Sentry

Static Control

&

Monitoring System

User Manual

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Table of Contents

How This Manual Is Organised

Your SENTRY User's Manual is divided into five sections: "Getting Started," "Operating Instructions," "SENTRY Observer Software," "Engineering Mode" and "Hardware Technical Reference."

"Getting Started" contains information that is essential for proper installation and operation of the SENTRY Static Control and Monitoring System. Please read this section before using the product. It explains how to install the SENTRY Observer Software on your PC.

The "Operating Instructions" section explains how to use your SENTRY system.

Section three, "SENTRY Observer Software", explains how to use the comprehensive control and analysis features it provides.

Section four, "Engineering Mode", explains how the in-built debug firmware can be used to control and fault-find the system at a low level.

Section five, the "Hardware Technical Reference," gives technical information regarding the SENTRY and contains data on the SENTRY I/O connectors.

Getting Started

General Introduction

Installation

Installing the SENTRY Observer Software

1

General Introduction

What Is the SENTRY?

The system is designed to test and record the integrity of anti-static wrist straps and footwear or foot-straps worn by personnel working within a static protected area.

The SENTRY unit comprises a single measurement circuit that may be switched, under firmware control, to any or all of three measurement nodes, each having independent PASS/FAIL/TEST status indicators. Any of the test nodes may be included or excluded from the test sequence by use of the control software.

Foot strap users stand on the footplate(s). Wrist strap users connect the free end of their wrist strap to a connector on the front panel of the tester. In either case the reference ground test plate or grab handle is touched/held. The user then enters their ID number using the built-in keypad, or by some alternative means such as a bar code or swipe card reader attached to the auxiliary socket. The SENTRY unit then measures the DC resistance from the plate to each enabled measurement node in turn, thereby testing the effectiveness of the entire earthing arrangement, rather than just the wrist or foot strap.

Having made the measurements, the system displays the test results by means of Red and Green LEDs. A warning buzzer sounds in the event of a failure.

Results of the measurements are stored against user identity, time and date in a non-volatile memory for subsequent inspection or retrieval by the SENTRY Observer Software, for analysis.

Did You Get Everything?

Verify that you have received the following items:

1 SENTRY Test System including
1 Wall Plate (Instructional Mounting panel)
1 DC Regulated Power Supply (see below*)
1 SENTRY Serial Cable (2 metres)
1 User Manual
1 CD containing the SENTRY Observer Software etc.

Options:

a) Single or Double Foot Plate including cable
b) RS485 Network Node Host, including:
    12-volt DC Regulated Power Supply and
    Terminating Connector (for last slave on network)
c) RS485 Network Node Slave, including:
    12-volt DC Regulated Power Supply
    Sentry to Network Node power lead (2 metres)
d) Optical Barcode Reader

*The DC Regulated Power Supply is +12 Volts for Sentry units with a serial interface, or +5 Volts for units with a built-in Ethernet Network (RJ45) Interface.

Installation

Installation of your SENTRY Static Control and Monitoring System involves fixing the main unit to a wall, or other smooth vertical surface and making the following connections: (please refer to Fig 1)

- Connect the DC regulated power supply to the DC input socket.
- Connect the ground footplate (if used) to mini-Din or 4mm sockets.
- Connect the jack plug end of the serial data lead to the jack socket.
- Connect the other end of the serial data lead to a COM port of the PC running the Observer software.
- If an external reader is to be used, connect it to the 9-way DIN socket.
- If required, additional connections can be made to the voltage free relay contacts.

Switch on the DC supply; the unit should power up in this sequence:

Some of the status indicators or ENTER ID light will illuminate for approximately 2 seconds and then extinguish

The ”Enter ID” indicator will start to flash.

See Hardware Technical Reference for more details of I/O connections.

Installation Procedure for Sentry Network (RS485) (Refer to figures 2 & 3)

1. Position the Network Node Host near to the control PC (within 1.8 metres) and the Network Node Slaves near to the Sentry units (within 2 metres).

2. a) Using the 9-way Sentry serial data cable, connect the RS485 Network Node Host to the control PC RS232 interface port.

b) Connect the 12V DC Power Supply to the Network Node Host.

3. a) Using the 9-way Sentry serial data cable connect the RS485 Network Node Slave unit to the Sentry unit.

b) Using the double ended power lead connect one of the RS485 Network Node Slave power sockets to the Sentry power input socket.

c) Using customer supplied network cables, connect the RS485 Network Node Host data port to one of the RS485 Network Node Slave data ports.

d) Set RS485 Network Node Slave ID number. (1-F starting with 1 for the first node). There is a rotary switch located inside the RS485 Network Node Slave box.

e) For the next RS485 Network Node Slave, repeat steps a-d except that the data cables connect the current RS485 Network Node Slave data port to the previous RS485 Network Node Slave data port.

f) For the last RS485 Network Node Slave use the Terminating Connector on the data port socket.

Installation Procedure for Local Network (TCP/IP with EXTERNAL Lantronix Ethernet Network Interface Unit)

1. a) Using the supplied serial cable, connect the Sentry unit to the Lantronix Ethernet Network Interface Unit.

b) Using a standard network patch cable with RJ45 connectors, connect the Lantronix Ethernet Network Interface Unit to the network hub.

c) Connect the 12V DC Power Supply to the Sentry unit.

d) Connect the 5V DC Power Supply to the Lantronix Network Interface Unit.

Repeat for all Sentry units.

2. Connect the PC to the network using a standard RJ45 patch cable.

Installation Procedure for Local Network (TCP/IP with INTERNAL Lantronix Ethernet Network Interface Board)

1. a) Using a standard network patch cable with RJ45 connectors, connect the Sentry unit to network hub.

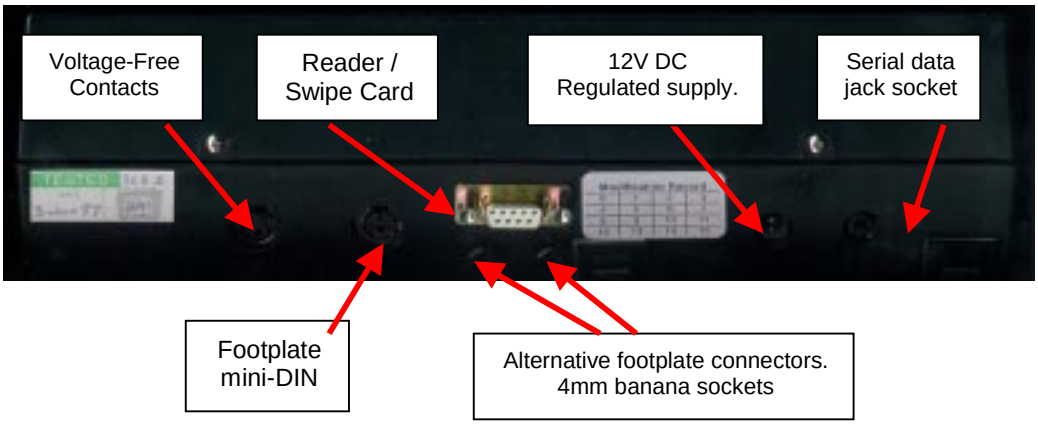
b) Connect the 5V DC Power Supply to the Sentry unit.

Repeat for all Sentry units.

2. Connect the PC to the network using a standard RJ45 patch cable.

Figure 1.


1
2
3
4
5
6
7
8
9
*
0
#
CANCEL
ENTER
Sentry
ENTER ID
WRIST STRAP


Voltage-Free Contacts
Reader / Swipe Card
12V DC Regulated supply.
Serial data jack socket
Footplate mini-DIN
Alternative footplate connectors. 4mm banana sockets

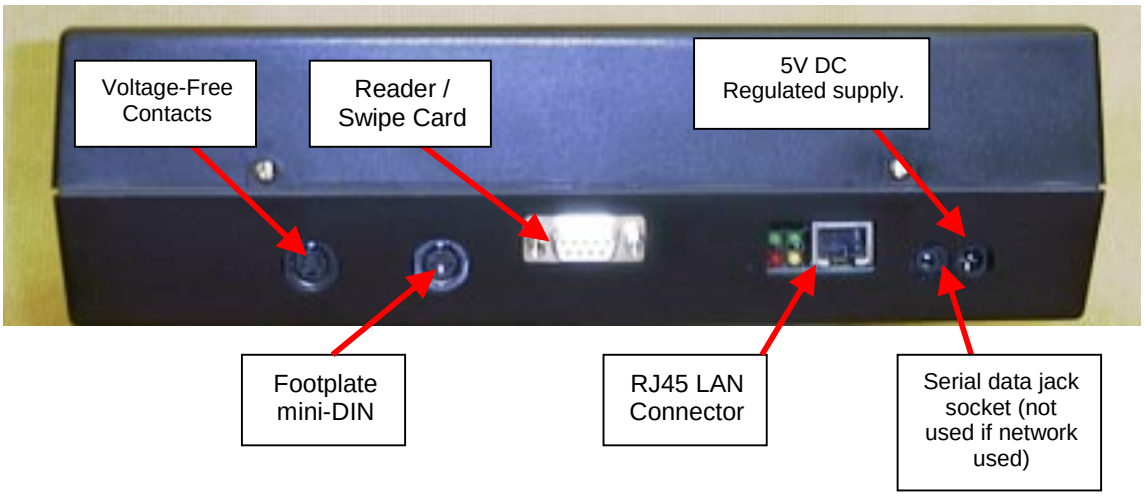

Voltage-Free Contacts
Reader / Swipe Card
5V DC Regulated supply.
Footplate mini-DIN
RJ45 LAN Connector
Serial data jack socket (not used if network used)

Figure 2

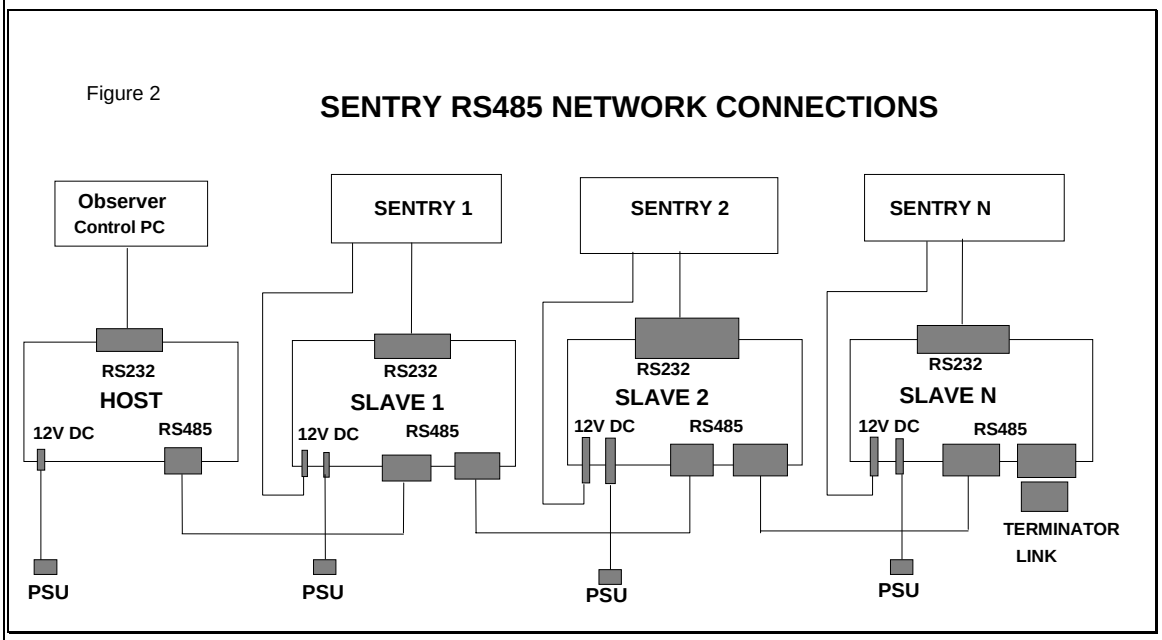
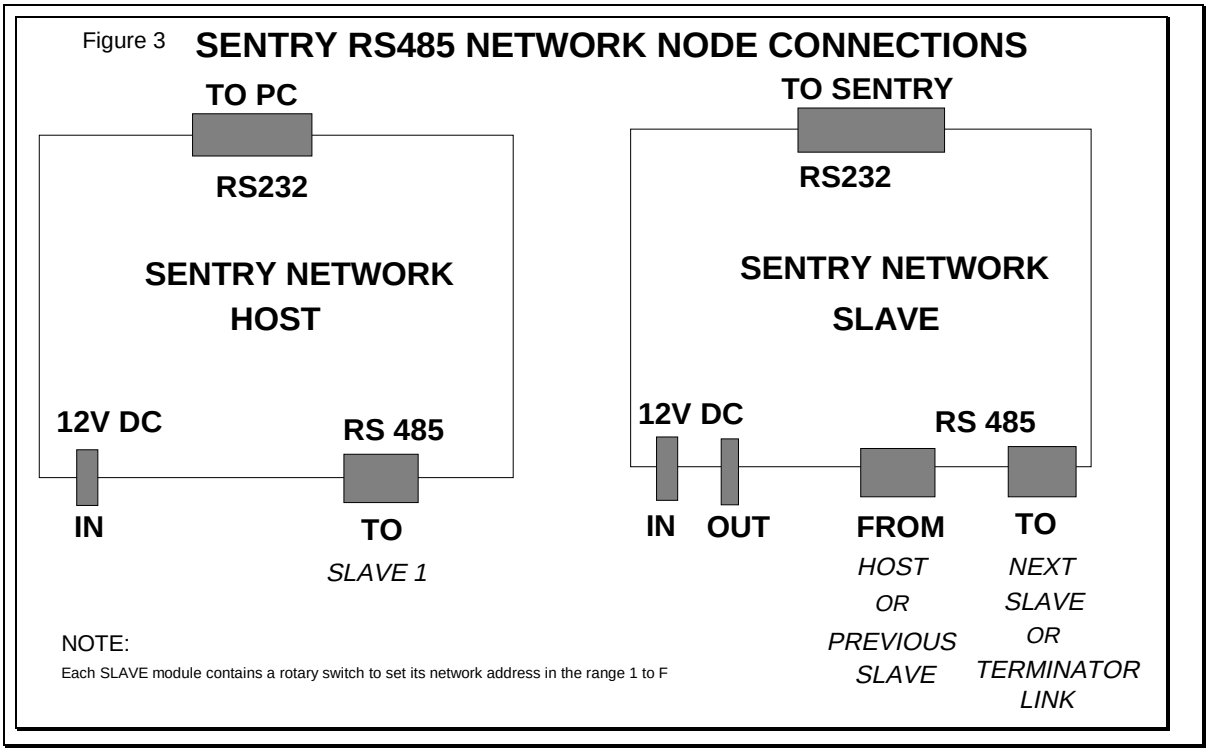


Figure 3



NOTE:
Each SLAVE module contains a rotary switch to set its network address in the range 1 to F

Installing the Sentry Observer Software

The Sentry Observer Software will work on any PC that has Windows 95/98 or NT and a free COM port for the Sentry hardware to connect to. If you are using a local network to connect the Sentry units, then instead of a free COM port you need to use a PC with a NIC (Network Interface Card). That PC must have TCP/IP protocol installed.

