WAVEWIN

TIS

USER'S GUIDE

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Preface

This document contains information about how to install, configure and operate the Wavewin TIS. The Wavewin TIS is composed of a set of non-intrusive components that install on live circuits and are used for monitoring protection system performance.

It is ideal for dynamic relay testing and for trouble-shooting control circuits, ct and motor currents.

Documentation Format

The documentation is structured to the following format:

- Chapter 1, Quick Start - A brief overview on how to use the Wavewin TIS.
- Chapter 2, Describes the Wavewin TIS software and hardware specifications.
- Chapter 3, Describes the system requirements and installation along with uninstall procedures and technical support.
- Chapter 4, Describes how to use the TIS configuration software (TISConfig).
- Chapter 5, Describes how to use the Wavewin software for viewing data files.

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Quick Start

This chapter describes a brief overview on how to use the Wavewin TIS. Before you begin make sure all the following items are included with your package:

- Recorder with a Cross-over Ethernet cable,
- Eight Non-Intrusive Clamp-on Current Sensors,
- External Power Supply,
- CD (includes: TISConfig software, Wavewin software and User's Guide)
- User's Guide

Software Installation

To install the software using the CD, place the CD into the CD-ROM drive. The installation program will run automatically, if the installation program does not run automatically double click on the **INSTALL.EXE** file located on the CD to begin the installation. Follow the steps below to install the software:

1. At the welcome screen click "**Next"** to accept the default path for the Wavewin TIS destination folder **C:\Program Files\SoftStuf\Wavewin TIS.**

2. Click "**Yes"** to create the specified install path **C:\Program Files\SoftStuf\Wavewin TIS**, or use the browse button to create your own path.

3. Click **Finish** to complete the Wavewin TIS software installation.

The Wavewin TIS software consists of two components: **TISConfig** software and the **Wavewin** software.

TCP/IP Configruation for Windows XP

In order to communicate with the recorder, the PC and the recorder should be on the same network. The following steps allow you to configure your PC with an IP address that resides on the same network as the recorder's default IP address.

1. From the desktop, left click on the **Start Menu** then click on **Control Panel**.

2. Double click on **Network Connections.**

3. Double click on **Local Area Connection.**

4. Select **Internet Protocol (TCP/IP)** then click on **Properties**.

5. Select **Use the following IP address**.

6. Enter **192.168.100.2** for the IP address.

7. Enter **255.255.255.0** for the Subnet mask.

8. Enter **192.168.100.1** for the Default Gateway.

9. Click on **Ok** to save and exit.

Using the TISConfig Software

The TISConfig software is used to configure the recorder and poll the sensors connected to the recorder. To begin, connect the recorder to your PC using a cross-over Ethernet cable. To run the software, click on the **Start Menu**, select **Programs**, then select **TISConfig** or double click on the **TISConfig** shortcut on the desktop.

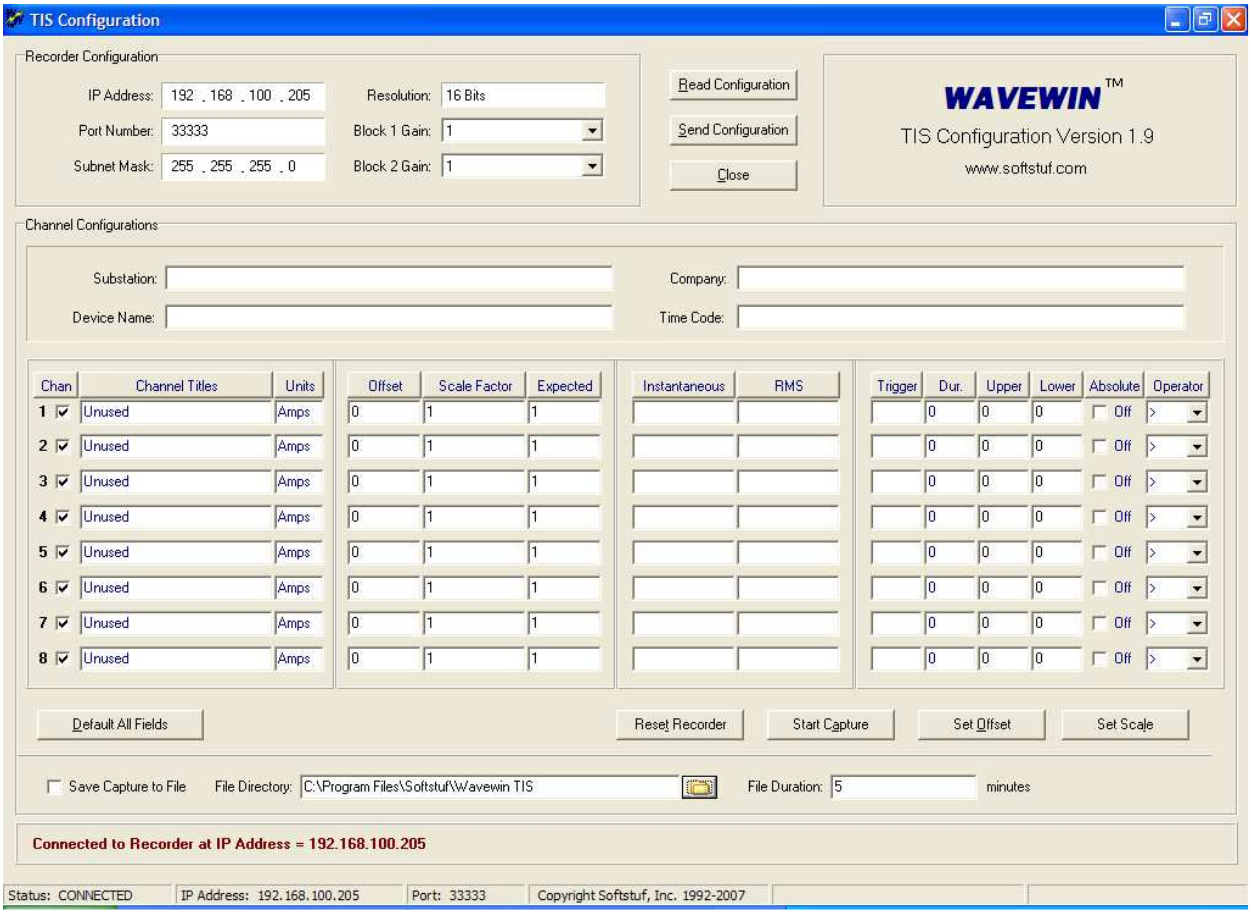

Figure 1.1 TISConfig Interface

Follow the instructions below to configure the recorder:

1. The recorders default IP address is **192.168.100.205**.
2. Enter the substation name.
3. Enter the company name.
4. Enter the device name.
5. Enter the time code.
6. Select the channel to be polled by clicking the “Chan” check box next to the “Channel Titles” fields. Channels that are unchecked are saved as “Unused” channels and are displayed in the Wavewin analysis software.
7. Enter a new channel name other than the default name **Unused**. Channels that have the name “Unused” are not displayed in the Wavewin analysis software.
8. Enter a unit for the data. The default data unit is **Amps**.
9. Select **Save Capture to File** to save all the polled data continuously. For triggering it is not necessary to select **Save Capture to File**.
10. Enter **C:\SDCSAVE** into the File Directory field.
11. Finally, click on the **Send Configuration** button to save the configuration to the recorder.

Sensor Calibration

Each sensor may have a different offset and scale factor and will need to be calibrated. The sensors can be manually calibrated by entering the **Offset** and **Scale Factor** in their respective fields, or they can be calibrated using the software.

Follow the instructions below to calibrate the current sensor using the software:

1. To begin, select the channels to be calibrated.
2. Click on the **Offset** header button to set the offset fields to **0**.
3. Click on the **Scale Factor** header button to set the scale factor fields to **1.**
4. Clamp & lock the sensor/s onto the wire. Before passing current through the wire, click on **Start Capture** to start a polling session for several seconds.
5. Click on **Stop Capture** to stop the polling session and then click on **Set Offset.**
6. Inject current through the wire and enter the amount of current injected in the **Expected** fields.
7. Click on **Start Capture**. Wait several seconds and then click on **Stop Capture.**
8. Click on **Set Scale**.
9. Finally, in order to save the calibration settings click on the **Send Configuration** button to save the settings to the recorder.

