5 Driver Software Operations

The Keynes Controls NetPod manager software is the package provided by Keynes Controls when you purchase any of our network products. The software operates under Microsoft Windows 95, 98, 2000 and NT operating systems. The following operations are supported:

Password Protected Operating Environment
Starting & Stopping data acquisition operations.
Channel Configuration.
Data Recording.
Calibration Operations.
Sensor Selection.
Multi-user operations.
Real Time Display
Multi-instrument Operations.

All of the graphical operations of the driver are identical no matter which network is being used to gather data.

Upon installing the driver software and up on initialisation, the NetPod manager scans the serial and local area network interfaces within the host system for Pod traffic. If any traffic identified as originating from NetPod instruments then the software auto-configures the instruments for operation. All the user need do is to assign channel names to the instruments that can be used to easily identify the source of data.

5.1 Password Protected Operating Environment

The PodMng driver software provides a password protected operating environment. There are two modes of operation **Admin** and **Operator.**

Operator mode enables data to be presented to third party applications software but prevents any changes of configuration and data transmission operations from the driver of third party software. You cannot change any instrument configurations or start and stop the data transmissions. **Operator** mode operations are ideal where you require terminals to display data only.

Admin Mode enables full configuration of the instruments. You can select and configure any instrument operation.

5.2 Software Mode Changes

To change the mode of operation of the driver software:

From the Default PodMng Window select **File > Access Control**

Figure 13 PodMng - Access Control Window

The Access Control Window will appear. Enter your password.

Select the Mode of Operation

Press the **OK** button to activate the mode change.

When the Access Control Window disappears you have changed operating modes.

5.3 Starting and Stopping Global Data Acquisition Operations

The driver software allows the user to have full control of all aspects of the data acquisition operations of the instruments. You can start and stop all data acquisition operations for all instruments simultaneously across a network or individually to a dedicated unit. The aim of this section is to describe the data acquisition operations that control all instrument operations simultaneously across a network, for the purpose of this manual called global data acquisition operations.

The status of the data acquisition operations can be clearly seen directly from the instrument status lights and from the driver by the colour of the task bar icon. The task bar icon is coloured green when data transmission operations are active and red when no data is present. See images below

Starting Global Data Transmission Operations

The following section shows the instruction to follow to start global data acquisition operations ie start all instruments up on a network to broadcast data.

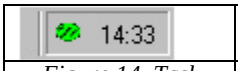

Figure 14 Task bar icon - Data Transmission Active

1. From the main menu select the ***FILE*** menu item.
2. Using the mouse pointer or cursor keys select the ***Run Mode*** menu item.

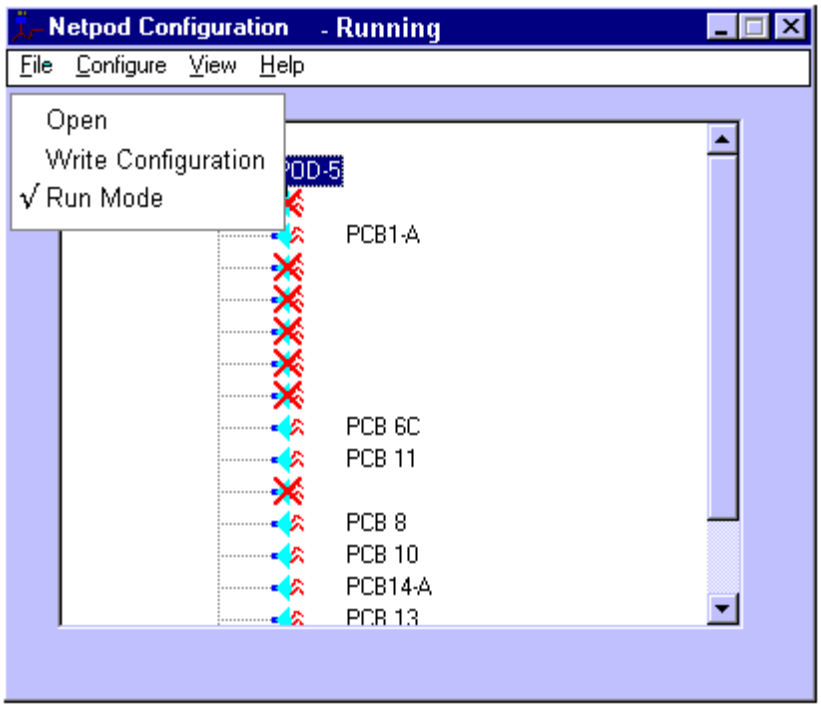

Figure 16 PodMng Software - Run Mode Active

A tick mark will appear adjacent to the ***Run Mode*** menu option. The tick mark is used to indicate that data recording and control operations are under way.