To install the software insert the “Sentry Observer Software” CD into your PC’s CD drive. The CD should auto-run, but if not then run the SETUP program on the CD.

To do this on Windows NT 3.51, from the Program Manager select FILE and then RUN. Type A: SETUP in the box then press OK.

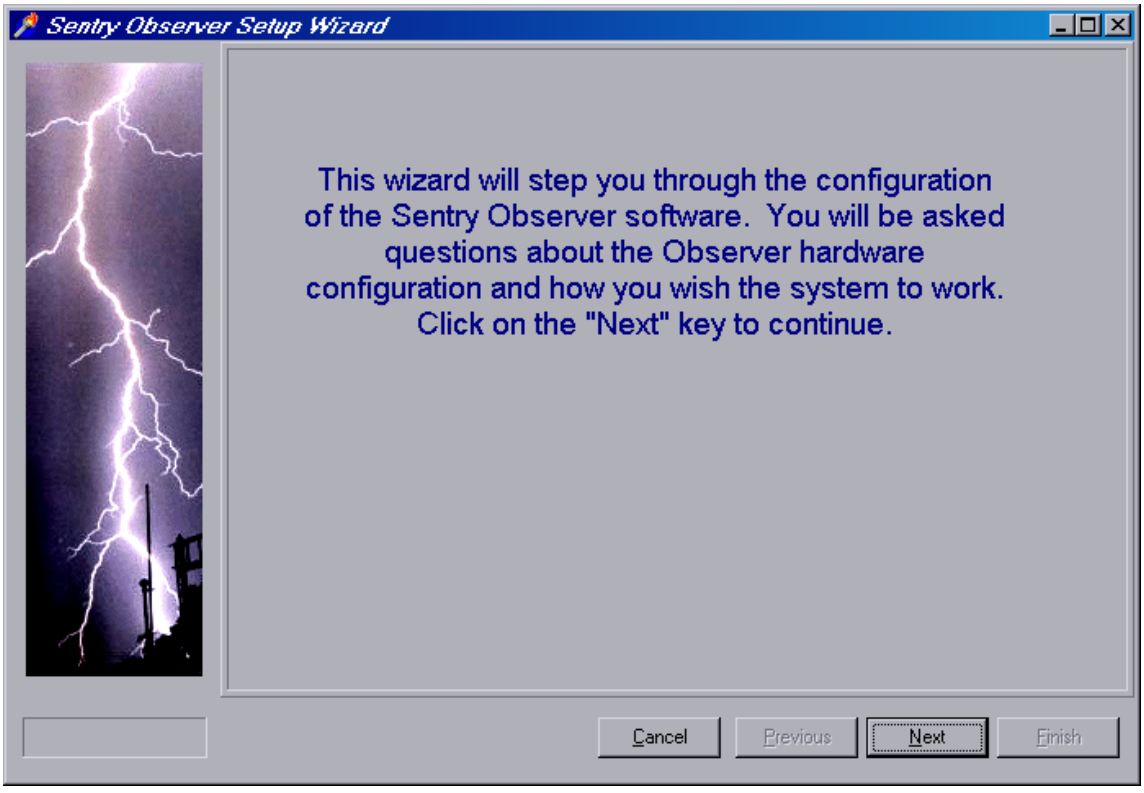
On Windows 95/98/NT4 under the START menu select RUN and type D:SETUP (replace D with the drive letter of your CD) in the "Open" box then press OK.

The setup program will install the software and create a program icon to run it. You will be asked to re-boot the machine; please do so before using the software.

System Set-up

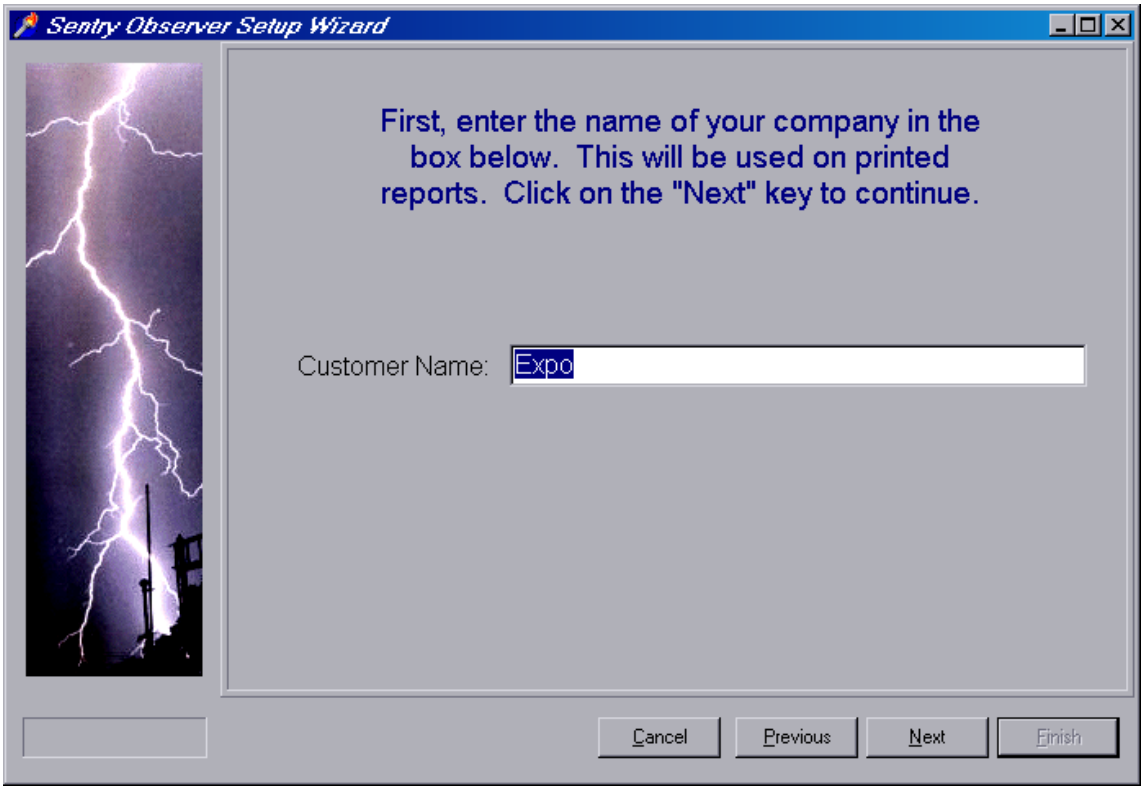
Step 1 - Wizard

Before use the system configuration must be defined and the test parameters set for each Sentry unit. Start the Wizard (Start button, then Programs, then Sentry, then Sentry Wizard). This is the first screen:

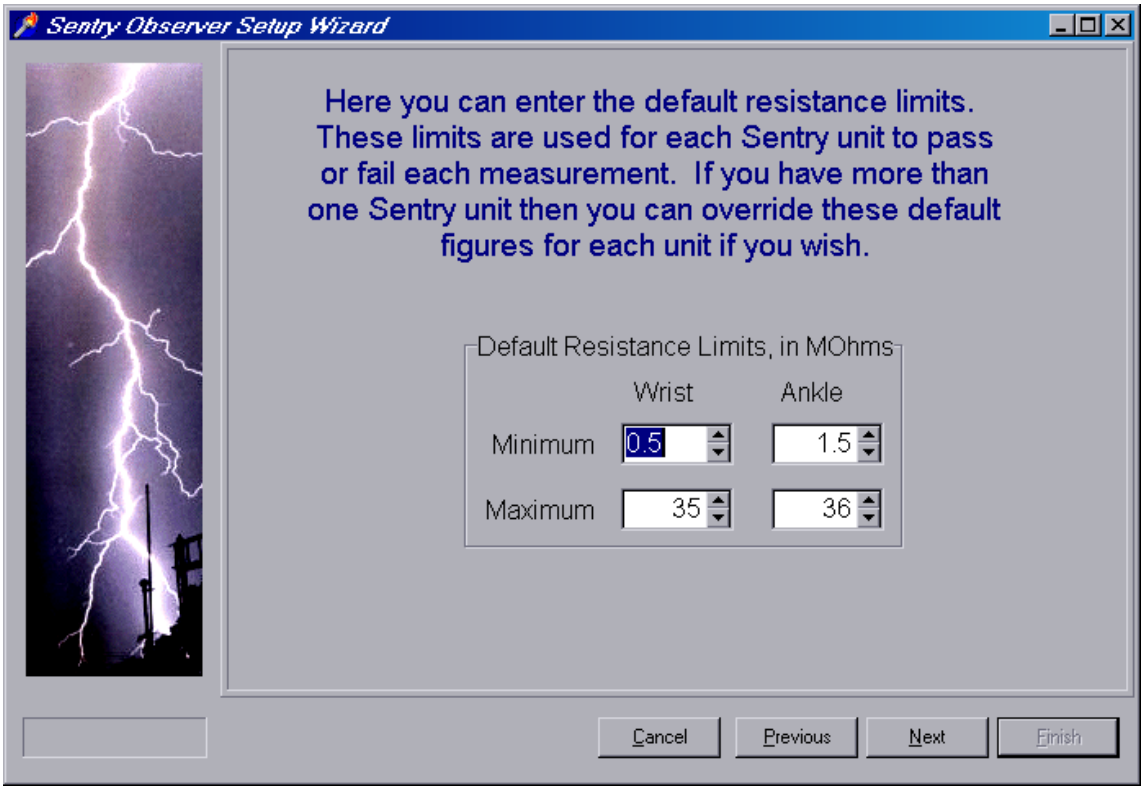


Click on “Next” to continue. You can cancel at any time using the “Cancel” button. You can also redo a step by clicking on “Previous”.

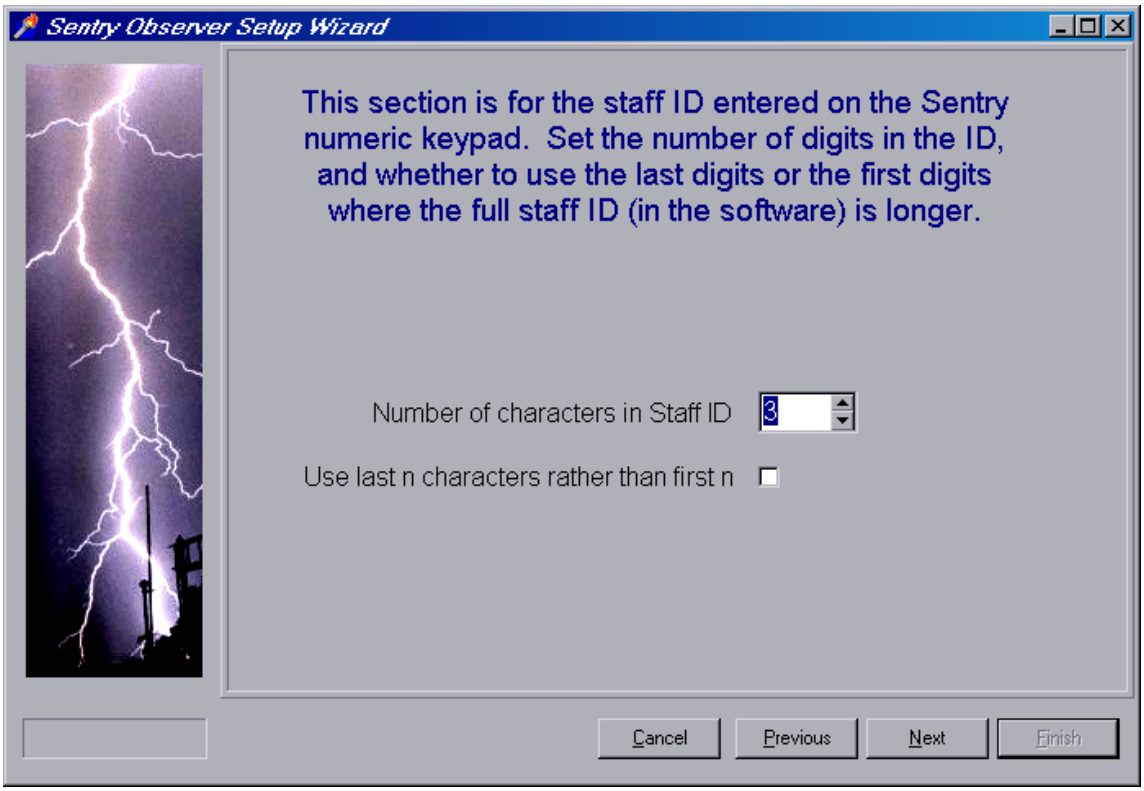
Once you click on “Next”, the second screen appears:



