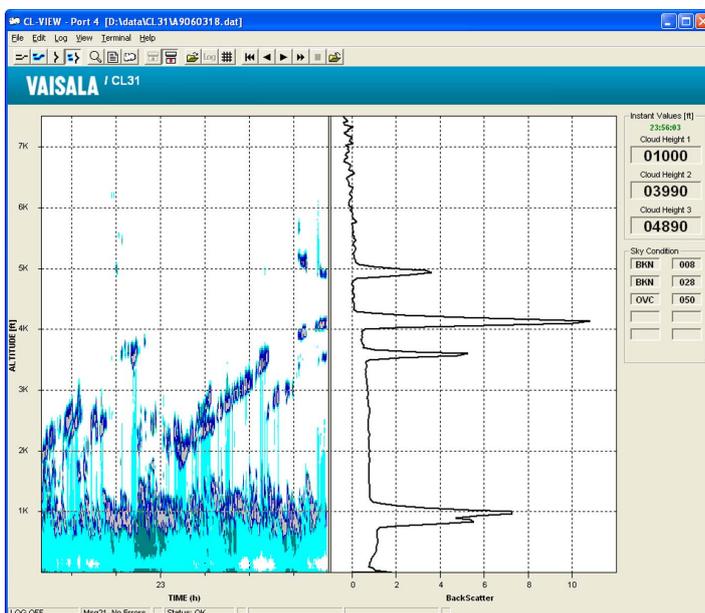


## USER'S GUIDE

### Vaisala Graphical User Interface for Ceilometers CL-VIEW



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# CHAPTER 1

## GENERAL INFORMATION

This chapter provides general notes for the manual and the product.

### About This Manual

This manual provides information for installing, operating and maintaining Vaisala Graphical User Interface for Ceilometers **CL-VIEW** software version 2.0.

### Contents of This Manual

This manual consists of the following chapters:

- Chapter 1, General Information, provides general notes for the manual and the product.
- Chapter 2, Product Overview, introduces the features and advantages of the product.
- Chapter 3, Functional Description, describes the functionality of the product.
- Chapter 4, Installation, provides information that is intended to help with installing this product.
- Chapter 5, Operation, contains the program description.
- Chapter 6, Troubleshooting, describes common problems, their probable causes and remedies, and contact information.

### Version Information

**Table 1**      **Manual Revisions**

<b>Manual Code</b>	<b>Description</b>
M210717EN-A	CL-VIEW software version 1.0.
M210717EN-B	CL-VIEW software version 2.0, this manual.

## Related Manuals

**Table 2**      **Related Manuals**

Manual Code	Manual Name
CT75K-U118en-1.2	Ceilometer CT75K User's Guide
M210345EN-A	Ceilometer CT25K User's Guide
M210482EN-D	Ceilometer CL31 User's Guide
M210801EN-A	Ceilometer CL51 User's Guide

## 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.

## Feedback

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Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

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## CHAPTER 2

# PRODUCT OVERVIEW

This chapter introduces the features and advantages of the product.

## Introduction to CL-VIEW

Vaisala Graphical User Interface for Ceilometers CL-VIEW software is a graphical presentation program for cloud height and backscatter profile information measured by Vaisala ceilometers.

The purpose of CL-VIEW is to collect messages from Vaisala ceilometers and store them on the hard disk. The program is made for ceilometer types CL31, CL51, CT12K, CT25K, CT75K and LD40. It displays the data in graphical form on the screen and can be used to examine the stored data.

The operating system for CL-VIEW is based on Microsoft Windows 7, Microsoft Windows Vista, Microsoft Windows XP, Microsoft Windows 2000, Microsoft Windows NT, Microsoft Windows 98, Microsoft Windows 95, or later, on a PC.

CL-VIEW has two main operating modes: online and offline mode. In the online mode, CL-VIEW is connected to the ceilometer and can be used for data collection and instant data presentation. The online mode is entered by opening the communication port. In the offline mode, the stored data files can be studied in the same way as in the online mode. In the offline mode, backscatter profiles can also be converted to a suitable Microsoft Excel spreadsheet format or other spreadsheet formats for further examination.

