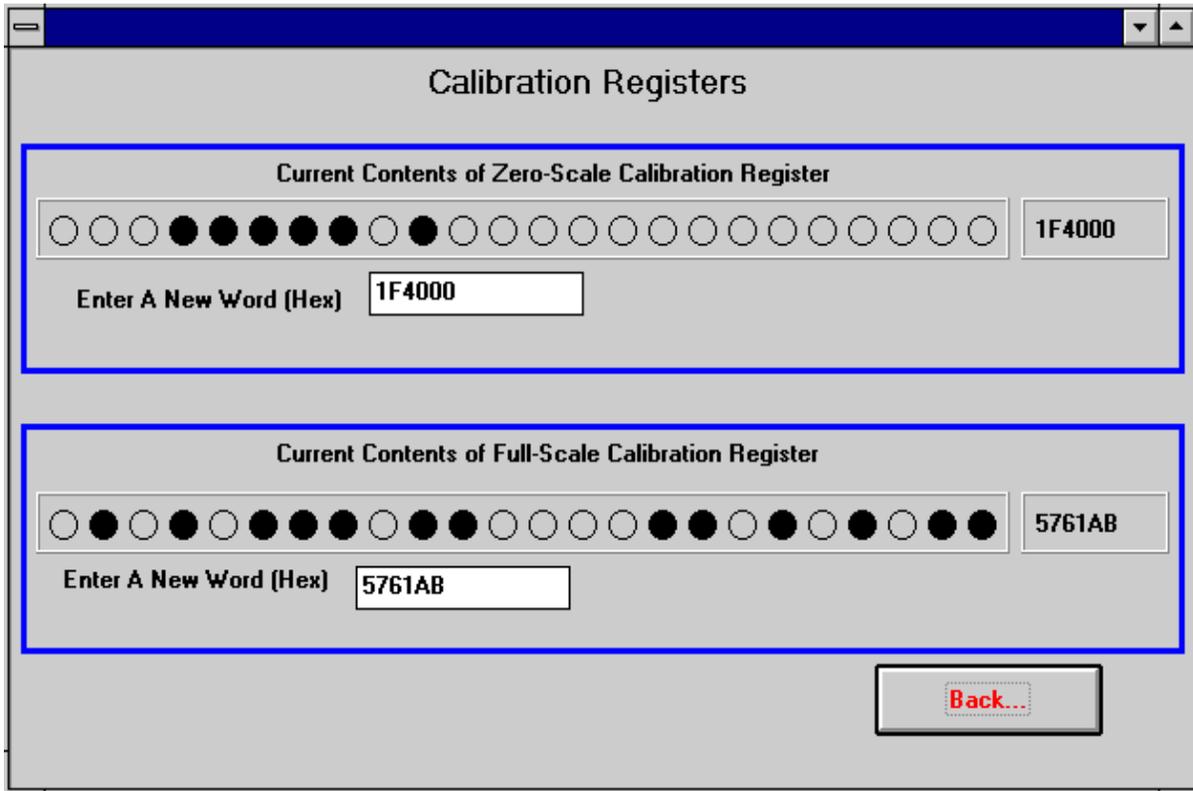


Fig. 6 - Calibration Registers

## 6.0 ADDITION INFORMATION

When any of the registers described above are changed the changes are immediately written to the AD7714. The information is then read back to ensure that it was sent correctly. If there is a discrimination an error message is displayed. In order to redetermine the correct contents of the register in question the user should go back to the previous window and reload the register window. The contents of the AD7714 register will be read and displayed as the window opens.

## 7.0 READING DATA

Once the AD7714 has been set up as required data can be read from the part by entering the READ DATA window. The windows is shown in Fig. 7. There are two ways in which data can be read from the AD7714. The first method (Read Data For Analysis) will read the required number of samples into an array and these can be graphed, saved or have noise analysis performed on them. The second method (Read Data For Display) will read single values from the AD7714's data register and display them as it goes. If it is not necessary to read every sample a delay value can be entered to create a pause between reading data values. In order for the delay value to be recognized the "Use Delay Value" checkbox should be ticked. Regardless of which method of reading data is used pressing a key on the keyboard will stop the program from reading any more data and return control to the user.