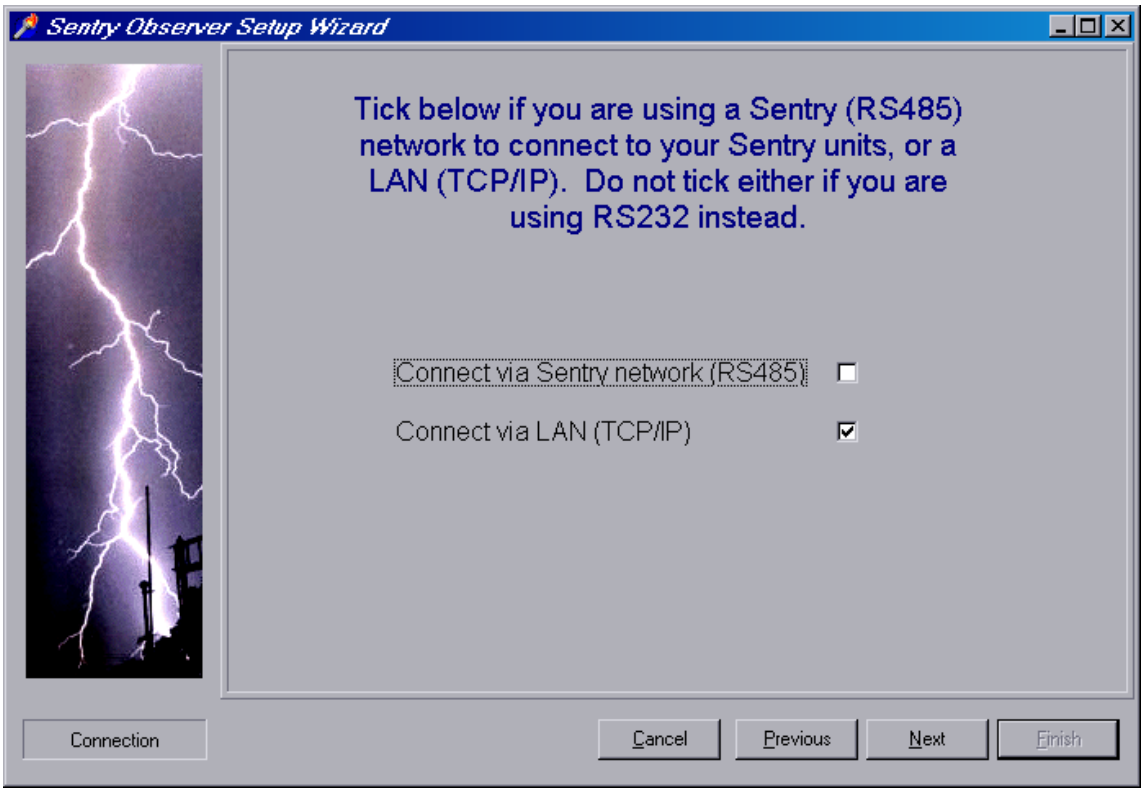
Enter your company name as requested, and then click on Next.



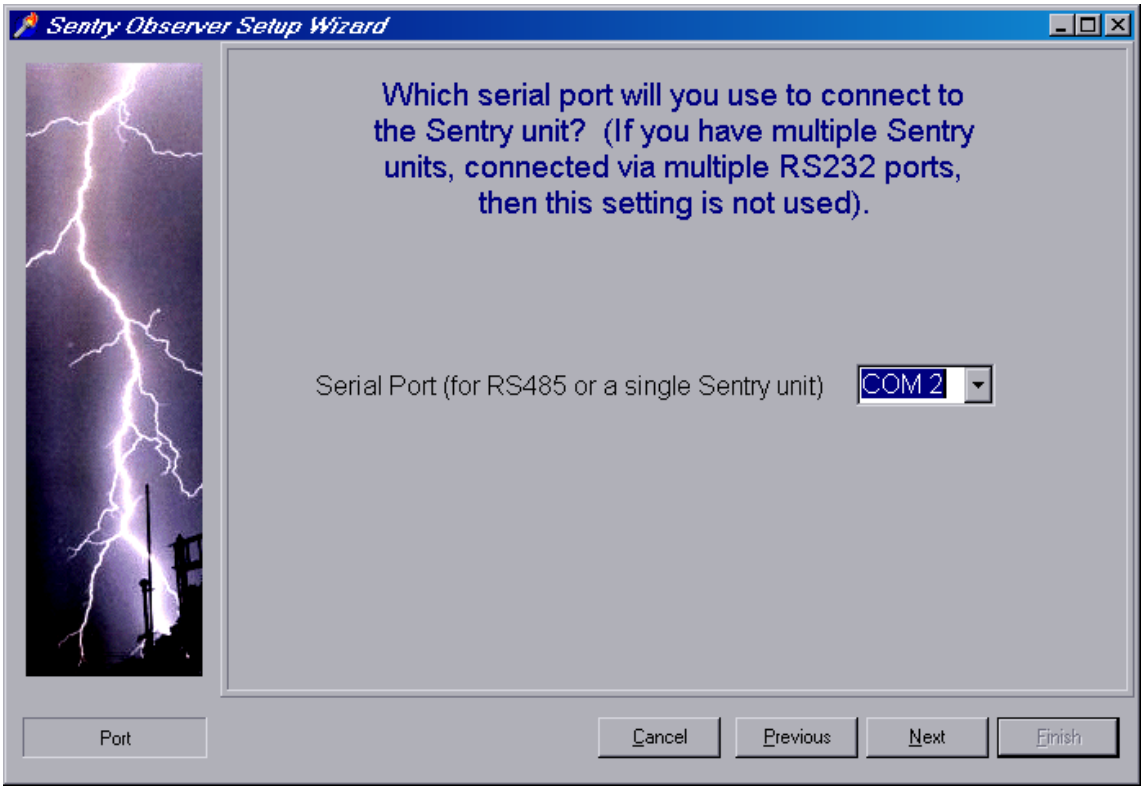
Enter the resistance limits as explained, then click on Next.



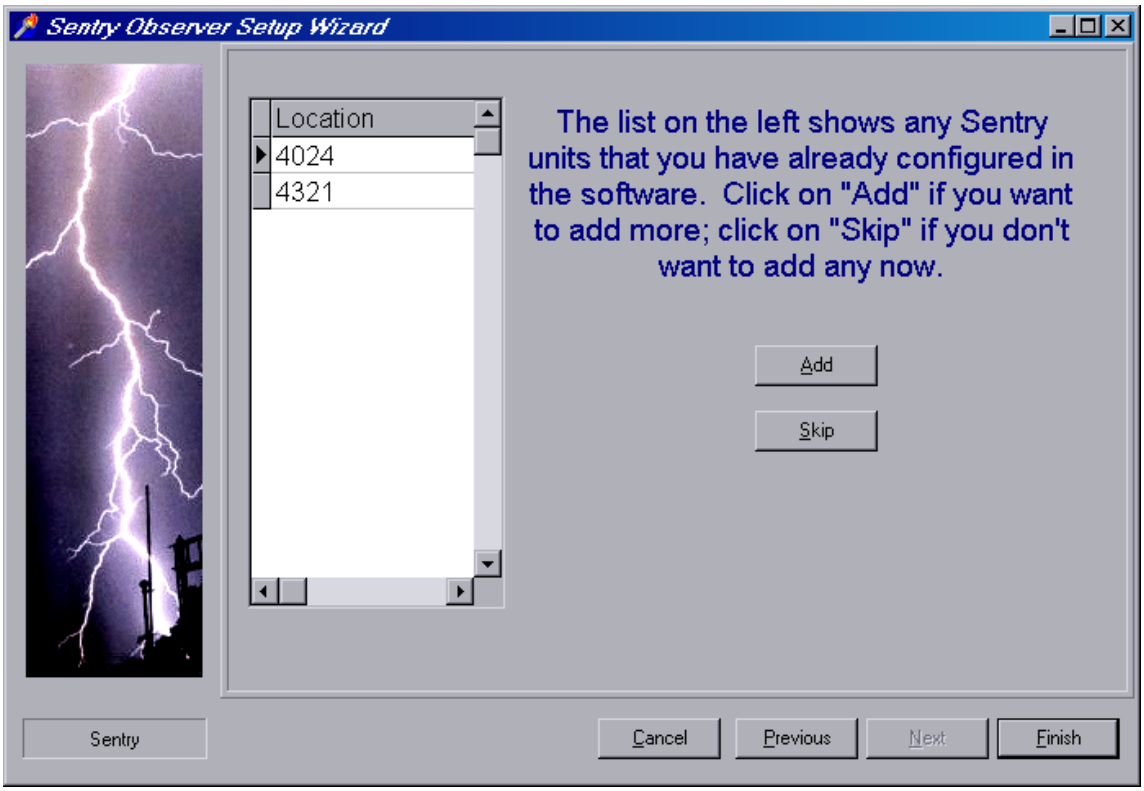
Again, enter the requested information and click on Next. All of your choices can be changed later, either by re-running the Wizard or by using the various setup functions with Sentry Observer itself.



Choose the connection type, according to the type of system you have purchased.

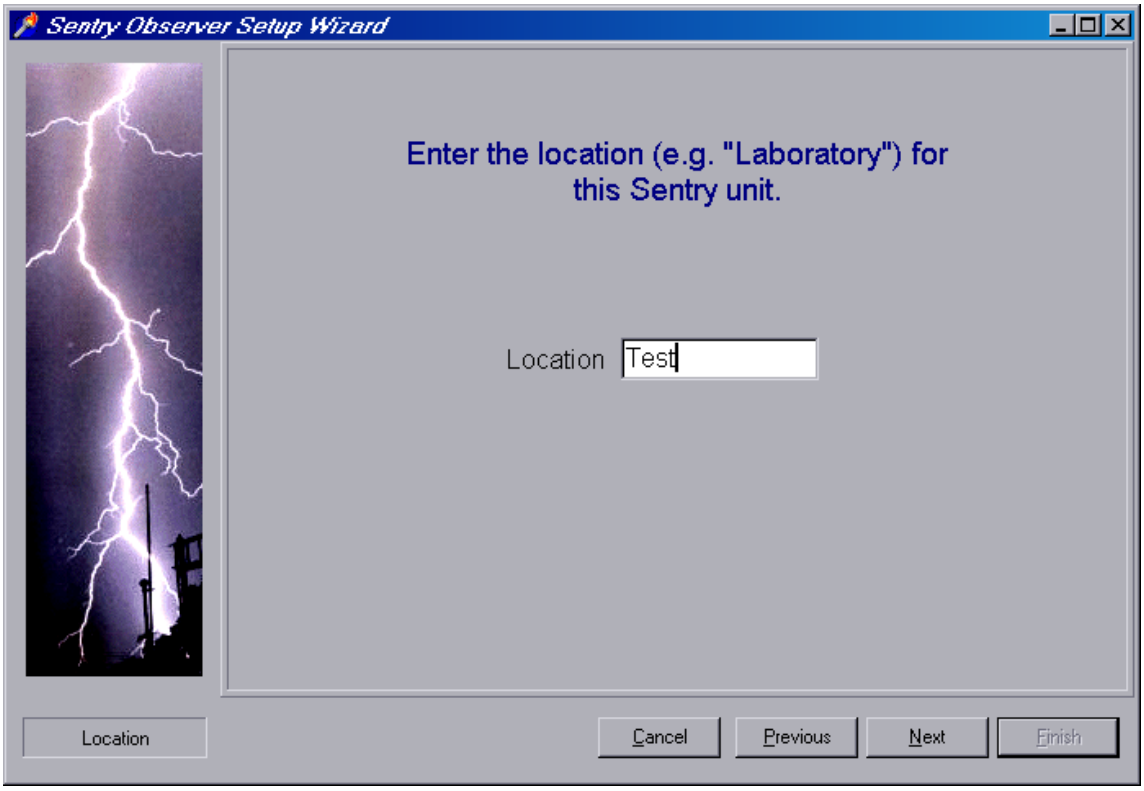


Now choose the serial port. You can ignore this step if you are using RS485 or a Local Area Network.