Saving the Configuration

Click on the **Send Configuration** button to save the device configuration settings in the recorder.

Polling the Data

To start a polling session, click on the **Start Capture button**. The **Start Capture button** changes to **Stop Capture** when the polling session begins. Click on **Stop Capture** to end a polling session. The duration of the polling session is displayed in the status fields.

During a polling session, the data retrieved from the connected sensors are displayed in the **Instantaneous** and **RMS** columns. If the "**Save Capture to File**" field is checked then a data file or files (depending on the file duration) will be saved to the **C:\SDCSAVE** directory. To specify the duration of the continuous saved files enter the time in minutes into the "**File Duration**" field.

Viewing the Data Files

Wavewin is used for viewing the captured data files. Click on the **Wavewin** desktop icon to run the Wavewin software or open the **Start Menu** and navigate to the **Wavewin** shortcut.

Wavewin's File Manager is used to manage files on disk, search the contents of a drive or directory, and edit, plot, or draw the contents of a file. The File Manager supports the IEEE Standard C37.232-2007 for naming time sequence data files.

To change the active drive, click on **ChDir** menu button or press **F7**, browse to the **C:\SDCSAVE** directory and click on **Ok**.

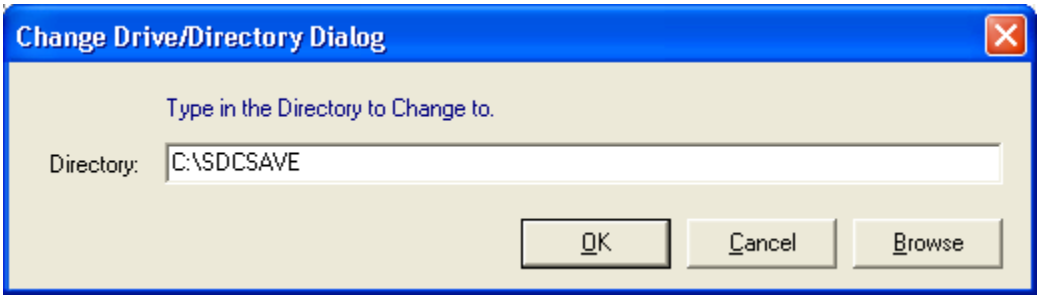

Figure 1.2 Wavewin Change Directory Dialog

The data files generated are saved in the **SDCSAVE** folder located in the directory: **C:\SDCSAVE**.

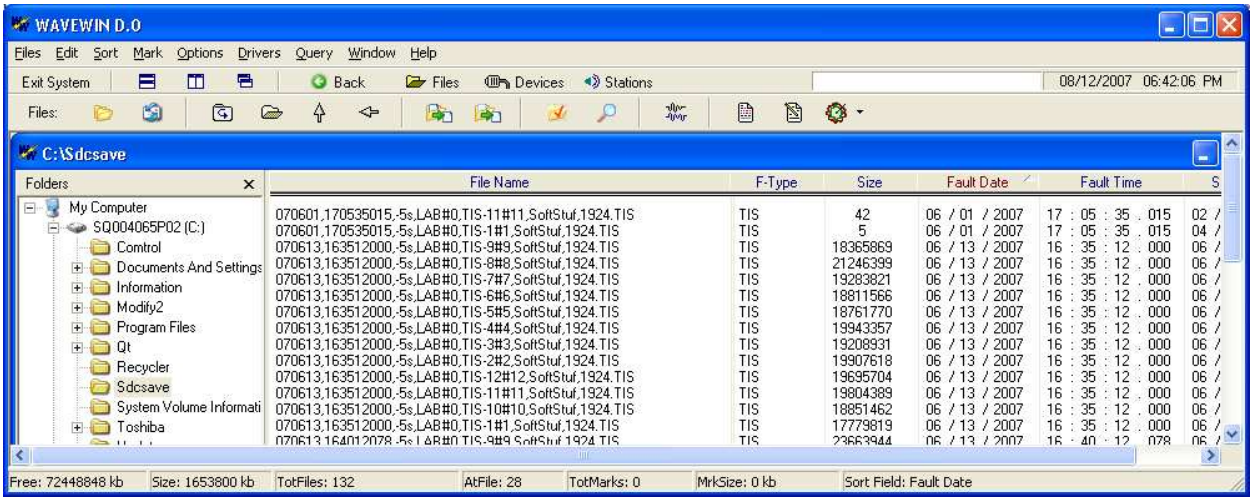

Figure 1.3 Wavewin SDCSAVE Folder

In order to view a data file, navigate to the **SDCSAVE** folder and double click on a data file name with the **.TIS** extension. Wavewin's Data Display offers a high-resolution graphical interface for displaying, analyzing, and manipulating analog and digital channels of a waveform record or a periodic load file.

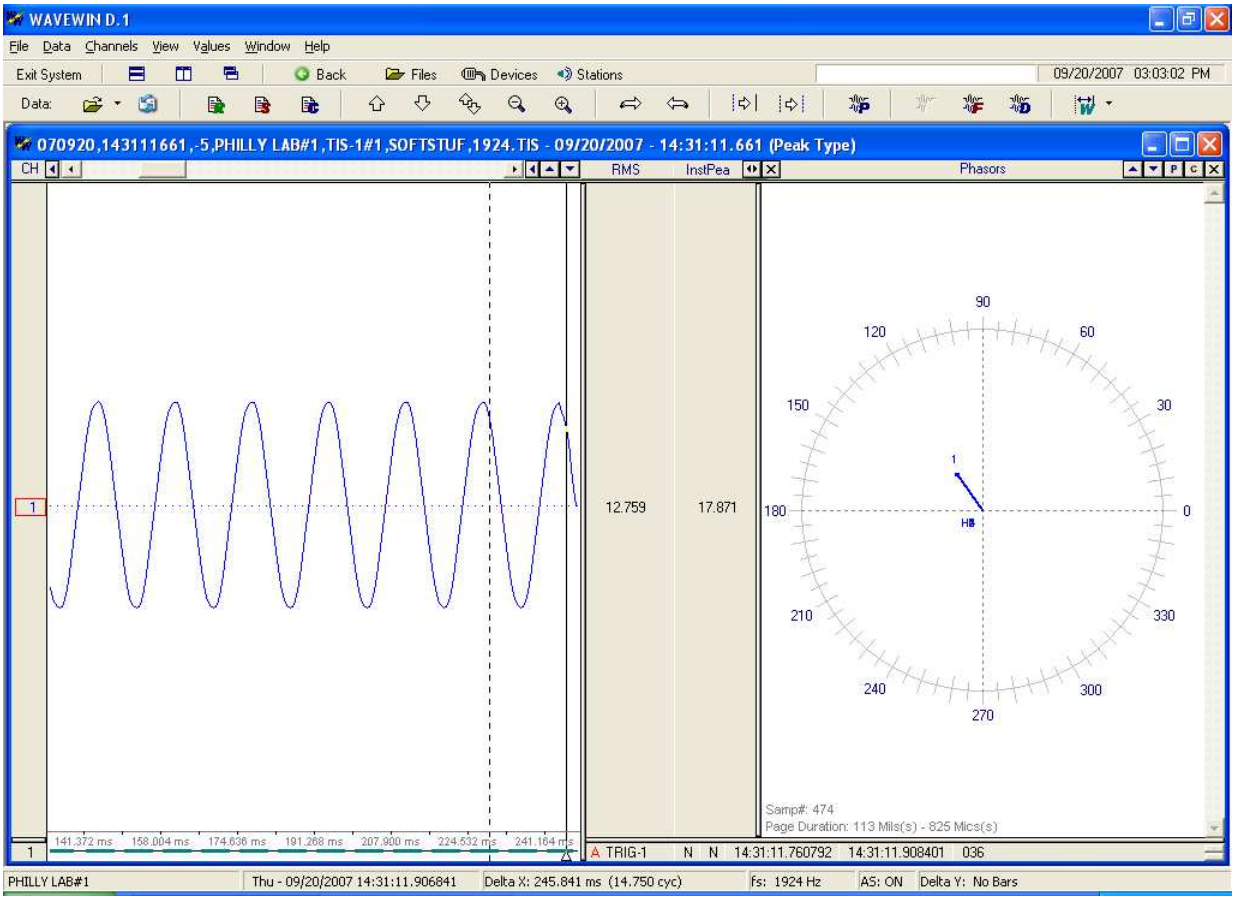

Figure 1.4 Data Display

C H A P T E R 2

Wavewin TIS

This chapter describes the Wavewin TIS software and hardware specifications.