The value of the reference voltage being used on the evaluation board should be entered in the appropriate text box in the Read Data Window. The value entered here will be used to calculate the LSB size for the particular gain selected. The default value for the reference is 2.50V

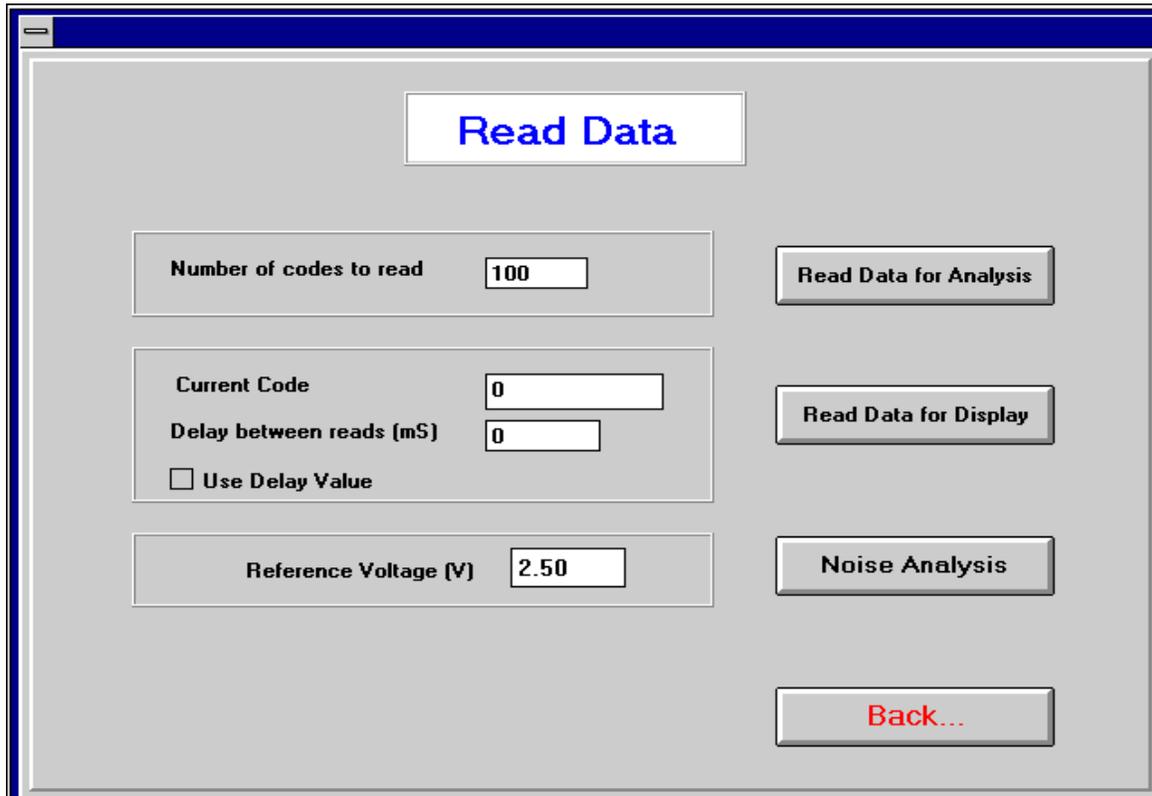


Fig. 7 - Read Data Menu

## 8.0 NOISE ANALYSIS

When data has been gathered it can be examined by entering the Noise Analysis window (Fig. 8). It is possible to enter the Noise Analysis Window from the Read Data Window or from the Main Menu Window. The window has three sections, the conditions under which the data was taken, the noise results displayed in LSBs and the noise results displayed in volts.

In the "Conditions" section the reference voltage is displayed as is the LSB size. The Gain and number of codes read are also displayed.

The "Results in LSBs" section shows the RMS noise of the samples gathered. It also shows the maximum and minimum code, the code span and the average code.

The "Results" section also shows the RMS noise and the Average Value of the data as well as the Peak to Peak noise but the results are displayed as volts.

## 9.0 GRAPH AND HISTOGRAM WINDOWS

From the Noise Analysis window it is possible to display the data gathered either by graphing it as real time data or displaying a histogram of the codes. Fig. 9 shows the Graph Window. When the window is first opened the all data is plotted on the graph. It is then possible to zoom in on a section. The left and right arrows allow the user to scroll through the graph and display small sections at a time. It is also possible to turn a grid on or off and copy the graph to the clipboard so that it can be pasted into another application.

Fig. 10 shows the Histogram Window. This window will display a graph which shows the occurrences of each code in the data that was gathered.