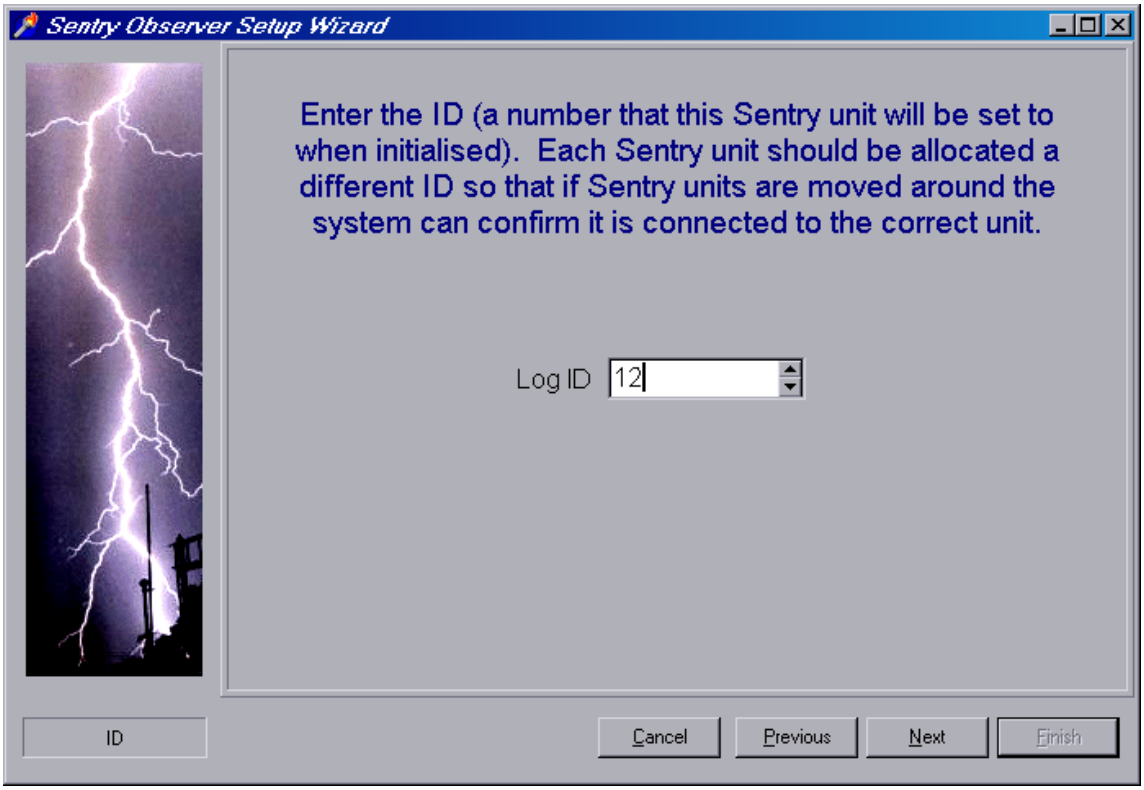


The screen above shows any Sentry units that are already entered. Click on “Add” to add any new ones; click on “Skip” when you are done.

For each new Sentry, you will be shown the following screens.

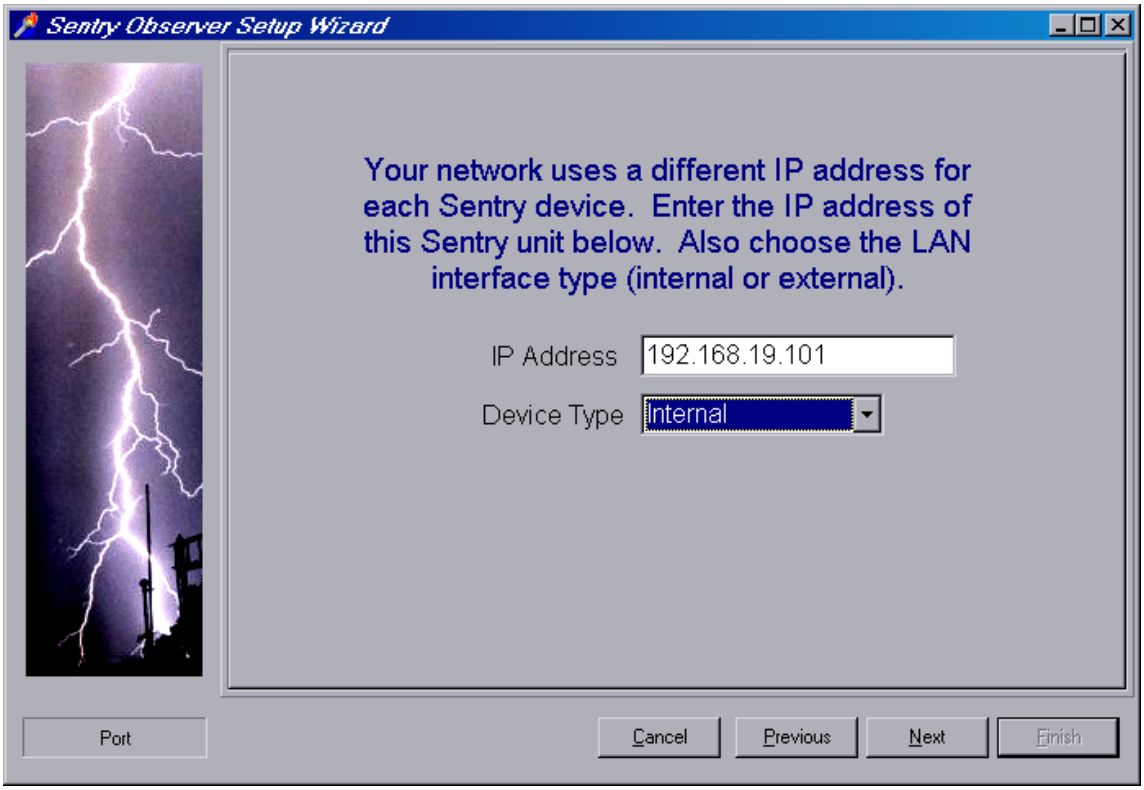


Enter the location (some text helping you determine which Sentry the software is referring to).

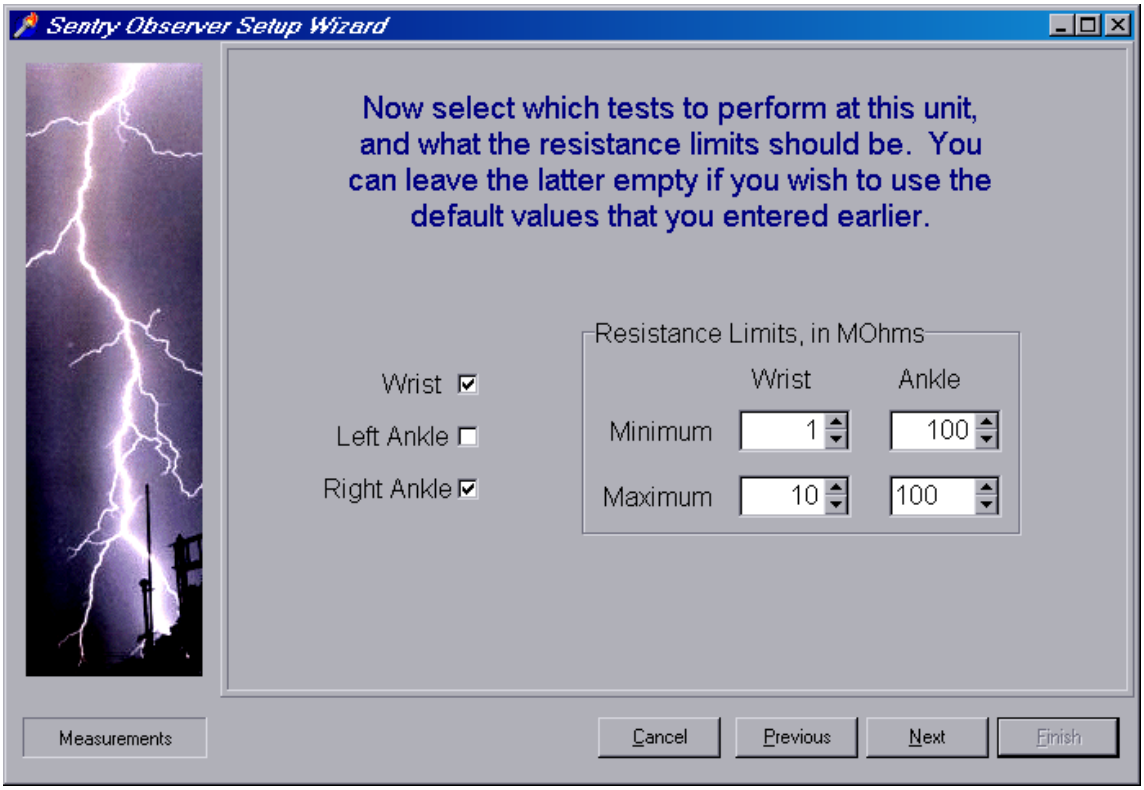


The ID is not the same as an RS485 or Local Area Network address. The ID enables the software to confirm that the correct Sentry unit is located at the correct address (or is plugged in to the correct serial port).

The next screen varies according to the connection type. Here is the one for a Local Area Network:



The next screen offers Sentry-specific settings (which override the system-wide default settings specified earlier):



After this step, you will be returned to the earlier screen where you chose to add a new Sentry. Repeat for all new Sentries; click on Finish when you are done.

Step 2

For Sentry units permanently connected to a PC, a pre-set Automatic Scheduled Download can be established.

The Scheduled Download can be set for multiple downloads each day, or as a daily, weekly or monthly operation.

Using the “Schedule” icon users can define the time for each download to take place.

NOTE
Scheduled Download acts on all Sentries known to the software.

Step 3

Using the “Staff” icon/button names can be entered against all Staff IDs.

System Modifications

Using the “Sentries” icon additional Sentries can be included in the system configuration and the test parameters can be changed.

NOTE

After a new Sentry is added to the system, or the test parameters are changed, the software will update the units. A warning message will be displayed so that stored data can be retrieved, as this will be deleted when the Sentry is initialised.

Operating Instructions

Basic Operation

2

Basic Operation

Before using your SENTRY Static Control & Monitoring System for the first time set the Pass/Fail limits, time, date, log number etc. Refer to Section 3 “SENTRY Observer Software” for details of how to do this.
Using your SENTRY couldn’t be simpler! Just follow these steps:

Testing Wrist Strap Continuity

Connect the wrist strap to the reference connector on the front panel of the tester (See Fig. 1)

Touch **and maintain contact with** one of the silver touch pads (or handles if fitted).
Using the keypad or card reader, enter your operator ID number followed by Enter (#).
Note: You only have 15 seconds to enter your ID, after which the unit will emit a long tone and reset.
The TEST indicators will light after you have pressed “Enter”. If less than the correct number of ID characters are entered a buzzer sounds and the ID must be entered again.
Maintain contact with the touch pad until the TEST indicators have extinguished and the PASS/FAIL indicators are illuminated.

The unit will emit a beep sound to indicate a failed measurement.

Test Foot Strap Continuity

Ensure that the reference ground plate(s) is (are) connected to the tester
(See Fig. 1)

Touch **and maintain contact with** one of the silver touch pads (or handles if fitted).
Using keypad or card reader, enter your operator ID number followed by Enter (#).
Note: You only have 15 seconds to enter your ID, after which the unit will emit a long tone and reset.
The TEST indicators will light after you have pressed “Enter”. If less than the correct number of ID characters are entered a buzzer sounds and the ID must be entered again.
Maintain contact with the foot plate(s) and touch pad (or handle if fitted) until the TEST indicators have extinguished and the PASS/FAIL indicators are illuminated.

The unit will emit a beep sound to indicate a failed measurement.

Testing BOTH Wrist and Foot Strap Continuity

Depending on the unit’s configuration Sentry will test both feet and the wrist strap in one operation. Maintain contact with the foot plate(s) and touch pad (or handle if fitted) until the TEST indicators have extinguished and the PASS/FAIL indicators are illuminated.

Memory Full Indication

Using the “Setup” icon, either of two conditions can be set to apply when the memory is full:-

1) When the system main log is full, the FAIL indicators will flash alternately. The Sentry cannot be used until the main log has been downloaded and cleared.

2) Alternatively the Sentry will continue to test normally but no results will be logged.

Refer to Section 3 “SENTRY Observer Software” for details of how to retrieve data from the main log.

Back-up Battery Failure

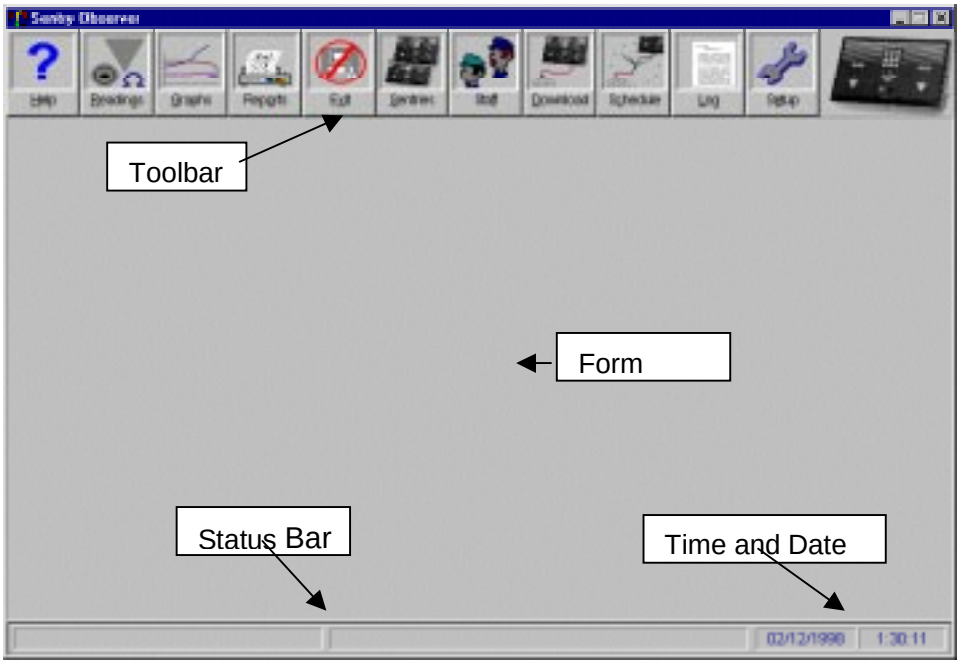
The FAIL indicators will flash continuously when the system is powered to indicate the battery needs to be replaced.