General Description

The Wavewin TIS is a data acquisition system for non-intrusive capturing of AC and DC transient waveforms during dynamic relay testing, trip check and transformer monitoring. The sensor is a small, non-intrusive, clamp-on current sensor that uses Hall effect technology in order to sense current flow through 12 AWG electric wires. The sensor has a curved mu-metal strip used for shielding against external magnetic fields and amplifying internal magnetic fields. It has a clothespin like enclosure and is capable of sensing microsecond transients (AC and DC) with a 2% accuracy range. The sensor uses a single RJ45 Male 4 pin cable dedicated for both power and output signals.

The recorder is a small, high speed sampling unit used for digitizing the outputs of the analog current sensors. The recorder transmits data continuously to a host computer over an Ethernet connection. The recorder can be used to connect up to a maximum of eight current sensors. The recorder also can be connected to specific sensors for many different applications, such as measuring temperature, or humidity. In addition, the recorder can start and stop data logging by analog triggering. When the input signal reaches a specified analog voltage level (trigger level) the software will save a 1 second file (6 cycles pre-trigger and 54 cycles post-trigger).

The TISconfig software primarily allows users to independently configure each current sensor on the recorder. It also allows users to start and stop the recording from all the channels simultaneously. All the data collected is logically separated and provided to the users in the form of data files. The size of the data files generated via the TISConfig software depends on the chosen file duration size.

The Wavewin software allows users to poll, manage, view and analyze the data files. The software provides a common, universal display that works with the various types of deposited formats. The software also provides advanced interfaces for displaying fault and disturbance plots, phasor diagrams, historical trends, circular charts, station diagrams and so on.

Images of a current sensor and recorder are shown in figures 2.1 & 2.2.

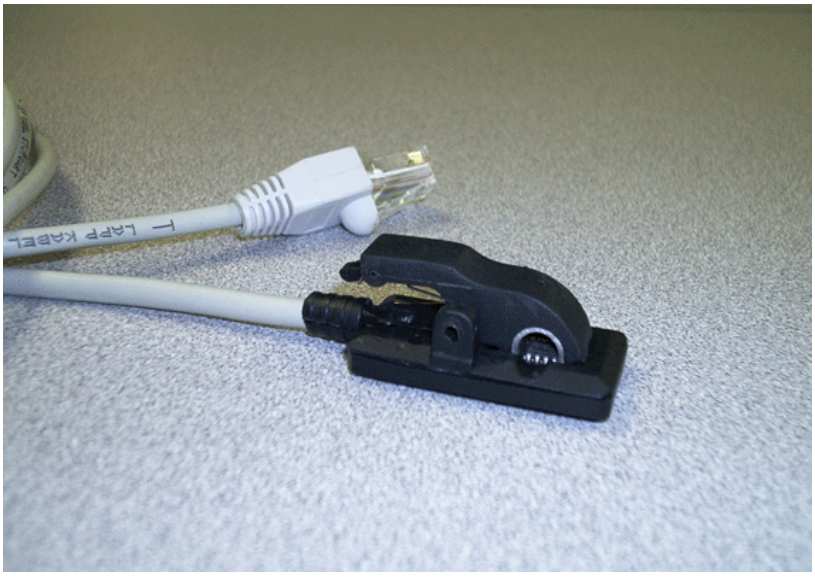

Figure 2.1 Current Sensor

Figure 2.2 Recorder

Current Sensor Specification

ELECTRICAL SPECIFICATION

Current Range	0.2 to 40 Amps secondary
Output (Pin# 3)	0 to 5 Volts
Reference Output (Pin# 5)	2.5 volts
Supply Voltage (Pin# 1)	5 Volts
Ground (Pin# 7)	0 Volts
Supply Current	16 milliAmps
Bandwidth	DC to 10 KHz
Single-Ended (Pin#3 and Pin# 7)	0 to 5 Volts
Differential (Pin#3 and Pin# 5)	-2.5 to 2.5 Volts

MECHANICAL SPECIFICATION

Dimensions (L x W x H)	1.56 x 0.78 x 0.41 inches
Maximum Conductor Diameter	12 AWG
Temperature Range	-40 to 85 ^{o}C
Humidity Range	0-95% non-condensing
Cable Length	10 ft with RJ45 Male connector

Recorder Specification

ELECTRICAL SPECIFICATION

A/D Resolution	16-bit
Analog Inputs	8 differential voltage inputs
Sampling Rate	1920 Hz per channel
PC Connection	1 10/100Base-TX Ethernet
Input Gain	1,2,3,5,10,20,40,130
Power Supply	24 Volt DC
Power Consumption	6 Watts

MECHANICAL SPECIFICATION

Dimensions (L x W x H)	L=6.25, W=3.5, H=2.5 inches
Temperature Range	-20 to 65 °C
Humidity Range	0-95% non-condensing
Analog Inputs Connecter Type	RJ45 Female
Power Connecter Type	Screw Terminal, 6 position
Ethernet Connecter Type	RJ45 Female

Daisy Chaining Power

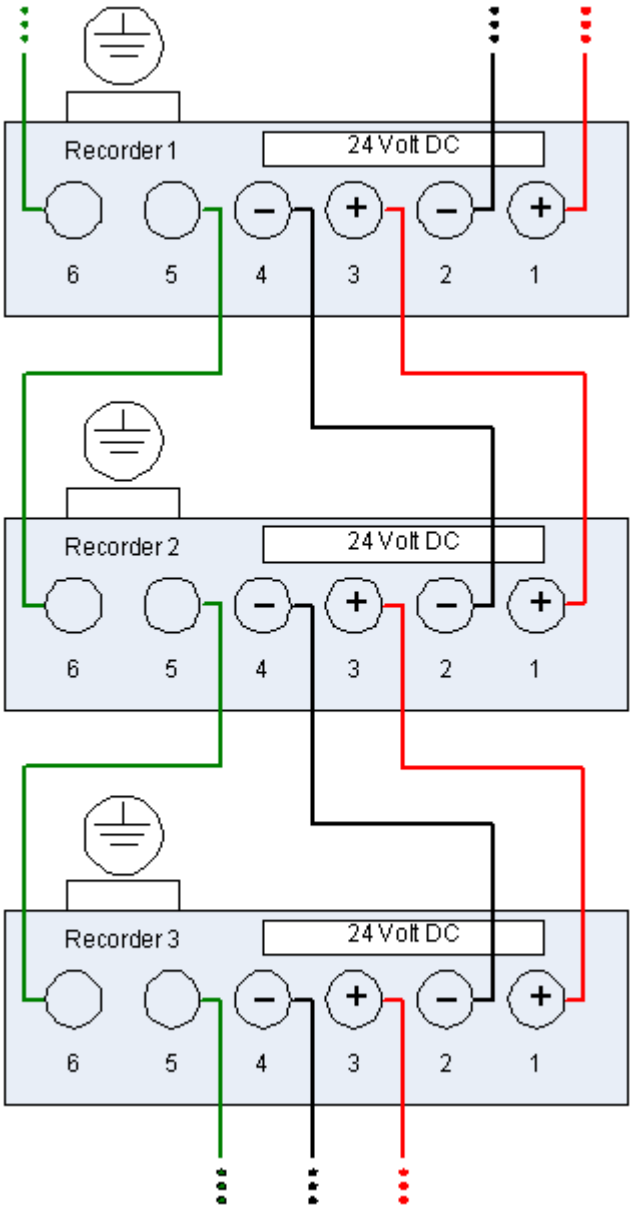

Figure 2.3 Daisy Chain Power Diagram

C H A P T E R 3

System Requirements & Installation

This chapter lists the system requirements needed for installing and running the TISConfig software and Wavewin software. It also describes the TCP/IP network configuration for Windows XP, software removal procedures and provides technical support information.

System Requirements

The system requirements are listed below.