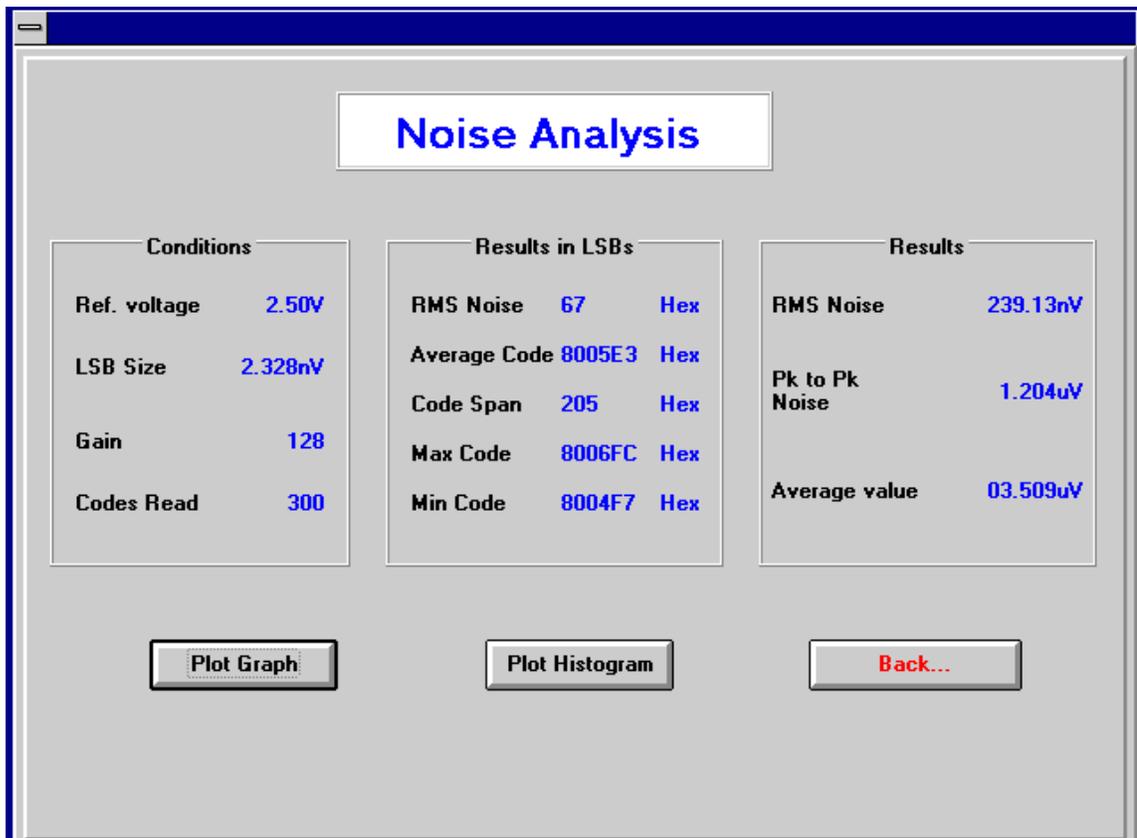


Fig. 8 - Noise Analysis Window

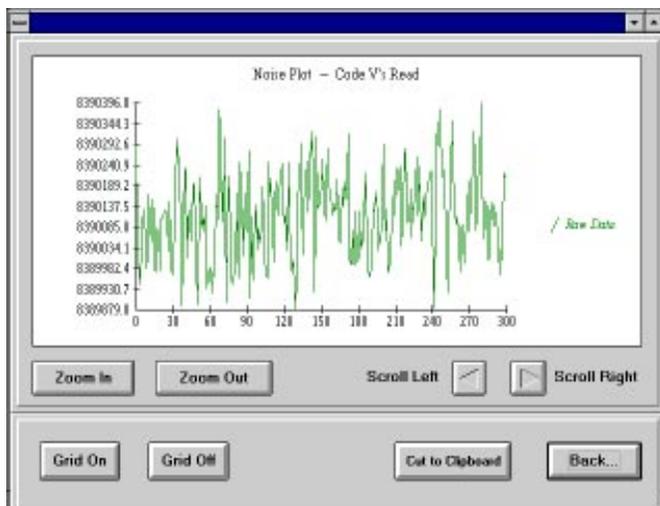


Fig. 9 - Graph Data Window

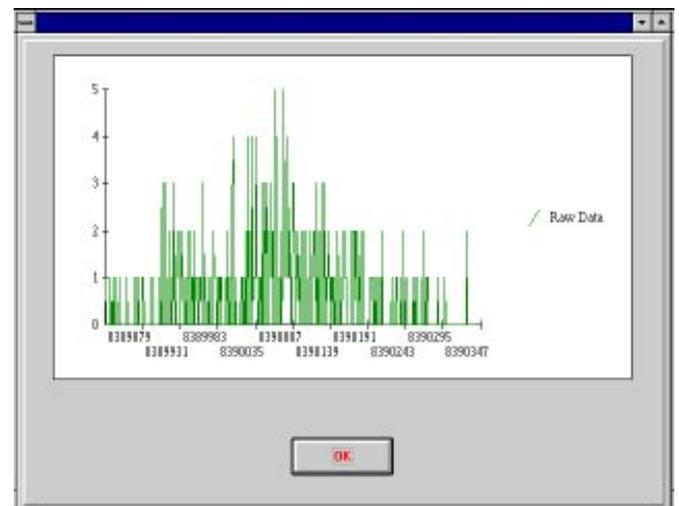


Fig. 10 - Histogram Window