3. The File menu options will disappear and the main menu be displayed. You can now carry out any further operations.

Note. In order to check the status of the logging operations from the NetPod manager simply select the **FILE** menu option from the main display. You will see a series of menu items displayed on the screen , one of them being the ***Run Mode*** option.

If a tick mark is displayed adjacent to the **Run Mode** menu item then data acquisition operations are underway.

The task bar icon will appear to be flashing green in colour.

Stopping Data Transmission Operations

The following section shows the instruction to follow to start global data acquisition operations ie start all instruments up on a network to broadcast data.

1. From the main menu select the ***FILE*** menu option.
2. Using the mouse pointer or cursor keys select the ***Run Mode*** menu item.

   The tick mark which appears adjacent to the ***Run Mode*** menu item will disappear.

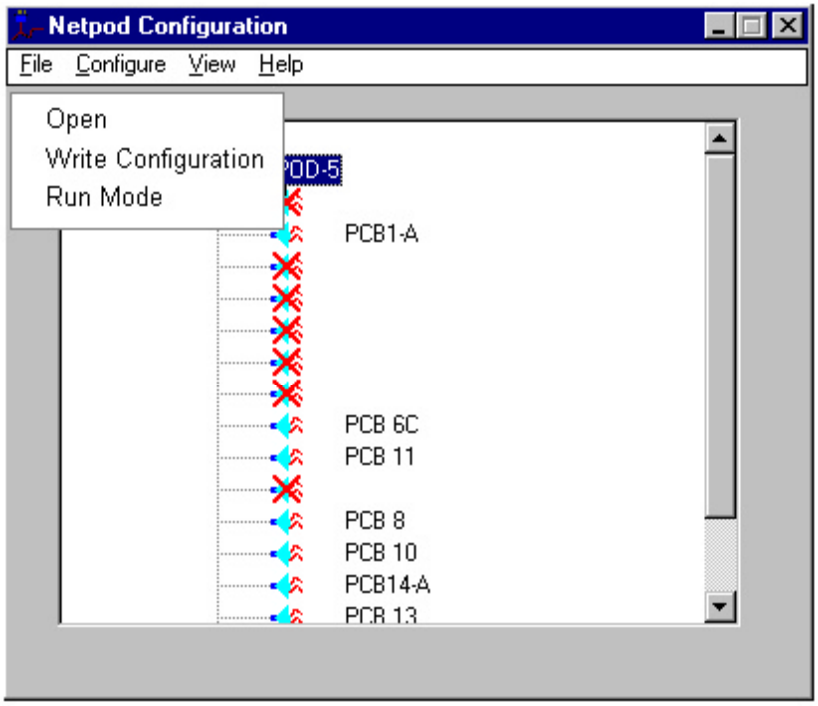

Figure 17 PodMng Software - No Data Acquisition Stopped

A tick mark is used to indicate that data recording and control operations are active and that data may be in the process of being recorded.

3. The File menu options will disappear and the main menu be displayed. You can now carry out any further operations.

   The instrument Tx and Rx LEDs will stop flashing (LAN operations only)

   The task bar icon will appear to be flashing green in colour.

5.4 Starting and Stopping Data Acquisition Operations for a Specified Instrument

The following section describes the operations to follow to start and stop data acquisition operations for a single specified instrument. These operations are meant as an aid to testing the network prior to acquisition operations are overridden by the use of global acquisition commands.

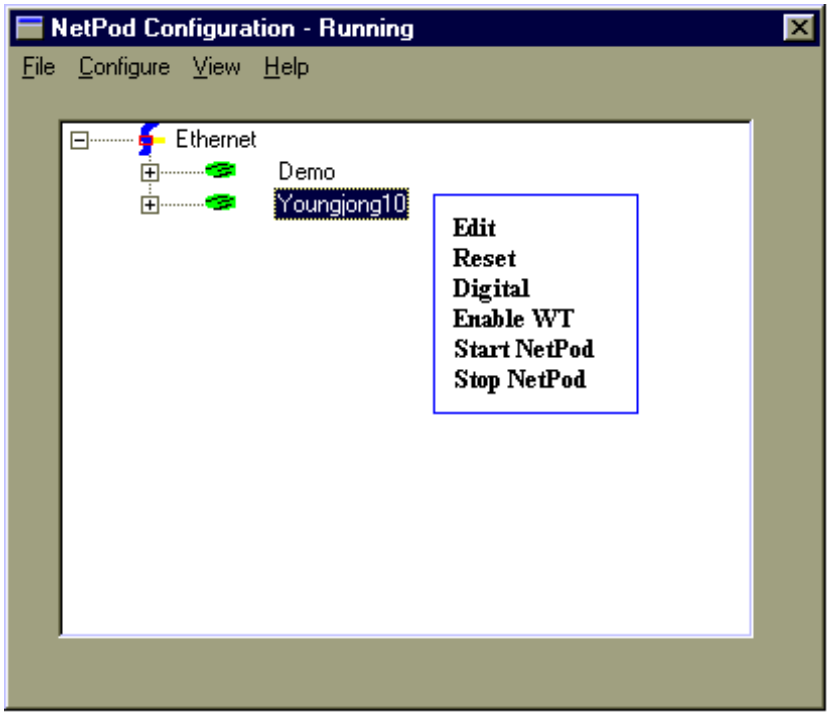

Figure 18 - Start and Stop acquisition - menu options

Stopping Data Acquisition Operations for Specified Instrument.

