DigiCORA® III MW31

USER'S GUIDE

M210488EN-B
October 2004

DigiCORA III
MW31

Version 3.12

© Vaisala Oyj 2004
All Rights Reserved

Table of Contents

This page intentionally left blank.

CHAPTER 1
GENERAL INFORMATION

About This Manual

This manual provides information for operating the Vaisala DigiCORA® III Sounding Software MW31.

Contents of This Manual

This manual consists of the following chapters:

- Chapter 1, General Information, provides important safety, revision history, contact, and warranty information for the product.

- Chapter 2, Product Overview, introduces the Vaisala DigiCORA® III Sounding System MW31 features.

- Chapter 3, MW31 User Interface, introduces the elements of the user interface.

- Chapter 4, Operation, contains information that is needed to operate the MW31 software.

- Chapter 5, Technical Data, provides the technical data of MW31.

Safety

General Safety Considerations

Throughout the manual, important safety considerations are
highlighted as follows:

WARNING	Warning alerts you to a serious hazard. If you do not read and follow instructions very carefully at this point, there is a risk of injury or even death.

CAUTION	Caution warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.

NOTE	Note highlights important information on using the product.

ESD Protection

Electrostatic Discharge (ESD) can cause immediate or latent damage
to electronic circuits. Vaisala products are adequately protected
against ESD for their intended use. However, it is possible to damage
the product by delivering electrostatic discharges when touching,
removing, or inserting any objects inside the equipment housing.

To make sure you are not delivering high static voltages yourself:

- Handle ESD sensitive components on a properly grounded and
  protected ESD workbench. When this is not possible, ground
  yourself to the equipment chassis before touching the boards.
  Ground yourself with a wrist strap and a resistive connection cord.
  When neither of the above is possible, touch a conductive part of
  the equipment chassis with your other hand before touching the
  boards.

- Always hold the boards by the edges and avoid touching the
  component contacts.

Version Information

Table 1   Manual Revisions

Manual Code	Description
M210488EN-A	Applicable to software version 3.10.
M210488EN-B	Applicable to software version 3.12.

Related Manuals

Table 2   Related Manuals

Manual Code	Manual Name
M210487EN	MW31 Installation Manual
M210489EN	MW31 Technical Reference
M210583EN	MW31 Maintenance Documentation
M010070EN	MW31 Metgraph User's Guide
M210220EN	MW31 Special Sensor User's Guide
M210551EN	MW31 Stanag Messages
M010117EN	MW31 and RT20A User's Guide

Trademarks

Microsoft, Windows, Windows NT, Windows 2000, and Windows XP are registered trademarks of Microsoft Corporation in the United States and other countries.

DigiCORA is a registered trademark of Vaisala in the United States and other countries.

Getting Help

Contact Vaisala technical support:

E-mail   helpdesk@vaisala.com

Telephone   +358 9 8949 2789

Fax   +358 9 8949 2790

Warranty

Vaisala hereby represents and warrants all Products manufactured by Vaisala and sold hereunder to be free from defects in workmanship or material during a period of twelve (12) months from the date of delivery save for products for which a special warranty is given. If any Product proves however to be defective in workmanship or material within the period herein provided Vaisala undertakes to the exclusion of any other remedy to repair or at its own option replace the defective Product or part thereof free of charge and otherwise on the same conditions as for the original Product or part without extension to original warranty time. Defective parts replaced in accordance with this clause shall be placed at the disposal of Vaisala.

Vaisala also warrants the quality of all repair and service works performed by its employees to products sold by it. In case the repair or service works should appear inadequate or faulty and should this cause malfunction or nonfunction of the product to which the service was performed Vaisala shall at its free option either repair or have repaired or replace the product in question. The working hours used by employees of Vaisala for such repair or replacement shall be free of charge to the client. This service warranty shall be valid for a period of six (6) months from the date the service measures were completed.

This warranty is however subject to following conditions:

a) A substantiated written claim as to any alleged defects shall have been received by Vaisala within thirty (30) days after the defect or fault became known or occurred, and

b) The allegedly defective Product or part shall, should Vaisala so require, be sent to the works of Vaisala or to such other place as Vaisala may indicate in writing, freight and insurance prepaid and properly packed and labelled, unless Vaisala agrees to inspect and repair the Product or replace it on site.

This warranty does not however apply when the defect has been caused through

a) normal wear and tear or accident;

b) misuse or other unsuitable or unauthorized use of the Product or negligence or error in storing, maintaining or in handling the Product or any equipment thereof;

c) wrong installation or assembly or failure to service the Product or otherwise follow Vaisala's service instructions including any repairs or installation or assembly or service made by unauthorized personnel not approved by Vaisala or replacements with parts not manufactured or supplied by Vaisala;

d) modifications or changes of the Product as well as any adding to it without Vaisala's prior authorization;

e) other factors depending on the Customer or a third party.

Notwithstanding the aforesaid Vaisala's liability under this clause shall not apply to any defects arising out of materials, designs or instructions provided by the Customer.

This warranty is expressly in lieu of and excludes all other conditions, warranties and liabilities, express or implied, whether under law, statute or otherwise, including without limitation ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE and all other obligations and liabilities of Vaisala or its representatives with respect to any defect or deficiency applicable to or resulting directly or indirectly from the Products supplied hereunder, which obligations and liabilities are hereby expressly cancelled and waived. Vaisala's liability shall under no circumstances exceed the invoice price of any Product for which a warranty claim is made, nor shall Vaisala in any circumstances be liable for lost profits or other consequential loss whether direct or indirect or for special damages.

CHAPTER 2
PRODUCT OVERVIEW

This chapter introduces the Vaisala DigiCORA® III Sounding System MW31 features.

Introduction to MW31 Sounding System

The MW31 sounding software is a radiosounding data analysis, archival and relaying software for the MW31 sounding system. The software consists of the main program and several optional applications.

The MW31 sounding system consists of a PC computer, which is connected to a sounding processor subsystem via a network adapter. The passive sounding controller contains the processor cards for PTU, GPS and/or VLF wind finding, and appropriate connections to the required antennas. MW31 can also be used with a radiotheodolite.

GPS Satellites

Radiosonde

UHF Telemetry
Antenna

Printer (optional)

GA20 Local
GPS Antenna

GC Set

CA21 Loran-C
Antenna

Sounding Workstation

SPS311/
SPS220

RP20 Power Unit

Radiotheodolite

0306-005
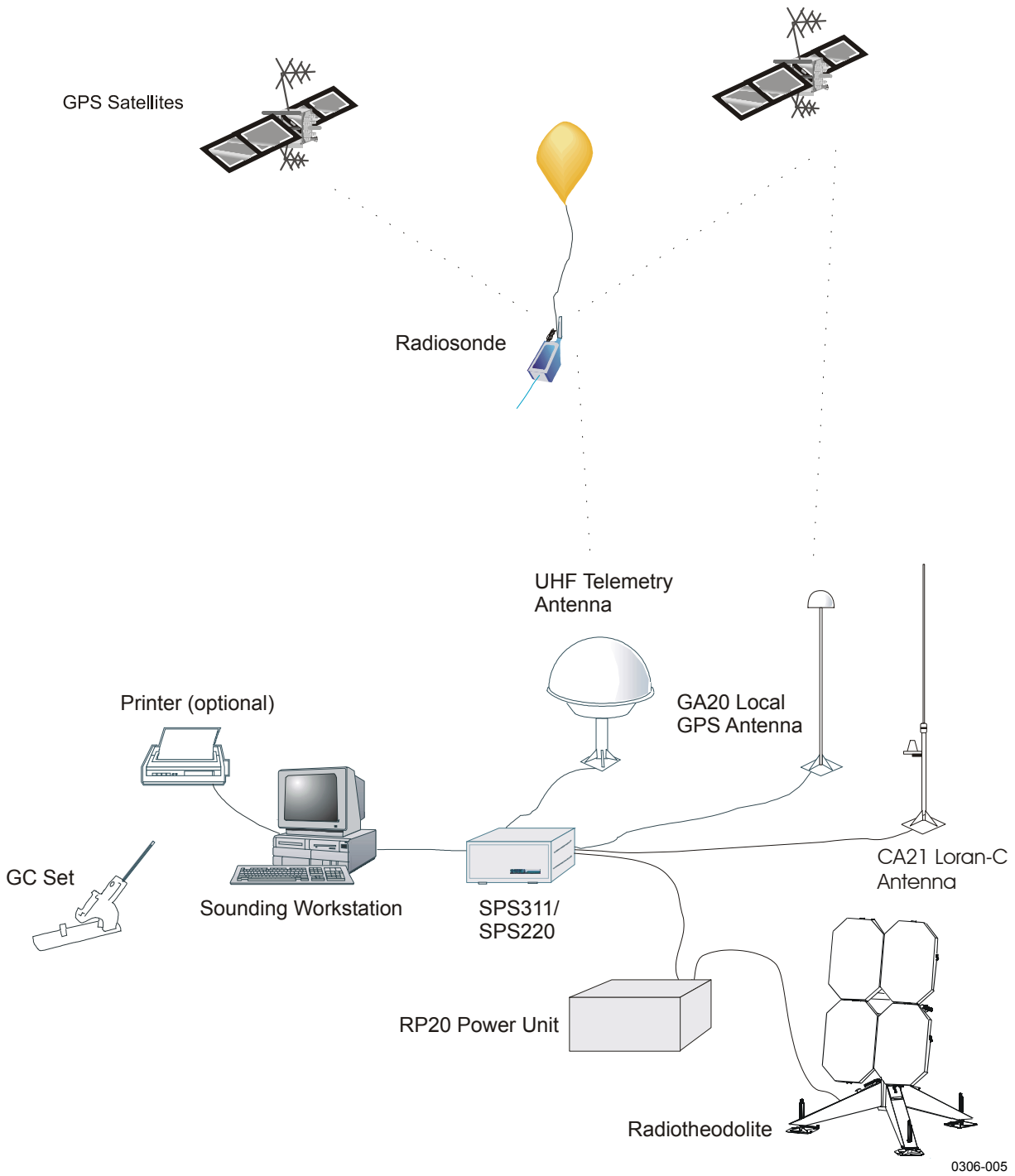
Figure 1   DigiCORA III System Overview

MW31 software can be used either with an SPS311 or with an SPS220
sounding processing subsystem.

Theory of Wind Finding

GPS Wind Finding

The GPS processor unit is a subsystem, that calculates wind information from the GPS data processed and transmitted by the radiosonde. The GPS processor unit uses the GPS Remote (from sonde) and GPS Local (received at the station) signals for calculating the wind solution.

The Global Positioning System (GPS) is a continuous worldwide navigation system maintained by the US Department of Defense. The system consists of three main segments:

1. The **space segment** is a constellation of 24 low orbit satellites transmitting military and civil navigation signals.

2. The **control segment** consists of ground stations monitoring the satellites. Certain stations also load the satellite orbit parameters based on the satellite orbit estimation.

3. The **user segment** can be divided into military and civil code users.

The military code is encrypted and the usage is allowed only for selected users.

Each satellite transmits a digitally modulated spread spectrum signal on two carrier frequencies, L1 at 1.575 GHz and L2 at 1.226 GHz with power levels below thermal background noise. The L1 carrier is used in civil applications and is modulated by a satellite specific pseudo random noise (PRN) code known as C/A-code. The chipping rate of C/A-code is 1.023 MHz resulting in a 2 MHz wide signal. The satellites are identified through an individual PRN code. Because the codes for different satellites do not correlate with each other, they can be sent on the same frequency.

Vaisala Code Correlating GPS Wind Finding

The GPS receiver in RS92 sonde has a 12-channel digital C/A code-correlating receiver. Each channel measures code and carrier phases of GPS signal for different PRN codes. The code phase measurements are converted to pseudo range measurements and yield a positioning solution. The carrier phase measurements give the Doppler frequency (i.e. the carrier frequency shift) and are used in wind calculation. The

Doppler shift is caused by a relative motion between the receiver (sonde) and a satellite and is typically ±5 kHz. The measurements are sent down via a narrowband 2400-baud GFSK link once a second.

Vaisala Codeless GPS Wind Finding

The radiosonde RS80-15G is a RS80 based radiosonde with an integrated 8-channel codeless digital GPS receiver (GPS121). It measures the L1 carrier shift frequencies (Dopplers) using a unique detection technique. The measured Doppler frequencies of a maximum of 8 satellites are sent down to the base station using a low bandwidth digital link (1200-baud FSK modulation).

Loran-C Wind Finding

The word LORAN stands for LOng RAnge Navigation. Loran-C is a maritime and aerial navigation system. Loran-C utilizes transmitters transmitting pulses in the 90 to 110 kHz frequency band. It is mainly available in the Northern hemisphere in major sea traffic and coastal areas, but it is being expanded inland as well.

Loran-C can be used for tracking moving objects, such as meteorological balloons. The system consists of a network of fixed ground stations, each transmitting radio waves which propagate freely in all directions. The signals are received and relayed to the meteorological ground station by a radiosonde attached to the balloon. A minimum of three Loran-C stations is needed for a complete positioning of the radiosonde.

At the ground station, the Loran-C signals received from the radiosonde are analyzed by the receiver. Since the transmitter locations are known exactly, the signal travel time can be used to calculate the position of the radiosonde. The ground station compares the arrival time of incoming Loran-C signal from the radiosonde to the local reference signal.

Signals

Loran-C consists of transmitting stations arranged in groups forming chains. At least three transmitting stations make up a chain. One transmitting station is designated master while the others are called secondaries or slaves. Chain coverage is determined by the power transmitted by each station, the distance between them, and their geometry.

The Loran-C sounding mode uses signals from two chains and up to twelve transmitters simultaneously. A combination of at least three to four transmitters with good geometry is required for a sounding.

Synchronization

Before each launch, the Loran-C receiver synchronizes up to four predefined chains and selects be the best combination of two chains for the sounding. The selection is based on sounding geometry and the number of available Loran-C transmitters.

Automatic Chain Selection

Synchronization is followed immediately by automatic chain selection. The receiver is capable of listening to two Loran-C chains simultaneously. The user is able to define up to four Loran-C chains to be used in wind finding. If the user has defined more than two chains to be used, MWV2XX uses automatic chain selection to choose two best Loran-C chains. The selection of chains is based on station geometry and signal quality.

This page intentionally left blank.

CHAPTER 3

MW31 USER INTERFACE

This chapter introduces the elements of the user interface.

User Interface
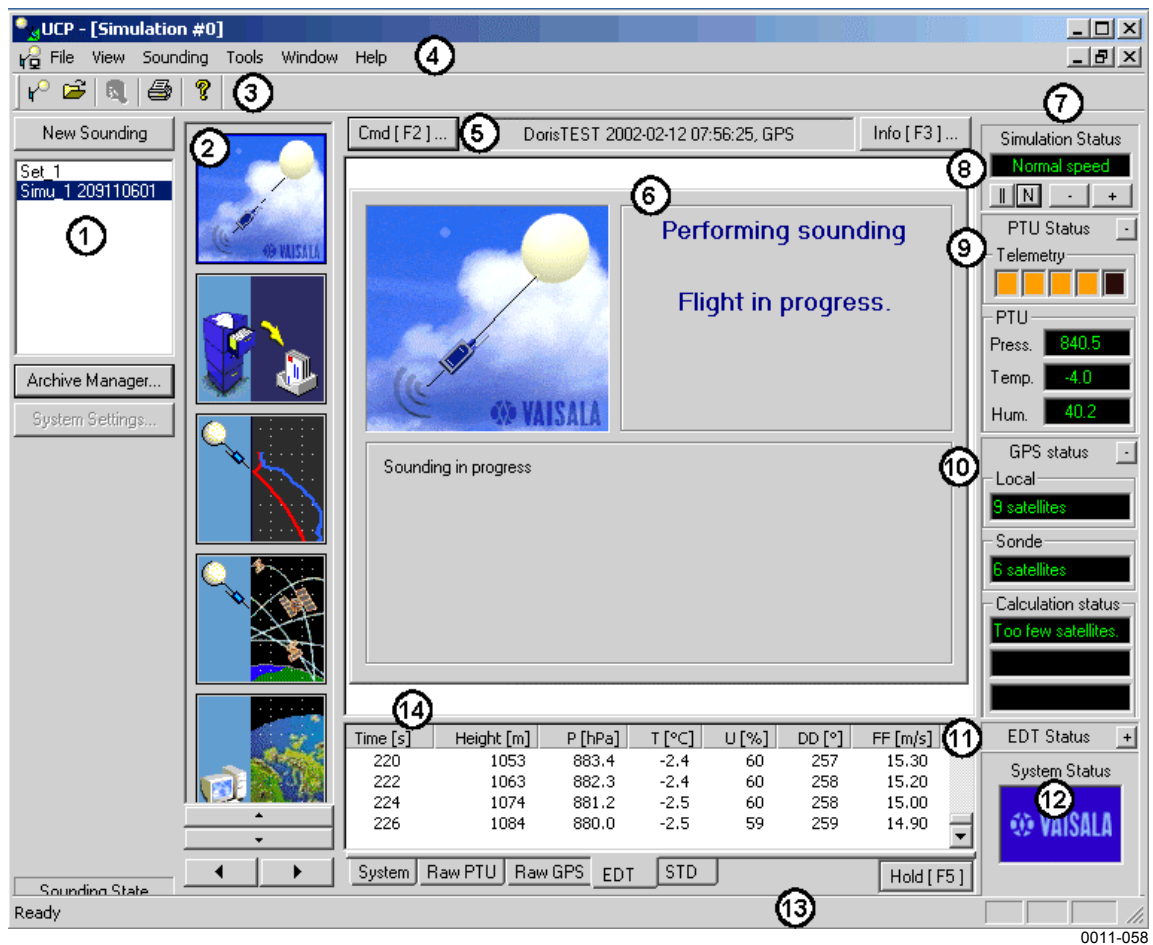
Figure 2   User Interface Elements

The following numbers refer to Figure 2 on page 15:

1	Control Bar
2	Task Miniview Pane
3	Toolbar
4	Menu Bar
5	Control Pane
6	Main View Pane
7	Sounding Status Pane
8	Simulation or Hardware Status Pane
9	PTU Values
10	Wind Status Pane
11	EDT Status Pane
12	System Status Pane
13	Status Bar
14	Text Scroll Pane

Control Bar [1]

The **Control** bar contains buttons for starting a new sounding and starting Archive manager. The **System Settings** button is only available for users belonging to the Sounding managers user group.

Attaching a Sounding

It is possible to take ownership of an ongoing sounding. This is done by clicking the ⬛ button on the toolbar. Attaching a sounding is a useful feature when, for example, the UCP (user interface) is closed by mistake during a sounding.

Task Miniview Pane [2]

The **Task Miniview** pane displays the active tasks during sounding. The miniview displays a scaled-down image of the image in the **Main View** pane. The miniview pane may contain several columns of miniviews. Each column contains the tasks specific to a single sounding. Each miniview refers to an active task. Clicking a miniview makes the selected task active on the **Main View** pane. A miniview is replaced by an empty view, when it is in wait state.

The miniviews can be scrolled by clicking the horizontal and vertical arrows on the bottom of the pane.

The miniviews can be minimized by clicking under the last pane with the right mouse button and selecting **Small Icons**. Selecting **Large Icons** will restore panes to original sizes.

Moving between miniviews is possible by pressing **Ctrl+N**, where **N** means the miniview number: 1 is the first from up, 2 is the second and so on.
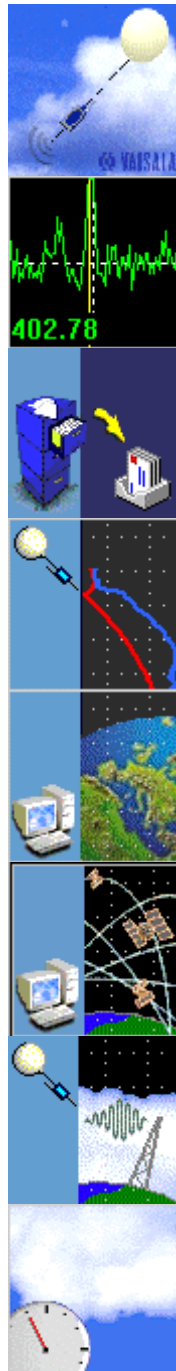
Sounding Control
Note that this image changes dynamically according to the state of the sounding.

Radio
In this view you can control the radio.

Messaging
In this view you can generate, edit, and spool messages.

Raw PTU
This view contains a graph of the raw PTU data.

Sonde Trajectory
This view shows the sonde trajectory in polar coordinates and on a user-defined map.

GPS Status
In this view you can check the GPS Status.

Loran-C Status
This view contains information on Loran-C status.

Any View in Wait State

Radio View

SPS311 Radio View

This radio view is available for software radio based systems, typically SPS311 rack.

0409-011
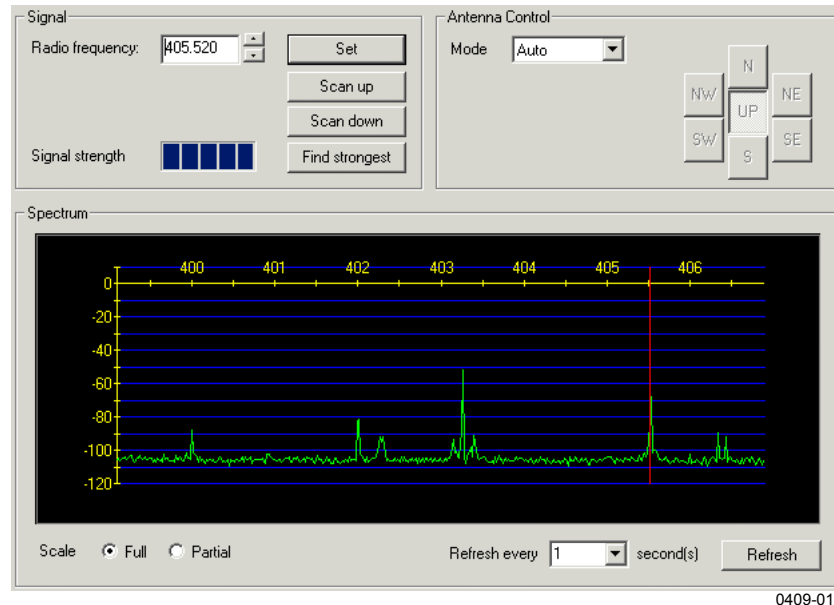
Figure 3   SPS311 Radio View

The x-axis has an MHz scale and the y-axis has a dB scale.

Clicking the **Find strongest** button causes the software to locate the strongest radio signal in the frequency band and set the radio on that frequency. In Figure 4 above, the sonde signal is shown at 405.52 MHz.

The required frequency value can also be entered in the **Radio frequency** box and then set by clicking the **Set** button or pressing **Enter**. The Up/Down arrows on the right side of the **Radio frequency** box can be used to fine-tune the radio frequency. The **Scan Up/Down** buttons can be used to set the radio to the next/previous signal on the spectrum.