SENTRY Observer Software

3

SENTRY Observer Software

Start the SENTRY Observer Software by choosing Start | Programs | Sentry | Observer. The program will appear like so:

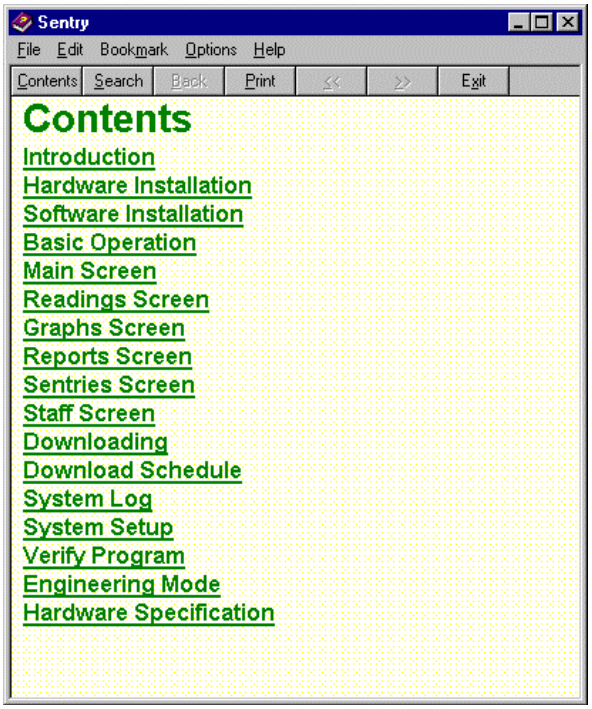


The main program screen is always visible when the SENTRY Observer Software is running. The top of the screen has a toolbar containing a set of buttons for the main program functions. Each button contains an icon and some text. To choose a function just click on the appropriate button.

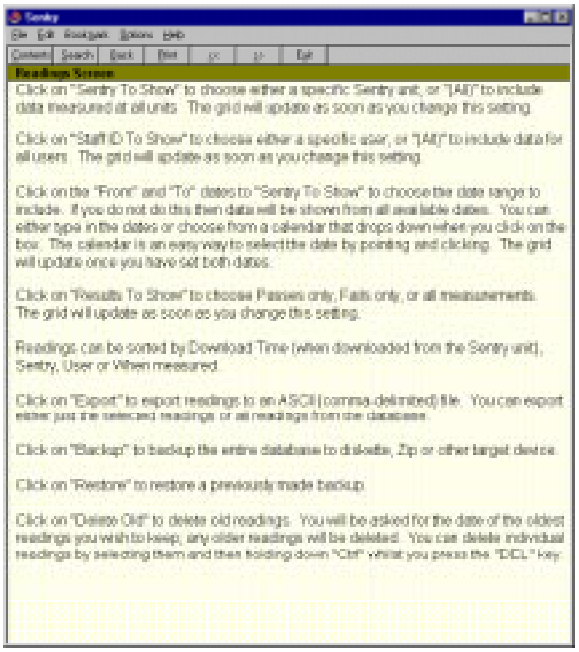
The buttons and their functions are:

F1	Help
F2	Readings
F3	Graphs
F4	Reports
F5	Exit
F6	Sentries
F7	Staff
F8	Download
F9	Schedule
F10	Log
F11	Setup

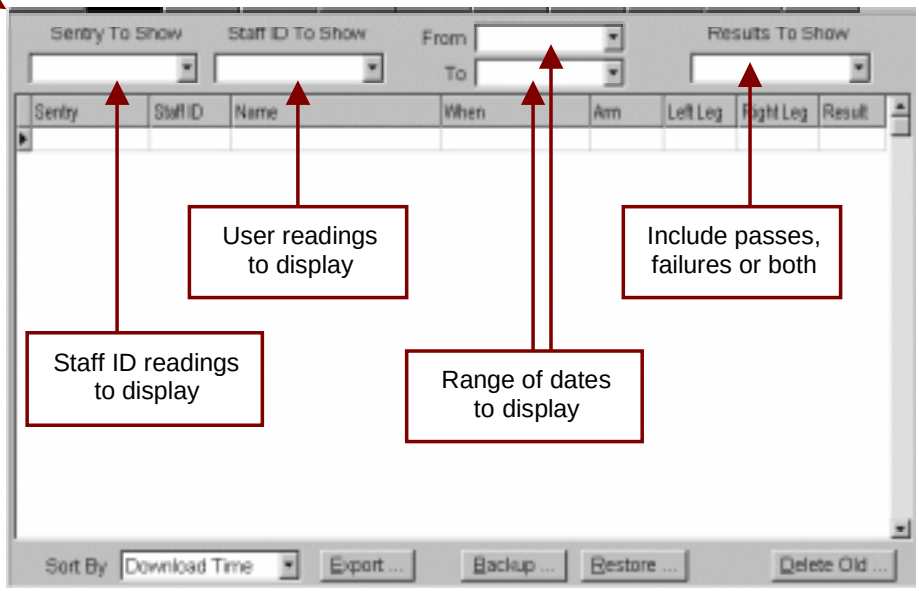
Help. This button displays the contents page of the help file. E.g.



Pressing the function key “F1” at any time will bring up a context-sensitive Help Screen. E.g., pressing F1 whilst the “Readings” screen is displayed will bring up this section of the help file:



Readings. This button displays the stored readings in a grid, like so:



Click on “Sentry To Show” to choose either a specific Sentry unit, or “(All)” to include data measured at all units. The grid will update as soon as you change this setting.

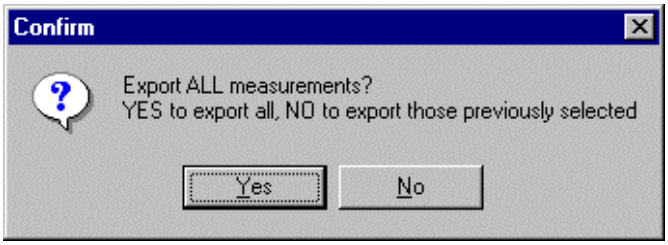
Click on “Staff ID To Show” to choose either a specific user, or “(All)” to include data for all users. The grid will update as soon as you change this setting.

Click on the “From” and “To” dates to choose the date range. If you do not do this then data will be shown from all available dates. You can either type in the dates or choose from a calendar that drops down when you click on the box. The calendar is an easy way to select the date by pointing and clicking. The grid will update once you have set both dates.

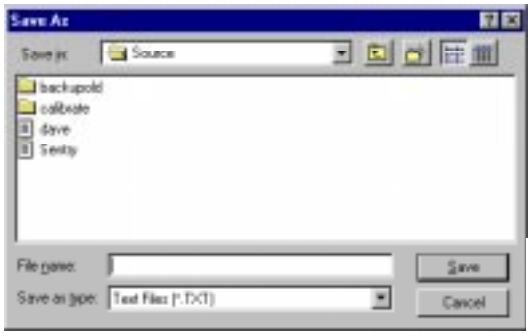
Click on “Results To Show” to choose to show only: All Passes, Any Passes, All Fails, Any Fails, or All Measurements. The grid will update as soon as you change this setting.

Readings can be sorted by: Sentry Unit, User, Download Time (i.e. when downloaded from the Sentry unit), or When Measured.

Click on "**Export**" to export readings to an ASCII (comma-delimited) file. You will be asked if you want to export just the selected readings or all readings from the database:



You will then be asked to choose the name and location of the file to create:



After choosing or typing in the name of the file, click on the "Save" button. The system will then create the file and copy to it all the records you chose. The file is a standard comma-delimited file, with double-quotes around strings and a title line at the beginning. e.g.

```
SentryLocation,UserCode,TimeDate,Arm,LeftLeg,RightLeg,Failed
"Sentry 2","123",29/03/1999 9:16:00,2.566,,,"PASS"
"Sentry 2","123",29/03/1999 9:22:00,4.057,,,"PASS"
"Sentry 2","123",29/03/1999 9:25:00,1.235,,,"PASS"
```

You can also schedule automatic exports on the "Schedule" screen. Such exports are to the same format as above. When the automatic export runs, it creates the exported file if it does not exist, otherwise it appends data to it. The automatic export includes only new measurements captured since the previous automatic export.

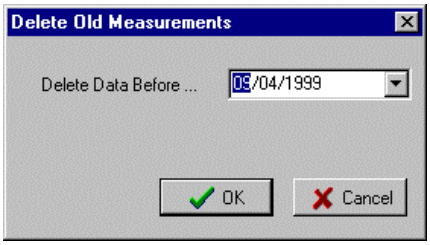
Click on "**Backup**" to backup the entire database to diskette, Zip or other target device. You will be asked to provide a target location for the backup:

Backups to diskettes will ask for further diskettes if the amount of data is too large for a single diskette. However, data is compressed before storage (using the standard PKZIP/WinZip format) and a great many readings will fit on a single formatted diskette.

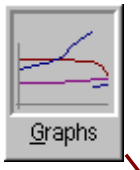
Please note that backup media must be formatted – Sentry Observer does not do this for you.

Click on "**Restore**" to restore a previously made backup.

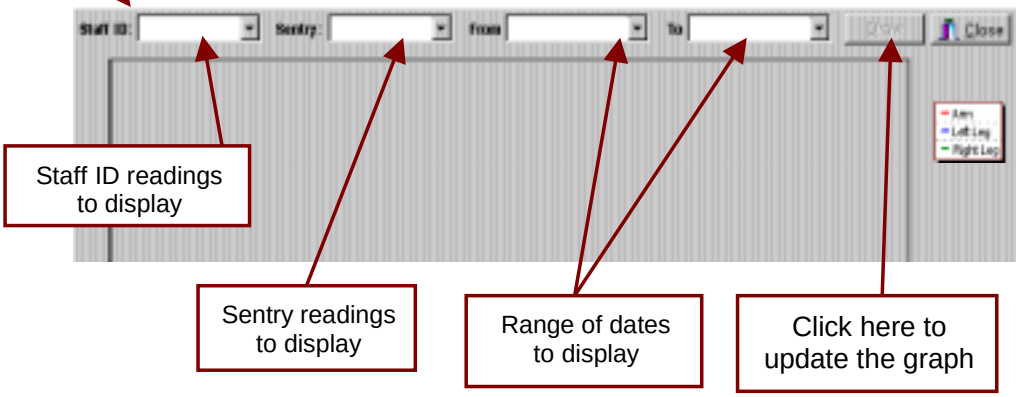
Click on "**Delete Old**" to delete old readings. You will be asked for the date of the oldest readings you wish to keep; any older readings will be deleted. ***Make sure that you have made a backup of your data first if there is any chance that you will need it again.***



You can delete individual readings by selecting them and then holding down "Ctrl" whilst you press the "DEL" key.



Graphs. This button displays the stored readings in a graph**:**



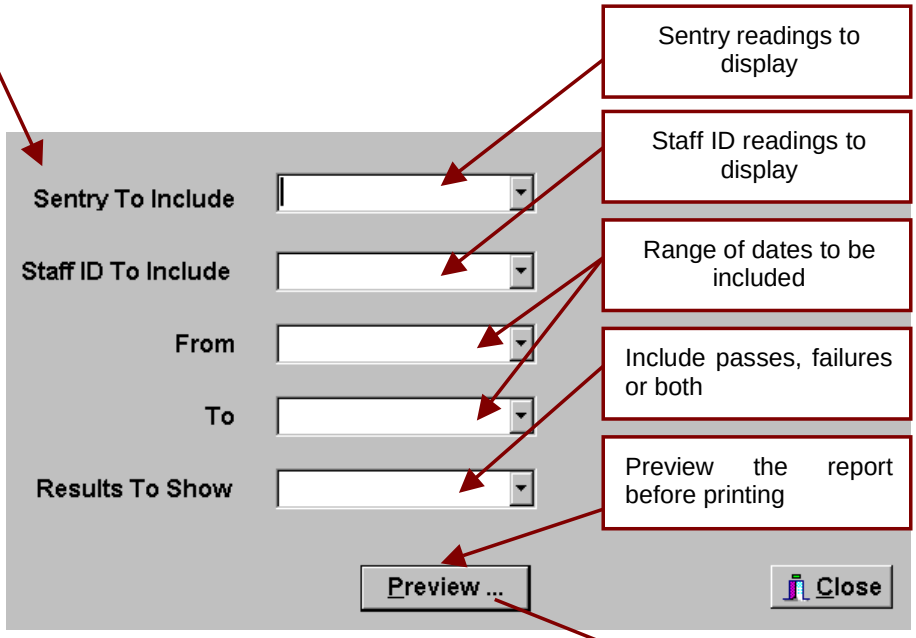
Click on “Sentry To Show” to choose either a specific Sentry unit, or “(All)” to include data measured at all units. Click on the “Draw” button when you want to update the graph.

Click on “User To Show” to choose a specific user. Click on the “Draw” button when you want to update the graph.

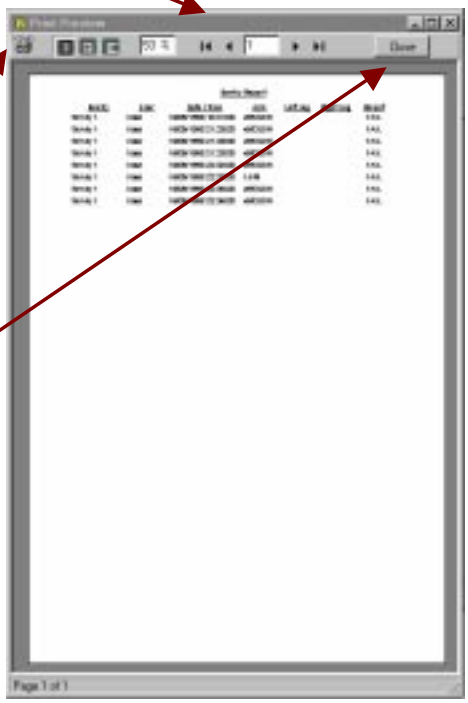
Click on the “From” and “To” dates to choose the date range. If you do not do this then data will be shown from all available dates. You can either type in the dates or choose from a calendar that drops down when you click on the box. The calendar is an easy way to select the date by pointing and clicking. Click on the “Draw” button when you want to update the graph.