1. Ensure that the driver is active and receiving data. The task bar icon should be flashing green

2. From the main driver window (as above) select the instrument whose data acquisition operation you want to suspend (stop) using left hand mouse.

3. Once you have selected the instrument whose data transmission operations you want to suspend press the right hand mouse button. You will observe a menu appear adjacent to the selected instrument with the following options: EDIT, RESET, DIGITAL, ENABLE WT, START NetPod, STOP NetPod

4. Select " Stop NetPod" option – you will observe the Tx status light on the instrument is off.

5. The Error log will report `Time (00:00:00) Pod-id disabled`

Starting Data Acquisition Operations for Specified Instrument.

1. Ensure that the driver is active and receiving data. The task bar icon should be flashing green

2. From the main driver window (as above) select the instrument whose data acquisition operation you want to activate (start) using left hand mouse.

3. Once you have selected the instrument whose data transmission operations you want to activate press the right hand mouse button. You will observe a menu appear adjacent to the selected instrument with the following options: EDIT, RESET, DIGITAL, ENABLE WT, START NetPod, STOP NetPod

4. Select " Start NetPod" option – you will observe the Tx status light on the instrument is now active.

5. The Error log will report "`Time (00:00:00) Pod-id Enabled`"

REMEMBER – activating logging from the driver for all units will over ride these actions.

5.5 Configuring the Analogue Input Channels

The following instructions detail the procedures followed to assign channel configuration details for use within the Pod Manager software package:

From the main menu select a Pod whose channel you want to configure.

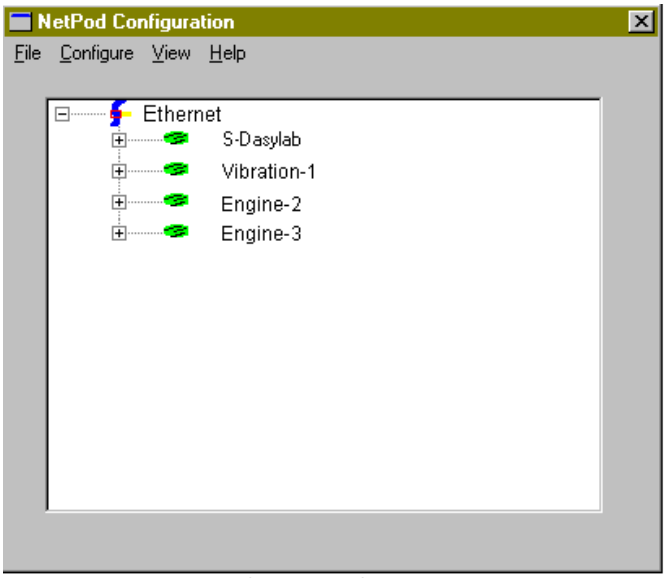

Figure 19 PodMng Software - Default Screen (Multi-user operations)

The Window shown above is the main configuration Window that appears when the PodMng software first activated and the network scanned in a multi-instrument environment. Each of the NetPod instruments for which data traffic has been identified will be shown on the main screen below the title listing the interface upon which traffic was detected.

For data originating from instruments connected to the RS-485 or RS-232 serial ports then the interface named on the main configuration menu will be titled **Ports**. For data identified as originating from the 10 Base-2 or 10BaseT interfaces then the titled **Ethernet**.

1 Move the mouse pointer over the Pod chosen for channel configuration. Select by pressing the left hand mouse button either the + symbol; which appears adjacent to the Pod for which channel details are going to be adjusted, or directly the channel which is going to be configured.

NOTE.

On selecting the + symbol. The channel details associated with the chosen pod will be listed. The Pod manager software will interrogate all identified units and report details of any analogue and digital interface cards installed within the instruments.

2. Move the mouse pointer until it is above the channel name which has been selected for configuration.

Double click the left hand mouse button. The **Edit Channel** window will appear. If you do not double click the left hand mouse button quickly enough then only the text on the menu will change. The text will change from black on a white background to white on a blue background.