The **Antenna Control** part of the view shows the currently used antenna element when a directional antenna is used. The element can be manually selected when antenna control is first set to **Manual** from **Mode** list.

The **Scale** selection below spectrum display can be used to select **Full** or **Partial** display of spectrum. **Refrech Every** selection is for setting

the time interval for the spectrum display update. The **Refresh** button
refreshes signal levels across the spectrum.

Zoom is available by pressing **Ctrl** key down and selecting an area for
zooming with the left mouse button. To restore zoom, right-click over
the spectrum and select **Restore view**.

SPS220 Radio View

This radio view is available for UPP and URR radio based systems,
typically with the SPS220 rack.

0301-015
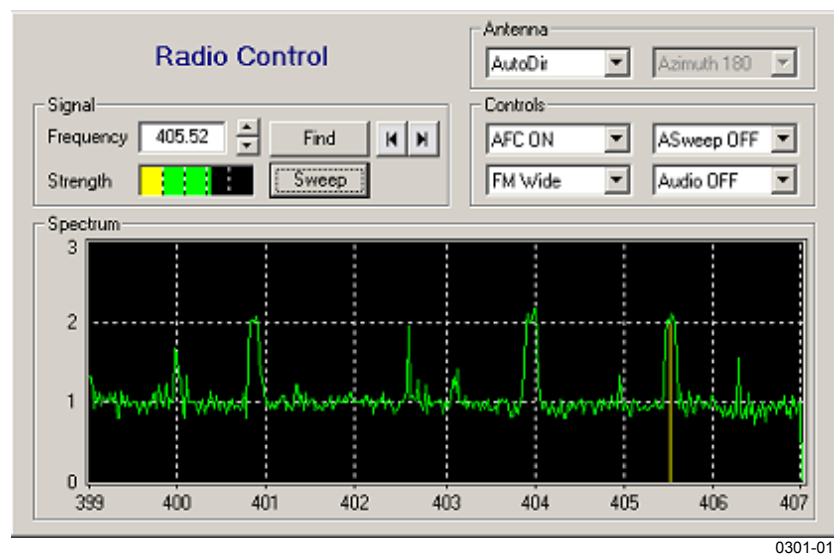
Figure 4   Radio View

Clicking the **Find** button causes the software to locate the strongest
radio signal in the frequency band and set the radio on that frequency.
In Figure 4 above, sonde signal is shown at 405.52 MHz. The radio
can be set to other frequencies by double clicking at the wanted
frequency in the frequency spectrum window. Required frequency
value can also be entered to frequency box.

Up/Down arrows on the right side of Frequency box can be used to
fine-tune radio frequency. The **Sweep** button refreshes signal levels
across the spectrum. Left/Right arrows right side of the **Find** button
can be used to set the radio to last/next signal on the spectrum.

Table 3   Antenna Options

Option	Description
AutoDir	Directional antenna. Direction of receiving is automatically selected by the system (default setting).
ManDir	Direction of receiving can be selected manually.
OmniDir	Omni-directional antenna in use.
PowerOff	Turns power off from antenna-amplifier.

Table 4   Controls Options

Option	Description
AFC ON	Automatic frequency control is on.
AFC OFF	Automatic frequency control is off.
TRACK ON	AFC and tracking mode on. For special purposes only.
ASweep OFF/ 10 sec/5 min/10 min	The system automatically sweeps the frequency spectrum at chosen interval.
Audio off	No audio.
PTU to Audio	The PTU signal (isolated from demodulated FM signal) is output through workstation's audio system. (Applicable only to analog radiosonde.)
FM to Audio	Demodulated FM signal from sonde is output through workstation's audio system. (Applicable only to analog radiosonde.)
FM Wide	Wide band receiver.
FM Narrow	Narrow band receiver.
FM External	When using an external receiver.

Raw PTU View

The **Raw PTU** view is for visualizing raw PTU values during entire data receiving. The view also shows edited PTU values.

The view can be zoomed by using the mouse right button.
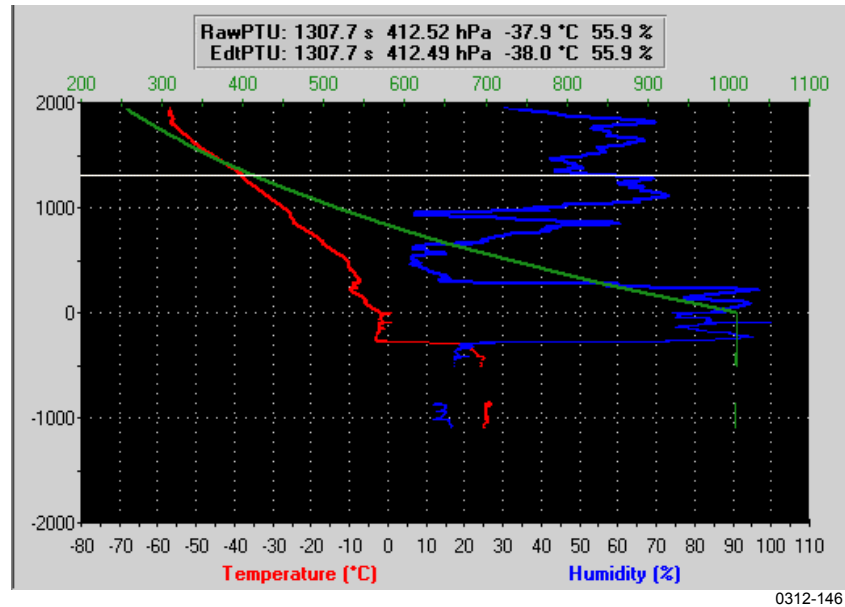
0312-146

Figure 5   **Raw PTU View**

Sonde Trajectory View

The **Sonde Trajectory** view is for visualizing radiosonde movement by showing the direction and range from the sounding station to the radiosonde and also the latitude and longitude of the radiosonde.

The **Polar Trajectory** tab shows the direction and range from the sounding station to the radiosonde. It has a text line, which shows the height, range, and direction of the latest or the selected level.

The **Coordinate Trajectory** tab shows the latitude and longitude of the radiosonde. It has a text line, which shows the height, latitude, and longitude of the latest or the selected level.

Any level can be selected by moving the cursor over the sonde path.

Zoom is available by pressing **Ctrl** key down and selecting an area for zooming with the left mouse button.

0312-147
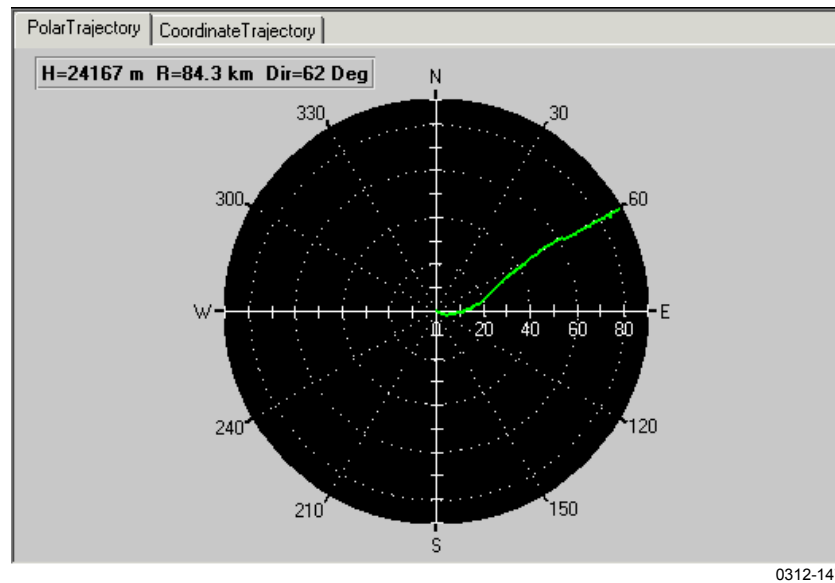
Figure 6   Sonde Trajectory View

It is possible to add a local map to the **Sonde Trajectory** view, refer to Technical Reference manual for more information.

GPS View

The GPS User Interface Module (GPSUIM) is a multipage interface module that displays information about the GPS calculation in DigiCORA III. GPS information is divided into three pages. The first two pages explain what GPS satellites are available, in what direction they are and whether they are used by Vaisala sounding system or not. The third page gives details about the GPS wind calculation.

The Receiver Information Pages

The structure of the first two GPSUIM pages are indentical. Both give the same information about the GPS system, but in addition to that, the first page gives information about the GPS receiver in the radiosonde and the second page provides information on the GPS receiver in the ground equipment.

0301-016
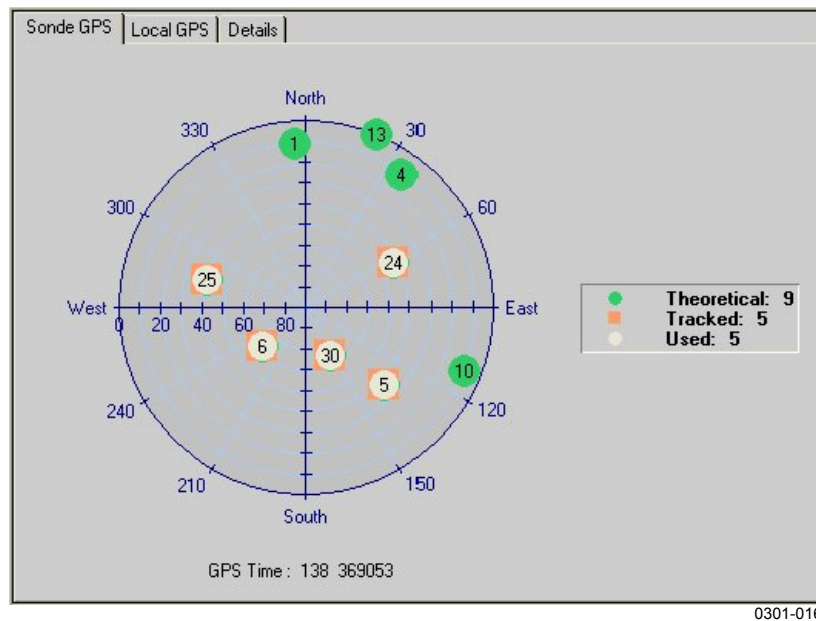
Figure 7   Radiosonde GPS Information Page of GPSUIM

The **Sonde GPS** page contains a sky view diagram that shows the directions to all GPS satellites that are above horizon. The horizon is the edge of the polar plot. All the symbols in the plot stand for a GPS satellite. The number inside each symbol is a number that identifies all the GPS satellites. A green circle stands for a GPS satellite that is not being received by the receiver. An orange square stands for a GPS satellite that is being tracked (signal received but not used) by the receiver. If the satellite signal is used for wind calculation, that satellite is marked with a white circle.

NOTE	If less than four satellites are tracked, wind calculation is not possible and the number of used satellites is thus zero

The position of the symbol in the plot corresponds to the satellite position in the sky so that the closer the satellite is the center of the plot, the closer the satellite is the zenith. The azimuth (horizontal) angle is zero when the satellite is towards the North, 90 degrees when the satellite is towards East, and so on.

At the bottom of the page the current GPS time is displayed. The time consists of the week number (range from 0 to 1023) and the second (range from 0 to 603799). Week number increments and second rolls over at midnight between Saturday and Sunday.

0301-017
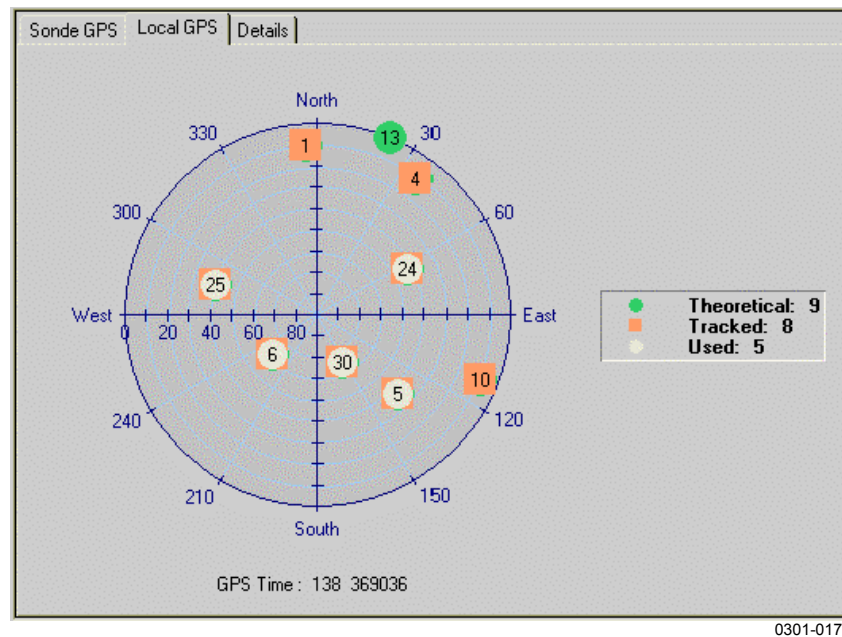
Figure 8   Local GPS Information Page of GPSUIM

An example interpretation of the 'Local GPS' page is provided in
Figure 8 above:

- 9 GPS satellites are above horizon in the current sounding place:
  {1, 4, 5, 6, 10, 13, 24, 25, 30}.

- 8 satellites are tracked: {1, 4, 5, 6, 10, 24, 25, 30}, satellite 13 is
  not tracked.

- 5 satellites are used in wind calculation: {5, 6, 24, 25, 30}.

- satellite number 1 is about 10 degrees above horizon to the North
  from the sounding station.

The Calculation Information Page

The **Details** page gives information about the wind calculation
software. On the left, two diagrams show what GPS satellite orbit
parameters are available for the calculation. On the right, the wind
calculation result is displayed.

0301-018
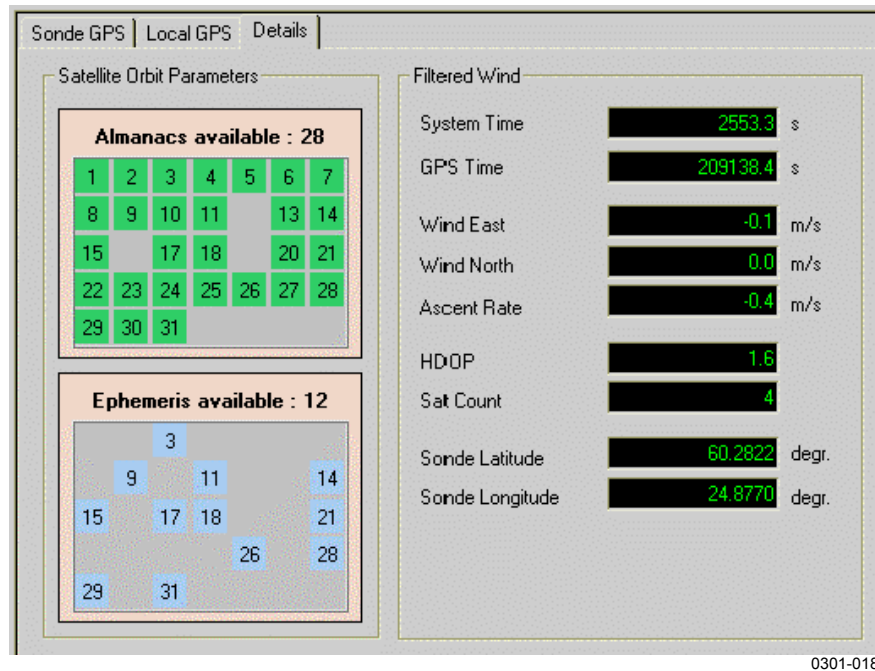
Figure 9   Calculation Information Page of the GPS View

There are two types of orbit parameters: almanacs and ephemeris.
Almanacs are lower precision orbit parameters, that are not used in
wind calculation, but they are useful for predicting which satellites are
in view. Ephemeris are precise orbit parameters, that are used in wind
and position calculation.

The **Almanacs** diagram shows all satellites, whose almanacs have
been received. Those satellites, that are not shown here, are not in use
for some reason. For example, sometimes GPS satellites require
maintenance and during that time they may not send any data.

The **Ephemeris** diagram show all satellites, whose ephemeris has
been received, i.e which have been or still are in the line of sight for
the sounding system's local GPS antenna. The numbers shown inside
the diagram symbols are the satellite identification numbers.

Calculation uses the satellites, whose signal is good and ephemeris
data is available. A minimun of four such satellites is needed for
calculation. All satellites, whose ephemeris has been received, are not
necessarily able to provide good measurement signal to sounding
system, so they are not used in calculation. So the number of satellites,
that calculation uses, can be smaller than the number of satellites
whose ephemeris has been received.

The wind result shown on the right side of the details page is either filtered wind or raw (unfiltered) wind. Which one is displayed can be seen on the group box title that is either **Filtered Wind** or **Raw Wind** (See the figures above and below). The filtered wind display shows the sonde position in addition to the items that are showed in the raw wind display. See Table 5 below for the explanations of the wind result items that are displayed.

Table 5   Wind Calculation Result Items

Title	Meaning	Unit
System Time	Running time since wind calculation was started.	Seconds
GPS Time	GPS second of week	Seconds
Wind East	East wind component. Positive when air flows from East.	Meters / second
Wind North	North wind component. Positive when air flows from North.	Meters / second
Ascent Rate	Rising speed of radiosonde	Meters / second
HDOP	Horizontal Dilution of Precision, a geometry factor. Values <20 are considered to be an indicator of accurate wind calculation. The HDOP value increases, when satellite geometry gets worse, for example when all available satellites are in the same direction and a building is blocking the view. The smaller the value is, the better the satellite geometry.	No unit
Sat Count	Tells how many satellites were used for calculating wind.	No unit
Sonde Latitude	Sonde position in WGS84 coordinate system. SHOWN ONLY WITH FILTERED WIND.	Degrees
Sonde Longitude	Sonde position in WGS84 coordinate system. SHOWN ONLY WITH FILTERED WIND.	Degrees

When the wind filter is not providing new filtered wind levels the display switches to raw wind. This is the case in the beginning of a sounding. The wind filter starts providing filtered wind after its buffers are full enough. Raw wind is also displayed when the wind calculation is continuously failing to calculate raw wind. This can happen if the sonde GPS has tracking problems or there is a telemetry break. Figure 10 on page 27 shows the raw wind result.

0301-019
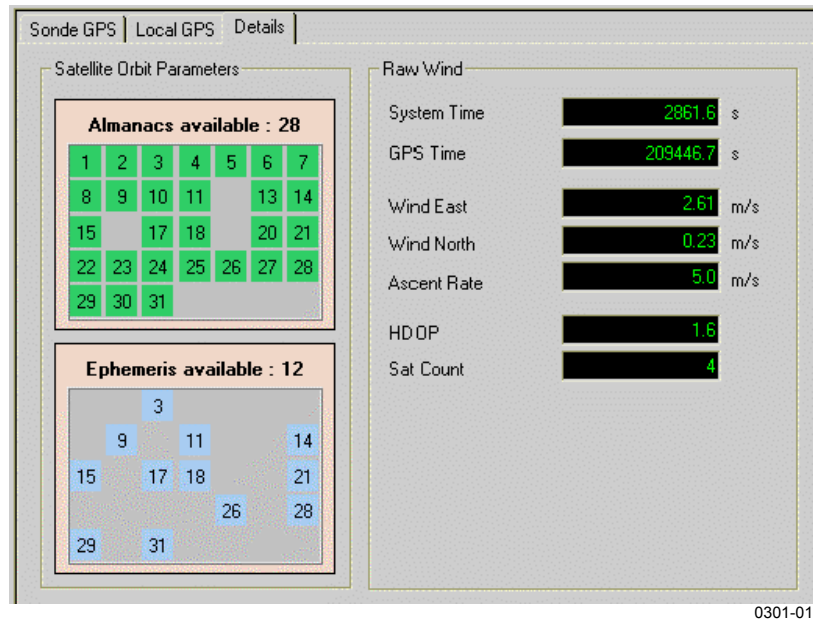
Figure 10   Raw Wind Level Displayed Instead of Filtered Wind Level

Loran-C View

The **Loran-C** view consists of three parts, Selecting Chains, Chains Selected, and Station Geometry.

Selecting Chains

0208-078
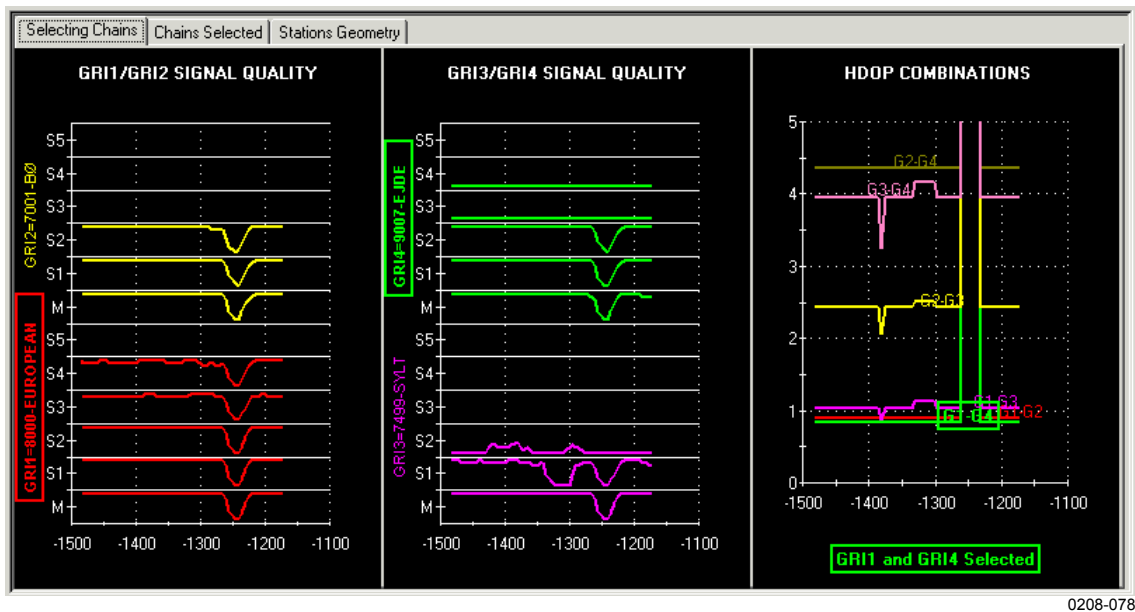
Figure 11   Loran-C - Selecting Chains

When the MWV2XX unit is powered, it will in ten minutes select two chains out of four pre-selected chains that are to be used in wind measurement. Pre-selection for four chains is done when the station position is set. The **Selecting Chains** tab shows chain selection in real-time.

In Figure 11 on page 27, the left part of the window shows data on chains 8000 and 7001. Line M is signal quality of the master station in this chain. Lines S1 ... S5 show signal quality of the slave stations in this chain. The higher the line is drawn on its scale, the better the signal quality is.