IBM or compatible PC with an 80486 microprocessor or higher.
256 Megabytes of memory.
20 Megabytes of available hard disk space.
VGA, 8514/A, or compatible graphics adapter.
Microsoft Windows version 98 or higher.
Ethernet port.

Software Installation

To install the software follow the instruction for the type of storage media distributed with this manual.

Web: To install the software from the web go to www.wavewin.net. Under the **Wavewin Upgrades** link click on **TIS** to download. Enter your username and password. The username & password are case sensitive. Click on the application link to download the system's executable files. Extract the zipped files and run the **INSTALL.EXE** program.

CD: To install the software using the CD place the CD into the CD-ROM drive. The installation program will run automatically, if the installation program does not run automatically double click on the **INSTALL.EXE** file located on the CD.

Follow the instructions provided to fully install the software:

Figure 3.1 Start Installation

The default install folder path is **C:\Program Files\SoftStuf\Wavewin TIS**. To change the installation path either type the install path into the destination folder edit box or click on the browse button to select an existing directory.

Click **Next** to start the installation.

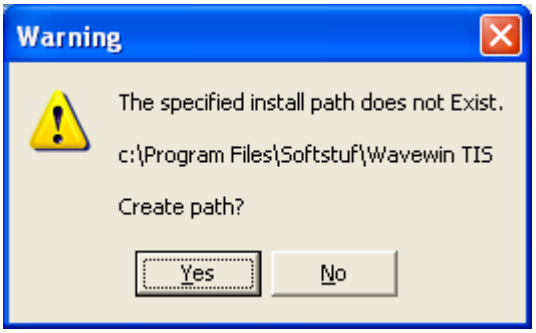

Figure 3.2 Create Path

Click **Yes** to create the path.

Figure 3.3 Finish Installation

The installation is now complete. Click **Finish** to end the installation.

TCP/IP Configrution for Windows XP

Click on the **Start Menu**, and then click on **Control Panel**. In Control Panel, double-click on **Network Connections**. The Network Connections dialog box opens.

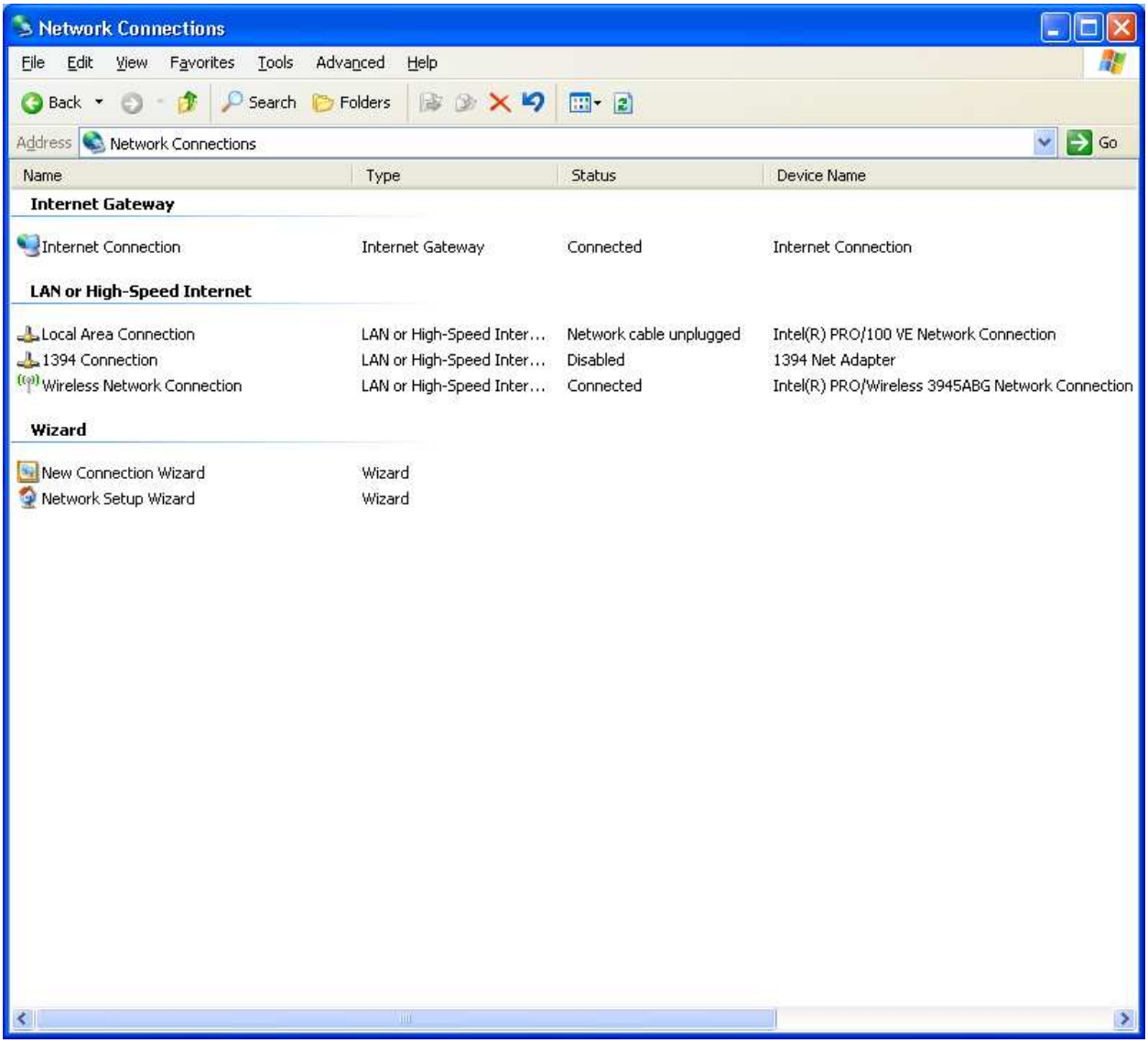

Figure 3.4 Network Connection

Right-click on **Local Area Connection** and then click on **Properties**. The Local Area Network Connection Properties dialog box opens.

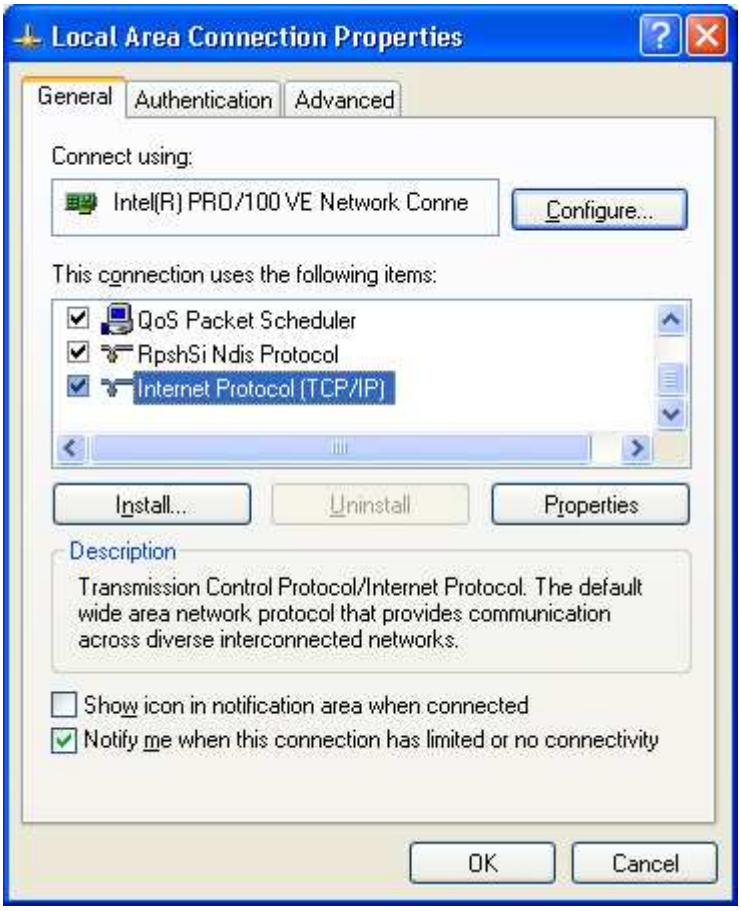

Figure 3.5 Local Area Connection Properties

Highlight **Internet Protocol (TCP/IP)**, and then click on **Properties**. The Internet Protocol (TCP/IP) Properties dialog box appears.