Reports. This button prints the stored readings as a report.

First, you choose which measurements to include in the report:



When you click on the "Preview" button you will see a window like the one here



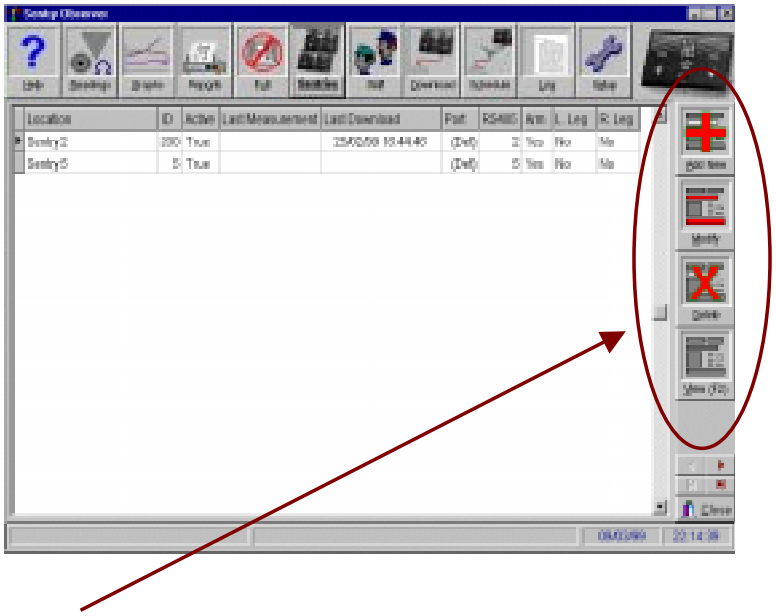
Click on the printer icon to print the report.

Click on the "Close" button when you're done.

Exit. This button exits the software.

Remember that if your system is configured for automatically scheduled downloads and/or exports, these will only happen while the software is loaded. You may wish to just minimise the Observer program instead of closing it.

Sentries. This button displays the list of Sentry units known to the system.



You can use these buttons to Add a new Sentry or Modify or Delete an existing Sentry. These are the details for each Sentry:

Location
This is a user specified name allocated to each unit in the Observer software.

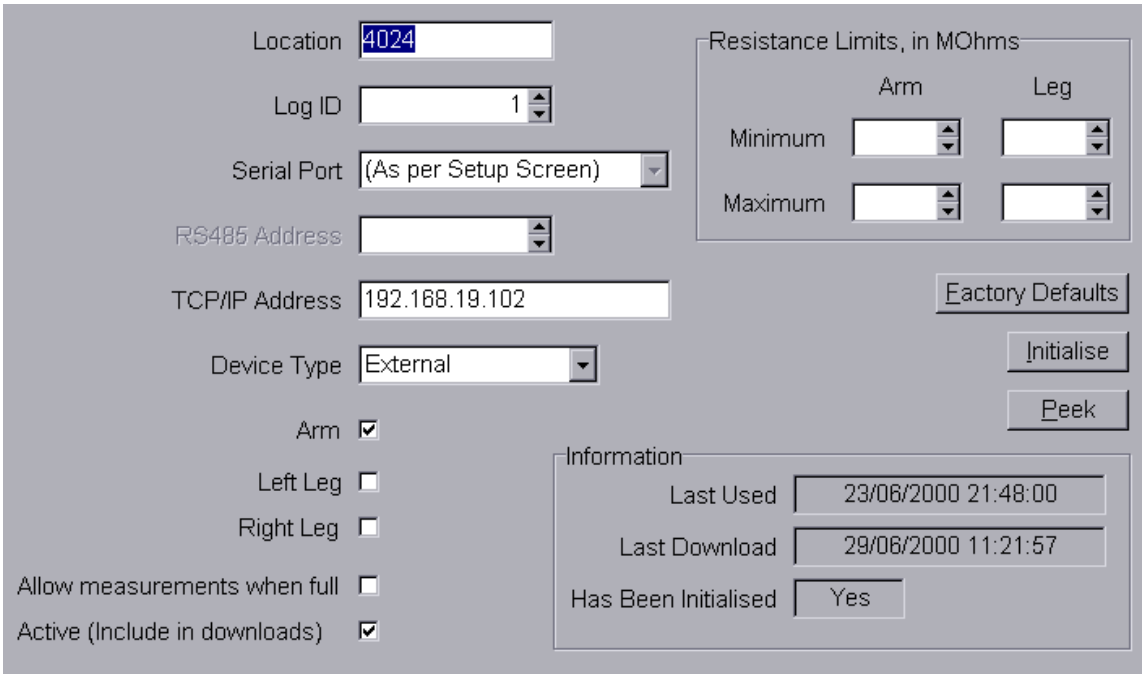
ID
This is a unique identifier stored in each unit. It can be any numeric value from 1 to 250. It is used by the Observer software during download to confirm the connection.

Serial Port
This is the RS232 port on the PC. It can be set on the Set-up screen or on each unit.

RS485 Address
This is the value set in the Sentry RS485 Network Slave module. It is used to address the unit on the RS485 network.

IP Address
This is the value set in the Sentry Ethernet/Token Ring Network Interface Unit/Board. It is used to address the unit on the Local Area network.

Resistance Limits in MOhms
These are the user-specified values. They can be set on the Set-up screen or on each unit.



If you have more than one Sentry unit, then you need to set either the Serial Port (if you are using RS232) or the address (if you are using RS485 or Local Area Network) for each unit. For a Local Area Network, as well as the TCP/IP address you need to enter the device type (Internal Ethernet Network Interface Board, External Ethernet Network Interface Unit or External Token Ring Network Interface Unit).

Tick the appropriate boxes to enable measurements of arm and leg resistances.

After each new Sentry is added or an existing Sentry is modified, the set-up data should be sent and the unit initialised.

If a Sentry is no longer in use (so you no longer want to download from it), then modify it and untick the “Active” box. This will ensure that you can still see measurements from when the Sentry was in use, but that no further downloads take place.

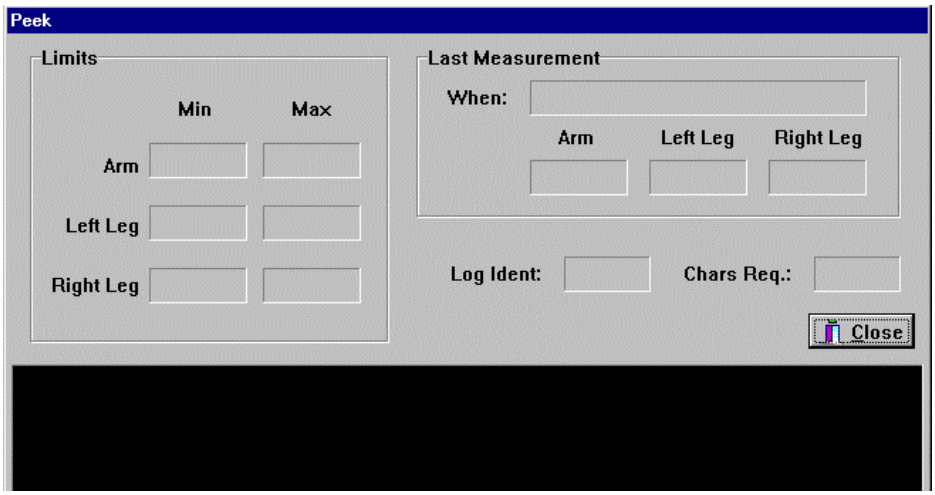
You can set the minimum and maximum resistance values for each Sentry individually. Leave these settings empty to use the default values on the Setup screen (see later).

Note: If you delete a Sentry, then measurements made at that unit will be lost. The software warns you of this and asks you to confirm that this is what you really want to do.

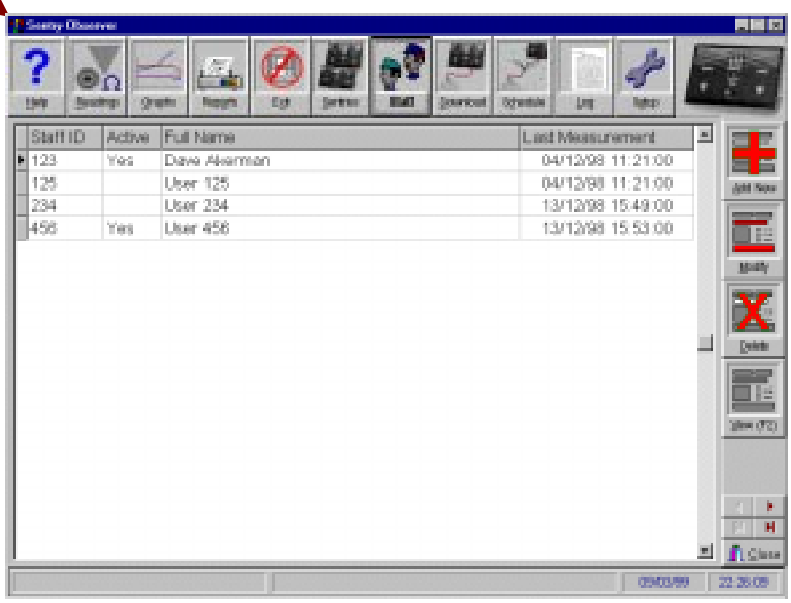
The “FACTORY DEFAULTS” mode resets the Sentry unit to its default factory settings.

The “INITIALISE” function initialises the Sentry unit (i.e. sets the Staff ID length etc., and clears the log).

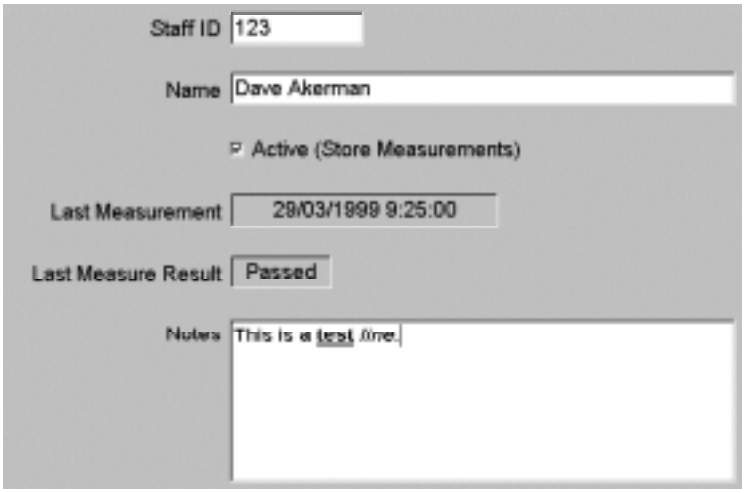
The “PEEK” function lets you inspect the current settings at a particular Sentry unit, and then watch any activity (i.e. measurements) in real time. Click on “Peek” and you will see the following screen. Any activity will be displayed in the black terminal window.



Staff. This button displays the list of Staff (people who can use the Sentry units).

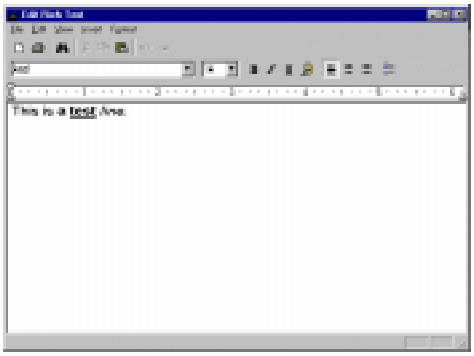


The functions are the same as for the Sentries screen. All you need to do is enter the full name against each Staff ID.



If a Staff ID is no longer in use (so you no longer want to download measurements made by that member of staff), then modify it and untick the “Active” box.

You can also enter the “Full Name” of the member of staff, plus any other information in the “Notes” box. When you tab to or click on the latter whilst modifying a staff entry, a text editor pops up to allow you to change the font etc.

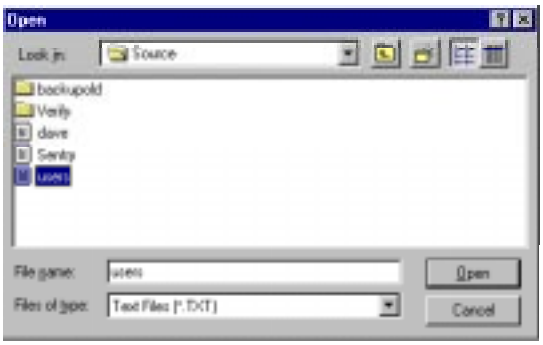


Click on File/Exit to leave the editor. If you have made any changes you will be asked if you want to save them.

You can import staff entries from a comma-delimited text file. Each line in the file should contain the staff ID (which must be unique) and the staff name. Either of these can be enclosed in double-quotes. The ID and name should be separated by a single comma. Valid examples are:

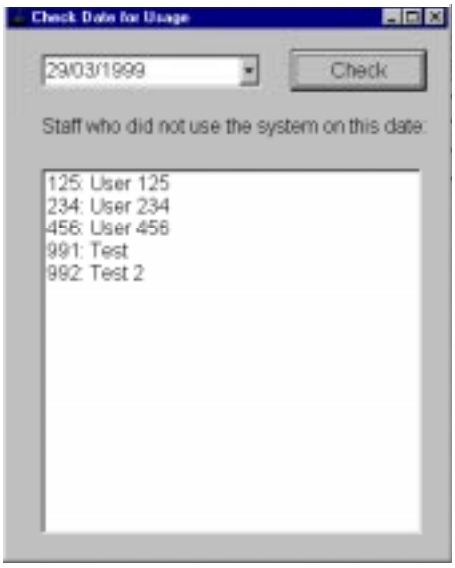
123,"Fred Bloggs"
"123","Fred Bloggs"

To import, view the staff list and click on the "Import ..." button at the bottom-left of the screen. Choose the file to import from, then the file will be imported automatically.