The middle part of the window shows data of chains 7499 and 9007. Chains 8000 and 9007 are outlined so they are selected to use in calculation.

The right part of the window shows calculated HDOP values for selected chain combinations. The ideal HDOP value is 1. HDOP values <3 are good, and values >7 are poor. (HDOP = Horizontal Dilution of Precision).

When the chains are selected, this window is no longer updated.

Chains Selected
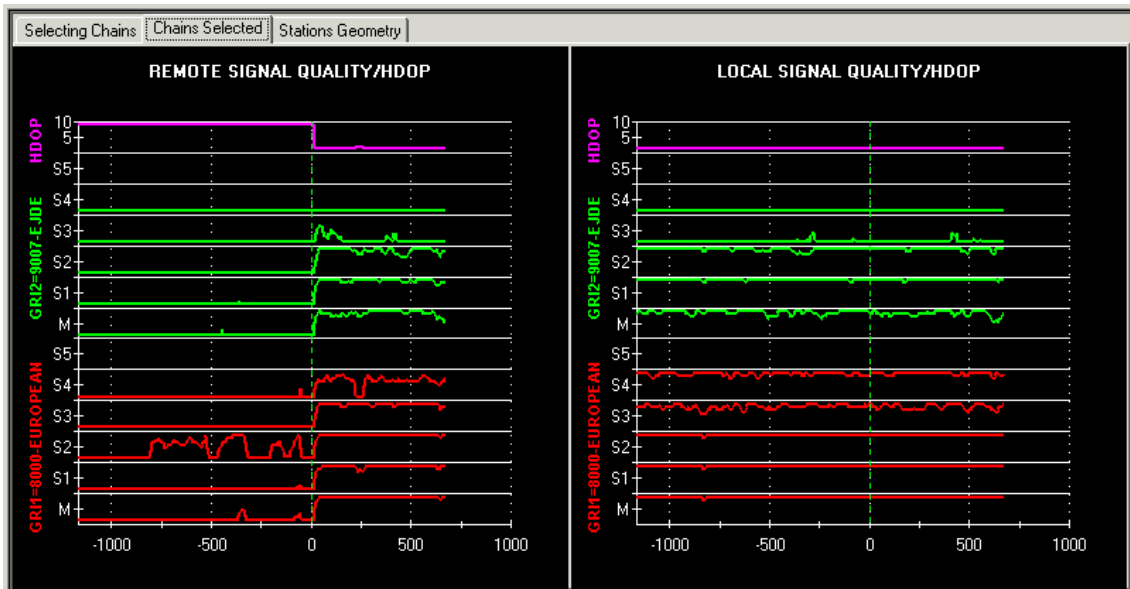
0208-079

Figure 12   Loran-C - Chains Selected

After the two chains, that are to be used in this sounding, have been selected, their data is displayed in this window. **Remote Signal** means data received from sonde. **Local Signal** means data from sounding

station. In this example you can see that chain 8000 has five stations
that have good quality signal and chain 9007 has three such stations.
Horizontal axis is time, where 0 means the moment of launch.

Station Geometry
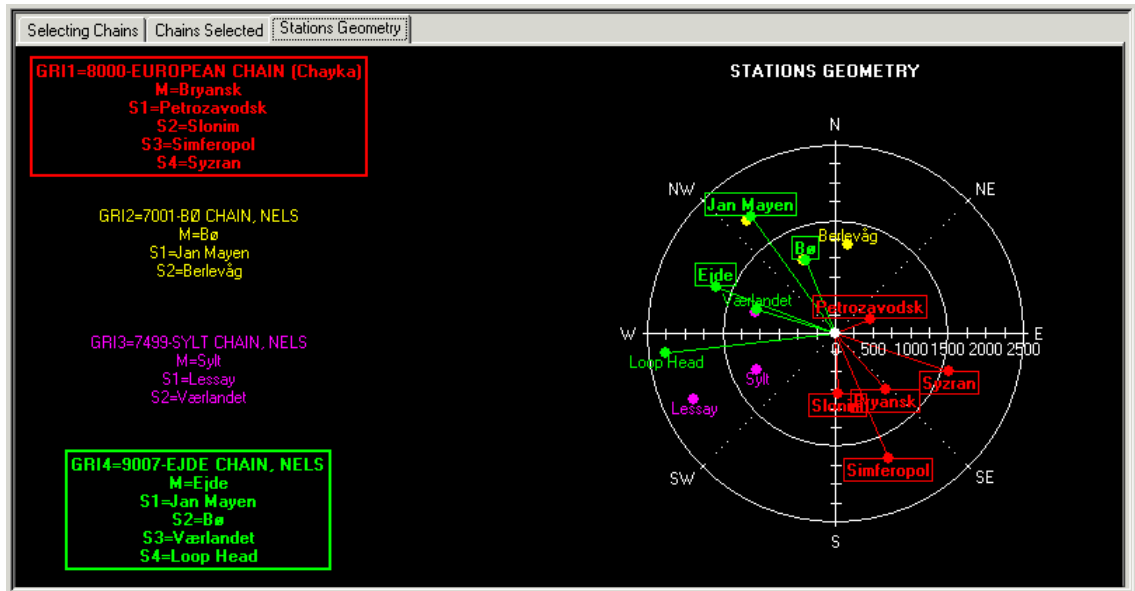
0208-080

Figure 13   Loran-C - Station Geometry

After sonde launch in this window you can observe in real time what
chains and stations are used. On the left side of the window are listed
the four pre-selected chains. Two of them are outlined, which means
that they are selected to be used in calculation. On the right side of the
window is shown how the stations are located in proportion to the
sounding station. Sounding station is in the middle of the circle.
Stations, that are outlined, are used in calculation. Scale is 2 500 km.

Local Weather View

If the system comprises an AWS device, local weather is available in
graphical and in text format in real time in the **Local Weather** view.
The **Local Weather** view can be displayed by selecting **Tools - Local
Weather**.
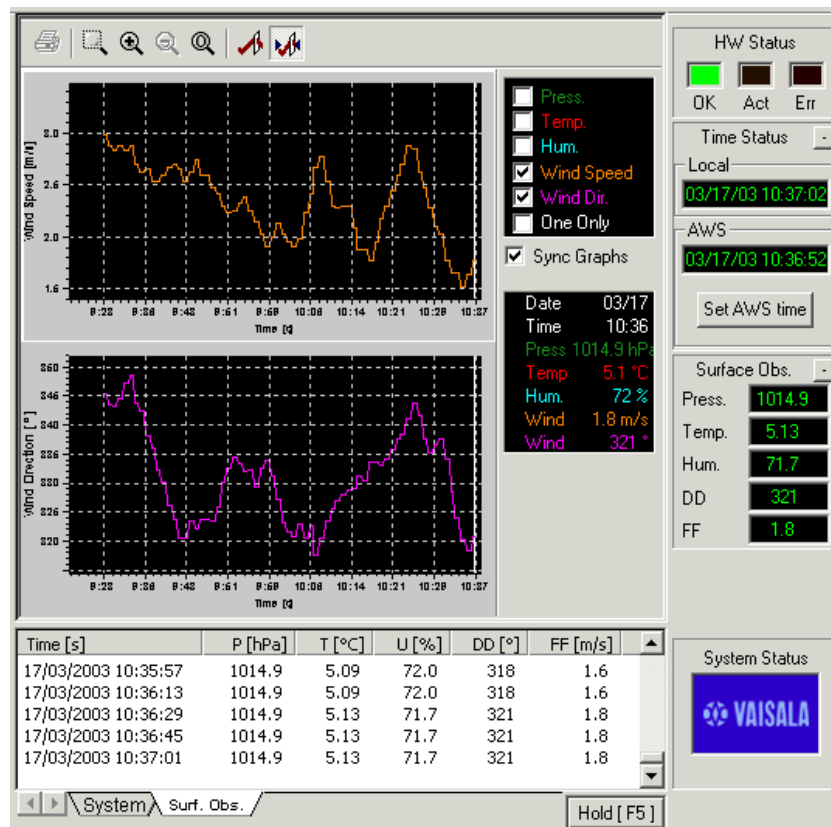
0312-148

Figure 14   Local Weather View

The **Local Weather** view can be displayed when a sounding is in progress. The **Local Weather** or the **Sounding** view can be selected from the **Window** menu.

Surface Obs. status pane shows last data fetched from the AWS device. Graphical display shows all gathered data, that is placed in a buffer. The buffer can by default hold data from the last 12 hours. When the buffer is full and a new data is fetched, the oldest data in the buffer is removed.

Buffer size and data fetching interval can be altered, refer to the Technical Reference manual for more information on AWS server settings.

Clicking the curve on the graphical display shows detailed data from that particular moment of time. The **Zoom In**, **Zoom Out,** and **Mouse Zoom** buttons can be used to zoom the graphical display.

Selecting the **Sync Graphs** check box causes the changes made to affect all shown graphs.

Local weather data is fetched from the AWS device, when the workstation is powered up, UCP does not need to be started.

Time Status and **Surface Obs.** panes can be displayed and hidden in the same way as other status panes.

AWS Device Time

AWS device time can be set in this view. Clicking the **Set AWS Time** button will set the AWS device time to be the same as the workstation's time. This feature is feasible only with an AWS device that supports time setting.

View Control Buttons

If all tasks are not showing at the same time, they can be scrolled with these buttons. The buttons are located at the bottom of the **Task Miniview Pane**.

0206-039

Figure 15   View Control Buttons

Toolbar [3]

The **Toolbar** functions are for starting a new sounding or opening an archived sounding in DigiCORA III, and for setting system parameters. The toolbar cannot be modified, i.e., you cannot edit the selection or arrangement of the toolbar buttons.

0206-033

Figure 16   Toolbar

Table 6   Toolbar Functions

Button	Description
New Sounding	Starts a new sounding.
Open Sounding	Opens an existing sounding.
System Settings	Shows system parameters.
About	Shows information on the software.
Sounding(s)	Attaches to an ongoing sounding. See section Attaching a Sounding on page 16.

Menu Bar [4]

The **Menu** bar contains the drop-down menus for starting the various DigiCORA III operations. When there is no sounding text file open, the menu bar consists of **File**, **View**, **Tools** and **Help** menus. When a text file from a sounding is opened, further **Sounding** and **Window** menus are shown. In the description below, an asterisk (*) indicates the functions that are always available.

The **File** menu contains commands to create new text files; to open and close existing text files; and to convert and save existing binary files as text files. The last eight opened files are listed here. Finally, DigiCORA III can be closed from here.

Table 7   File Menu Options

Command	Shortcut	Description
File		
New sounding	Ctrl+N	Starts a new sounding.*
Open...	Ctrl+O	Opens an existing sounding.*
<filename>		Last four opened files. *
Exit	Alt+F4	Closes the UCP (DigiCORA III user interface). *

The **View** menu is used for displaying or hiding the toolbar and the status bar and for modifying other viewing properties.

Table 8   View Menu Options

Command	Description
View	
Toolbar	Displays or hides the Standard or Soundings toolbar. Resets the toolbars to their original positions.*
Control Bar	Displays or hides the control bar.*
Status Bar	Displays or hides the status bar.*
Full Screen	Selects the DigiCORA III Full Screen mode

The **Sounding** menu contains the commands to make system level operations and query information about the current sounding.

Table 9   Sounding Menu Options

Command	Description
Sounding	
Sounding Command...	Opens the Sounding Termination window.*
Sounding Info...	Information from current sounding. Time of start is UTC time.*
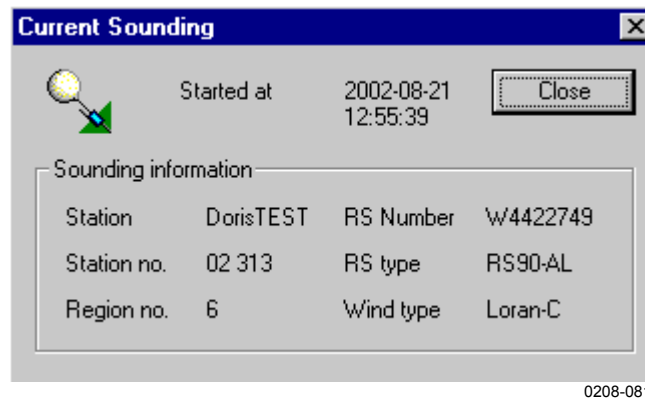
0208-081

Figure 17   Sounding Information

The **Tools** menu has commands for setting various DigiCORA III sounding system and sounding station parameters.

Table 10   Tools Menu Options

Command	Description
Tools	
Station Position	Shows sounding station information.
System Parameters	Shows system parameters. See the **Technical Reference** manual for more information.

The **Window** menu contains standard window manipulation functions found in all Windows software. This menu is only displayed when a text file is open in the main window.

Table 11   Window Menu Options

Command	Description
Window	
Cascade	Arranges child windows in a row so that only the front one is completely visible. The others are partially obscured.
Tile Horizontally	Aligns the windows in rows.
Tile Vertically	Aligns the windows in columns.
Arrange Icons	Arranges the icons of minimized windows in the main window.
<filename>	Brings the named sounding window to the front.

The **Help** menu contains general information about the DigiCORA III software.

Table 12   Help Menu Options

Command	Description
Help	
About DigiCORA III...	Shows information on available memory and free hard disk space. Also shows the current software version

Control Pane [5]

The **Control** pane contains the command button (Cmd) and the information button (Info) and a mini-info display on the sounding.

0110-149
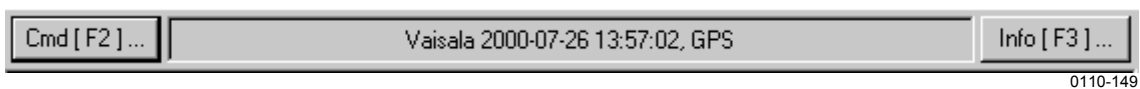
Figure 18   Control Pane

Main View Pane [6]

The view in the **Main View** pane is selected by clicking the miniviews in the **Task Miniview** pane. It is divided into two sections. The top section contains a status picture along with a status message or an operating prompt. The bottom section may contain either input fields or a data display.

0206-006
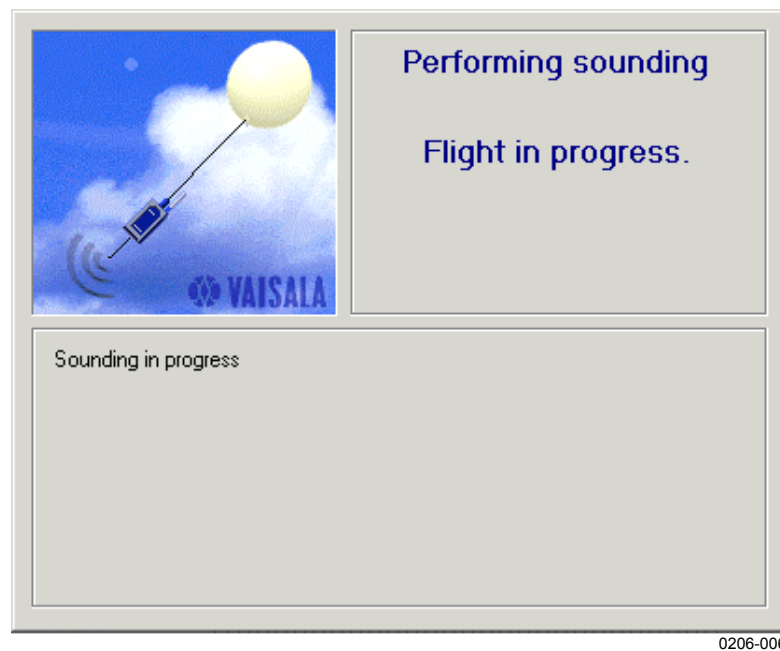
Figure 19   Main View Pane

Simulation Status Pane [8]

The **Simulation Status** pane is located in the upper right hand corner. The panel is only visible during simulations, when it replaces the **Hardware Status** pane. Clicking the **+** button increases simulation speed, and the **-** button decreases it. The **N** button restores simulation speed to normal and the **II** button pauses the simulation.

NOTE	Usable simulation speed depends on workstation's speed. Too much speed can cause trouble especially to GPS calculation.

0206-007

Figure 20   Simulation Status Pane

Hardware Status Pane [8]

The **Hardware Status** pane is located in the upper right corner. With live soundings, the pane shows three indicator lights that are used to show the overall status of Vaisala sounding processors.

0206-034
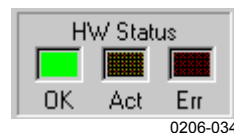
Figure 21   Hardware Status

Indicator light colors are as follows:

- Red light indicates serious hardware failure.

- Flashing yellow light indicates special hardware activity, such as startup tests, I/O or wait states.

- Green light indicates that the hardware is running. Green light may be lit simultaneously with red light, which can be caused by a misplaced cable, for example.

Sounding Status Pane [7]

The **Sounding Status** pane takes up the rest of the right hand side. It provides status information about essential sounding processes at a glance. The pane contains four status panes: **PTU Status**, **Wind Status, System Status,** and **Time**.

PTU Status [9]

0206-035
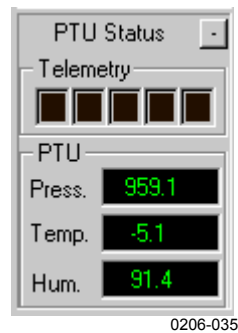
Figure 22   PTU Status

The **PTU Status** pane consists of telemetry quality indicator and the current Pressure (P), Temperature (T) and Humidity (U) values.

Wind Status [10]

The display shows the active wind finding mode status. There are three different wind finding systems available, depending on the station configuration. If everything is working properly, the values are on a black background. Red background color indicates an error state. Additional information on the error is located in the Info field.

GPS Status

0206-036
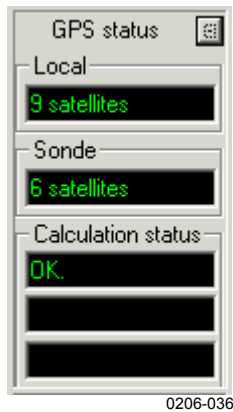
Figure 23   GPS Status

The GPS status display contains the number of tracked satellites for both sonde GPS receiver and the local GPS receiver. It can also inform the user about problems in the data flow. See Table 13 belowfor details.

Table 13   GPS Status

Local / Sonde	Meaning
N satellites	The receiver is tracking N satellites.
Waiting for data.	Initial value for both **Local** and **Sonde**. The calculation module does not receive the track count data.
Check antenna cable.	The calculation module has not received any data from local GPS receiver. This happens when the GPS antenna is not attached when the sounding is started.
Check telemetry.	The calculation module has not received any data from sonde GPS receiver. This happens when the frequency is tuned wrong.

The lower part of the GPS status display also contains information about the GPS calculation. The possible messages are shown in the Table 14 below.

Table 14   GPS Calculation Status

Calculation Status	Meaning
OK	Calculation is working normally.
Unable to calculate.	Calculation is not possible. More information, if available, is given below this text.
W. for orbit data.	The calculation is waiting for GPS satellite orbit parameters from the local GPS receiver.
Too few satellites.	Sonde GPS is not tracking enough satellites.
Bad satellite geometry.	Satellite positions are bad for reliable wind calculation.

Loran-C Status

The Loran-C status display contains information on selected chains, stations on selected chains used in calculation, and status of wind calculation.

0208-082
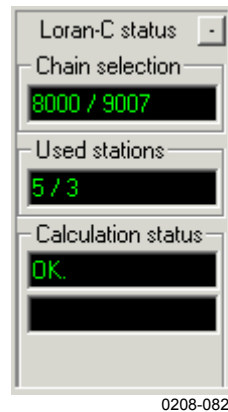
Figure 24   **Loran-C Status**

The **Chain selection** box displays the selected chains, in this case 8000 and 9007. When chain selection is in progress, the text **"Progressing..."** is displayed. After chains are selected, the Loran-C status display will show remote information. When the radiosonde is on the ground before launch, it usually can not receive signal from Loran-C ground stations. Therefore, **Used stations** will display **0/0** and **Calculation status** will display **Unable to calculate** until the sonde is launched.

The **Used stations** box displays the number of stations that are used in the selected chains for wind calculations, here 5 and 3. This box can also show the number of stations found.

Table 15   **Loran-C Calculation Status**

Calculation Status	Meaning
OK	Calculation is working normally.
Unable to calculate.	There is not enough information for wind calculation.
Too few stations	Too few stations available for wind calculation.
Bad stations geometry	Used stations geometry prevents wind calculation.

RT Status

The status display contains Azimuth and elevation (Mechanical and Phase), Tilt (N/S or front/back, E/W or left/right), and Mode (Manual or Automatic).

0206-037
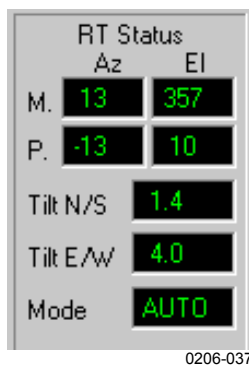
Figure 25   RT Status

EDT Status [11]

EDT Status shows the latest EDT values.

0206-038
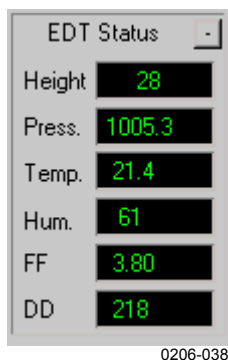
Figure 26   EDT Status

Time Status

Time Status shows the elapsed time from sounding start.

0409-012

Figure 27   Time Status

The status displays that are available depend on the type of sounding. For example, the **GPS Status** display is only available on GPS soundings. It is possible to choose which status displays of those that are available are shown. Clicking the right mouse button under the last status display opens a selection box shown in Figure 28 below.

0409-013

Figure 28   Status Selection

If so many displays are selected that they do not all fit on the window at the same time, some of them will be hidden. To indicate that some displays are hidden, a button is displayed on the window. All status displays can be minimized by clicking this button.

0206-005

Figure 29   Hide Button

It's also possible to minimize selected status display by clicking the – located on the upper right corner of the status display.

System Status Pane [12]

There are six distinct states indicated in this display. The animation and other pictures may vary depending on display properties.

Default status

The system is operating normally.

Wait

The system is performing internal operations. No user input is required.

Keyboard input required

This animation prompts the user for keyboard input.
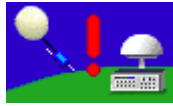
Check Telemetry

The user needs to check the radiosonde and/or radio tuning.

Coefficient error

The coefficient values were not received by the system. The user needs to reapply the paper tape.

Error

The system is in an error state. The sounding is terminated.

Status Bar [13]

The **Status** bar on the bottom shows information about the status of the program. It also gives information about the menu options as they are highlighted.

0110-152

Figure 30   Status Bar

Text Scroll Pane [14]

The **Text Scroll** pane is a tabbed data display. The tabs are created dynamically according to the status of the sounding and available data streams. Moving between tabs is possible by pressing **Alt + N**, where **N** means the tab number: 1 is the first from left, 2 is the second and so on.