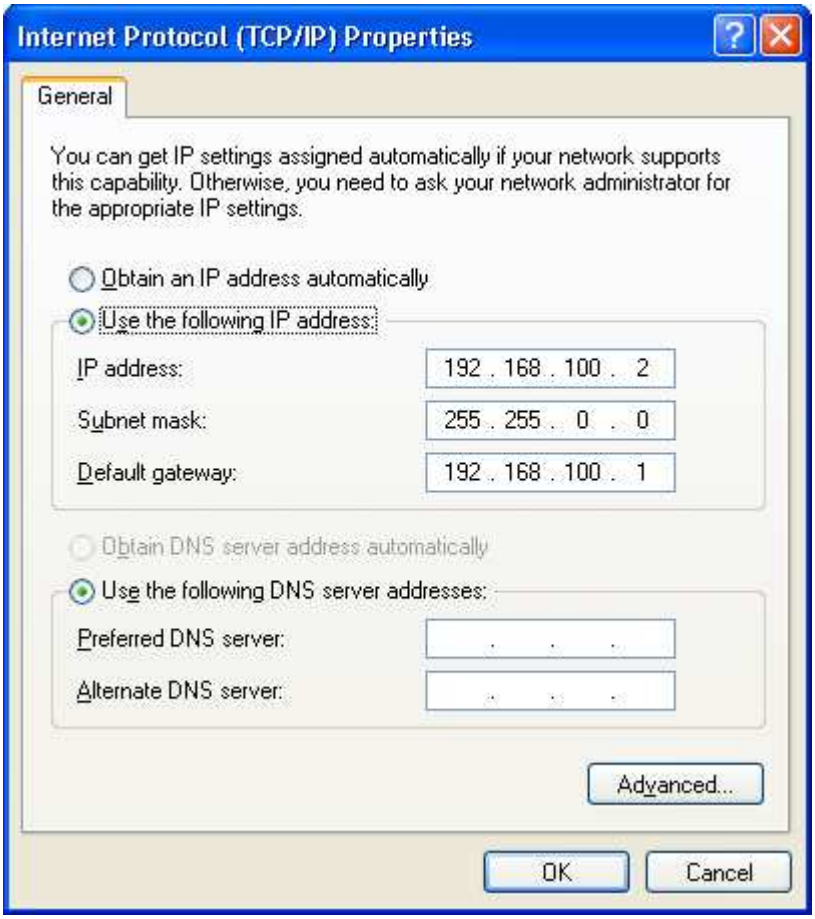

Figure 3.6 Intenet Protocol Properties

Select **Use the following IP address** option.
Enter **192.168.100.2** in the **IP address** field.
Enter **255.255.255.0** in the **Subnet mask** field.
Enter **192.168.100.1** in the **Default gateway** field.
Click on **OK** to save & exit the properties dialog box.

Software Removal

Follow the instructions below to remove the Wavewin TIS software, which includes the Wavewin software and the TISConfig software:

Follow the instructions below to remove the Wavewin software:

1. To remove the Wavewin software, locate the folder where the Wavewin32.exe file is installed, select the **Wavewin32.exe** file and delete it. The default install folder path is **C:\Program Files\SoftStuf\Wavewin TIS\Wavewin.exe**

Follow the instructions below to remove the TISConfig software:

1. To remove the TISConfig software, locate the folder where the TISConfig.exe file is installed, select the **TISConfig.exe** file and delete it. The default install folder path is **C:\Program Files\SoftStuf\Wavewin TIS\TISConfig.exe**

Technical Support

Although this system is easy to use and understand, at some point you may encounter a technical question, feel that the system has improperly operated, or have suggestions for future improvements. In either case, contact SoftStuf using one of the following methods:

Phone: 215-627-8850, hours are from 9:00 a.m. to 6:00 p.m. Mon- Fri, (EST).
Fax: 215-625-2497, response time is 24 hours.
E-mail: support@softstuf.com, response time is 24 hours.

C H A P T E R 4

Using the TISConfig Software

This chapter describes the main features of the TISConfig software.

TISConfig Software

The TISConfig software is used to configure and poll the sensors connected to the recorder. The interface to the recorder allows for selecting the recorder settings, selecting the connected sensor properties and specifying the properties for the data files saved during a polling session. Review the sections below to learn how to set the interface properties and how to start and stop a polling session.

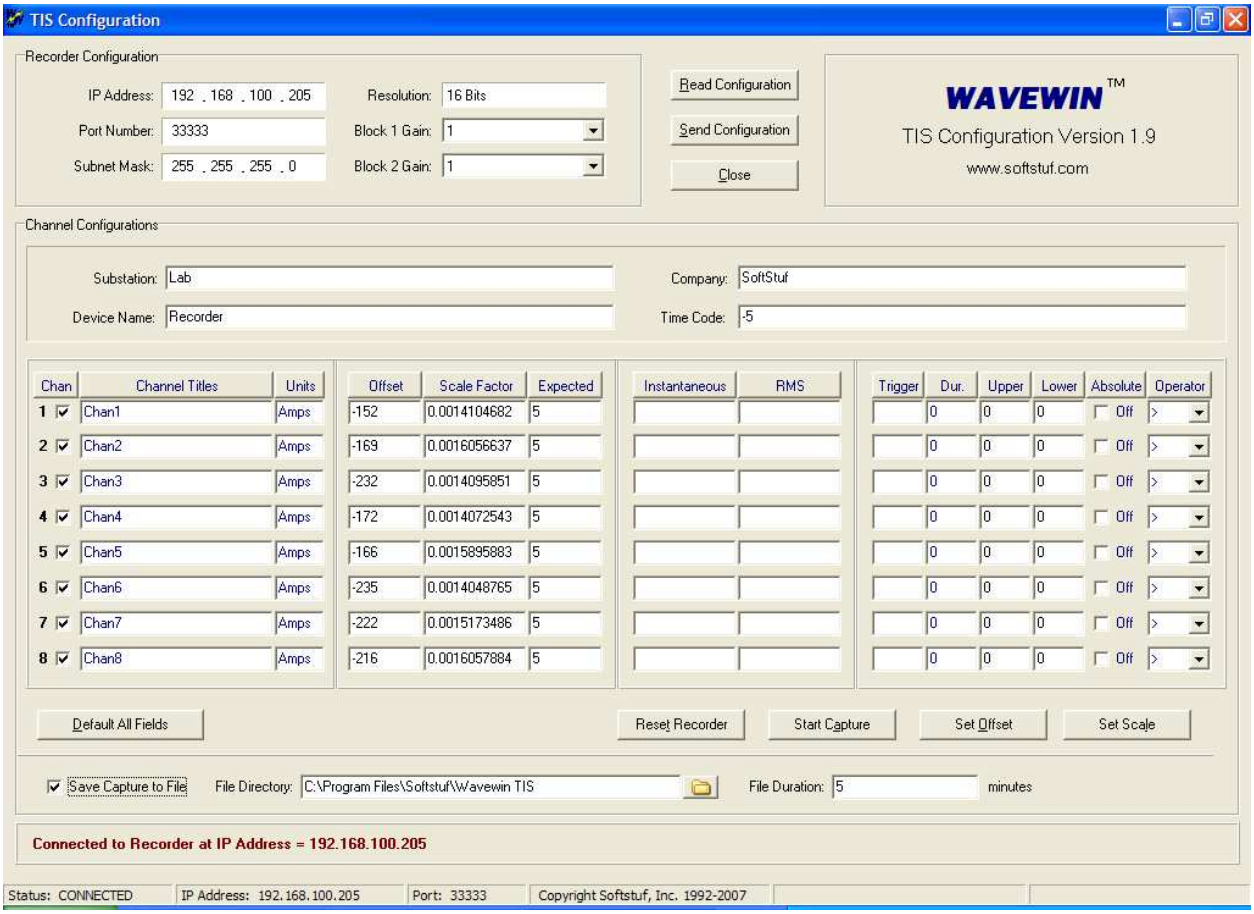

Figure 4.1 TISConfig Interface

Below is a description of all the TISConfig interface fields and their default values.