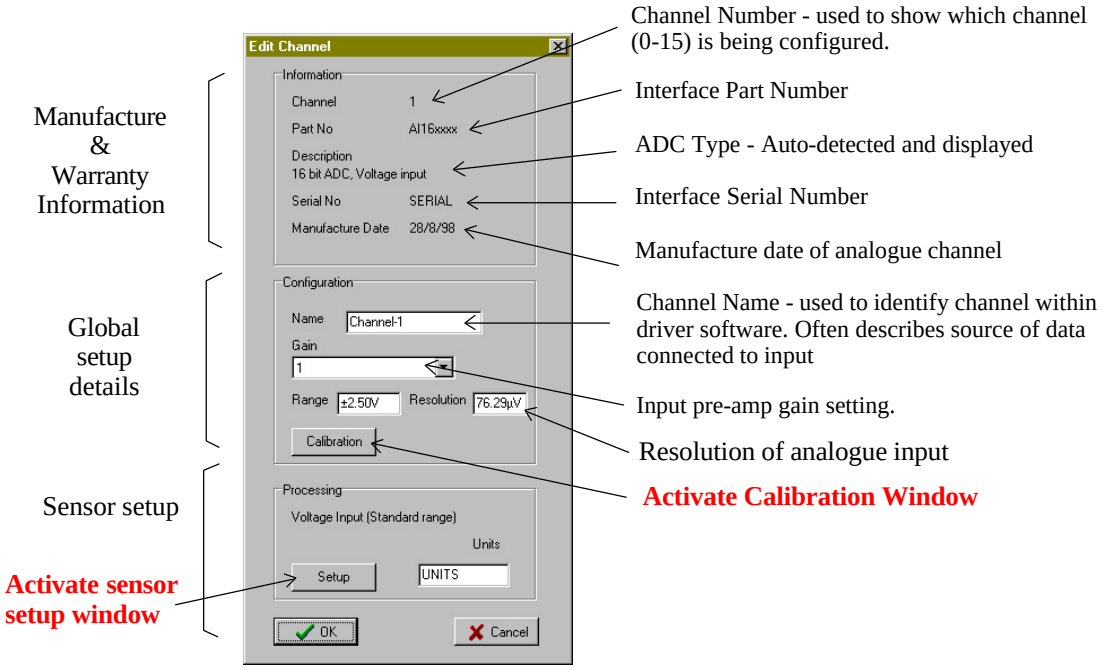

Figure 20 PodMng Software - Edit Channel Window

3 Using either the Tab key or mouse pointer, select the parameter that is to adjusted.

4 On completing the channel configuration details select the "OK" button. All of the newly configured parameters will now take effect.

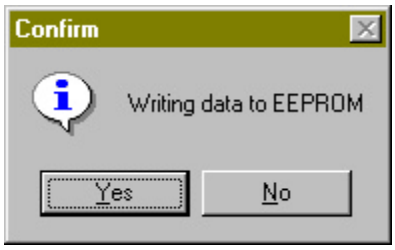

Figure 21 PodMng Software - Confirm Window

NOTE.

If at any time you want to stop the configuration process simply select the "Cancel" button on the Edit Pod menu. The Edit Pod menu will disappear and you will return to the main system configuration menu.

5.6 Setting the Sample Rate

The following section details the operations that are to be undertaken to set the sample rate of the NetPod. Unlike most data acquisition systems the NetPod supports multiple sample rate operations.

5.7 Multi-Rate Data Acquisition

NetPod enables multi-rate sampling to be undertaken across a network. You cannot mix sample rates directly within a single unit but you can have multiple units running on a network operating at different rates. For example, if you have three units on a network, Pod-1 can operate at 1 KHz, Pod-2 at 500 Hz, and Pod-3 at 10 Hz. There are no limitations on how you mix the sample rates. You can choose any option specified on the sample rate setup menu. The sample rates at which are unit will operate are automatically determined and are based upon the technical specifications of the input modules.

5.8 Data Decimation

In order that you can undertake multi-rate data processing for analogue channels contained within the same unit, you will have to develop you own processing software. A drivers developers kit has been created to enable you to design you own applications and utilise the functionality within the instruments

To set the sample rate of a chosen NetPod unit follow the instructions specified below

5.9 Sample Rate - Instructions.

Using either the Config or Podmng software, stop the data transmission operations across the network.

For sample rate changes the data transmission operations must be stopped regardless of type of network from which data is being acquired. The Podmng software displays a green flashing icon while data is being broadcast by NetPod instruments across a network. The Podmng software displays a red icon when data transmission operations are suspended.

1) Display the Default driver menu.

   Move the mouse pointer until it is above the Podmng icon. Press the Right hand mouse button.

   Select the ***Config*** menu option.

2) The Default driver screen will appear. Select the NetPod unit whose sample rate you want to adjust.

   Move the mouse pointer until it is directly above the NetPod icon whose sample rate you want to adjust.

   Double click the left hand mouse button.

3) The **Edit Pod** window will appear. Note. It is using the **Edit Pod** Window that the sample rate can be adjusted.

4) Using the mouse pointer or **Tab** key select the Sample Rate pull down menu list.

   Once you have selected the Sample Rate pull down menu, you can select the new sample rate by using the Up and Down cursor keys to adjust the highlight bar or by simply selecting the new rate directly by the mouse pointer.