0312-149
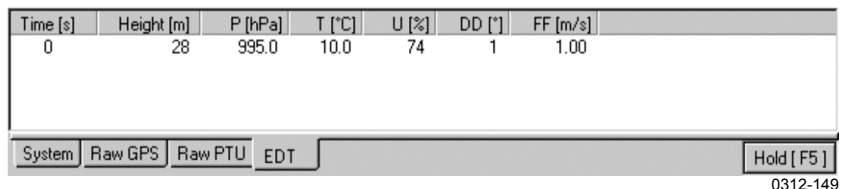
Figure 31   Text Scroll Pane

0312-150

Figure 32   RawGPS Tab

Raw GPS data has the following columns:

Time [s]   =   Time from data receiving start
East[m/s]   =   Sonde speed east
North[m/s]   =   Sonde speed north
Vert [m/s]   =   Sonde speed vertical
Pos East[m]   =   Sonde position from launching point to east
Pos North[m]   =   Sonde position from launching point to north

Data /////// means that the system was not able to calculate sonde position. This usually means that there are not enough satellites available, for example when sonde is indoors.

Data ------- means that GPS data was not received from the sonde, usually due to gap in telemetry.

It is possible to copy/paste or print the data shown it these tabs. Select the tab you want to use. You can select part of the data using mouse and **Ctrl** and **Shift** keys. Right-clicking the highlighted data will display a menu, where the data can be printed or saved to file. See example below.

0301-020

Figure 33   Example of Right-Click Menu

This page intentionally left blank.

CHAPTER 4
OPERATION

This chapter contains information that is needed to operate the MW31 software.

Getting Started

NOTE	Before you start doing soundings, please read the **Installation** manual carefully and follow the instructions. The **Configuration** chapter contains important information on station parameters that need to be set before soundings can be carried out.

NOTE	For normal soundings, log in as "operator". The sounding process can vary with different user groups (Sounding operator, Sounding manager, or Sounding administrator). Not all windows appear with all user groups. Operation of the software is determined by the DigiCORA III database. See the **Technical Reference** manual (section Database Key Management) for more information on customizing the DigiCORA III software and user privileges.

Sounding Preparation

Power up the sounding subsystem (SPS311 or SPS220) and start
DigiCORA® III MW31 software.

Click on the **Start** button and select **Programs - DigiCORA III -
DigiCORA III** or click the **DigiCORA III** icon on the desktop. The
DigiCORA III user interface, or the UCP (User Control Process), is
started.

0301-021
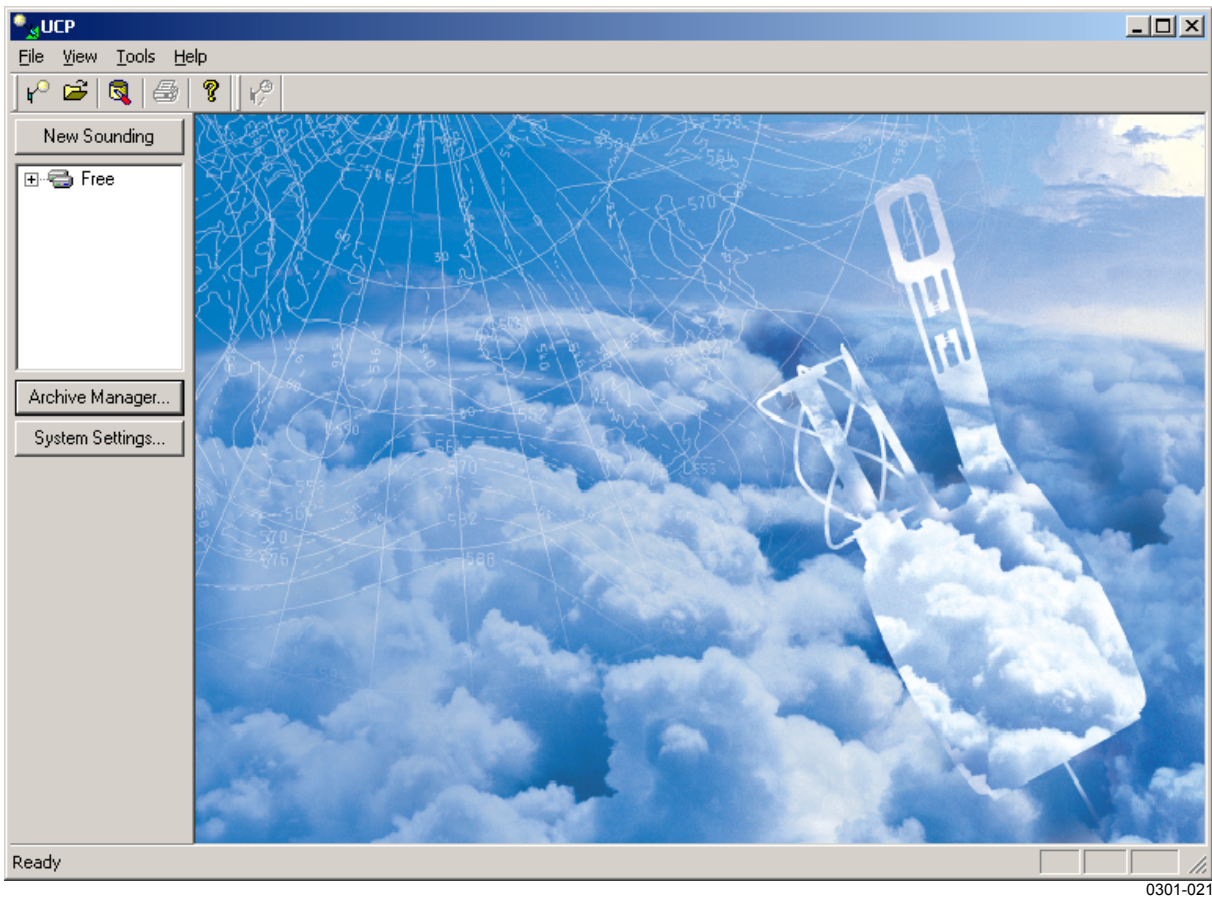
Figure 34 DigiCORA® III Start Window

Start a new sounding by clicking the **New Sounding** button once.
When a sounding is started for the first time, the system requires the
user to set the station position. For information on how to set this,
refer to section **Setting Station Parameters** in the **Installation**
manual.

Entering Sonde Coefficients

Enter sonde coefficients. There are four ways to do this: from Paper Tape, from file, via cable from sonde, or via radio from sonde. The default way is decided during DigiCORA® III setup.

NOTE	If the ground check device is connected to the workstation via cable, the device is then operated using only the DigiCORA® III user interface instead of the panel on the device. After the radiosonde has been placed on the ground check device and powered up, reconditioning, as well as frequency and killer time setting are done using DigiCORA® III software.

You can alternatively, click the Back button on the screen where the coefficients are requested, refer to Figure 45 on page 54. Then all the available selections are shown (see Figure 35 below).

0312-151

Figure 35   Selecting Coefficient Source

The default media can be set manually, for more information see the DigiCORA® III Technical Reference manual.

a. Entering Coefficients via Cable

If the system has a cable connection to radiosonde, for example a connection via GC25, the calibration coefficients can be read via cable from the radiosonde. This is only applicable for RS92 family radiosondes.

- Connect the sonde to the GC unit (see more instructions in the GC unit's User's Guide) port and power up the radiosonde.
- Click the **Cable** button.

0312-152
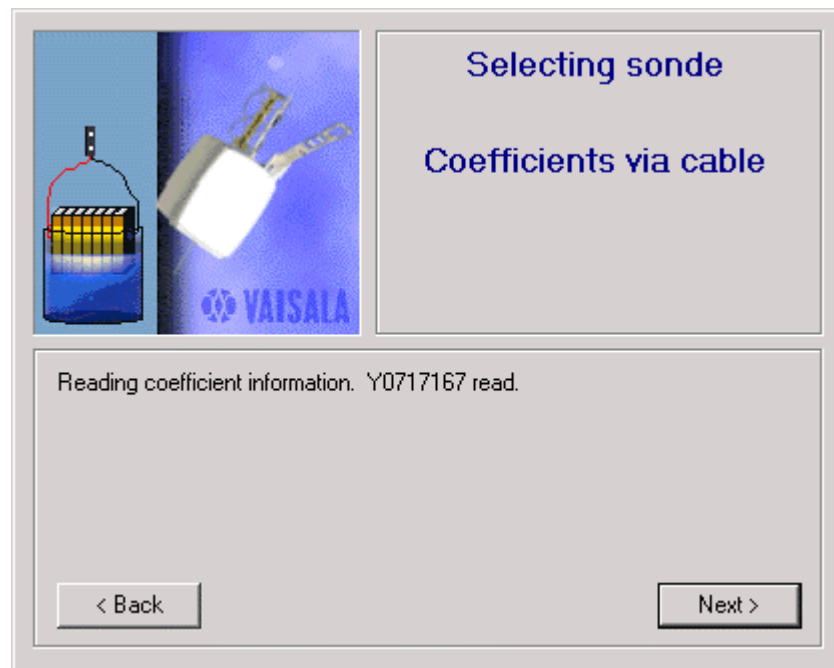
Figure 36   Coefficients Read Successfully via Cable

The coefficients have been read successfully. Click **Next**.

b.   Entering Coefficients via Radio

The calibration coefficients can also be read via radio from the radiosonde. This is only applicable for digital radiosondes.

0312-153
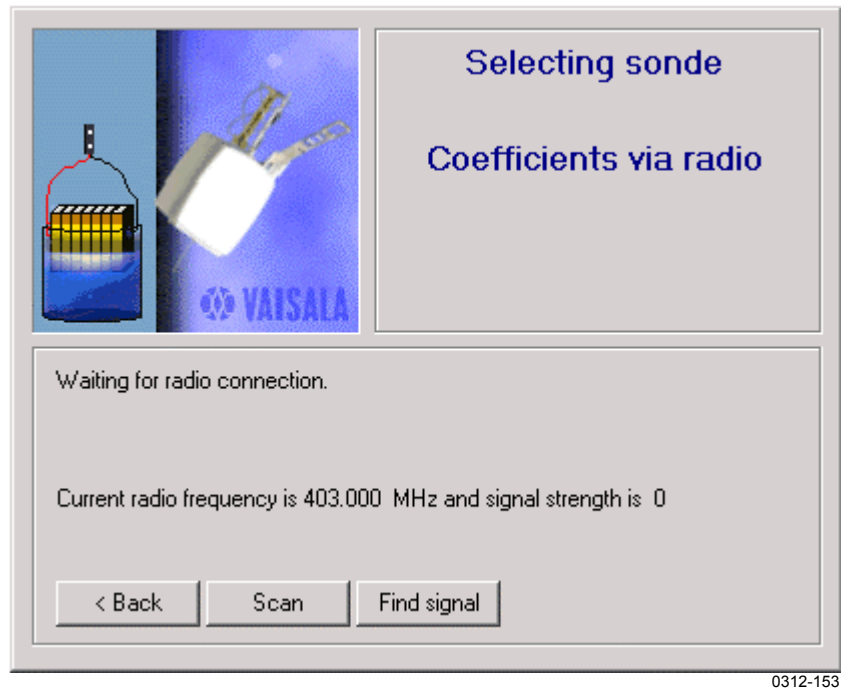
Figure 37   Ceofficients via Radio

Set radio to the radiosonde frequency. This can be done using **Scan** or **Find Signal** buttons. Clicking the **Scan** button locates next signal in the frequency band and sets the radio on that frequency.

The Find button locates the strongest signal in the frequency band and sets the radio on that frequency.

Radio frequency can also be set using the **Radio** view.
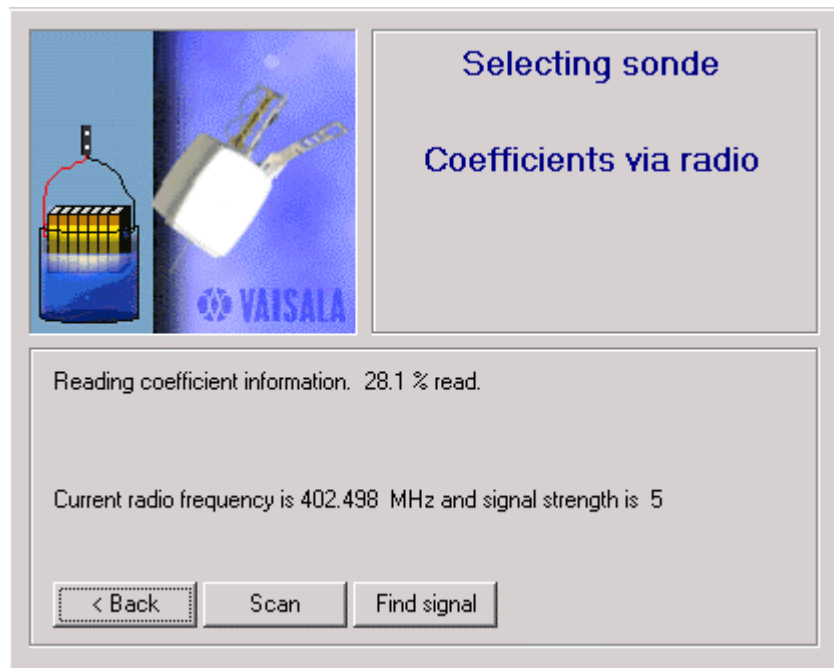
0312-154

Figure 38   Reading Coefficients via Radio

Once the radio is set to radiosonde frequency, the coefficients are read via telemetry.
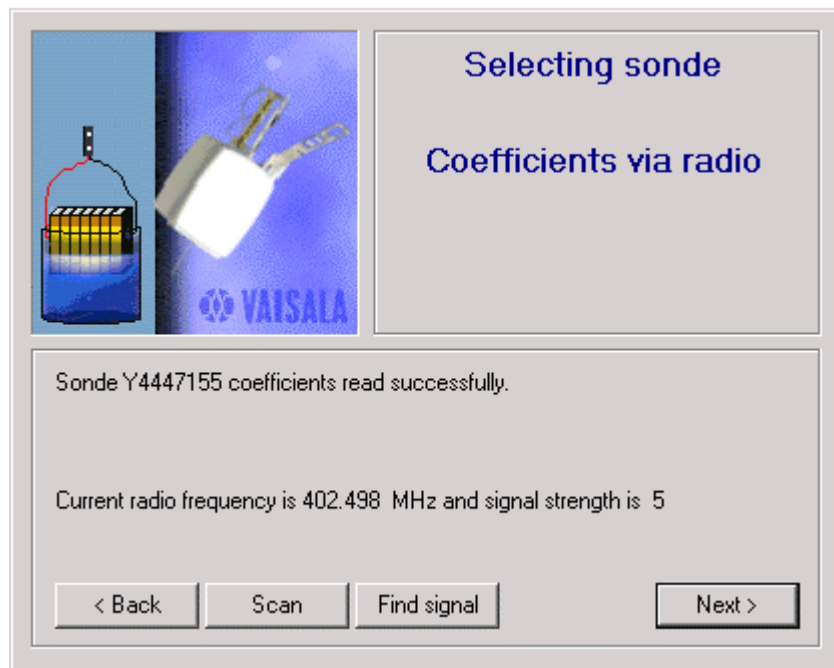
0312-155

Figure 39   Coefficients Read Successfully via Radio

The coefficients have been read successfully. Click **Next**.

c.   Entering Coefficients from File

The calibration coefficients can also be imported to the system from file.

0312-156
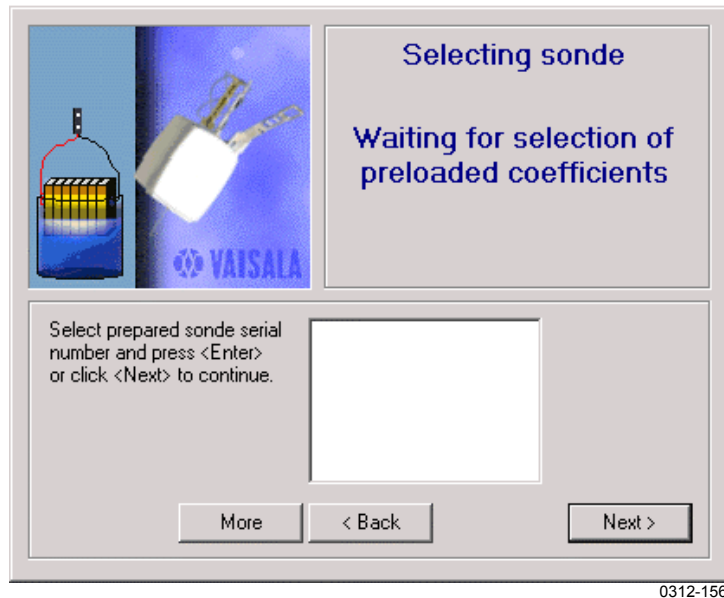
Figure 40   Waiting for Preloaded Coefficients

Select the desired calibration coefficient and click **Next**. If there are no calibration coefficients in the window, (as in Figure 40 above), click **More**. You will be prompted to select a path for the calibration coefficients. See Figure 41 below.

0312-157
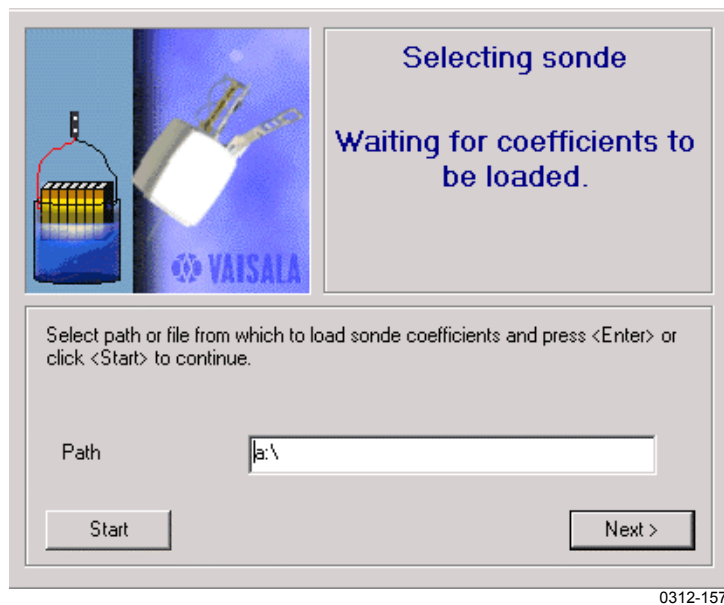
Figure 41   Selecting Path for Coefficients

Select a path or a file from where the calibration coefficients are to be loaded. If you write a file name into the **Path** box, only the particular file will open. If you write a path to a drive, all the files in this location will open.

When you have selected the file or path, click **Start**. Once the coefficients have been loaded, the following window in will appear.

0312-159

Figure 42   Coefficients Successfully Loaded

The coefficients have been read successfully. Click **Next**.

When the calibration coefficients have been loaded, you can select the sonde serial number and click **Next** to continue.

0312-160
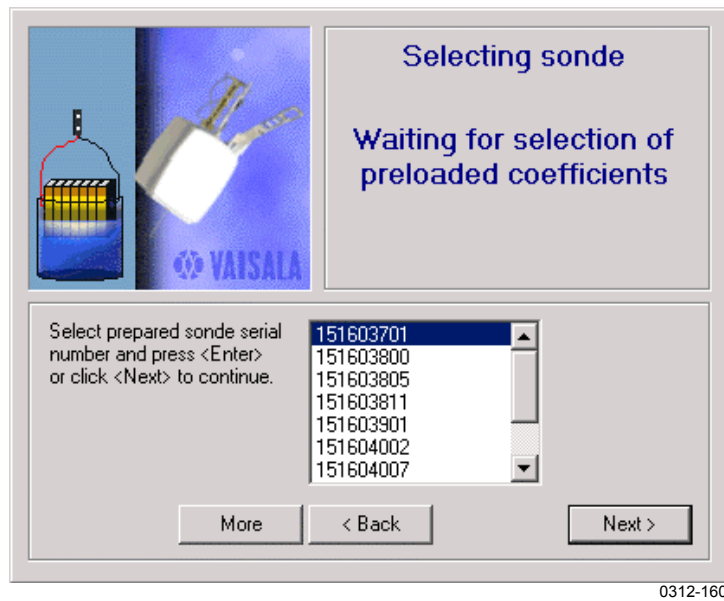
Figure 43   Selecting Sonde Serial Number

Once you have selected the sonde serial number, the window shown in Figure 44 below will appear to indicate that the selected coefficient has been successfully read. If you select the wrong sonde, you can go back to the previous window by clicking **Back**.

0312-179

Figure 44   Coefficient Read Successfully

    d.   Entering Coefficients from Paper Tape

Run the tape through SPT11A. If the system goes into Coefficient error state, run the paper tape through the reader again.
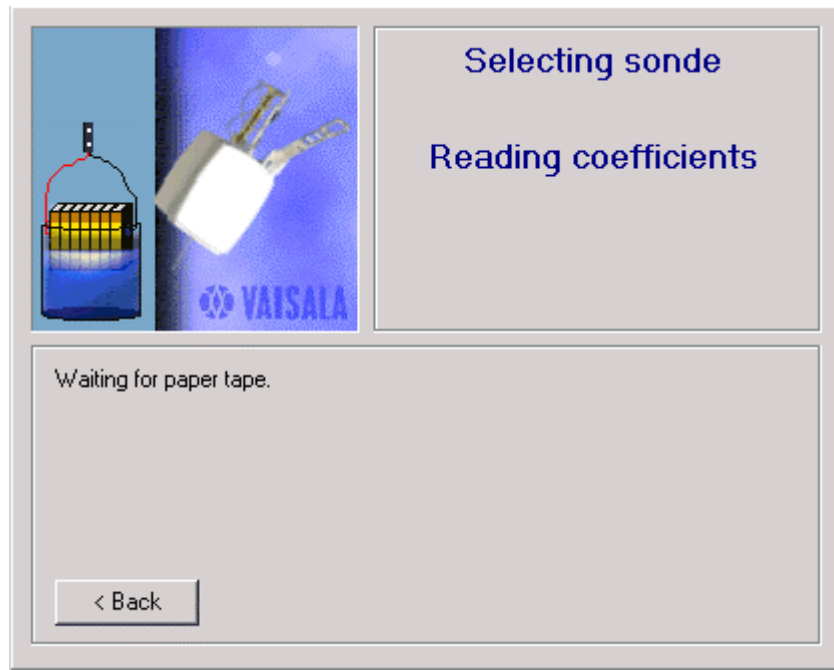
0312-158

Figure 45   Waiting for Paper Tape Reading

Selecting Sonde Type and Properties

Select the sonde type from the list and click **Next**. The registry key **SondeTypes** defines the sonde types shown in this menu. More information on sonde types can be found in the Technical Reference manual's section Sonde Types. The next window (Figure 46) appears only with analog sondes. Otherwise, proceed to Figure 47 below)

0312-180

Figure 46   Sonde Type Selection

0403-076

Figure 47   Radiosonde Properties

When using an analog radiosonde, it is recommended to set radio frequency using the **Radio** view at this point.