Field	Description	Default
Recorder Configuration		
IP Address	A unique identifier for the recorder on a TCP/IP network.	192.168.100.205
Port Number	The recorder's Ethernet port.	33333
Subnet Mask	Defines which part of the IP address is	255.255.255.0

	used for the network.	
Resolution	Indicates the number of discrete values that the Anolog to Digital converter can produce over the range of analog values (expressed in bits).	16 bits
Gain	Magnitude ratio of output/input channels 1 - 8. The gain increases the magnitude of an input signal.	1
Read Configuration	Reads the configuration settings from the recorder.	-
Send Configuration	Writes the configuration settings to the recorder.	-
Close	Exit the TISConfig software.	-
Channel Configuration		
Substation	The name of the substation where the data file is generated.	Blank
Company	The name of the company where the data file is generated.	Blank
Device Name	The name of the device used to generate the data file.	Blank
Time Code	The time code where the data file is generated.	Blank
File Duration	The time duration of the data file measured in minutes. The software will automatically create a new file when the maximum file duration is reached.	5 minutes
Channel	The channel selection box.	Checked
Channel Title	The name of the channel.	Unused
Unit	The unit of the data being polled.	Amps
Field	**Description**	**Default**
Offset	The Offset is a measure of the distance to the zero reference axis when there is no current passing through the sensor.	0
Scale Factor	The Scale Factor is a real number used to scale the raw data.	1
Expected	Known value for calibration process. Example, the amount of current injected into the wire during the calibration process.	1
Instantaneous	Amplitude of the signal at a particular instant.	Blank
RMS	Root Mean Square value calculated over a one second average.	Blank
Trigger Level	The threshold value at which the actual trigger takes place.	Blank
Duration or Persistence	The number of consecutive samples captured before triggering.	0
Upper Hysteresis	Upper offset for trigger level (Trigger Level + Upper Hysteresis = Upper Trigger Level).	0
Lower Hysteresis	Lower offset for trigger level	0

	(Trigger Level - Lower Hysteresis = Lower Trigger Level).	
Absolute	Used to convert all the negative numbers to positive numbers.	No
Operator	Used to compare the value of one element with another. There are four types of operators: greater than, less than, equal to, or not equal to.	> Greater than
Reset Recorder	A soft reset command to reset the recorder power.	-
Default All Fields	Defaults all the configuration settings.	-
Start Capture	Start a polling session.	-
Stop Capture	Stop a polling session.	-
Set Offset	Read the DC offset from the raw data and place it in offset field.	-
Field	**Description**	**Default**
Set Scale	Calculate the scale factor and place it in the scale factor field. Scale Factor= Expected value/ Raw data	
Save Capture to File	Save the polled data to a file.	Unchecked
File Directory	The folder path where the data files are saved.	C:\ProgramFiles\ SoftStuf\Wavewin TIS
File Duration	The time duration of the data file measured in minutes. The software will automatically create a new file when the maximum file duration is reached.	5 minutes

Recorder Configuration

The recorder can be configured using an Ethernet connection. The default values are:

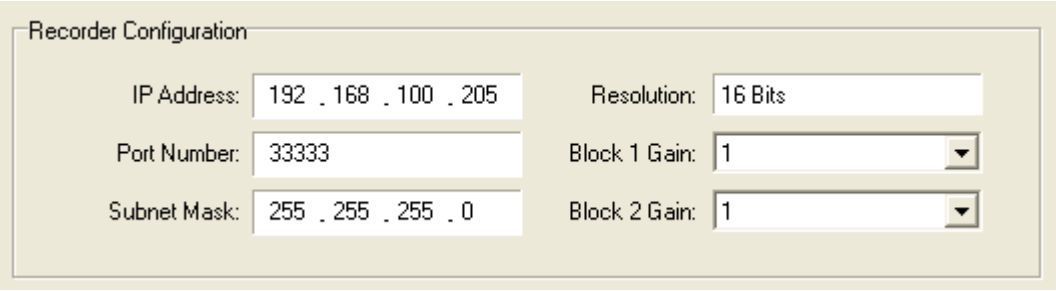

Figure 4.2 Recorder Configuration

Field	Description	Default
IP Address	A unique identifier for the recorder on a TCP/IP network.	192.168.100.205
Port Number	The recorder's Ethernet port number.	33333
Subnet Mask	Used to define which part of the IP address is used for the network.	255.255.255.0
Resolution	Indicates the number of discrete values it can produce over the range of analog values.	16 bits

Gain	Magnitude ratio of output/input channels 1 - 8. It increases the magnitude of an input signal.	1

IP Configuration

You can change the recorder's IP address by typing the new one in the **IP Address** field and then click on **Send Configuration**. Turn off and on the power to the recorder in order for the changes to take affect.

Channel Configuration

The channel configuration allows for selecting the name of the generated data files. The Substation, Company, Device Name and Time Code fields are used to specify the IEEE Standard C37.232-2007 long file naming fields used when naming the generated data files.

Field	Description	Default
Substation	The substation name where the data file is generated.	Blank
Company	The company name where the data file is generated.	Blank
Device Name	The device name that is used to generate the data file.	Blank
Time Code	The time code where the data file is generated.	Blank

When the Channel box is selected that channel will be included in the polling session. By default, all eight channels are selected.

The Channel title is the channel's name. By default, the channel title is named "Unused". Change the default name of the channel, when selecting it for polling. This field is saved in the first line of the data file.

The Unit indicates the unit of measurement. By default, the unit is Amps. This field is saved in the first line of the data file.

The Offset is a measure of the distance to the zero reference axis when there is no current passing through the sensor. This field is saved in the first line of the data file. The default value is 0.

The Scale Factor is a real number used to scale the raw data. This field is saved in the first line of the data file. The default value is 1.

The Expected value field is available for the user to enter the amount of current injected for the auto scaling portion of the calibration process.

The Instantaneous values are displayed during the polling. These fields are displayed when a polling session is started.

The RMS field contains the Root Mean Square value calculated over a one second average.

The Trigger level is the threshold value at which the actual trigger takes place.

The Duration or Persistence is the number of consecutive samples captured before triggering.

The Upper Hysteresis value allows the maximum analog trigger level to be set.

The Lower Hysteresis value allows the minimum analog trigger level to be set.

The Absolute is used to convert all the negative numbers to positive numbers.
The Operator is used for comparison of the input signal with the Hysteresis region. There are four types of operators: greater than, less than, equal to, or not equal to.

Below is a description of the Analog Channel properties and their default values.

Field	Description	Default
Channel	The channel selection box.	Checked
Channel Title	The name of the channel.	Unused
Unit	The unit for the data being polled.	Amps
Offset	The Offset is a measure of the distance to the zero reference axis when there is no current passing through the sensor.	0
Scale Factor	The Scale Factor is a real number used to scale the raw data.	1
Expected	The amount of current injected into the wire for calibration process.	1
Instantaneous	The amplitude of the signal at a particular instant.	Blank
RMS	Root Mean Square value calculated over a one second average.	Blank
Trigger Level	The threshold level at which the actual trigger takes place.	Blank
Duration or Persistence	The number of consecutive samples captured before triggering.	0
Upper Hysteresis	Upper offset for trigger level (Trigger Level + Upper Hysteresis = Upper Trigger Level).	0
Lower Hysteresis	Lower offset for trigger level (Trigger Level - Lower Hysteresis = Lower Trigger Level).	0
Absolute	Used to convert all the negative numbers to positive numbers.	Off
Operator	Used for comparison of the value of one element with another. There are four types of operators: greater than, less than, equal to, or not equal to.	> Greater than

The **File Duration** allows for specifying the maximum size of the generated data files. This field ensures data files do not get to large, which could make reading files time consuming. The software will automatically create a new file when the maximum file duration is reached.

Field	Description	Default
File Duration	The time duration of the data file measured in minutes. The software will automatically save a new file when the maximum file duration is reached.	5 minutes

Triggering

Each channel can be configured with 6 different trigger settings: **Trigger Level, Duration, Upper Hysteresis, Lower Hysteresis, Absoulte, and Operator.**

The recorder scans all of the connected sensors once every 0.528 milliseconds. Once the trigger settings have been configured and the software begins polling, each sample is checked individually to see if it is above a certain **Trigger Level** and the number of consecutive samples above that **Trigger Level** is counted. Based on these two findings a trigger condition will occur and a “fault record” will be created.