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## CHAPTER 3

# FUNCTIONAL DESCRIPTION

This chapter describes the functionality of the product.

## Modes

CL-VIEW can be operated in two different modes, online and offline. The online mode shows real-time data. In the offline mode it is possible to browse the stored message file.

### Online Mode

You can enter the online mode by opening the communication port. In this mode, CL-VIEW receives messages from the ceilometer through a modem or a serial line. The program then saves the message to the disk according to the selected options. It also displays graphs, the message, and instant values of the message.

For detailed communication with the ceilometer, a Terminal screen can be opened in online mode.

### Offline Mode

You can enter the offline mode by opening a stored offline file. In this mode, CL-VIEW reads messages from a file and displays the graph, instant values and the message according to the selected options.

## Inputs

CL-VIEW receives messages from the serial channel or reads them from the hard disk.

When CL-VIEW receives messages from the ceilometer, some error checking is done. If a communication error occurs, the entire message is discarded. For example, if the hardware buffer of the computer was full

when receiving data, which resulted in losing data. The length of the message and the start and end characters are checked to verify that they are in their appropriate places. If these checks fail as well, the entire message is discarded. CL31 and CL51 data messages contain a CRC16 checksum. This checksum is recalculated by CL-VIEW. The message is discarded if the recalculated checksum and the checksum in the data message are not the same.

When a message is read from a file, the length and the end sign of the message are checked. Because some data is read to the computer's memory, the size of the input file is limited. The limit is about 30 000 messages. Usually, this limit is not exceeded in normal use.

Various option dialogs can be opened from the main window menu bar. These allow you to set the option settings, which are as follows: **Port Settings**, **Ceilo Type**, **Start Up Options**, **Log Settings**, **Cloud Graph Settings**, **Backscatter Profile Settings**, and **Sky Condition Settings**.

Some checks are done on inputs. In the **Log Settings**, the possibility to write to the specified directory and the length of the file (must be between 1 and 24 hours) are checked. In the **Backscatter** and **Cloud Graph Settings**, it is checked that the plotting ranges are reasonable.

## Processing Data

All messages contain numerical values, such as cloud base height and status of the ceilometer. These data are copied to the appropriate display boxes. Most message types also contain backscatter profiles. These are coded as intensity numbers for each range gate. To allow the display of backscatter profile averages the last 30 instant profiles are kept in memory.

In online mode window resizing and rescaling of the cloud graph is possible because repainting is always done from the profile data memory.

## Outputs

The averaged data from messages and the data from the current message are plotted in the backscatter profile display box according to the **Backscatter Profile Settings**.

A line with a thickness of one pixel is plotted for the cloud graph, in the place identified by the current time. The color of the points plotted identifies the amount of backscatter at the altitude in question.

## Initialization, Startup, and Termination

The program is started using Windows operating system. The communication settings must be set according to the hardware. If **File - Save Settings on Exit** is enabled when exiting, the program settings do not have to be reset once you have set them according to your needs. Alternatively you can use **File - Save Settings Now**.

When CL-VIEW is started, the communication port and the data logging file open automatically, if this selection has been done with the **Start Up Options** dialog from the **File** menu. On **Start Up Options** you can also set the caption of the main screen. If no caption is defined, CL-VIEW shows the current com port number on the caption.

The program can be terminated by either closing the main window or choosing **File - Exit**. If **File - Save Settings on Exit** is enabled, all settings are saved.

### Starting on Windows Start-up

You can make a more fault-tolerant data collection system by placing the CL-VIEW.exe shortcut to your Windows StartUp program group. In Windows 95, the path is usually **C:\WIN95\Start Menu\Programs\StartUp**, in Windows NT it is **C:\WINNT\ Profiles\All users\Start Menu\Programs\Startup** and in Windows®2000 and later it is **C:\Documents and Settings\All Users\Start Menu\Programs\Startup**.