5) Once you have selected the new sample rate press the **OK** button. The ***Confirm*** screen will appear.

6) Select the OK button on the Confirm screen to store new sample in the specified pod.

   Once you re-start the data transmission operations the new sample rate will take effect.

5.10 Multi-user Operations

The standard driver supports multi-user operations. Simply load the driver software on to the additional PCs using the CD supplied with the instrument. The software for multi-user operations is generally supplied in two parts. The standard driver i.e. PodMng is provided for general purpose operations, diagnostics and instrument configuration. Third party drivers are supplied to integrate data from the instruments directly into applications packages.

When operating in a multi-user environment the PodMng software will appear in just the same way as described for single user operations. The software automatically determines the state of the data emissions from the instruments on a network. If data transmissions from the instruments is detected the task bar icon colour changes from red to green.

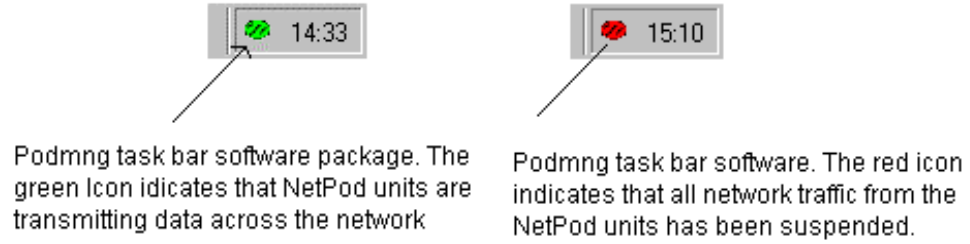

Figure 22 - Taskbar Operations Indication

Depending upon which mode of operation you are using, i.e. **Admin** mode or **User** Mode (See Section 4.3). you can configure the instruments, start and stop data transmissions and record data directly from each User's terminal. Most third party drivers call the NetPod.dll to transmit and receive configuration details to and from the instruments.

The control of the instruments is a global operation i.e. effects all users and instruments. Starting and stopping data transmissions and configuration changes are reflected directly to each user connected to the network. The driver software automatically detects any changes and updates each user automatically. There are no configuration files to maintain. The automatic updating of the Keynes Controls software is not necessarily a feature of third party packages.

5.11 Real Time Data Display

To observe real time data from any of the instruments on the network follow the instruction below. You must ensure that that the network data transmission operations are active.

1) At the PodMng Window select ***View*** window option

   The **Display** window will appear

2) The Display window has the following Tab options. Graph, Raw, Processed Errors

3) Select the Graph Tab The Chart Recorder display will appear.

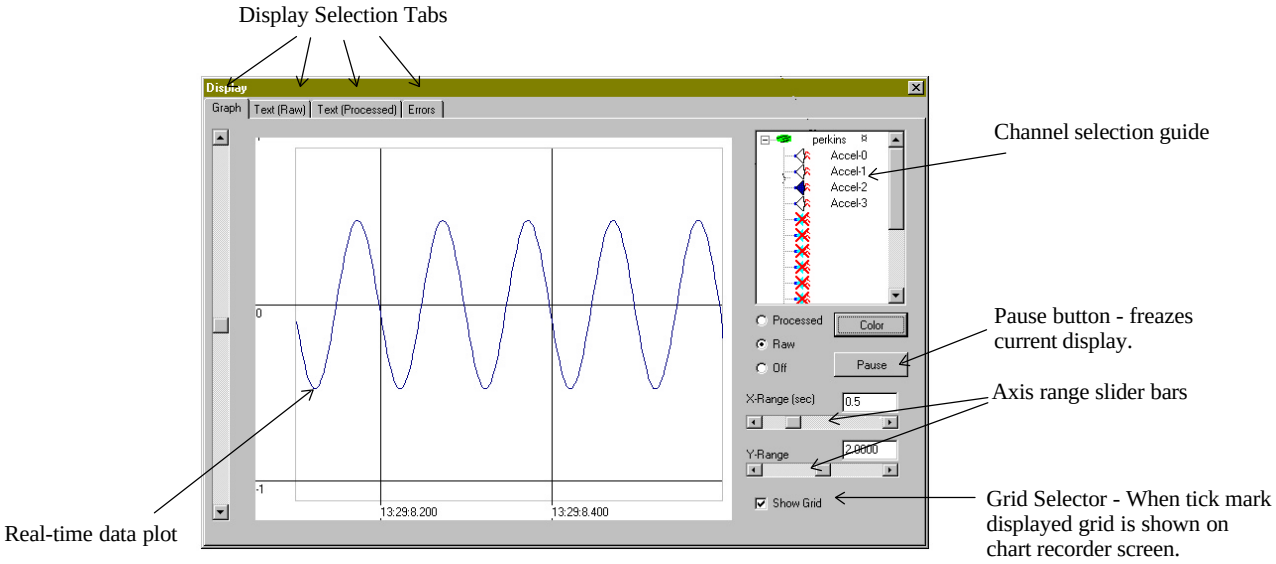

Figure 23 PodMng Software - Chart Recorder Display

4) You can observe data from any instrument on the network. Using the Channel selection guide select the instrument and channel whose data you require to plot.