The region between the upper and lower trigger levels is called **Hysteresis** region (Region 2). The user can create this region by entering values for the **Upper** and **Lower Hysteresis** fields. This region prevents contnious triggering and reseting as the input signal drifts around the trigger level.

The **operator** will allow users to select their region of triggering by comparing the input signal with the **Hysteresis** region. By selecting different operators the recorder can capture signals that are **outside** or

inside of the **Hysteresis** region. The following table shows 4 different operators with their **Trigger** and **Reset** regions.

Case	Operator	Trigger	Reset
1	=	Region 2	Region 1 or Region 3
2	<>	Region 1 or Region 3	Region 2
3	>	Region 3	Region 1
4	<	Region 1	Region 3

The **Absolute** field is used to convert all the negative numbers to positive numbers. This is helpful in case the sensor was mistakenly mounded in the reverse direction.

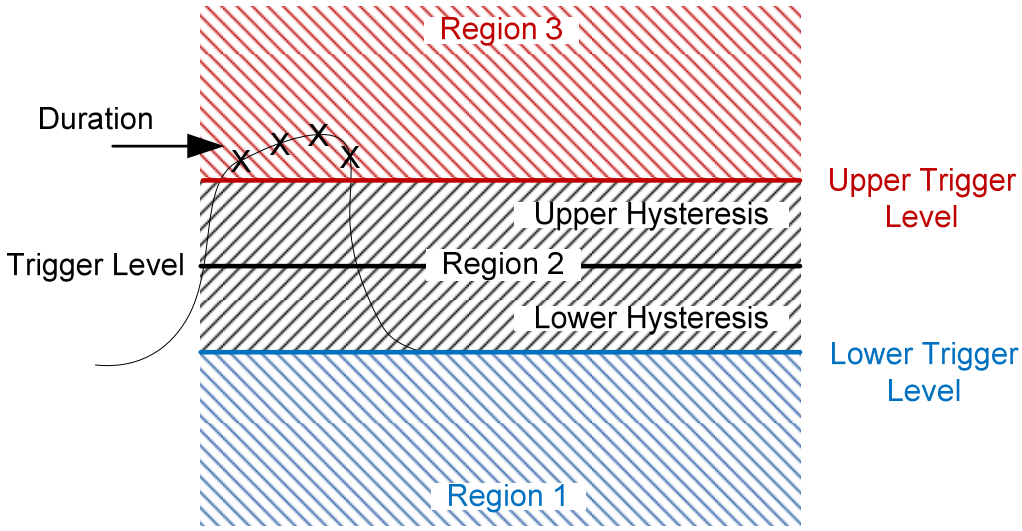

Figure 4.3 Trigger Regions

Currrent Detection

The following example describes how to detect a current flow of 2.0 Amps DC or more that last for 2 milliseconds. The input is a DC signal with an AC ripple (DC + AC).

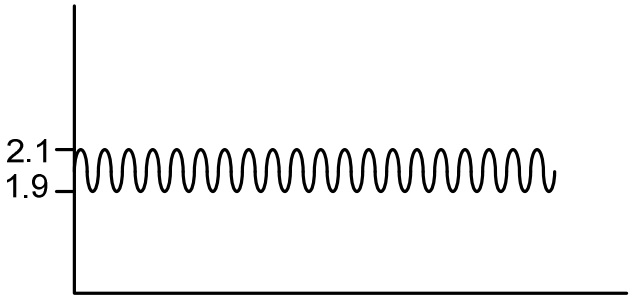

Figure 4.4 DC + AC Signal

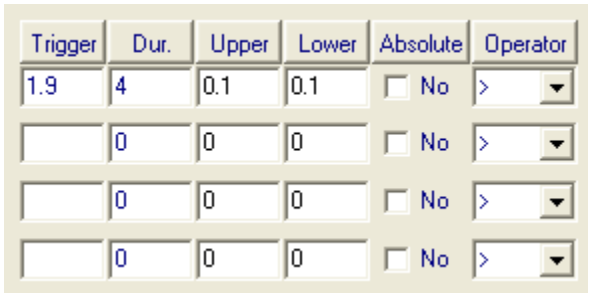

Figure 4.5 Trigger Settings

In order to make the triggering condition less sensitive to noise (AC ripple), create a **Hysteresis** region:

1. Enter **1.9** in the **Trigger Level** field.
2. Enter **4** in the **Duration** field.
3. Enter **0.1** in the **Upper Hysteresis** field.
4. Enter **0.1** in the **Lower Hysteresis** field.
5. Select **On** from the **Absolute** field.

6. Select **>** from the **Operator** list.
7. Click on **Send Configuration** to save the trigger settings into the recorder.
8. Finally, click on **Start Capture** to start polling.

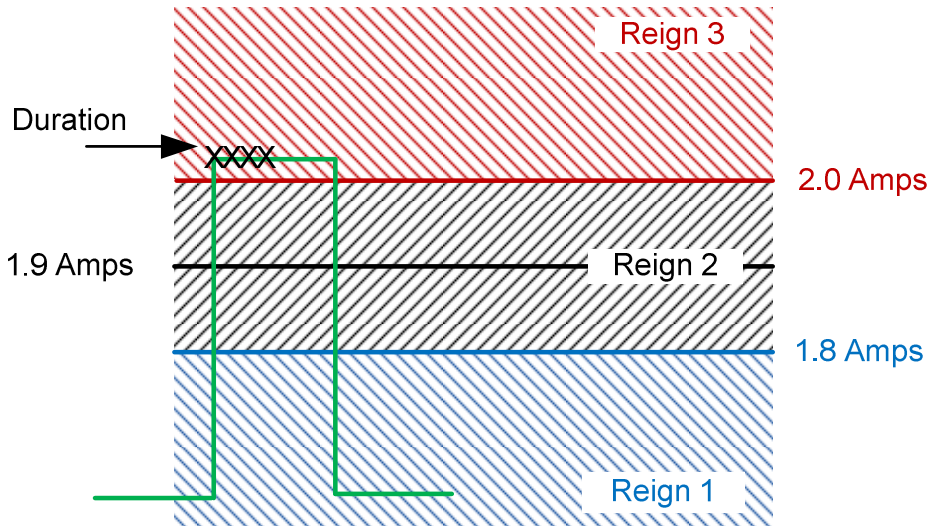

Figure 4.6 Trigger Regions

In reference to the example above, if the recorder detects 2.0 Amps or more for a minimum of 4 consecutive samples (2 milliseconds) then an "fault record" file will be created. The trigger will reset when the current goes below 1.8 Amps.

Polling the Data

Now you are ready to start sampling. If you have one recorder, you can use the TISConfig software to poll the data, but if you want to communicate to more than one recorder simultaneously you have to use the Wavewin software. Follow the steps below to start sampling using the TISConfig software:

Click on **Start Capture** to start a polling session. **Start Capture** changes to **Stop Capture** when the polling session begins. Click on **Stop Capture** to end a polling session.

During a polling session, the data retrieved from the connected sensors are displayed in the **Instantaneous** and **RMS** columns. During a polling session, a data file or files (depending on the file duration) will be saved to the **C:\SDCSAVE** directory.

The data filename contains the following fields stored in a comma-delimited fashion:

Date, Time, Time Code, Substation, Device Name, Company, Sampling Rate.TIS

Sensor Calibration

Each sensor may have a different offset and scale factor and will need to be calibrated. The sensors can be manually calibrated by entering the **Offset** and **Scale Factor** in their respective fields, or they can be calibrated using the software.

Follow the instructions below to calibrate the current sensor using the software:

1. To begin, select the channel/s to be calibrated.
2. Click on **Offset** to set the offset fields to **0**.
3. Click on **Scale Factor** to set the scale factor fields to **1**.

4. Clamp & lock the sensor/s onto the wire. Before passing current through the wire,click on **Start Capture** to start a polling session for several seconds.
5. Click on **Stop Capture** to stop the polling session and then click on **Set Offset**.
6. Inject current through the wire and enter the amount of current injected in the **Expected** field.
7. Click on **Start Capture**. Wait several seconds and then click on **Stop Capture**.
8. Click on **Set Scale**.
9. Finally, in order to save the calibration settings click on **Send Configuration**.