On this window (see Figure 47 on page 55), you can choose not to measure wind. To do that, select **None** from the **Wind type** list. The **Special** drop-down list is available only if the system has special sensor capability installed.

The **Set** button is only available when using digital sondes. By clicking the **Set** button in the **Frequency** box, the window shown on Figure 48 below opens.

0312-162

Figure 48   Sonde Frequency and Killer Time

The **Set** button is available only when the system comprises a GC25 unit, which is connected to the workstation via cable, and coefficients are read via cable. Then radiosonde transmitter frequency and killer time can be set in this window.

The frequency can be set by typing it to the **Frequency** box or by dragging the slider with the mouse or with left and right arrow keys.

Killer time [min] means radiosonde transmitter operation time in minutes, starting from the moment the sonde is released. A value of zero (0) means that this option is disabled.

By default, the frequency band of 400.01 ... 405.99 is available. It is possible to configure the system so that the available band is limited. A part of the band can be excluded, and the step for frequency setting can be set. The default step is 10 kHz (or 0.01 MHz). An example is shown in Figure 49 on page 57.
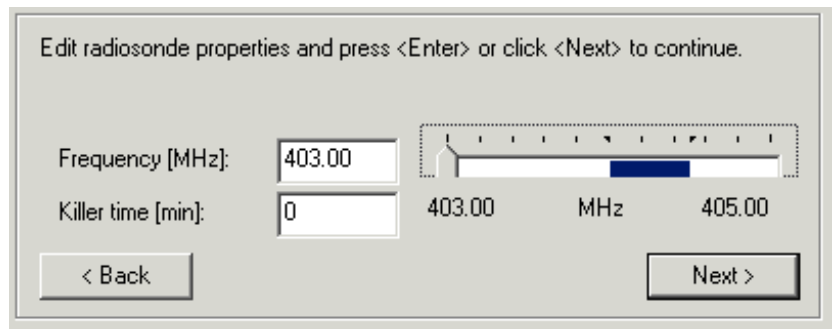
0312-163

Figure 49   Limited Frequency Band

Here the available band is 403 ... 405 MHz, and the band between 404 ... 404.5 MHz is excluded from the available band.

Refer to Technical Reference manual's section InputLimits for details on how to limit the available frequency band.

Checking for Free Disk Space and Version Compatibility

Next, the system checks free disk space. If there is not enough free space for a sounding to be archived, a warning is displayed. Continue by clicking **Next** or abort sounding preparation by clicking **Cmd - Exit**.
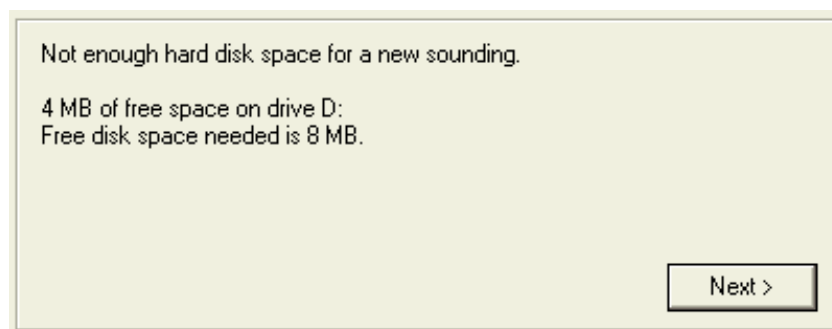
0312-178

Figure 50   Disk Space Warning

At this point, when using a digital radiosonde, the system checks the compatibility between DigiCORA® III software and radiosonde software. A warning is displayed, if a version mismatch is detected (see Figure 51 on page 58.
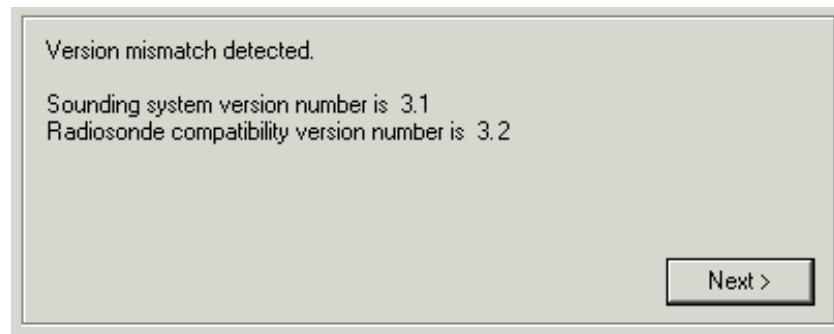
0312-164

Figure 51   Example of Version Mismatch

If this warning is displayed, stop the sounding preparation and contact Vaisala for instructions (see section Getting Help on page 7). Provide the following information:

- used radiosonde type,

- used hardware (sounding subsystem rack type), and

- both version numbers displayed in this window.

Selecting Triggering Profiles

The triggering profiles to be used for this sounding are selected in this window. By default, VoiceNotifications and WMOmessages are selected. Checking **Disable Spooling** will disable message spooling for this sounding. Ozone and Radac profiles are available only if the system has Special Sensor capability installed.

NOTE	The **Triggering Profiles Selection** window is not available for Sounding Operators by default.

0208-084
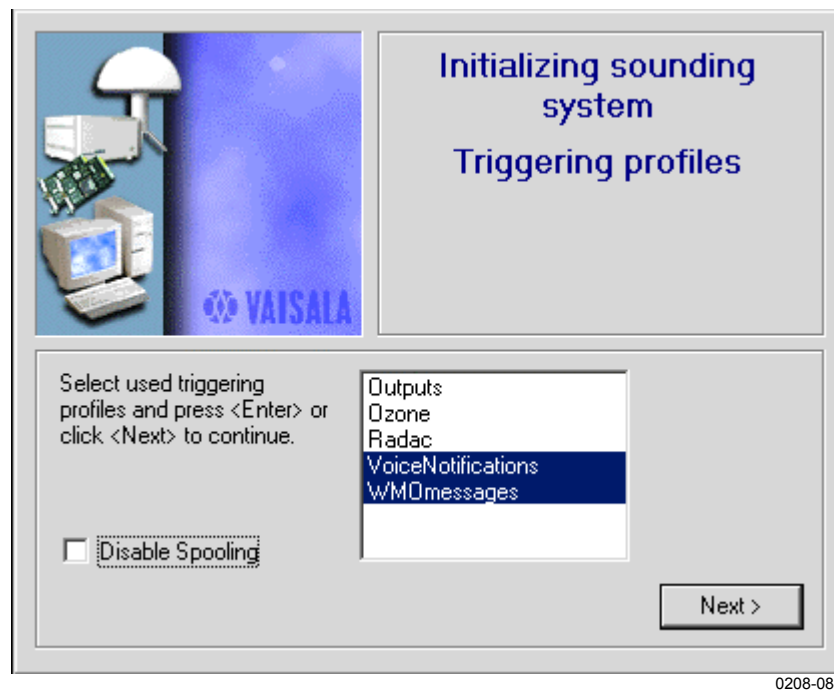
Figure 52   Triggering profiles

In addition, profiles from previous installations are available on systems upgraded from version 1.xx.

0301-026
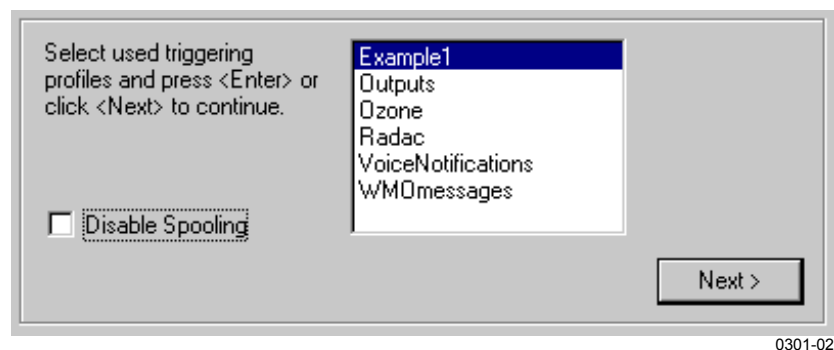
Figure 53   Old Triggering Profiles

On upgraded systems, it is recommended to start using new profiles. Default profiles are defined in parameters database key **UsedProfile**. Refer to the **Technical Reference** manual for more information on triggers.

Selecting Research Mode Option

NOTE	The **Research Mode Selection** window is not available for Sounding Operators by default.
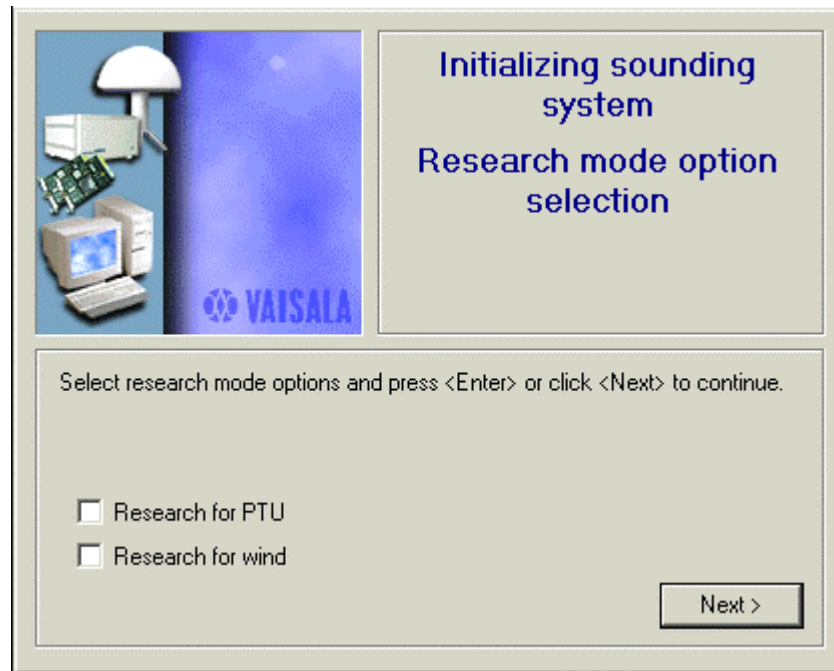
0312-165

Figure 54   Research Mode Option Selection

Research mode is designed to produce data which is edited as little as possible, because it is intended for research use only. The mode should not be used in standard synoptical soundings and no WMO messages should be generated.

Solar Radiation correction and pendelum effect removing are performed in **Research mode** in the same way as in a standard sounding.

Research mode can be selected separately for PTU or Wind measurement, although it is recommended to select both.

The main differences between a **Research mode** sounding and a standard sounding are:

- Raw and EDT data have minimum filtering.

- No interpolation of discontinuations in the data is performed.

- Autostop feature is not used, so data is also received during ascend and the sounding must be stopped by a Manual Stop.

- All graphical tools features are not fully supported, for example in Metgraph, the data scaling based on pressure can cause error messages on the screen. Data should be scaled based on height.

- STD-level calculation is not fully supported and this data must not be used.

- Significant Points are not calculated in **Research mode**.

When simulating a **Research mode** sounding and deselecting the **Research mode** option, the system will produce a sounding that is equal to a standard sounding. For example, WMO messages can be generated during or after the simulation and sounding is terminated by Autostop.

NOTE	The Automatic Termination feature is not in use when performing a sounding in Research mode. The user needs to terminate the sounding manually to stop the sounding. See section Manual Termination on page 80 for more information.

Entering Station Position Information

Enter the station position information.
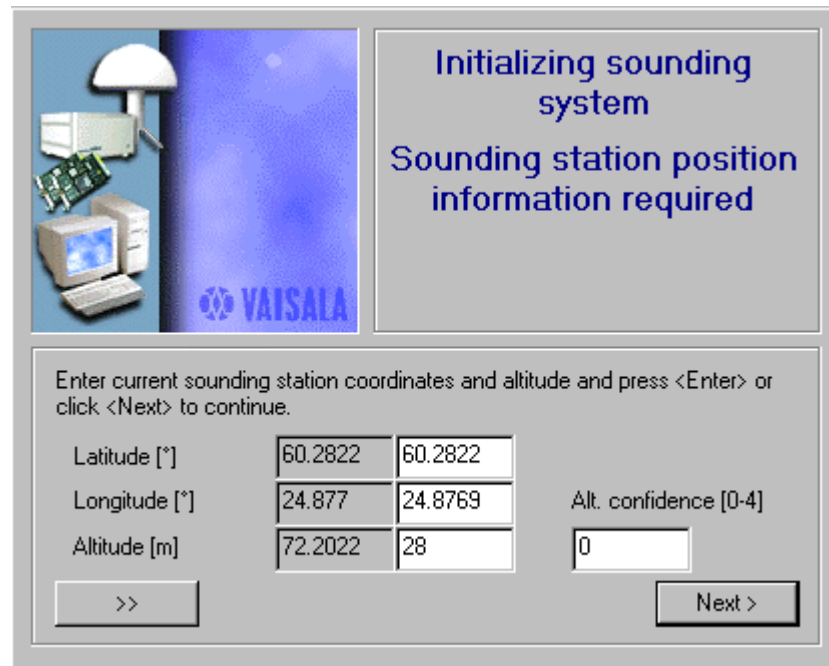
Figure 55   **Sounding Station Position**

Station position information shown on this window is read from the parameters database. Default values are set using the **Station Position** window. On this window, the default values can be changed for this sounding only. New values can be fetched from the GPS processor unit by clicking the `>>` button. These values present location in WGS-84 coordinates, and because of that, altitude is not automatically used as station altitude. If a GPS processor unit is not available, the values can be given manually.

Table 16   **Alt. Confidence**

Altitude Accuracy (in meters)	Confidence	Value to Enter
Within 3 meters	Excellent	1
Less than 10 meters	Good	2
Less than 20 meters	Fair	3
Over 20 meters	Poor	4
Ignore altitude accuracy.		0

Selecting Sounding Start Mode

Select the sounding start mode.

NOTE	The **Sounding Start Mode Selection** window is not available for Sounding Operators by default.

0312-181
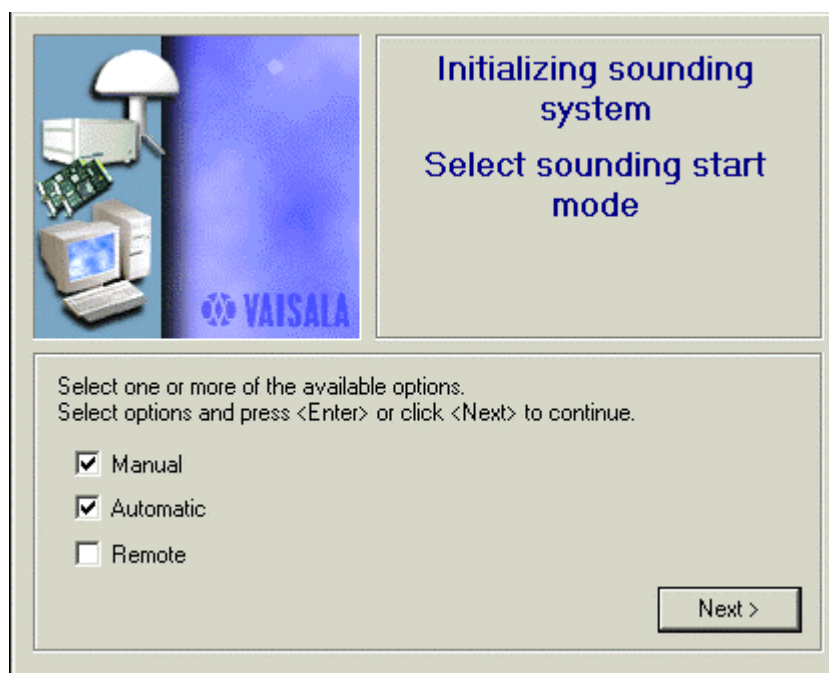
Figure 56   Sounding Start Mode Selection

- **Automatic:** DigiCORA® III detects launch automatically from the change in measured pressure.

- **Manual:** The launch is keyed in at launch time. With RT20A, check **Manual** and start the sounding by clicking **Manual Start** on the hand terminal.

- Both **Automatic** and **Manual**: If a manual launch is not keyed in, the system uses its detection mechanism to start the sounding.

- **Remote:** You can use this option if you have a remote control connected to the UPP210. Sounding is then started by connecting pins 1 and 9 of SER IO connector on UPP210 momentarily.

If you see the window shown in Figure 57 on page 64, it means that unit(s) in the sounding subsystem (SPS311 or SPS220) have not yet been logged on to the Vaisala Name Server. After the subsystem is

powered up, it takes about two minutes for the units to perform self-tests and be ready for use.

When the unit(s) are ready, the program proceeds automatically.

0206-019
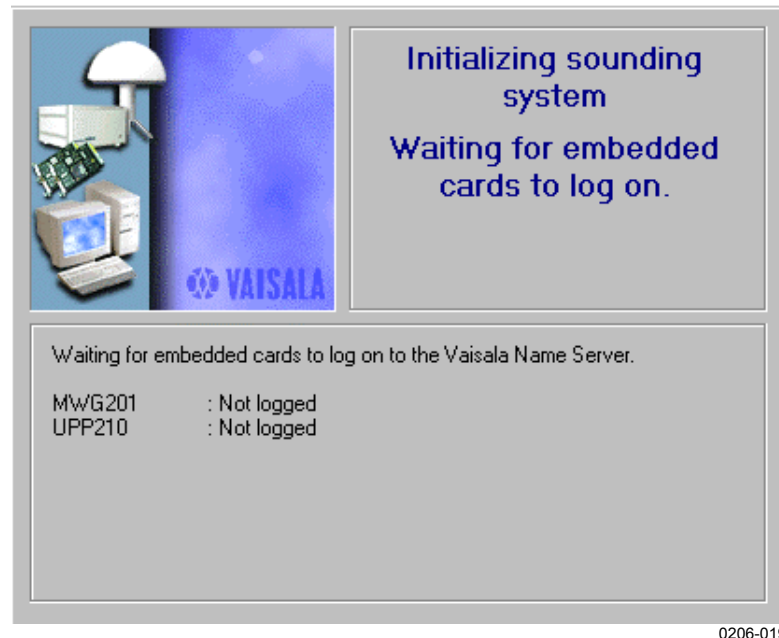
Figure 57   Waiting for Embedded Cards

NOTE	Remember to check from the **Radio** view (see section Task Miniview Pane on page 16), that the selected frequency is correct.

Sonde Reconditioning

If sonde is in GC25 and connected to the system via cable, it is now possible to perform reconditioning for sonde. Click the **Recond.** button to do this.

0312-166

Figure 58   Sonde Reconditioning

Click the **Recond.** button to start reconditioning.
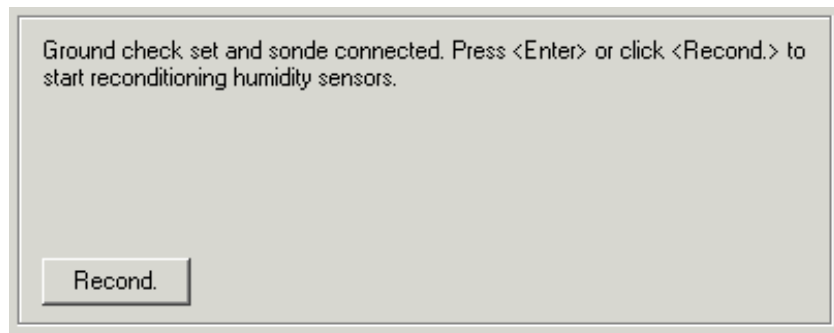
0312-167

Figure 59   Reconditioning Start

Humidity sensor heating is started, and the remaining time is displayed on the window.
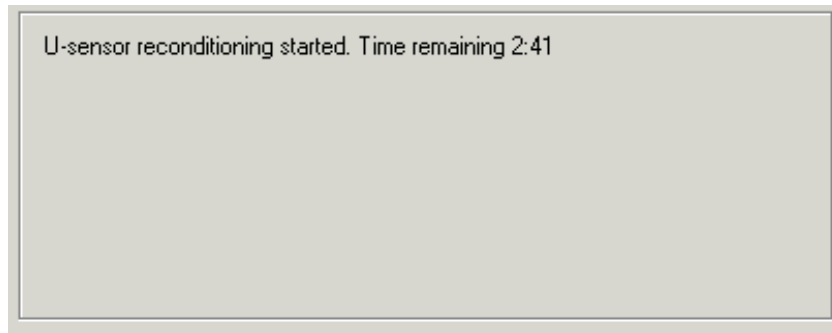
```
U-sensor reconditioning started. Time remaining 2:41
```
0312-168

Figure 60   Heating Time Remaining

When heating is completed, the sensors will be stabilized.
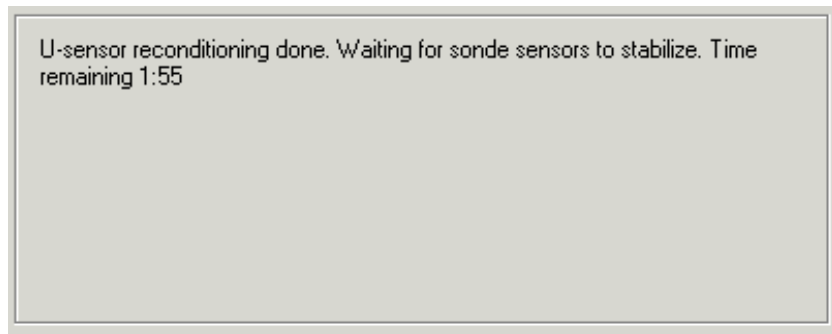
```
U-sensor reconditioning done. Waiting for sonde sensors to stabilize. Time
remaining 1:55
```
0312-169

Figure 61   Stabilizing Sensors

Sonde reconditioning is completed after this.
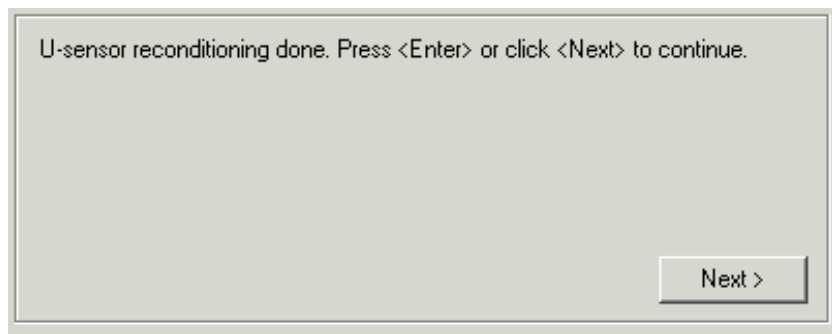
```
U-sensor reconditioning done. Press <Enter> or click <Next> to continue.


                                                          Next >
```
0312-170

Figure 62   Reconditioning Completed

Click **Next** to continue.