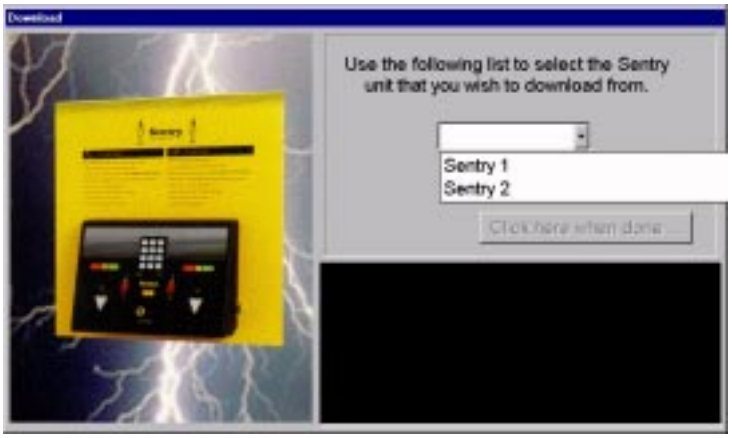


Any staff IDs in the file that are already in the Sentry database will be ignored. All imported staff will be set to "Active".

If you wish to check on who did not make a measurement on a particular day, display the staff list and click on the "Check Usage ..." button at the bottom of the screen. This will display a small window asking you to select the date in question. To do this, click on the date box and a calendar will pop up from which you can choose the day/month/year. When you're done, click on the "Check" button and a list of users who did NOT make one or more measurements on that date will appear. Repeat for other dates if required.



Download. This button starts the Download Wizard, which steps you through downloading data from a Sentry unit. Data from the unit is deleted once *successfully* downloaded.



If you have more than one Sentry unit, then the above screen will appear first. Using the drop-down list, choose the Sentry unit from which to download. Click on the button when you're done.

If you have just one Sentry unit, or your Sentry units are permanently connected, then the software will skip the above screen.

The next screen tells you which COM port to use (which will be the same one that you configured in the set-up and/or Sentry screens).

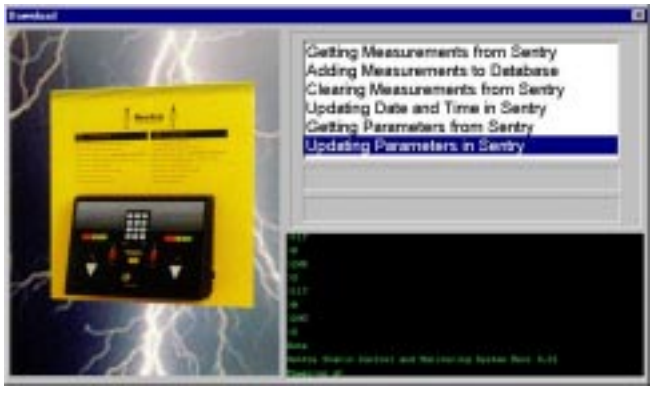
Click on the button when you have connected the Sentry unit to the PC. The software will then attempt to communicate with the Sentry:

If this communication fails, perhaps because the serial cable was not inserted correctly then the software will display the following message before allowing you to try again:

All communications failures are logged and can be seen on the log screen (see below).

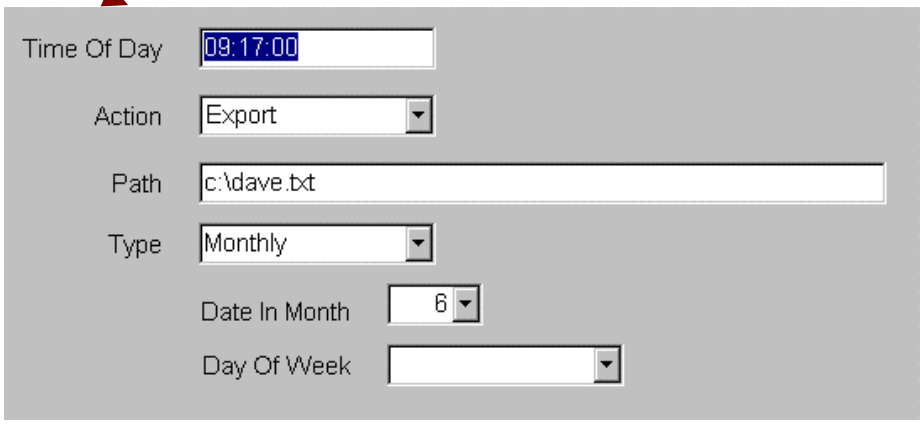
For systems with more than one Sentry unit, the system will then continue by attempting to communicate with the next unit.

Once communications have been established, then the system will step through a procedure of downloading data from the Sentry, *clearing the Sentry so that it can accept more measurements*, and uploading settings and the current time and date:



If for some reason the previous data downloaded from any of the Sentry units has been lost, this data can be retrieved ***provided that no new measurements have been made.*** *In order to restore the data, perform a download as usual* ***but hold down the SHIFT key when you click on the Download button.***

Schedule. This displays and allows you to edit the schedule for when the system will automatically download data from *all* the attached Sentry units, or export new measurements to a file.



This displays and allows you to edit the automatic schedule. The schedule can be used to download data from *all* the attached Sentry units, and also to perform automatic exports of new measurements.

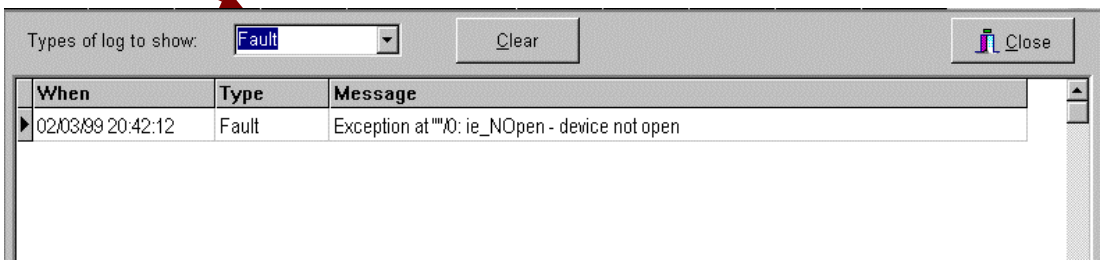
Provided the Observer software is running when a scheduled event arrives, then the event will start automatically and with no user intervention. Messages on the status bar will show what is happening, but you will be able to use the software as normal.

If a scheduled event is missed because the Observer software was not running, then the software will perform the event when it is next started.

You can set as many events as you wish. Events can be scheduled for every day, weekdays (Monday through Friday), the same day each week or the same date each month.

Download events cause the system to download from all attached Sentry units. Export events cause the system to export all new measurements to a specified text file. That file is created if necessary. If the file already exists then it is appended to. The format of the file is the same as in the manual export function (see the section on the Readings screen).

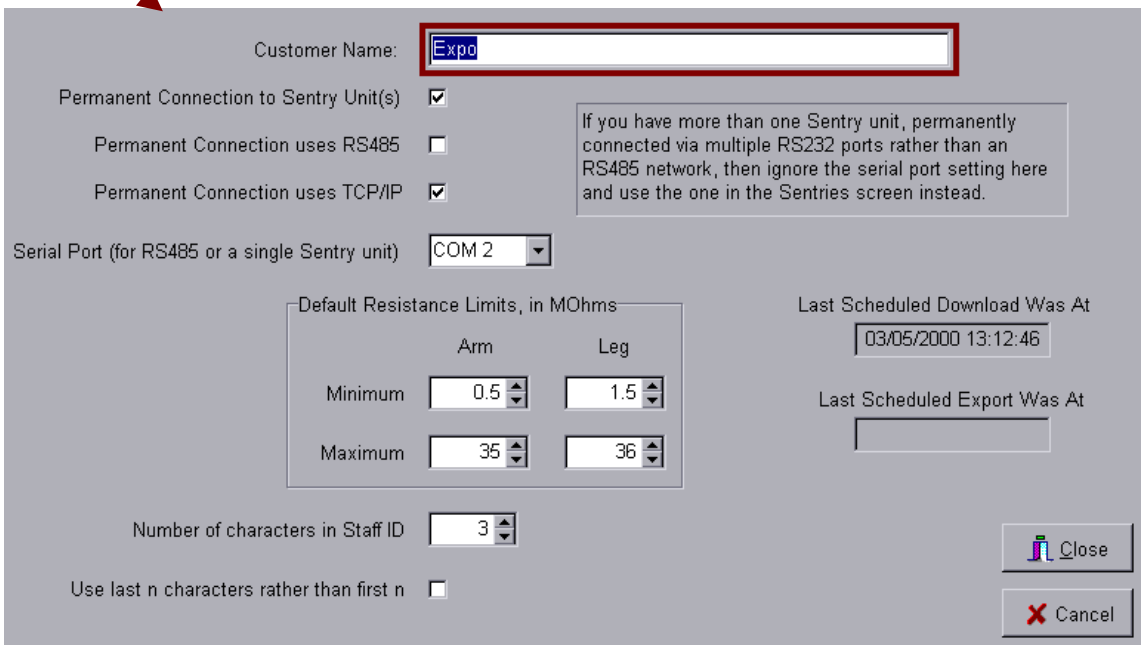
Log. This function displays the system log.



This includes informational messages (e.g. “Download occurred at …”), plus warnings (e.g. “Failed to communicate with Sentry”) and any program errors. You can choose which errors to display.

You can clear the error log at any time, however there is probably no need because the system automatically removes any logs that are more than 1 week old.

Set-up. This function allows you to set system parameters such as the minimum and maximum acceptable resistance values and the serial port(s) connected to Sentry unit(s).



Connections can be either permanent (i.e. the Sentry unit is always connected to the PC) or intermittent (i.e. you connect the PC to a Sentry unit when required).

Permanent Connection

A permanent connection allows for scheduled downloads, so that the PC software can download data from the Sentry unit(s) without user interaction.

You can use any serial port from COM1 to COM8 to connect to your Sentry unit(s).

If you have up to 4 units, each unit can be connected to a single COM port. Choose any free port for each device or they may all be connected to a single COM port using the Sentry RS485 Network options described in Section 1 Installation of this manual.

If you have more than 4 units, they must all be connected to a single COM port using the Sentry RS485 Network options described in Section 1 Installation of this manual, or may be connected to a Local Area Network.

Intermittent Connection

The intermittent connection requires that you manually make a connection before pressing the Download button.

You can use any serial port from COM1 to COM8 to connect to your Sentry unit(s).

Min / Max Values

The set-up screen includes resistance values for the minimum and maximum allowed. Limits must be within the range 0.5 to 45449.0 MOhms with the upper greater than the lower. Actual values will be rounded to the nearest whole number of bits within the measurement system. e.g. setting a value of 100MΩ results in an actual limit of 101.98MΩ being used.

Default settings are 0.5MΩ and 35.28MΩ.

These values are defaults. The values for individual Sentry units can be set specifically or can be set to use the defaults on this set-up screen (see the previous page for the Sentry Set-up screen, for more details).

SENTRY Verify

This is accessed via a separate icon “Sentry Verify”. This is a read-only function that enables the user to verify the measurement accuracy of any Sentry unit.

The engineering firmware refers to the measurement nodes as Pods. This is necessary because of the low level at which the program works. The normal interpretation is as follows:

Pod 1	Front panel wrist-strap connector
Pod 2	Left footplate
Pod 3	Right footplate

This program ONLY works with a direct RS232 connection. You must connect the Sentry directly and not via an RS485 or Local Area Network.

Choose the serial port (if you are not using COM 1), and the program will automatically place the Sentry in “Verify” mode. You can then verify resistance values using the first *Enabled* Pod. Click on “Next Pod” to select the next enabled pod. Note that only pods that have been enabled (i.e. on the Sentry screen in the Observer software) can be verified.

For more information on Verify see section 4 Terminal / Engineering Mode of this manual.

Verification Procedure

It is required that calibrated resistors are used for verification testing. These can be those in the optional SENTRY Verification Module, or individual precision resistors. The procedure is straightforward, requiring the operator simply to place a calibrated resistance between the touch plate and a reference point i.e. the wrist strap connector or footplate connector(s).

Note that the reading taken is subject to the resolution of the system.

No calibration adjustment is provided. See Section 5, for Hardware Specification. If the Audit procedure indicates the unit is out of tolerance it should be returned to your distributor for repair.