C H A P T E R 5

Viewing the Data Files

This chapter briefly describes how to use the Wavewin software for locating and displaying data files.

Locate the Data Files

Wavewin is used for viewing the captured data file/s. Click on the **Wavewin** desktop icon to run Wavewin or open the **Start Menu** and navigate to the **Wavewin** shortcut.

Wavewin's File Manager is used to manage files on disk, search the contents of a drive or directory, and edit, plot, or draw the contents of a file. The File Manager supports the IEEE Standard C37.232-2007 for naming time sequence data files.

To change the active drive, click on **ChDir** menu button or press **F7**, browse to the **C:\SDCSAVE** directory and click on **Ok**.

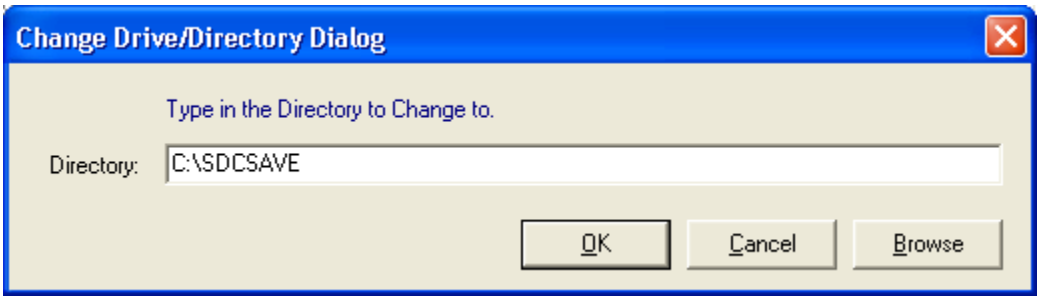

Figure 5.1 Wavewin Change Directory Dialog

The data files generated are saved in the **SDCSAVE** folder located in the directory: **C:\SDCSAVE**.

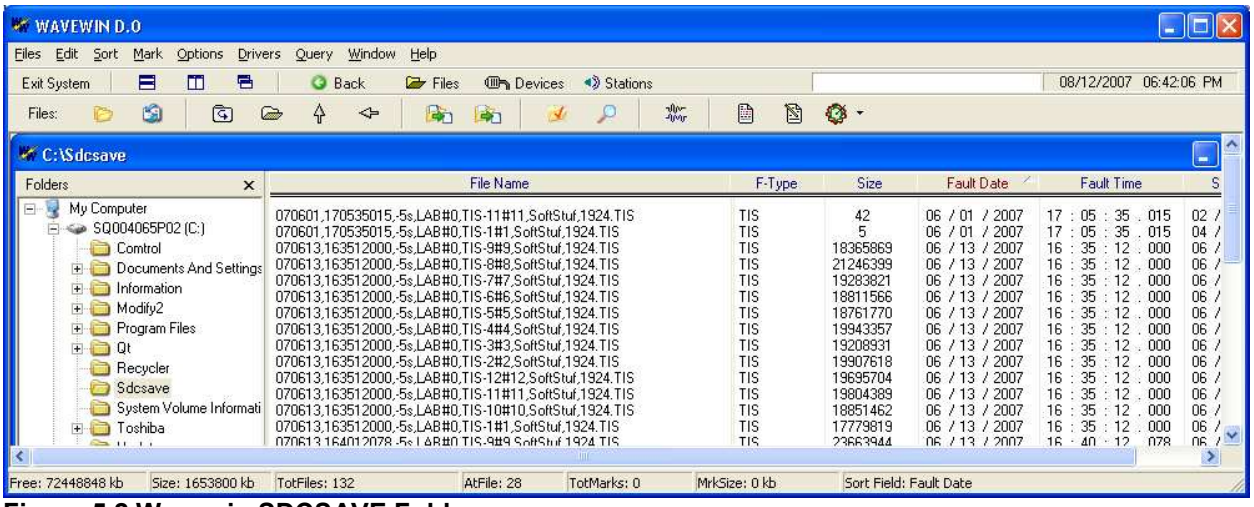

Figure 5.2 Wavewin SDCSAVE Folder

Display the Data Files

In order to view a data file, navigate to the SDCSAVE folder and double click on a data file name with the **.TIS** extension. Wavewin's Data Display offers a high-resolution graphical interface for displaying, analyzing, and manipulating analog and digital channels of a waveform record or a periodic load file.

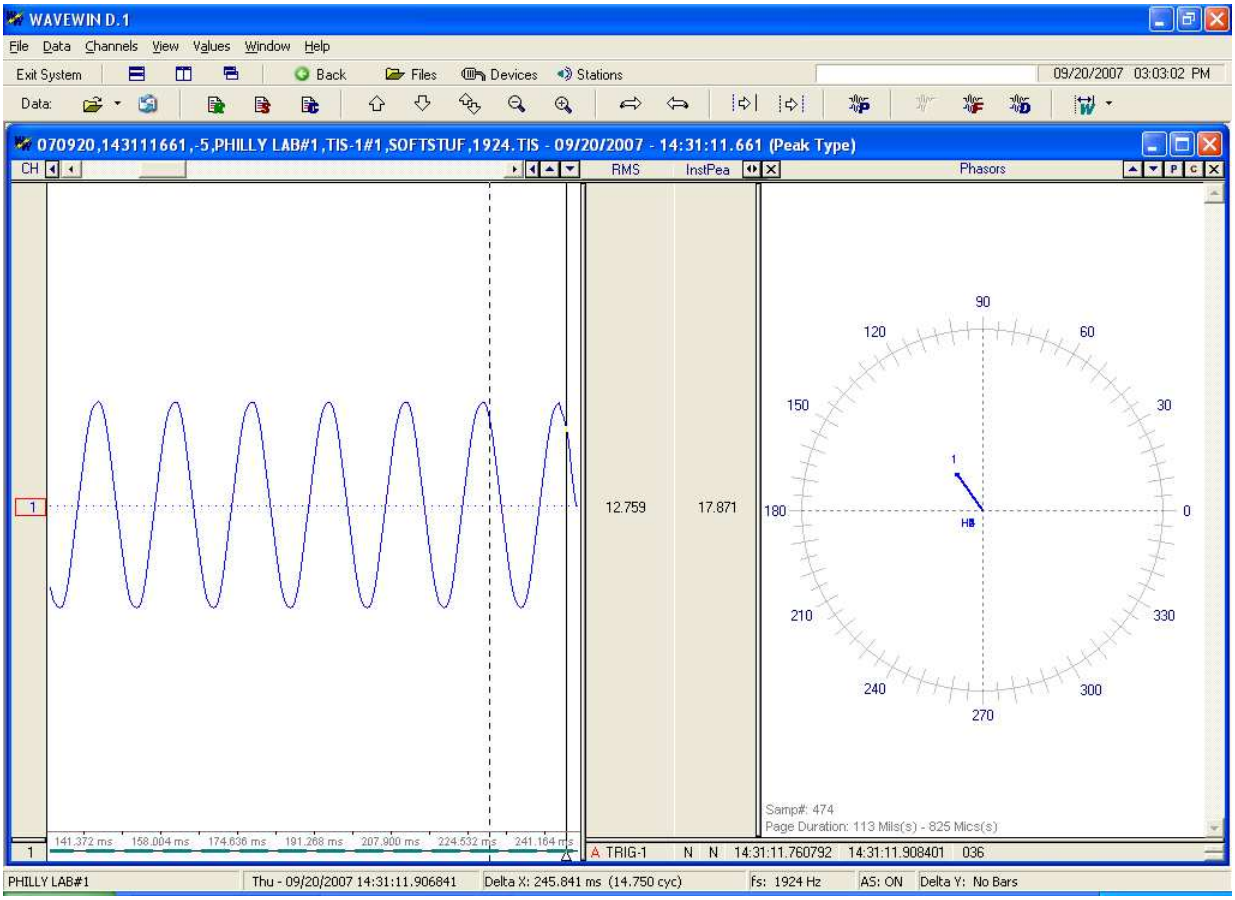

Figure 5.3 Data Display

Refer to the Data Analysis section for more details.

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