5) For each channel you are using select either Raw or Processed data type options. You can mix raw and processed data on the screen.

5.12 Text Display - Raw and Process Data

To observe the raw and processed data in a text format follow the instructions below:

1) At the Display Window (See Figure 20) select the **Text (Raw)** or **Text (Processed)** tab.

You will see a display similar to the one shown below.

Each instrument will be listed horizontally across the screen

Listed below each instrument will be the data from the analogue input channels. A blank space in the channel list shows that no channel is installed in the instrument.

The display should match directly the configuration of your channels in the instruments.

When you have finished with the display. Close the Display window. Closing the window does not stop the driver from operating. No data is lost if your are streaming results to disk.

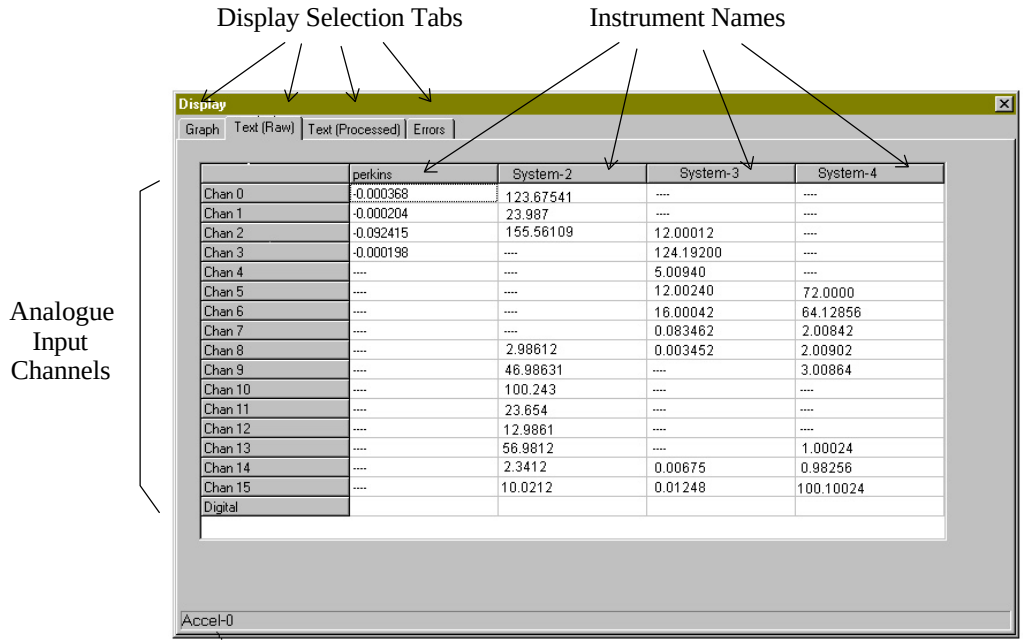

Figure 24 PodMng Software - Real Time Text Display

5.13 Channel Configuration - Edit Channel Menu

The following instructions detail the procedures to be followed to assign channel configuration details for use within the Pod Manager software package:

1. From the main menu select a Pod whose channel you want to configure.

NOTE.

The main configuration menu is the menu that appears when you first activate the NetPod manager software. Each of the NetPod instruments for which data traffic has been identified will be shown on the main screen below the title listing the interface upon which traffic was detected. For data originating from instruments connected to the RS-485 or RS-232 serial ports then the interface named on the main configuration menu will be titled **Ports**. For data identified as originating from the 10 Base-2 or 10BaseT interfaces then the titled **Ethernet**.

2. Move the mouse pointer over the Pod chosen for channel configuration. Select by pressing the left hand mouse button or the + symbol; which appears adjacent to the Pod for which channel details are going to be adjusted, or directly the channel which is going to be configured. Figure 15 shows the **Edit Channel** Window

NOTE.

On selecting the + symbol. The channel details associated with the chosen pod will be listed. The Pod manager software will interrogate all identified units and report details of any analogue and digital interface cards installed within the instruments.

3. Move the mouse pointer until it is above the channel name which has been selected for configuration.

Double click the left hand mouse button. The **Edit Channel** window will appear. If you do not double click the left hand mouse button quickly enough then only the text on the menu will change. The text will change from black on a white background to white on a blue background.

4. Using either the Tab key or mouse pointer, select the parameter that is to adjusted.

5. On completing the channel configuration details select the "**OK**" button. All of the newly configured parameters will now take effect.

NOTE.