Engineering Mode

Terminal Program

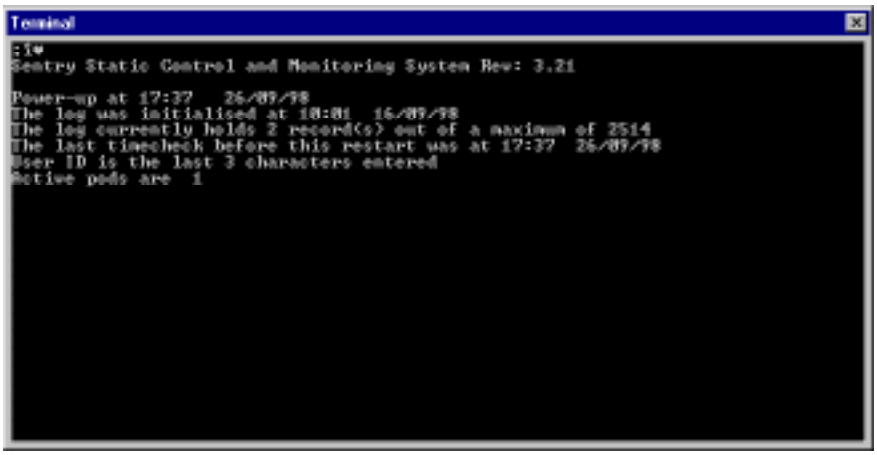
Using the SENTRY Control Menu

Control Menu Advanced Functions

4

Terminal Program

The terminal program is provided for direct access to the Sentry unit(s). **This function is not required in normal operation.**



SENTRY is fitted with an RS232 serial port, (See Fig.1), which may be connected to a terminal (or computer) to allow test results to be displayed as they are gathered. Such a terminal also provides 2-way communication with the Sentry firmware via the Control Menu. This allows setting of parameters such as date and time, pass limits, etc., and the inspection of logged results.

Please note that if you use this terminal window to change settings in the Sentry unit, those settings may be changed back again when the Observer software next downloads data from the Sentry unit. The Observer software is the primary store for all settings, and you should normally use the SETUP function, and not the Terminal Window, to change any settings.

The engineering firmware refers to the measurement nodes as Pods. This is necessary because of the low level at which the program works. The normal interpretation is as follows:

Pod 1	Front panel wrist-strap connector
Pod 2	Left footplate
Pod 3	Right footplate

Engineering Mode

Using the SENTRY Control Menu

Engineering mode is accessed via a terminal program communicating directly with a Sentry unit. A suitable terminal program is provided in the Sentry installation directory. The SENTERM.EXE program allows the setting of parameters such as date and time, pass limits, etc., and the inspection of logged results. The engineering firmware refers to the measurement nodes as 'Pods'. This is because of the low level at which the program works. The normal interpretation is as follows:

Pod 1	Front panel wrist-strap connector
Pod 2	Left footplate
Pod 3	Right footplate

When the SENTRY is first powered up the following typical opening screen is sent to any terminal connected to the RS232 port:

```
Sentry Static Control and Monitoring System

    Power-up at 17:18 28/11/95
    The log was initialised at 21:13 08/11/95
    The log currently holds 2 record(s) out of a maximum of 1312
    The last timecheck before this restart was at 17:18 25/11/95
    User ID is the last 3 characters entered
    Active pods are 1  2
```

The main Sentry log will hold more than 2400 entries in chronological order. The first entry in the log is always an initialisation record, such as:

```
    Log initialised at   21:12 08/11/95
```

NB: The actual number of records the log will hold depends on the number of characters in the ID string. More characters means less records.

The remainder will be test results, such as:

```
    12345678  1.39 Meg    2.06 Meg   3.68 Meg    18:44  10/11/95
    abcdefgh  2.00 Meg    3.65 Meg   7.56 Meg    18:45  10/11/95
```

In addition to the main log, there is an auxiliary log that holds only the last test result. This makes it easy to find the identity of the last operator tested and the test result, without having to search the main log.

Using the SENTRY Control Menu

To enter the Control Menu, press the TAB key on the computer keyboard.

The menu will appear in the following format:

```
Sentry Test System - Control Menu

19:30  23/11/95

Select function required

1 - Read most recent pod records
2 - Read log
3 - Set date & time
4 - Define Pods
5 - Advanced functions
6 - Exit Control menu
```

The date and time shown at the top are those which will be attributed to any changes made during the opening of the menu, no matter how long the menu is open.

Note: Normal system operation is suspended while the Control Menu is open

Menu Items

1 Read most recent pod records
Displays results from the auxiliary log mentioned above.

```
Last stored result was:
ID 123    Open        10.0 Meg     Open      11:43  27/07/97
```

2 Read log
Displays results from the main log after the number of results to be output has been entered in response to:

```
The log was initialised at 11:41  27/07/97
and has 10 record(s)
Enter number of records to print
```

Enter the number of records required, or ‘0’ to start from beginning,

The response will appear in the following format:

```
LOG DATA   Printing 1 records starting 27/07/97
ID 123    2.39 Meg   10.0 Meg    5.67 Meg      11:43  27/07/97

END OF DATA - Press any key to continue
```

If there is more than one screenful, results are displayed in groups of 20 at a time, separated by:

Press any key to continue, or ‘ESC’ to stop

until the last screen, when the message is:

END OF DATA - Press any key to continue

3 Set date & time

Sets date and time into the system's internal clock:

```
Current date & time are 21/11/95  15:01:49
Enter the required date in the form ddmmyy - 301095

Enter the time in the form hhmmss - 12:00:00
30/10/95  12:00:00
```

Note that entering a carriage return in response to either prompt will cause the current value to be retained, e.g.:

```
Current date & time are 30/10/95  12:02:00
Enter the required date in the form ddmmyy - [RETURN]
30/10/95

Enter the time in the form hhmmss - [RETURN]
12:02:00
```

4 Define pods

Allows the wrist or foot nodes to be excluded from the scan sequence if not required:

```
Active pods are 1  2
Enter the numbers of the pods in use in any order,
then press 'Return'
(Just press 'Return' to leave things as they are)    1
Please confirm active pods will be 1
Enter 'Y' to accept, 'N' to re-enter, or 'ESC' to abort Y
Active pods are 1
```

Pods may also be re-introduced into the sequence:

```
Active pods are 1
Enter the numbers of the pods in use in any order,
then press 'Return'
(Just press 'Return' to leave things as they are)    123
Please confirm active pods will be  1  2  3
Enter 'Y' to accept, 'N' to re-enter, or 'ESC' to abort Y
Active pods are  1  2  3
```

5 Advanced functions

Please see separate section on use of Advanced Functions.

6 **Exit control menu**

Closes the control menu and returns the system to normal operation.

Using the SENTRY Control Menu Advanced Functions

Select Option 5 of the Control Menu and the Advanced Functions sub-menu appears:

```
Current log identifier is 0
Enter new identifier between 0 and 255?  12

Control Menu Advanced Functions - Log No. 12

Select function required

1 - Initialise log
2 - Set pass limits for pod 1
3 - Set pass limits for pod 2 & 3
4 - Set log identifier
5 - Verify
6 - Set ID parameters
7 – Set memory full option
8 - Exit Advanced Functions
```

Menu Items

1 Initialise log

This option deletes **all** logged results and starts a new log by recording the pods used in the current scan sequence. Once the log has been initialised, deleted records cannot be recovered. **USE WITH CARE !**

```
ARE YOU SURE YOU WANT TO LOSE ALL RECORDS IN THE LOG?
Type '!' to confirm, any other key to cancel!


The log is cleared
```

It is suggested that test results are downloaded and archived before initialising the log.

2 Set pass limits for pod 1

Allows the setting of Pass/Fail limits for the wrist strap test node. This only affects the value at which the RED and GREEN (FAIL and PASS) lamps are lit in response to a test; it does not affect the log in any way.

```
Currents pass limits are:
LOW 0.78 Meg
HIGH   35.2 Meg
Enter '0' to leave these limits unchanged

Enter new LOW limit (MOhms)? .5
New LOW limit is   0.50 Meg
Enter new HIGH limit (MOhms)? 50
New HIGH limit is   50.2 Meg
```

Note that the system automatically adjusts Pass/Fail limits to values that are compatible with the measurement circuitry resolution.

For example:
Setting the HIGH limit to 50 the system automatically sets the limit to 50.2.
At a reading of 50 MΩ the resolution of the system is approximately 300KΩ See Section 3, Hardware Specification for system resolution.

3 Set pass limits for pods 2 & 3

Allows the setting of Pass/Fail limits for the footstrap test nodes, and operates exactly as above.

4 Set log identifier

The log identifier is a user definable number between 0 and 255, which may be used for any purpose such as keeping logs in sequence or, where more than one unit is in use, relating a log to a particular SENTRY unit. The log identifier is displayed in the Advanced Functions heading and is sent in the header information of a system dump (see page 23), but plays no other part in the logging process:

```
Current log identifier is 0
Enter new identifier between 0 and 255?  12

Control Menu Advanced Functions - Log No. 12

Select function required

1 - Initialise log
2 - Set pass limits for pod 1
3 - Set pass limits for pod 2 & 3
4 - Set log identifier
5 - Verify
6 - Set ID parameters
7 – Set memory full option
8 - Exit Advanced Functions
```

5 Verify

The Verify function forces continuous measurements to be made from a single node, and is intended for use with the SENTRY Verification Module. When this mode is first entered, the selected pod will be the first one in the current scan sequence.

Pressing the SPACE BAR causes the next pod in the sequence to be selected.

Press the ESC key to exit Verify mode.

Typical displays for Verification Module switch settings:

Bit pattern	Pod	Value	Hex
Pod 1		Open circuit	00H
Pod 1		50 Meg	3F4H
Pod 1		1.00 Meg	38EH
Pod 1		10.0 Meg	144H
Pod 1		19.9 Meg	BEH
Pod 1		30.0 Meg	86H
Pod 1		35.2 Meg	74H
Pod 1		40.6 Meg	66H
Pod 1		50.2 Meg	54H
Pod 1		153.1 Meg	1DH
Pod 1		249.1 Meg	12H

6 Set ID Parameters

Default parameters are set for ID to be taken from last 3 characters of string.

To change parameters.
Enter new number of characters (3 to 8) e.g. 4
If string entered is longer than ID length then user can choose to read the first or last characters of the ID string. For **F**irst or **L**ast characters select. F or L.

7 Set Memory Full Option

User can select (S or C) to
(S)top testing when memory is full and alarm*,
or
(C)ontinue testing without logging test results.

***Note that when the stop on full option is chosen, the red LEDs on the Sentry will flash, and the unit will not be available for normal use until the log has been cleared.**

8 Exit Advanced Functions

Closes the advanced function sub-menu and returns to the Control Menu.

Hardware Technical Reference

Hardware Specifications

I/O Connections

5

Hardware Specifications

SENTRY Technical Specifications

- Communication Port and Bar Code Reader Settings

Baud Rate:	19200
Data Bits:	8
Stop Bits:	1
Parity:	None
Flow Control:	None

- Network Information

  Standard RJ45 connector.
  TCP/IP protocol.

- General

Chip Technology:	Advanced CMOS
Internal Construction:	Three Printed Circuit Boards Ribbon Cable Interconnections
Power Supply:	External Regulated 12V DC @ 1A adapter (5V if built-in network interface)

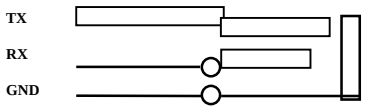
- Dimensions: 267 x 185 x 80 mm (W x L x H)

- System Resolution:

@ 1135 MΩ	20.0%
@ 500 MΩ	10.08%
@ 250 MΩ	5.35%
@ 100 MΩ	2.31%
@ 50 MΩ	1.26%
@ 40 MΩ	1.05%
@ 35 MΩ	0.94%
@ 30 MΩ	0.84%
@ 20 MΩ	0.63%
@ 10 MΩ	1.69%
@ 5 MΩ	1.41%
@ 1 MΩ	2.18%
@ 0.5 MΩ	3.50%

I/O Connections (See Fig 1)

RS232 Socket



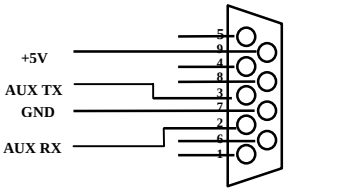
PHONEJACK STEREO 3.5MM

DC Input Socket

POWER JACK 2.1MM

The version of Sentry that requires a 5V PSU (the version with internal network interface) has a 2.5mm power jack; the 12V PSU will not fit into the 5V socket).

Bar code Reader Input



D-TYPE 9 PIN SOCKET

RJ45 Socket

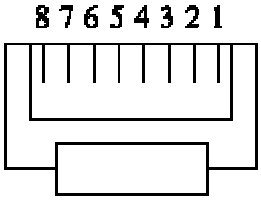


Figure 1:
End view of RJ45 Plug

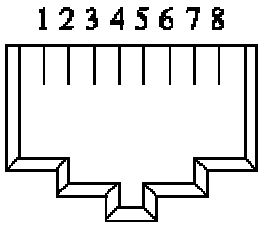


Figure 2:
Looking into an RJ45 Jack

To connect the Sentry to a hub, a cable is wired with a straight thru cable as follows:

10BaseT Wiring Chart

Pin	Color	Signal
1	White-Orange	TD+
2	Orange	TD-
3	White-Green	RD+
4	Blue	N/C
5	White-Blue	N/C
6	Green	RD-
7	White-Brown	N/C
8	Brown	N/C

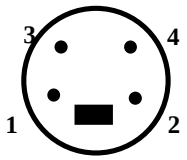
A **cross-over** swaps **TD** and **RD**. That is, swap pins 1 and 3 as well as pins 2 and 6, on one end of the cable (swap orange and green). This is required to connect the Sentry ***directly*** to a single PC without a hub.

Voltage-free Relay Contacts Socket

4-pin MiniDIN socket pin connections

Pin 1	**Pass 1**
Pin 2	**Fail 1**
Pin 3	**Pass 2**
Pin 4	**Fail 2**

PIN LAYOUT DRAWING

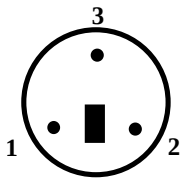


Footplate Socket

3-pin MiniDIN socket pin connections

Pin 1	**Left footplate**
Pin 2	**Right footplate**
Pin 3	**RFI screen**

PIN LAYOUT DRAWING



Note: Alternative footplate connectors are 4mm banana (Pin 3 n.c.)