CAUTION	Doing multiple reconditionings without allowing the sensor to cool down, may cause the sonde to produce erroneous humidity data.

Performing Ground Check

If the view was changed to **Radio** view, return to the **Sounding Control** view by clicking its icon on the Task Miniview Pane. Perform the optional ground check by clicking **Perform GC**. See the **Ground Check Set User's Guide** for more information.

Figure 63   Ground Check

If you selected to perform a ground check, the following four windows will be displayed.
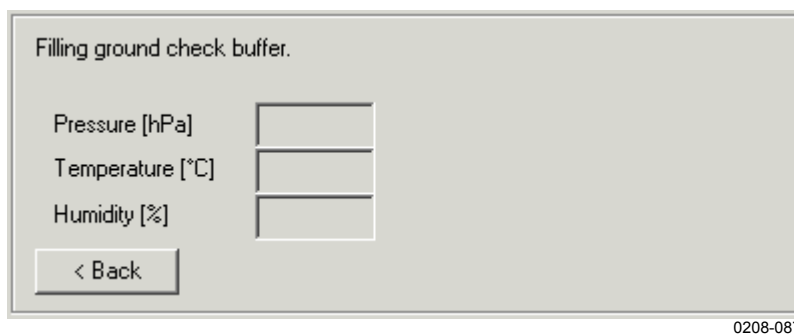
Figure 64   Ground Check Start

Buffer for PTU data from sonde will be filled.
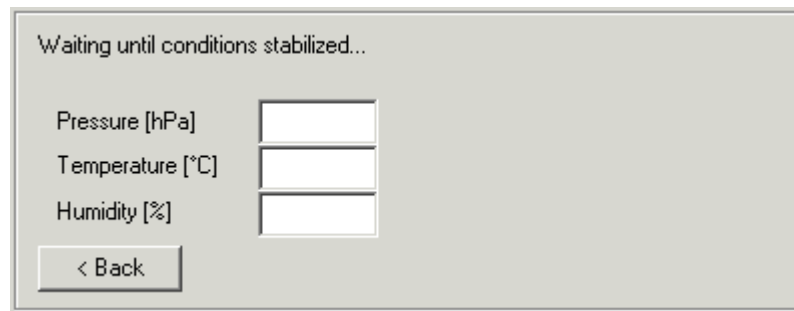
0208-088

Figure 65   Waiting for Conditions to Stabilize

Conditions must be stabilized, which means that PTU values must be steady.
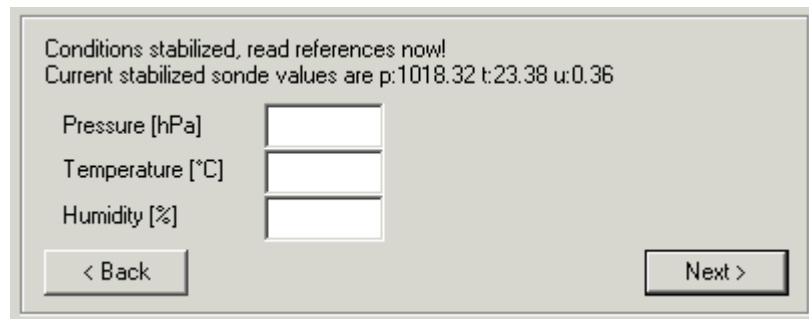
0208-089

Figure 66   Conditions Stabilized

Fill out the boxes for reference PTU values.
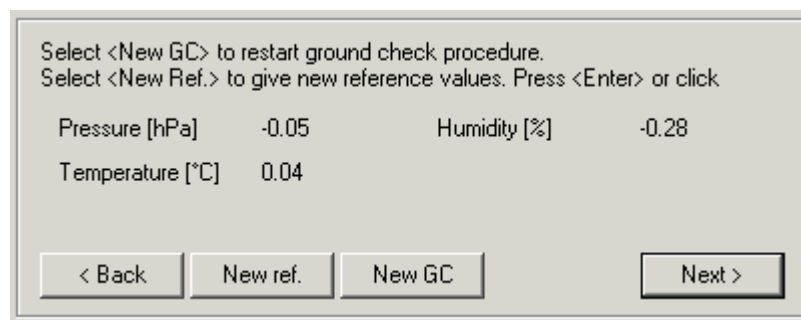
0208-090

Figure 67   Ground Check Calculated

The system shows calculated corrections for PTU. Accept them by clicking **Next** or perform a new ground check.

Ground Check Correction Limits

With the RS92 sonde family, tighter limits for correction acceptance can be used than with analog sondes (RS80/90). The system has by

default limits for analog sondes. If you want to use tighter limits, accepted correction values need to be changed manually. Refer to Technical Reference manual for information on how to modify database.

Selecting Loran-C Chains

Wait for the **Ready for release** window before launching the sonde. On Loran-C soundings, it is possible that following window will be displayed. It means that chain selection for Loran-C based wind measuring is still ongoing. Chain selection takes 10 minutes. It is recommended to wait until chains are selected by calculation. Clicking **Force** on this window will force calculation to select two chains that has best HDOP value at that time.

0208-091

Figure 68   Forcing Loran-C Chains

NOTE	It is also recommended to wait for Raw GPS data before releasing the sonde. GPS data is received when backslashes change to numbers in the **Text Scroll** pane (see Figure 31 on page 41).

0312-171

Figure 69   Ready for Release

Surface observation values can be entered before launch by clicking the **Surf. Obs**. button. The **Manual** button is available if the option **Manual** was checked when selecting Sounding Start Mode.
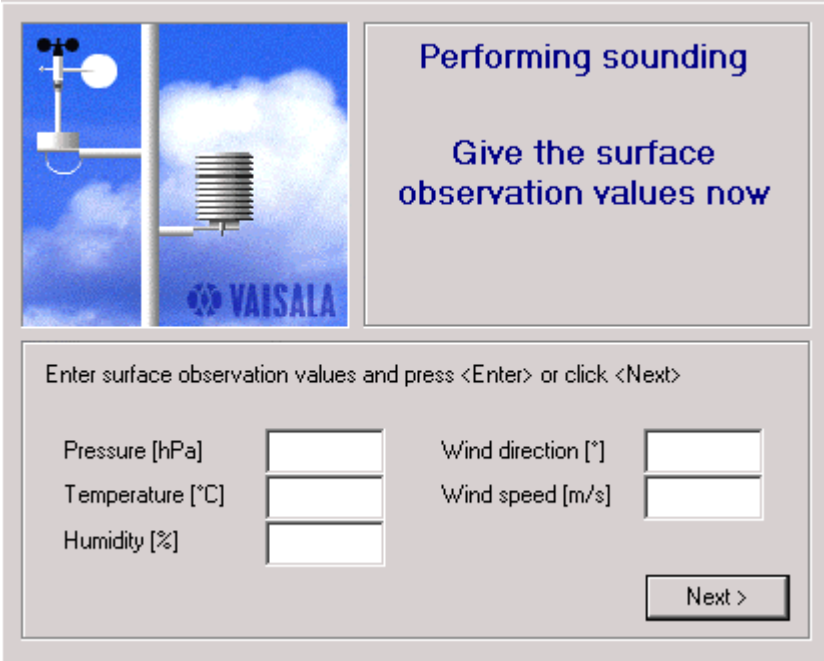
Launching the Sonde

Launch the sonde.

Entering Surface Observation Values

If surface observation values were not entered before launch, they will be asked now. If system has an AWS Server installed, values are fetched from the AWS device automatically. For more information on AWS Server, refer to Technical Reference manual.
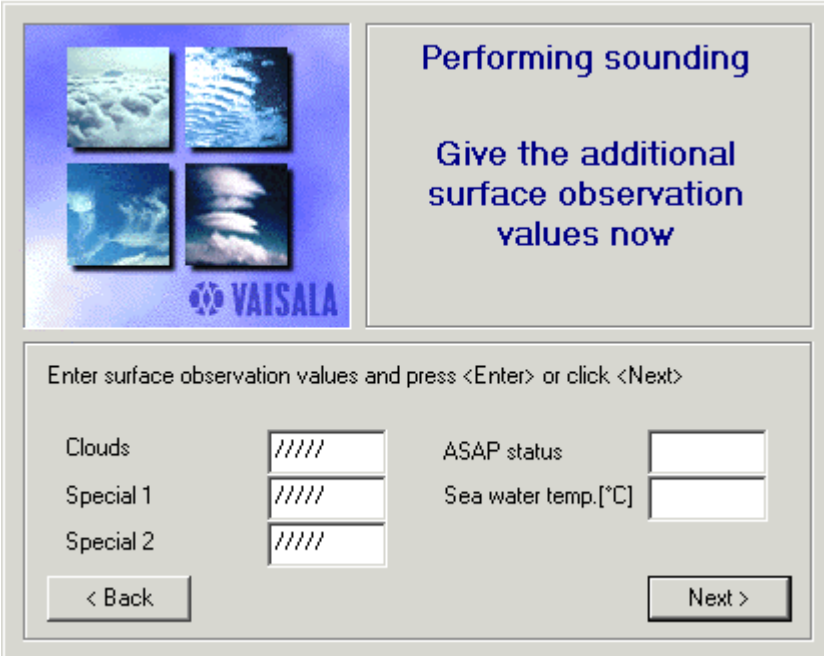
0312-172

Figure 70   Surface Observation Values

Surface observation values can also be fetched automatically from the sonde at the moment of launch. For more information on how to configure this feature, refer to Technical Reference manual's section Privileges. Next, enter cloud group information.

0312-173

Figure 71   Additional Surface Observation Information

Special 1 and **Special 2** are optional information, that is saved with sounding data.

ASAP status and **Sea water temp.** boxes are not available by default.

Privilege GroundObsAsapInput needs to be set to **Yes** for the user to be prompted to input ASAP Status and Sea water temperature. ASAP Status and Sea water temperature are only reported in TEMP SHIP.

Example of TEMP SHIP:

```
ZCZC
UKXX99 XXXX 280800
UUBB DorisTEST 78086 99603 10249 25004
00980 03130
21212 00980 00000 11980 30513 22979 28021
31313 47821 80801 90059
41414 /////
51515 11000 12511=
```

Given ASAP status was 21 and seawater temperature 5.9.

Acceptable ASAP status values are 20 ... 99. If the input value is outside these boundaries, this group in message will be replaced with a group of information on tracking technique. For example:

```
ZCZC
UKXX99 XXXX 280800
UUBB DorisTEST 78086 99603 10249 25004
00980 03130
21212 00980 00000
31313 47806 80822 90059
41414 /////
51515 11000 30005=
```

If ASAP status is enabled, and the system has an AWS device connected that can provide seawater temperature, that value is automatically fetched from the AWS device.

NOTE	This window is not available for Sounding Operators by default.

Sounding in Progress

The sounding is now in progress and EDT data starts flowing in the **Text Scroll** pane.
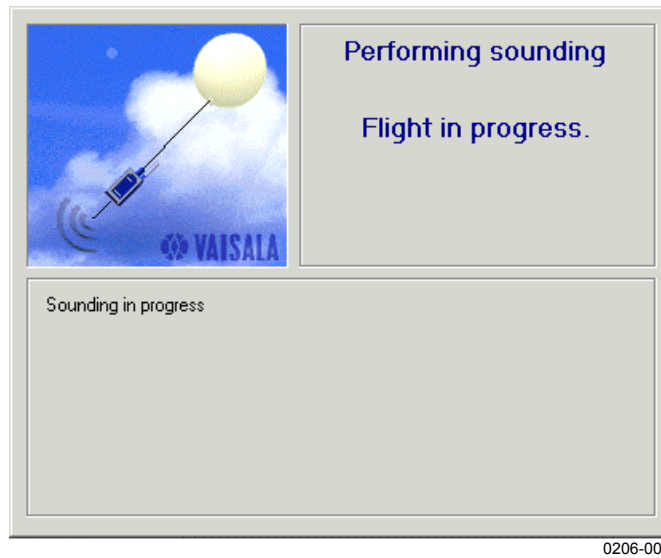
Figure 72   Sounding in Progress

Message Generation During Sounding

Messages can be triggered automatically, or they can be created manually at any time during sounding. To create a message manually, select the **Messaging** view, click the message you want to create and then click the **Code** button. Created messages appear in the **Coded Messages** tab.

Multiple messages can be selected by holding down the **Ctrl** or **Shift** key while clicking the messages.
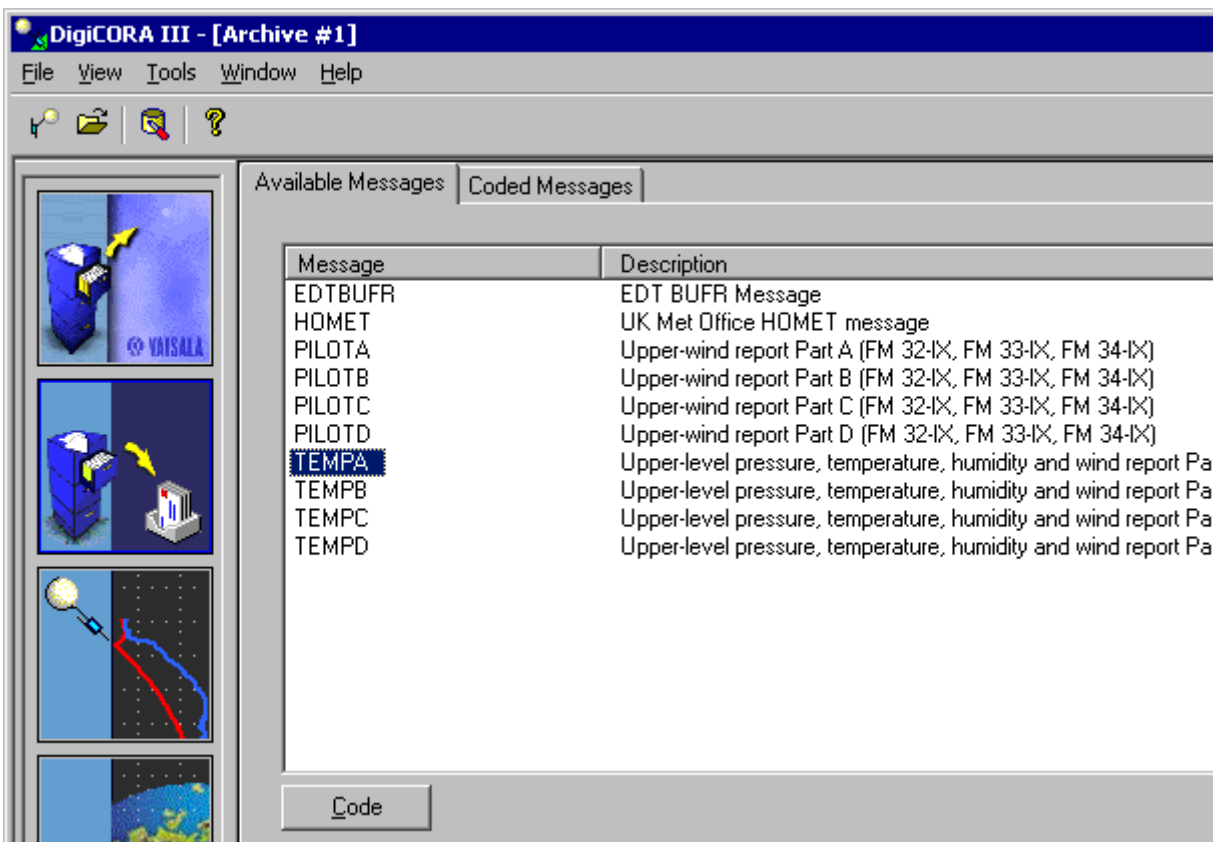
0110-167

Figure 73   **Available Messages Tab**

Messages are saved in the \DigiCORAIII\messages\ folder. Created messages can be edited and saved.
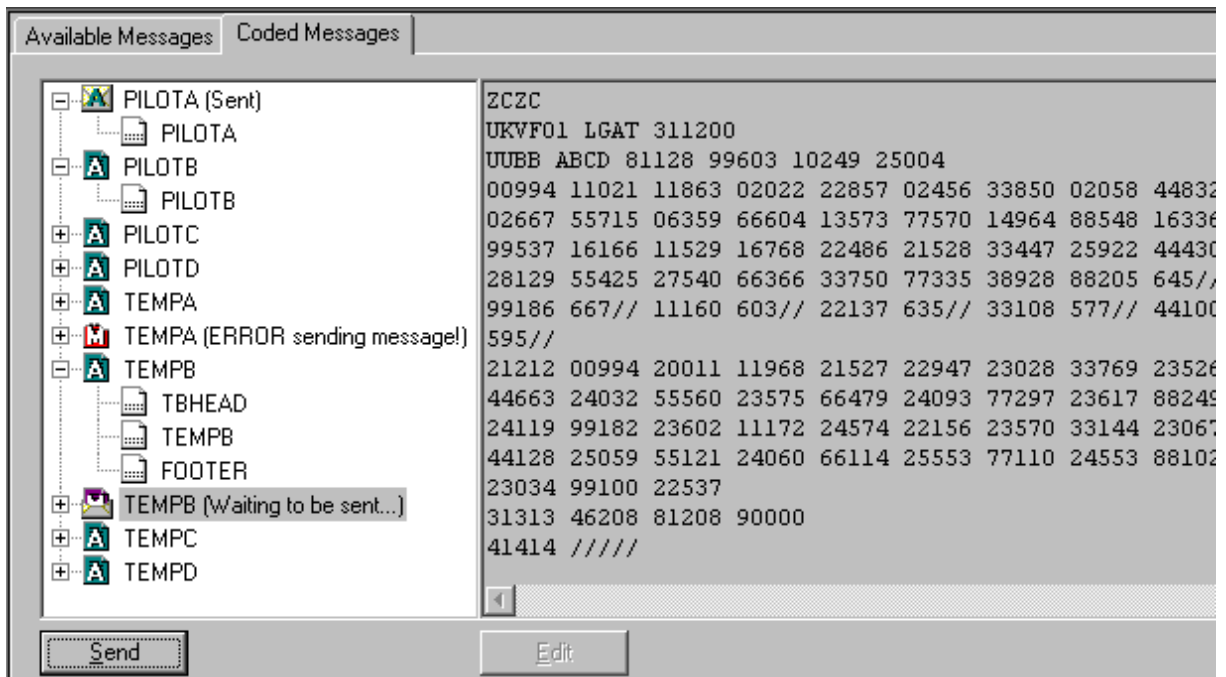
0110-168

Figure 74   Coded Messages Tab

The **Coded Messages** tab shows the available messages. A message consists of one or more sections. As seen in Figure 74 above, the PILOTA message has only section also named PILOTA. The TEMPB message has three sections: a header section named TBHEAD, message body named TEMPB, and a footer section named FOOTER. The message can only be edited one section at a time. A green letter A before the message name indicates that the message was created automatically. Manually generated messages are marked with a red letter M. The spooler status of a message shows if a message is waiting to be sent or has already been sent. Any message can be sent by selecting the message and clicking the **Send** button, or edited with a text editor by selecting a message section and clicking the **Edit** button.

Editing a Generated Message

The editor also shows the control characters. **\0x** is the prefix used to mark control characters with a hexadecimal escape notation. Any ASCII table contains the character codes and their respective hexadecimal values. For example, **\0x0a** represents a Line Feed and **\0x0d** a Carriage Return.

```
Available messages  Coded messages - Editing TEMPA

TTAA 64211 02313\0x0d\0x0a
99013 05039 34006 00133 04245 34511 92760 01307 01030\0x0d\0x0a
85432 04123 02527 70939 13140 01530 50541 30916 36051\0x0d\0x0a
40696 413// 01071 30887 501// 01073 25006 483// 01055\0x0d\0x0a
20154 473// 01542 15343 491// 01032 10607 517// 00524\0x0d\0x0a
88308 509// 00578\0x0d\0x0a
77323 01080 40520=\0x0d\0x0a

      Close        Save
```

0110-169

Figure 75   Message Editor

Ending a Sounding

There are two ways to end the sounding observations: automatic or manual termination.

Automatic Termination

There are four reasons for the system to detect an autostop.

Increasing pressure	=	Balloon has burst and pressure increases when sonde falls.
Max. interpolation time exceeded	=	Too many missing temperature values.
No PTU signal	=	No signal from sonde is received.
PTU analysis	=	PTU check has failed, for example because a. temperature sensor has broken down during sounding.

Immediately when the sounding has ended, sounding statistics are available in the **System** tab.

0409-014
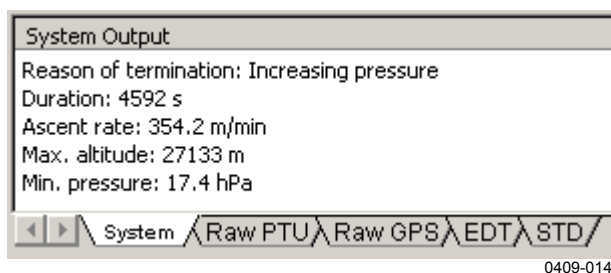
Figure 76   Sounding Statistics

0206-024
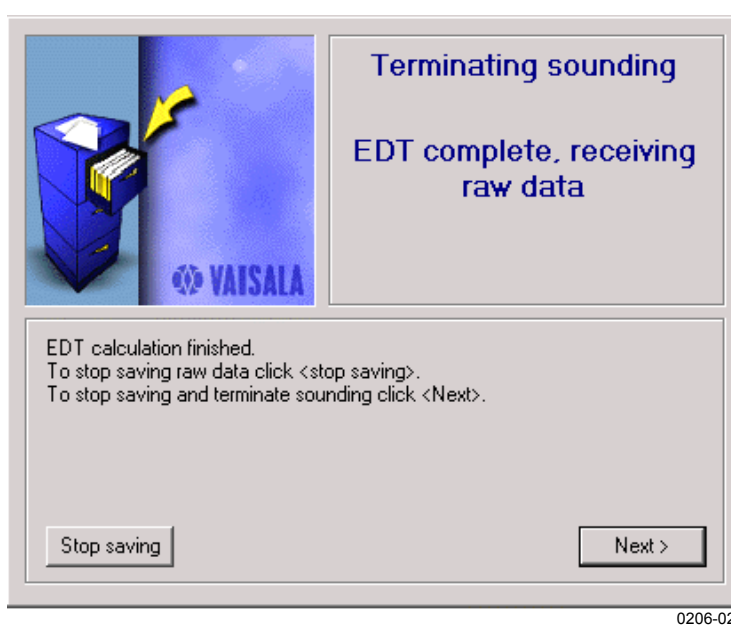
Figure 77   Automatic Termination

NOTE	If privilege **RawDataSavingAfterTermination** is set to **No,** this window is not displayed.

EDT calculation is finished, raw data is still received.

Click **Next** to stop the sounding. You will receive a request to add the sounding to the Climat statistics.