If at any time you want to stop the configuration process simply select the "Cancel" button on the Edit Pod window. The Edit Pod Window will disappear and you will return to the main system configuration menu.

5.14 Multi-instrument Operations

The NetPod supports multi-instrument operations on the 10Base2/10BaseT and RS-485 networks. NetPod has been designed for operation on Ethernet networks and it is with this type of network that the main benefit of the instrumentation will be achieved.

To install additional instruments to a 10BaseT network simply power on the instrument and connect the twisted pair network cable from the hub to the NetPod RJ45 socket. Instantly the instrument detects network data you will see the **link** status light illuminate. The Link status light is one of the LEDs mounted on the front panel of the unit. You must ensure that each instrument has its own unique IP address before connecting onto a network.

The addition of further instruments to a 10Base2 network is also a simple operation. This time instead of connecting the twisted pair cable as described for 10BaseT operations, simply connect the 10base2 Ethernet string to the instrument via the BNC connector using the a T piece. Remember, if the instrument is the last unit on the Ethernet string you must ensure that the 50 Ohm end terminator is connected.

When using 10Base2 network, the link status light does not function. You have to use the software to show that instrument is connected to the network and operating correctly. Figure 14 shows a typical PodMng Window in multi-instrument operation.

5.15 Data Recording Operations

The following page details the instructions that should be followed to store data to disk. Each user can record data using the PodMng software or third party application packages.

1) From the main menu select the ***Configure*** menu option

2) Select the ***Logging*** menu item to access the data recording operations setup screen.

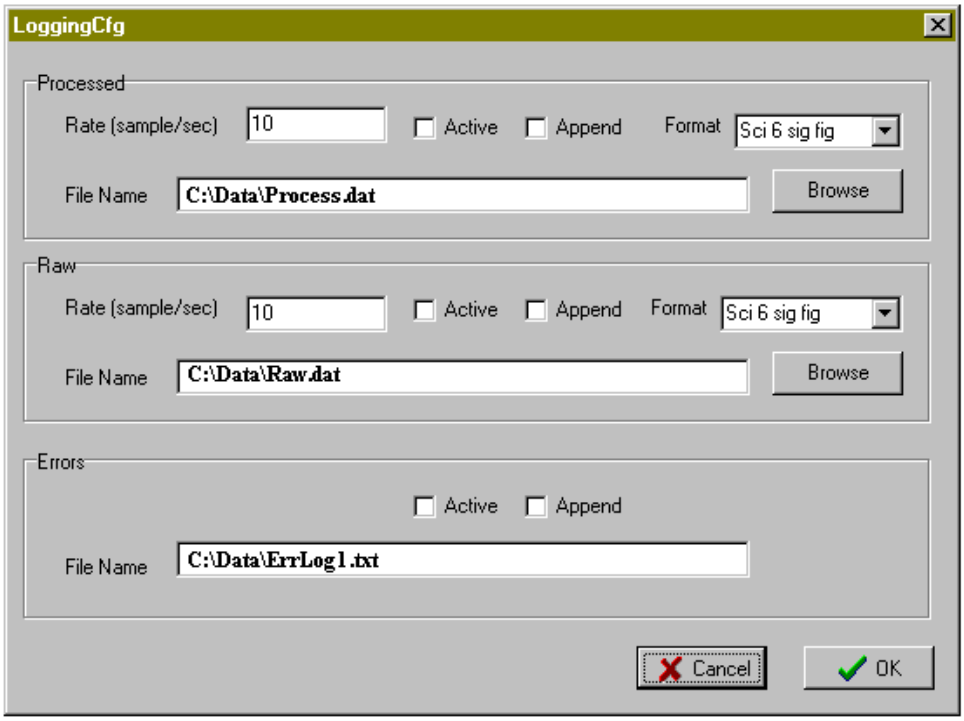

Figure 25 PodMng Software - LoggingCfg Window

Using the LoggingCfg setup dialog box simply enter the file names and directory locations where you want to store processed and raw data.

Processed Data: This is data converted into engineering units by a mathematical process.

Raw data: This is the data gathered by the NetPod instruments prior to any data processing

3) Enter in the "Rate (Sample/sec)" boxes the desired sample rate.

Only enter sample rates up to the maximum rate set for the NetPod instrumentation. The recording of data does not include any multi-rate filtering to eliminate aliasing effects.

4) Using the mouse pointer select the desired type of recording operations.

Active: Data is recorded to a new file each time storage operations are activated. Old files are over written.

Append: Data is appended to the end of the specified file at the resumption of data recording operations.

Move the mouse pointer over the data recording function tick boxes. Use the left mouse button to select the desired option. You can only select one option at any one time for either of the raw and processed data file.

5) Once you have completed the setup operations select the OK button. The **LoggingCfg** Window will disappear and you will return to the default screen.

5.16 Error Recording

Error recording is useful to show the status of the instruments and network operations for a series of instruments widely separated on an Ethernet network. It is possible to locate and in may cases identify the source of any system error with out need of manually inspecting the instruments.

The following page details the instructions that should be followed to record the instrument and network error messages to disk. Each user can record an error log using the PodMng software or third party application packages.

1) From the main menu select the ***Configure*** menu option

2) Select the ***Logging*** menu item to access the data recording operations setup screen.

3) Using the LoggingCfg setup dialog box (See Figure 22) simply enter the file name and directory location where you want to store the error log. Enter the error log file name in the space provided for this information.

4) Using the mouse pointer select the desired type of recording operations.

   Active: Data is recorded to a new file each time storage operations are activated. Old files are over written.

   Append: Data is appended to the end of the specified file at the resumption of data recording operations.

   Move the mouse pointer over the data recording function tick boxes. Use the left mouse button to select the desired option. You can only select one option at any one time for either of the raw and processed data file.

5) Once you have completed the setup operations select the OK button. The **LoggingCfg** Window will disappear and you will return to the default screen.

5.17 Network Error Report

In order to provide a clear indication as to the operating characteristics for each instrument connected to a LAN a network reporting system has been created.

To view the Error Report Window you should.

1. Select the **View** menu option from the PodMng default screen.
2. Select **Error** Tab on the Display Window. On selecting the Error tab the Error Display Window will appear.

The **Error Display Window** is split into two parts. The top screen shows the instantaneous messages that are directed to the PodMng from the instruments. The bottom of the screen shows each instrument connected to the network and a real time summary of the network statistics.

For each instrument connected to the LAN the following network statistics are reported:

Packets Missed
Packets Resent
Packets Lost
Status: OK (Normal Operations) Failed (Network time out, power failure)

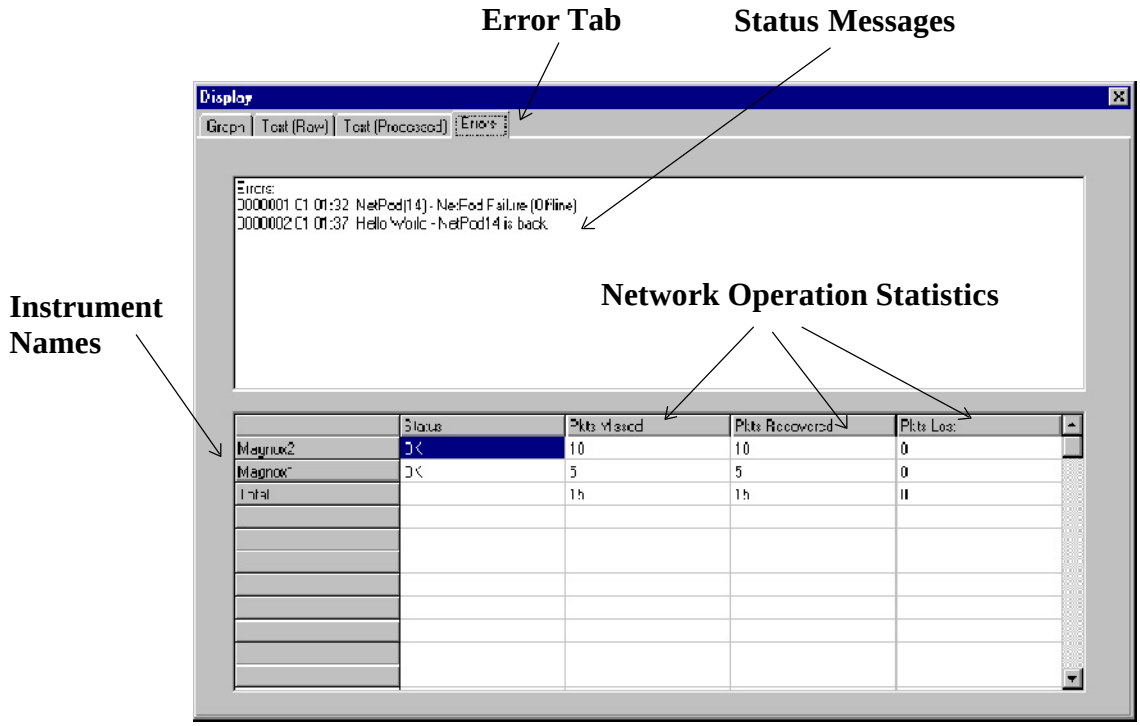

Figure 26 Error Report Window

The Status message indicates the instantaneous action of the instruments. **OK** for successful operations and **Failed** for any instrument that have timed out or become disconnected.

5.18 Hiding Error Screen From User

It is not possible to have a perfect network where no packets will be lost. In order to prevent confusion with a user, a facility has been included with the driver software to remove the error log from a users screen. The error log is removed by a simple command included in the operating system registery.

Remove error log from screen insert following command into Registery

Command1= nopackerr