0206-025

Figure 78   Request to Climat

NOTE	If privilege **AllowSkipClimat** is set to **No,** this window is not displayed and data is added to Climat statistics.

Click **Next** to perform Climat. A request to archive will follow.

0206-026
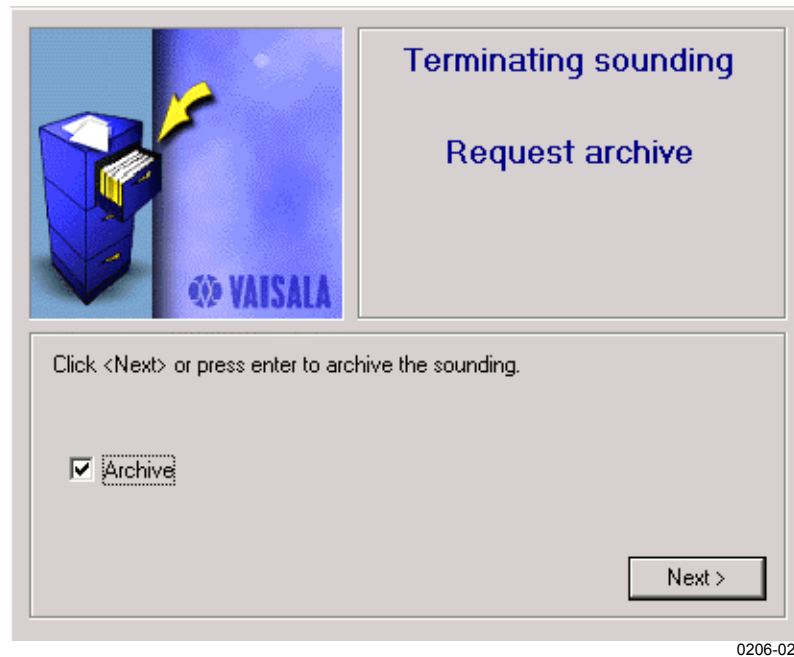
Figure 79   Request to Archive

NOTE　　　　If privilege **AllowSkipArchiving** is set to **No,** this window is not
displayed and the sounding is archived.

Click **Next** to archive the sounding.

0206-027

Figure 80　　　Closing the Sounding

NOTE　　　　If privilege **AutomaticCloseAfterSoundingTermination** is set to
No, the **Cancel** button is not shown and the sounding is not closed
automatically.

If you click the **Cancel** button in 30 seconds, your session will be left
open, and you can use graphical tools to analyze the archived data.
Message generation is also still possible. Automatically triggered
messages have been sent, but manual sending is still possible.
Changes made to the message at this point, for example sigpoint
editing, will affect the message sent manually after editing but does
not affect messages saved with sounding data..

Click **Next** to close the program manually.

Manual Termination

A sounding can be stopped manually at any time by doing the following:

Click the **Cmd** button on the **Control pane**. The following window will appear.

0206-028

Figure 81   Manual Termination

NOTE	If privilege AllowManualStop is set to **No,** the **Manual stop** button is not shown.

NOTE	Before sounding start, the **Exit** button is available for all users.
	After sounding start, the availability of the **Exit** button is defined by privilege AllowSoundingExit.

If you click **Exit**, the sounding will be stopped immediately without saving the data.

If you click **Manual stop**, the sounding will be stopped and you will be asked to archive the data as shown in Figure 79 on page 78. The **Manual stop** button is shown when EDT data is available and the sounding has started.

If you click **Cancel**, the operation will be cancelled.

CAUTION	If you need to stop the sounding before it ends automatically, it must be done as described above. Closing the UCP is not the same thing as stopping the sounding manually.

NOTE	After the sounding has ended, it is important to turn off the power from SPS311 or SPS220. Archive the sounding and close the UCP before turning off the power.

Restoring Sounding Data

If for some reason a sounding is stopped uncontrollably by, for example, a power loss of the sounding workstation, it still may be possible to save sounding data calculated and stored so far to the sounding.

This is based on the real-time archive feature. Real-time archive means that sounding data is saved as it is calculated during a sounding. Data is saved to file *SOUNDING_DATA*, which is located in folder *<Drive>:\DigiCORAIII\current_0*.

Each time the workstation is powered up, the DigiCORA III system process checks this folder for unarchived sounding data. If the file is found, the system seeks parameter database for information of the sonde used in this sounding. If sonde information is found, the system will create an archived sounding file by putting this information together. The created file is named `Restored_nnn.dc3db` and is located in same folder as other archived soundings. In the name *Restored_nnn*, `nnn` is a consecutive number for restored soundings. This task is performed automatically by the system.

Mobile Operation

Soundings can be performed also aboard ships and on other moving vehicles. In these cases, a few things need to be taken into consideration, although the sounding process is basically the same as in normal operation. Mobile operation is possible with a GPS wind finding system only.

GPS Position in Mobile Operation

If the sounding station position is not fixed during sounding, make sure that the **Station is moving during sounding** is selected in the **Station Position** window. Information on how to set this can be found in the **Installation** manual's **Setting Station Parameters** section.

Other Requirements

Offset has to be zero in mobile operation, i.e. the sonde launch site can not be further than 200 meters from the GPS antenna. Normal GPS signal reception requirements also apply during mobile operation. Line of sight to the satellite has to exist at all times. Thick forest or large obstacles, such as buildings, could hinder reception.

Workstation Time Validity

When the sounding subsystem comprises a GPS Processing unit, the system automatically keeps workstation in correct system time by using GPS time as reference time. During sounding, this feature is disabled. By default, workstation time is checked every 24 hours and adjusted if necessary. If time check can not be performed at that time, if for example the workstation or sounding subsystem is not powered, the time check is performed immediately when it is possible. The time checking interval can be adjusted and the feature disabled if needed. For systems that comprise an MRG111 unit, time is also checked every time a new sounding is started. For more information, refer to Technical Reference manual's section SNDC.

Advanced User Operations

Using Archive Manager

Archive Manager is a tool used to open, manage, and simulate archived soundings. Soundings can be imported to DigiCORA III and exported from it. Sounding data can also be converted to another format at export.

0209-018
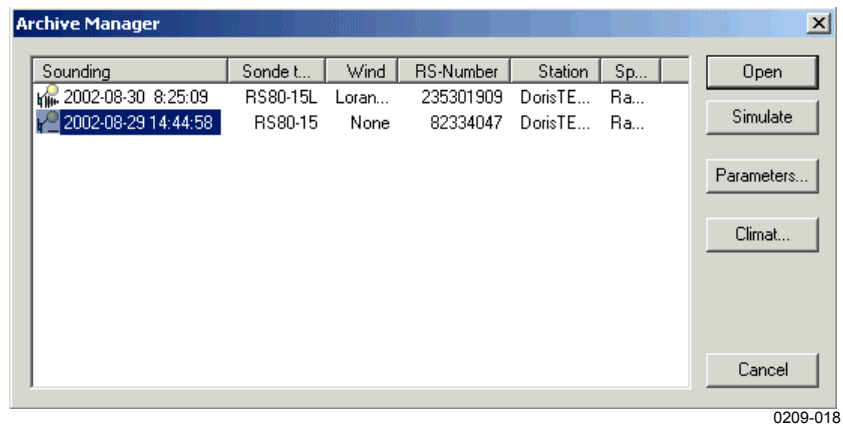
Figure 82   Archive Manager

Archived soundings can be listed by their file names of file properties.

0312-174
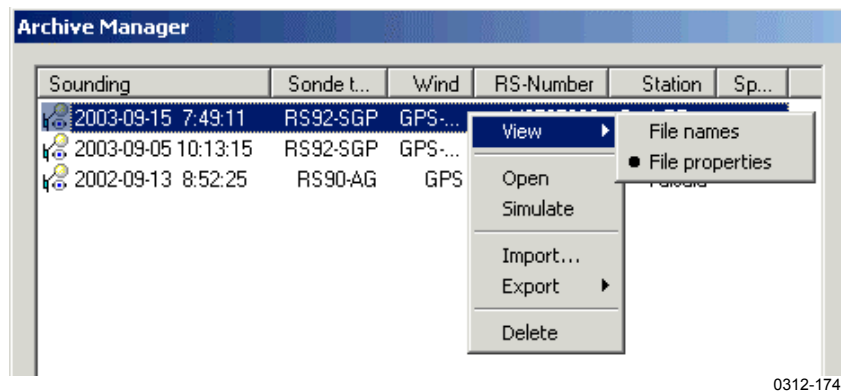
Figure 83   Soundings Listed by File Properties

An archived sounding file is named as follows:

StationName_sounding start date_sounding start time.dc3db

If a sounding is simulated and saved again, the new file will have the same name, but one minute is added to sounding start time.

Opening a Sounding

This option enables you to view a sounding's final statistics and the measured values. To open a sounding for viewing, do as follows:

1. Select **File - Open**. The Archive Manager window opens.

2. Select the archived sounding you want to open and click **Open**. Press **F5** to refresh the list of archived soundings.

Simulating a Sounding

Sounding simulation uses the selected archived sounding, and is in every respect like a live sounding. The simulation can be accelerated or decelerated as required. To open a sounding for simulation, do as follows:

1. Select **File - Open**. The Archive Manager window opens.

2. Select the archived sounding you want to use for the simulation and click **Simulate**.

   The system starts up as in a live sounding. Only the sonde coefficients are not entered during the initial stages of the sounding.

3. Set the surface and cloud parameters if you wish to change them. Otherwise, click **Next**.

4. Operate the sounding as described in the previous chapter.

Importing a Sounding

You can view archived soundings that have been made elsewhere by importing them to your own DigiCORA III system. After importing the sounding files can be opened or simulated. To import an archived sounding, do as follows:

1. Select **File - Open**. The Archive Manager window opens.

2. Right-click the file you want to import and select **Import** from the appearing popup menu.

3. Locate the sounding file you want to import and click **Open**.

4. The sounding file appears in the sounding file list and can now be opened or simulated as described above.

Exporting a Sounding

Archived soundings can be exported to be viewed with other sounding systems. To export an archived sounding, do as follows:

1. Select **File - Open**. The Archive Manager opens.

2. Right-click the file you want to export and select **Export - Copy** from the appearing popup menu.

0209-019
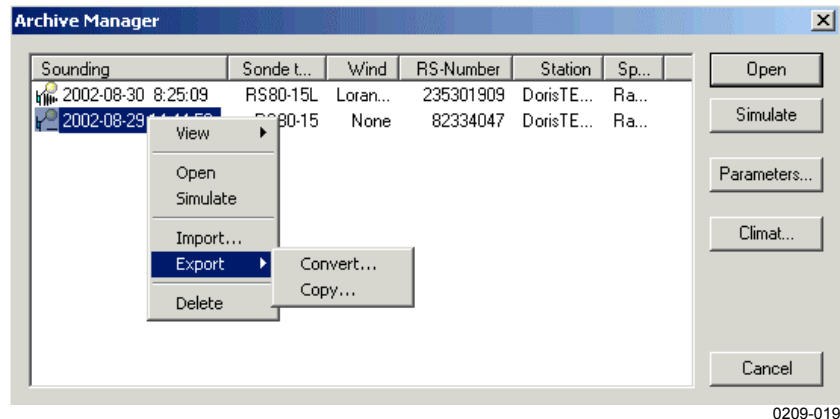
Figure 84   Exporting a Sounding

3. Browse the folder where you want to copy the sounding.

4. Type a new filename or use the default name.

5. Click **Save**.

Converting Sounding Data

Before exporting, the sounding file can be converted to another format. If you want to convert an archived sounding data table to be used with another data processing system, do as follows:

1. Select **File - Open**. The Archive Manager window opens.

2. Right-click the file you want to convert and select **Export - Convert** from the appearing popup menu.

3. Select **Convert**.

NOTE	Not all data can be converted to SPF Binary format.

4. Select the data table you want to export and click the button of the format you want to convert the sounding data to, e.g. **ASCII**.

5. Browse the folder where you want to place the converted data.

6.   Type a new filename or use the default name.

7.   Click **Save**. The conversion takes some time depending on the selected data table.

Only those data tables, that were included in the sounding archive, are available for exporting. For information on how to define which data tables (Filemap) are included in the sounding archive, refer to the Technical Reference manual section DataSets.

Conversion from FRAWPTU and GPSDCC_RESULT data tables is also available in SPFAscii format. From EDT data table it is also possible to generate AuditTrail, PTULevels, and WindLevels report.

Converted EDT and STD data has the following format:

Table 17   Converted EDT and STD Data Format

Name	Unit	Description
Time	Sec	Time from sounding Start
Pscl	ln	Scaled logarithmic pressure (4096 * ln P)
T	K	Temperature
RH	%	Humidity
v	m/s	Wind speed, north component
u	m/s	Wind speed, east component
Height	m	Height
P	hPa	Pressure
TD	K	Dew point
MR	g/Kg	The ratio of the mass of the water vapor to the mass of the dry air
DD	dgr	Wind direction
FF	m/s	Wind speed
AZ	dgr	Sonde azimuth
Range	m	Sonde distance
Lon	dgr	Sonde longitude coordinate
Lat	dgr	Sonde latitude coordinate
SpuKey	bitfield	System define significant point
UsrKey	bitfield	User define significant point
RadarH	m	Height from radar

Value -32768 means missing data.

Log Browser Application

The DigiCORA® III system writes events to log files at real time. There are two log files, one is for system events and second for user events. Both are plain ASCII text. System events are located in \DigiCORAIII\bin\LogFiles\SYSTEM\ folder by default. User events are located in \DigiCORAIII\bin\LogFiles\<user name>\ folder by

default. File sizes are handled by system, when they reach certain size, the oldest event is removed. The logbrowser.exe application is used to read these files. It is located in the \DigiCORAIII\bin\ folder by default. Start the application, select **File - Open** and browse for the log file. Both log files are named DORIS.LOG.

0312-175
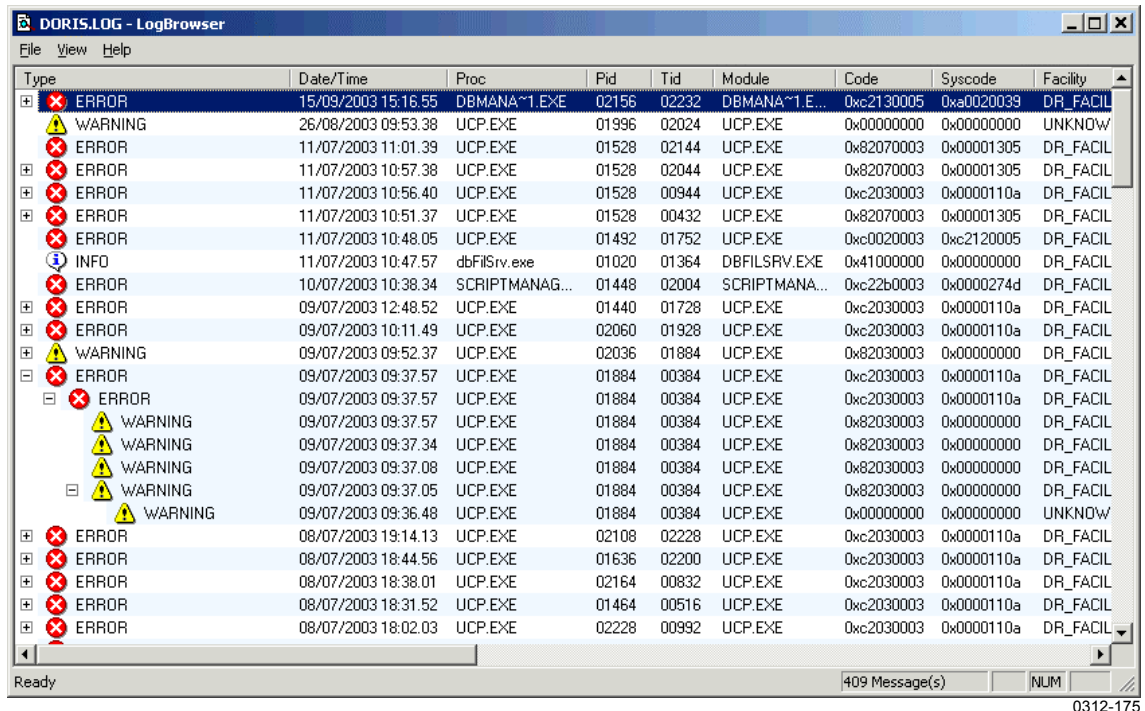
Figure 85   Log Browser Window

There are three kind of events: info, warning, and error.

For each event, additional information is shown in succeeding columns. An event has, for example, a date and time of occurrence, name of the process that created it, a specific event note and message, and some other detailed information. The user can select which columns are shown on the screen (see below).

The message bar window shows full information for an event as ASCII text. It can be enabled or disabled by selecting **View - Message Bar**.
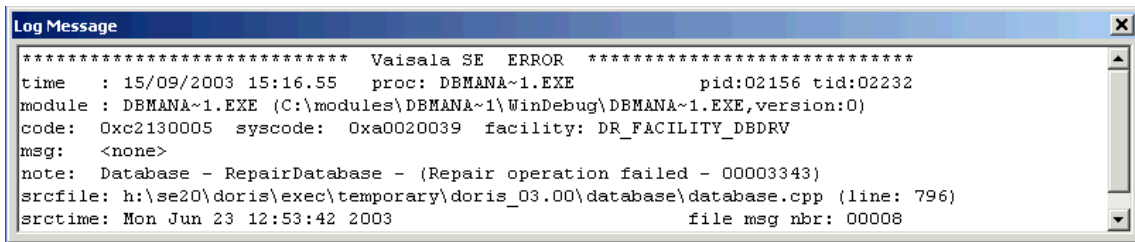
0312-176

Figure 86   Message Bar

Events can be viewed in hierarchical order (**Tree View**), or in flat time order (**Flat View**). The sequence of related log events is better seen in Tree view, whereas the Flat view preserves the order of occurrence of the log events. The user can switch between the Tree view and the Flat View by selecting **View - Tree View** or **View - Flat View**.

If the user wants to see only specific type of events, the types can be selected from the **View - Show Messages** menu.

The properties for the Log Browser application can be changed by selecting **View - Properties**, which opens the following window:

0312-177

Figure 87   Log Browser Properties Window

From the **Browser** tab, the user can modify the settings for how the Log Browser application should handle and view log files. From the **Columns** tab the user can select the detailed information (columns), which should be shown for each log event.

CLIMAT Application

CLIMAT is an application responsible for producing the WMO FM 75-X CLIMAT TEMP message - Report of monthly aerological means from a land station.

CLIMAT is a post processing application; the monthly averages are usually calculated once per month. The source data for CLIMAT are the EDT and STD data mappings from synoptical soundings performed during one month. Calculation parameters are retrieved from the database.

The standard levels, the ground level, and a header for each file are written to a cumulative file (CLIMFILE.VSL). All monthly sounding files need not be accessible simultaneously, the sounding data can be added to the cumulative climat file at the same time as the sounding is being archived. The sounding data can also be added later using the archive manager. The CLIMAT message is calculated from this cumulative file.

CLIMAT Message Structure and Spooling

CLIMAT message is structured and spooled with the same rules as other messages. Notice that CLIMAT message definition is in different location than other messages, for CLIMAT the location is \General\Syspar\Messages\. For more information, refer to the DigiCORA III Technical Reference.

Using the Application

The CLIMAT application is accessed via the Archive Manager.
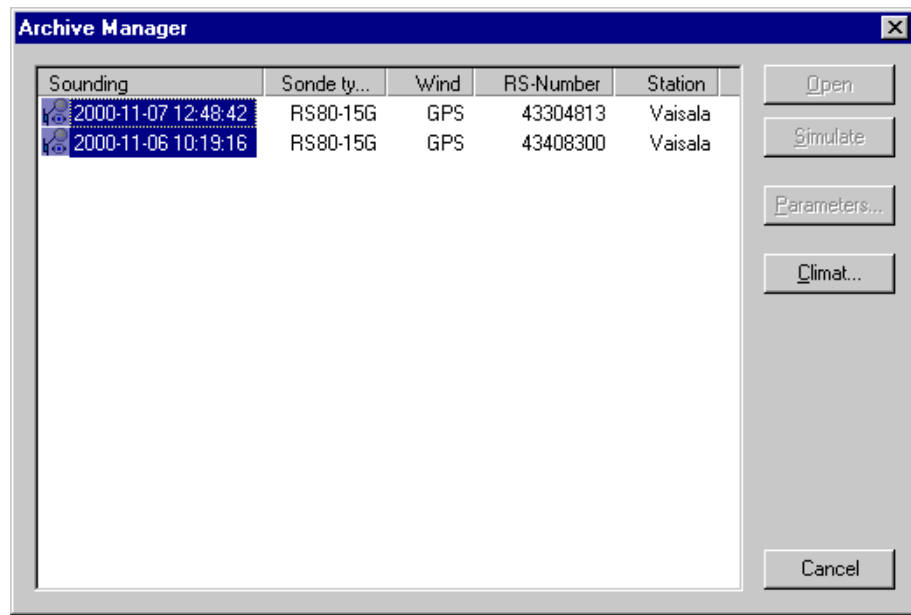
0110-172

Figure 88   Archive Manager

The CLIMAT window is opened by clicking the **Climat** button. If one or more soundings are selected before clicking **Climat**, they are added to the cumulative file.

A sounding can also be added to the cumulative file right after it has been finished. Select the **Climat** check box after the sounding and click **Next**.
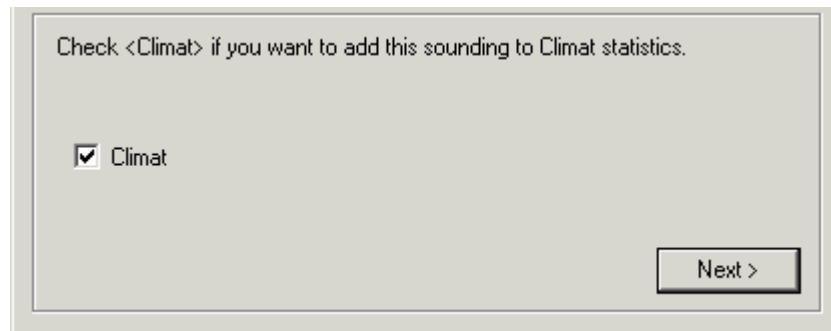
0206-029

Figure 89   Adding a Sounding to the Cumulative File
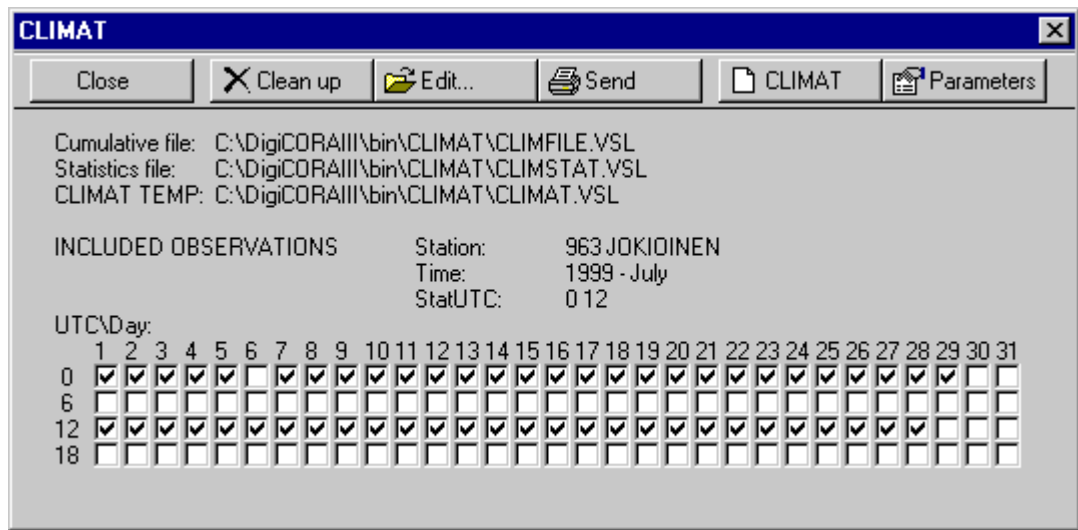
0110-174

Figure 90   CLIMAT Window

The check boxes in the CLIMAT window show which soundings are present in the cumulative file. The numbers 0-31 represent the days in a month and the numbers 0, 6, 12, and 18 are the UTC times. The CLIMAT TEMP file contains the message and the statistics file contains more informative statistical data from the month. There are six command buttons on the toolbar:

Table 18   CLIMAT Command Buttons

Command	Description
Close	Closes the CLIMAT window and returns to Archive Manager.
Clean up	Displays the Cleanup window. The user may define which (year & month) observations should be left in the Cumulative file and also the name of the backup file. Defaults are the current month and yymmBACK.VSL. Where yy denotes the last two digits of the year and mm denotes the two digits of the passed month.
Edit	Prompts the user to open the Statistics file and/or the CLIMAT TEMP file with Microsoft Notepad.
Send	Spools the contents of the CLIMAT TEMP file to a destination specified in the database. See the Technical Reference manual's section Message Descriptions and Sections for more information on message defining and spooling.
CLIMAT	Processes the monthly data in the Cumulative file. Fills statistics tables replacing duplicates with the latest find and taking into account exclusions chosen by the user. Writes general information into the Statistics file and the FM 75-X report into the CLIMAT TEMP file.
Parameters	Displays a window for editing certain parameters used as criteria for processing the monthly statistics. See Table 19 on page 92 for parameter explanations.

0110-175

Figure 91   CLIMAT Parameters

The additional parameters in Table 19 below can only be set in the database in the key \General\Syspar\Messages\Parameters\Climat. See Technical Reference for more information on database management.

Table 19   Parameter Descriptions

Parameter	Description
StationName	The name of the station (not included in FM 75 but shows in the Statistics file CLIMSTAT).
StatNum	The WMO station number of the station.
StatYear	The year of the report to be produced.
StatMonth	The month of the report to be produced.
StatUTC (0-23)	Lists the UTC hours to be included in the report, separated by spaces. These usually are the UTC times of the soundings. WMO standard hours are 0, 6, 12 and 18.
UTCShift (h)	The maximum time shift (in UTC) allowed between the start time of the sounding (release of balloon) and the defined UTC hour (listed on StatUTC line). If the start time is too far from the defined UTC hours, the observation is excluded from the statistics.
MaxMisObs (%)	The maximum acceptable amount of missing observations.
MaxMisDays	The maximum acceptable number of calendar days without observations.
MaxMisUTC	The maximum acceptable number of observation times without data.
MaxMisGap	The maximum acceptable number of consecutive days (gap) without data.

The additional parameters below can only be set in the database in the key \General\Syspar\Messages\Parameters\Climat. See Technical Reference for more information on database management.

Table 20   Additional Parameters

Parameter	Description
WindUnit	0=m/s, 1=knots. Default is 1.
RepExtrapStd	0=No, 1=Yes. Default is 0.

The Cumulative file (also referred here as ClimFile) contains several lines of text for one sounding. The first two lines contain the parameters taken from the identification data of the sounding file.

The first line contains the following parameters:

Table 21   Station Data Parameters (First Line)

Parameter	Unit or Description
Station type	
Region number	
WMO block number	
WMO station number	
Launch Year	4 digits
Launch Month	
Launch Day	
Day of the Year	1 ... 366
Launch Hour	0 ... 23
Launch Minute	0 ... 59
Message Year	
Message Month	
Message Day	
Message Hour	
Station Data Parameters (Second Line)	
Station latitude	0.01 degrees, Northern hemisphere is positive
Station longitude	0.01 degrees, East of Greenwich is positive
Station altitude	Meters, above mean sea level
Cloud group ($N_hC_LhC_MC_H$)	
Special Group 1	
Special Group 2	
Third Line	
Number of level data records	

The level data section contains data for ground level and for standard levels. Ground level is always the first line. A Level data record (line) contains the following parameters:

Table 22   Level Data Parameters

Parameter	Unit
Height	m/MSL, 30000 subtracted
Pressure	0.1 hPa
Temperature	0.1 K
Dew point temperature	0.1 K
Wind direction	degrees
Wind speed	0.1 m/s
Wind component South-North	0.01 m/s
Wind component West-East	0.01 m/s

An example of a data block for one sounding in ClimFile.VSL:

```
0 6   2 963 1999  6 30   181 11 30 1999  6 30 12
6080  2348   103 ///// ///// /////
15
-29897 10043   2975   2838    304     35     290     -195
-29859 10000   2949   2808    303     37     310     -201
-29190  9250   2885   2793    289     38     359     -123
-28482  8500   2816   2776    293     37     341     -144
-26898  7000   2749   2631    334     11      48      -98
-24268  5000   2580   2556    222     82     549      609
-22619  4000   2463   2409    212    104     551      882
-20617  3000   2300   2221    199    165     537     1560
-19413  2500   2218   2110    222    213    1425     1583
-17980  2000   2199   2027    209    147     713     1286
-16110  1500   2222   1930    196     61     168      586
-13486  1000   2201   1872    153     61    -276      544
-11184   700   2220   1885    152     43    -201      380
 -8999   500   2219   1885     78     42    -410      -86
 -5651   300   2253   1927     71     59    -557     -191
```

Definitions for the statistics are in the table below:

Table 23   Statistics File Definitions

Column Heading	Description
H	mean height of valid observations
P	mean pressure
T	mean temperature
Dewp	mean dew point temperature
DpD	mean dew point depression
u	mean north component of wind, i.e. sum of individual u values/number of observations
v	mean east component of wind, i.e. sum of individual v values/number of observations
Vddd	direction of the mean vector wind; the mean wind vector is that given by u and v (above)
V_{ff}	length of the mean vector wind, i.e.

Column Heading	Description
	$\sqrt{(u \times u + v \times v)}$
ff	mean wind speed, i.e. sum of individual ffs/number of observations
Stdf	100%*(V_ff/ff)

The first row under the unit definitions corresponds to ground level, all the others correspond to WMO standard levels. Since the wind direction usually varies in observations, V_{ff} and ff are not equal. If the wind direction in all observations had been the same there would have been no difference between the calculated mean vector wind V_{ff} and the wind speed ff.

The CLIMAT statistics file contains five pages. The following example illustrates statistics that are processed using an input file containing 56 soundings made in July 1999 at UTC sounding times 0 and 12.

Page 1:

```
VAISALA CLIMAT, DIGICORAIII          Processed at: Wed Nov 15 14:45:54 2000
                                                                     Page 1


 Monthly statistics for  963  JOKIOINEN

 Year: 1999   Month:  7

 Soundings included: 56
 Sounding times (message times):  0 12


      H      P      T    Dewp    DpD      u      v     Vddd   Vff    ff    Stdf
      m    hPa  deg C   deg C  deg C    m/s    m/s      deg   m/s   m/s      %

    103 1000.2   17.4   11.4    6.0   1.47   1.75     230   2.29  3.56   64.4
    104 1000.0   16.9    9.1    7.8  -0.07   3.52     271   3.52  5.11   68.8
    766  925.0   13.6    7.0    6.6   1.77   5.49     252   5.76  8.40   68.6
   1473  850.0    8.3    2.6    5.7   1.42   6.19     257   6.35  9.14   69.5
   3051  700.0   -0.5  -10.4    9.9   2.31   7.76     253   8.09 12.19   66.4
   5663  500.0  -16.3  -27.5   11.2   3.34  10.33     252  10.86 16.23   66.9
   7303  400.0  -28.1  -37.3    9.2   4.07  11.48     250  12.18 19.45   62.6
   9305  300.0  -42.2  -53.3   11.0   4.38  14.19     253  14.85 23.63   62.8
  10519  250.0  -48.4  -62.6   14.2   4.29  14.33     253  14.96 24.23   61.7
  11980  200.0  -49.0  -72.2   23.2   3.80  12.71     253  13.27 18.96   70.0
  13869  150.0  -49.1  -81.4   32.3   2.85   9.27     253   9.70 12.62   76.9
  16517  100.0  -50.6  -83.2   32.6   1.61   5.68     254   5.90  7.83   75.4
  18844   70.0  -49.9  -82.6   32.7   1.06   2.14     244   2.39  4.49   53.4
  21047   50.0  -49.0  -82.2   33.1   0.79  -1.65     116   1.83  4.25   42.9
  24410   30.0  -46.7  -80.5   33.8   1.07  -5.50     101   5.60  6.21   90.2
  27099   20.0  -44.6  -80.0   35.4   0.68  -6.15      96   6.19  6.20   99.8
      -    - -    - -    - -    - -   - --   - --       -   - --  - --    - -
      -    - -    - -    - -    - -   - --   - --       -   - --  - --    - -
      -    - -    - -    - -    - -   - --   - --       -   - --  - --    - -
      -    - -    - -    - -    - -   - --   - --       -   - --  - --    - -
      -    - -    - -    - -    - -   - --   - --       -   - --  - --    - -
```

Mean values were accepted when:

- Number of missing observations is less or equal than 62 (100 %)
- Number of days with no observations is less or equal than 29
- Number of consecutive days with no observations is less or equal than 29
- Number of observations for each observation time is at least 2

Page two:

VAISALA CLIMAT, DIGICORAIII   Processed at: Wed Nov 15 14:45:54 2000
                                                        Page 2

Monthly statistics for 963 JOKIOINEN

Year: 1999   Month: 7

Number of observations:

```
     P    H   P   T  TD  dd  ff

 1000.2   56  56  56  56  56  56
 1000.0   56  56  25  25  25  25
  925.0   56  56  56  56  56  56
  850.0   56  56  56  56  55  55
  700.0   56  56  56  56  55  55
  500.0   56  56  56  56  56  56
  400.0   56  56  56  56  56  56
  300.0   56  56  56  56  56  56
  250.0   56  56  56  56  56  56
  200.0   56  56  56  56  56  56
  150.0   56  56  56  56  56  56
  100.0   56  56  56  56  56  56
   70.0   55  55  55  55  55  55
   50.0   54  54  54  54  54  54
   30.0   38  38  38  38  38  38
   20.0    4   4   4   4   4   4
   - -     0   0   0   0   0   0
   - -     0   0   0   0   0   0
   - -     0   0   0   0   0   0
   - -     0   0   0   0   0   0
   - -     0   0   0   0   0   0
```

Page three:

VAISALA CLIMAT, DIGICORAIII   Processed at: Wed Nov 15 14:45:54 2000
                                                        Page 3

Monthly statistics for 963 JOKIOINEN

Year: 1999   Month: 7

Number of missing data observations:

```
     P    H   P   T  TD  dd  ff

 1000.2    6   6   6   6   6   6
 1000.0    6   6  37  37  37  37
  925.0    6   6   6   6   6   6
  850.0    6   6   6   6   7   7
  700.0    6   6   6   6   7   7
  500.0    6   6   6   6   6   6
  400.0    6   6   6   6   6   6
```

```
      300.0      6    6    6    6    6    6
      250.0      6    6    6    6    6    6
      200.0      6    6    6    6    6    6
      150.0      6    6    6    6    6    6
      100.0      6    6    6    6    6    6
       70.0      7    7    7    7    7    7
       50.0      8    8    8    8    8    8
       30.0     24   24   24   24   24   24
       20.0     58   58   58   58   58   58
       - -      62   62   62   62   62   62
       - -      62   62   62   62   62   62
       - -      62   62   62   62   62   62
       - -      62   62   62   62   62   62
       - -      62   62   62   62   62   62
```

Page four:

```
 VAISALA CLIMAT, DIGICORAIII        Processed at: Wed Nov 15 14:45:54 2000

                                                           Page 4


 Monthly statistics for  963  JOKIOINEN

 Year: 1999   Month:  7


 Maximum period of missing data (observations)

       P        H    P    T   TD   dd   ff

     1000.2     5    5    5    5    5    5
     1000.0     5    5   13   13   13   13
      925.0     5    5    5    5    5    5
      850.0     5    5    5    5    5    5
      700.0     5    5    5    5    5    5
      500.0     5    5    5    5    5    5
      400.0     5    5    5    5    5    5
      300.0     5    5    5    5    5    5
      250.0     5    5    5    5    5    5
      200.0     5    5    5    5    5    5
      150.0     5    5    5    5    5    5
      100.0     5    5    5    5    5    5
       70.0     5    5    5    5    5    5
       50.0     5    5    5    5    5    5
       30.0     6    6    6    6    6    6
       20.0    37   37   37   37   37   37
       - -     62   62   62   62   62   62
       - -     62   62   62   62   62   62
       - -     62   62   62   62   62   62
       - -     62   62   62   62   62   62
       - -     62   62   62   62   62   62
```

Page five:

```
 VAISALA CLIMAT, DIGICORAIII        Processed at: Wed Nov 15 14:45:54 2000
                                                           Page 5


 Monthly statistics for  963  JOKIOINEN

 Year: 1999   Month:  7


 Number of days with no observation:

       P        H    P    T   TD   dd   ff

     1000.2     2    2    2    2    2    2
```

```
1000.0      2    2   16   16   16   16
 925.0      2    2    2    2    2    2
 850.0      2    2    2    2    2    2
 700.0      2    2    2    2    2    2
 500.0      2    2    2    2    2    2
 400.0      2    2    2    2    2    2
 300.0      2    2    2    2    2    2
 250.0      2    2    2    2    2    2
 200.0      2    2    2    2    2    2
 150.0      2    2    2    2    2    2
 100.0      2    2    2    2    2    2
  70.0      2    2    2    2    2    2
  50.0      2    2    2    2    2    2
  30.0      6    6    6    6    6    6
  20.0     28   28   28   28   28   28
  - -      31   31   31   31   31   31
  - -      31   31   31   31   31   31
  - -      31   31   31   31   31   31
  - -      31   31   31   31   31   31
  - -      31   31   31   31   31   31
```

CLIMAT TEMP File Structure

FM 75-X CLIMAT TEMP - Report of monthly aerological means from a land station.

Code form:

$$\text{CLIMAT TEMP} \quad \overline{\text{MMJJJ}} \ \overline{\text{IIiii}}$$

$$g \cdot \overline{P_0 P_0 P_0 T_0} \quad \overline{T_0 T_0 D_0 D_0 D_0}$$

$\overline{H_1 H_1 H_1 H_1}\, n_{T1}$	$n_{T1}\,\overline{T_1 T_1 T_1 D_1}$	$\overline{D_1 D_1}\, n_{v1} r_{f1} r_{f1}$	$\overline{d_{v1} d_{v1} d_{v1} f_{v1} f_{v1}}$
$\overline{H_2 H_2 H_2 H_2}\, n_{T2}$	$n_{T2}\,\overline{T_2 T_2 T_2 D_2}$	$\overline{D_2 D_2}\, n_{v2} r_{f2} r_{f2}$	$\overline{d_{v2} d_{v2} d_{v2} f_{v2} f_{v2}}$
....	....	....	....
$\overline{H_n H_n H_n H_n}\, n_{Tn}$	$n_{Tn}\,\overline{T_n T_n T_n D_n}$	$\overline{D_n D_n}\, n_{vn} r_{fn} r_{fn}$	$\overline{d_{vn} d_{vn} d_{vn} f_{vn} f_{vn}}$

where

MM	=	Month of the year (01 ... 12)
JJJ	=	Three last digits of the year (e.g. 999)
II	=	WMO block number
g		Observation time indicator
1	=	0000 UTC
2	=	1200 UTC
3	=	0000 and 1200 TUC
4	=	0600 UTC
5	=	1800 UTC
6	=	0600 and 1800 TUC
7	=	0000, 1200 and either 0600 or 1800 UTC
8	=	0600, 1800 and either 0000 or 1200 UTC
9	=	0000, 0600 and 1200 and 1800 UTC
/	=	Other hours
		Note: The times of observation are one hour or less from the reported time.

$\overline{P_0P_0P_0}$ = Monthly mean surface pressure, in whole hectopascals, omitting the thousands digit at the time of release of the radiosonde.

$\overline{T_0T_0T_0}$ = Mean monthly air temperature, in tenths of a degree centigrade, at station level at the time of release of the radiosonde.
For negative temperatures, 500 shall be added to the absolute value of the mean temperature (for example, -05.5 -> 05.5 (absolute value) -> 55 (in tenths of a degree) -> 555 or -12.4 -> 12.4 -> 124 -> 624)

Note that the first digit is situated in a different group from the two others.

$\overline{D_0D_0D_0}$ = Monthly mean station level dew point depression, in tenth of a degree centigrade (0.1°C)

$\overline{H_1H_1H_1H_1}$ = Mean geopotentials of specified pressure surfaces, in standard geopotential meters.

$\overline{H_2H_2H_2H_2}$
. . . .
$\overline{H_nH_nH_nH_n}$

In the case of geopotentials above 9 999 standard geopotential meters, the figure indicating the number of tens of thousands shall be omitted.

$n_{T1}n_{T1}$
$n_{T2}n_{T2}$
. . . .
$n_{Tn}n_{Tn}$
= Number of days in the month for which temperature observations are missing for the specified isobaric surfaces.
Note: The digits are situated in different groups.

$\overline{T_1T_1T_1}$ = Mean monthly air temperature, in tenths of a degree centigrade, at special isobaric surfaces.

$\overline{T_2T_2T_2}$
. . . . . .
$\overline{T_nT_nT_n}$

For negative temperatures, 500 shall be added to the absolute value of the mean temperature (e.g. -50.0 = 000, -62.4 = 124, etc...)

$\overline{D_1D_1D_1}$ = Monthly mean dew point depression, in tenth of a degree centigrade (0.1°C) at specified isobaric surfaces.

$\overline{D_2D_2D_2}$
. . . . . .
$\overline{D_nD_nD_n}$

n_{v1}
n_{v2}
. . .
n_{vn}
= Number of days for which temperature observations are missing for the specified isobaric surface concerned (n_V = 9 if observations are missing for 9 or more days.

$r_{f1}r_{f1}$
$r_{f2}r_{f2}$
. . . .
$r_{fn}r_{fn}$
= Steadiness of wind at specified isobaric surfaces. The steadiness factor is the ratio of speed to the monthly mean vector wind to the speed of the monthly mean scalar wind expressed as a percentage. It is reported to the nearest one percent.

$$\overline{d_{v1}d_{v1}d_{v1}}$$
$$\overline{d_{v2}d_{v2}d_{v2}}$$
. . . .
$$\overline{d_{vn}d_{vn}d_{vn}}$$

= True direction , in whole degrees, of the monthly mean vector wind at specified isobaric surfaces
500 shall be added to direction when the speed of the monthly mean vector wind is 100 knots or more, up to 199 knots.

$$\overline{f_{v1}f_{v1}}$$
$$\overline{f_{v2}f_{v2}}$$
. . . .
$$\overline{f_{vn}f_{vn}}$$

= Speed, in knots, of the monthly mean vector wind at specified isobaric surfaces.

CHAPTER 5
TECHNICAL DATA

This chapter provides the technical data of MW31.

Minimum Hardware Requirements

Workstation

- Pentium II 400 MHz or equivalent (minimum),
  Pentium IV 1.6 GHz (recommended)
- 128 MB RAM (minimum), 256 MB (recommended)
- 8 GB of hard disk space
- SVGA 1024*768, 256 colors, 12" monitor (minimum),
  17" (recommended)
- Printer (optional)
- Ethernet Adapter
- MPA201 Arcnet adapter card (optional)
- CD-ROM drive
- CD-RW drive (recommended)

Sounding Subsystem SPS220

- UPP (PTU Processor unit)
- MWG (GPS Processor unit) or MWV (Loran-C Processor unit)
- MWI210

Sounding Subsystem SPS311

- MRR111 (400 MHz RF unit)

- MRG111 (GPS Processor unit)

- MRP111 (Receiver Processor unit)

Antennas

- RB21 Antenna System (400 MHz) for SPS220 rack or

- RB31 Antenna System (400MHz) for SPS311 rack

- GA20 (GPS local) or CA21 (Loran-C local)

Operating System Requirements

English language version of any of the following supported operating systems:

- Windows® 2000 Pro with Service Pack 4 (primary) or

- Windows® XP Professional with Service Pack 1

- Windows NT® 4.0 Workstation with Service Pack 6 or

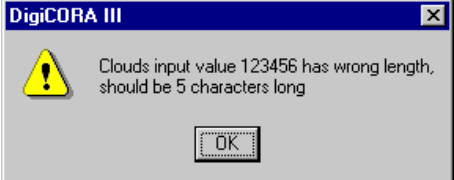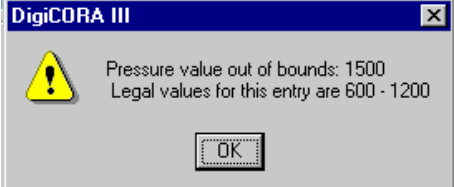- Windows NT® 4.0 Terminal Server Edition with Service Pack 6.

APPENDIX A
ERROR MESSAGES

This chapter contains the most common error messages and their remedies.

Table 24   Error Messages

Message Window	Description / Remedy
Not enough hard disk space for a new sounding. 4 MB of free space on drive D: Free disk space needed is 8 MB. Next >	This warning is displayed, if there is not enough free space for a sounding to be archived. Create more space by deleting old data or saving it to CD-ROM.
Version mismatch detected. Sounding system version number is 3.1 Radiosonde compatibility version number is 3.2 Next >	The system has detected a mismatch between DigiCORA® III software and radiosonde software. Stop the sounding and contact Vaisala for instructions.
DigiCORA III ⊠ ⚠ Clouds input value 123456 has wrong length, should be 5 characters long OK	The length of the input string is incorrect. Change the input to correct length
DigiCORA III ⊠ ⚠ Pressure value out of bounds: 1500 Legal values for this entry are 600 - 1200 OK	The input value is not within the accepted range. Change the input to be within the given range.