If you want to start more than one CL-VIEW automatically, you have to copy the Startup2.bat or the Startup3.bat file from the CL-VIEW directory and place it to the Windows Startup directory. To start two CL-VIEWS, select Startup2.bat file. To start three CL-VIEWS, select Startup3.bat file. If you want more than three instances, edit one of these files correspondingly.

After the above modifications, start as many CL-VIEW instances as needed and set the correct communication and other parameters. Then select **File - Save Settings Now** on each instance.

With these selections and modifications the data collection will continue automatically after resetting the PC.

## Multiple Configuration Files

CL-VIEW uses a different .ini file for every instance of the program. When a new CL-VIEW starts, it recognizes how many instances are running and chooses a corresponding .ini file. The .ini files are located in the directory of the operating system. The naming convention is the following: CLVIEW#.ini where # is a number of an instance.

For example, if two CL-VIEWS are already running and the user starts another, it will use the CLVIEW3.ini file. If the .ini file does not exist, a new file is created. The user can check which .ini file is being used by selecting **Help - About CL -VIEW**. At the bottom of the window is the following text:

*Instance: A/B CL-VIEW#. INI*

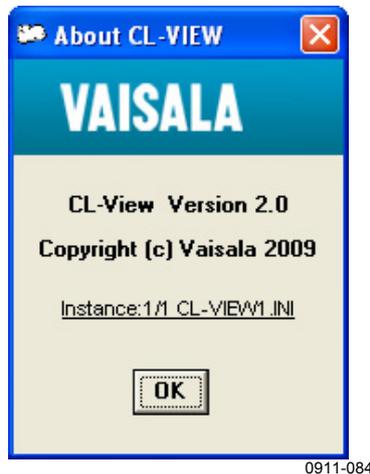
where

A<sup>1)</sup> = Number of current instance.

B<sup>1)</sup> = Number of total running instances.

<sup>1)</sup> A and B refer to numbers in the text.

For example, when A is 2, the program is using the CLVIEW2.ini file. See also Figure 1 below where the **About CL-VIEW** window displays that the current instance is using CL-VIEW2.ini and the total number of CL-VIEWS running is 3.



0911-084

**Figure 1 About CL-VIEW Window**

CL-VIEW can also be forced to use a certain .ini file by giving it a command line argument. For example, calling CL-VIEW from the command line using the argument below will force CL-VIEW to use the CL-VIEW3.ini file.

C:\CL-VIEW\CL-VIEW.exe 3

## CHAPTER 4

# INSTALLATION

This chapter provides information that is intended to help with installing this product.

## Minimum System Requirements

Minimum system requirements for this product are listed in Table 3 below.

**Table 3 Minimum System Requirements**

<b>Component</b>	<b>Minimum Requirement</b>
PC	133 MHz
Operating System	Windows NT, Windows 95 or later
Memory	32 MB RAM
Hard Disk Space	50 MB
Drives	CD-ROM Drive

A modem or a serial line is also needed to enable communication with the ceilometer. Without a connection to a ceilometer, only reading of saved messages is possible.

## Installation

Before installing CL-VIEW 2.0, uninstall any older versions of CL-VIEW or CT-VIEW as follows:

1. Click **Start - Settings - Control Panel - Add/Remove Programs**.
2. Select the older version of CL-VIEW or CT-VIEW from the list and remove it.

To install the new version of CL-VIEW from CD-ROM, do the following:

1. Insert the CD-ROM into your CD-ROM drive. The installation menu opens automatically in a few seconds.  
If the installation menu does not open automatically, double-click the **My Computer** icon on your Windows desktop, then the CD-ROM drive icon, and finally the **Setup** icon in the opened CD-ROM window.
2. After accepting the Vaisala CL-VIEW End User License Agreement click **Install CL-VIEW**.
3. The setup program will carry out the installation. The setup program lets you select the Program group and the directory where to install the program. The default directory is **C:\Program Files\CL-VIEW**.

<b>NOTE</b>	When running the program in the online mode on a laptop computer, turn off all power saving functions. Otherwise, unnecessary error messages may appear.
-------------	--

## CHAPTER 5

# OPERATION

This chapter contains the program description.

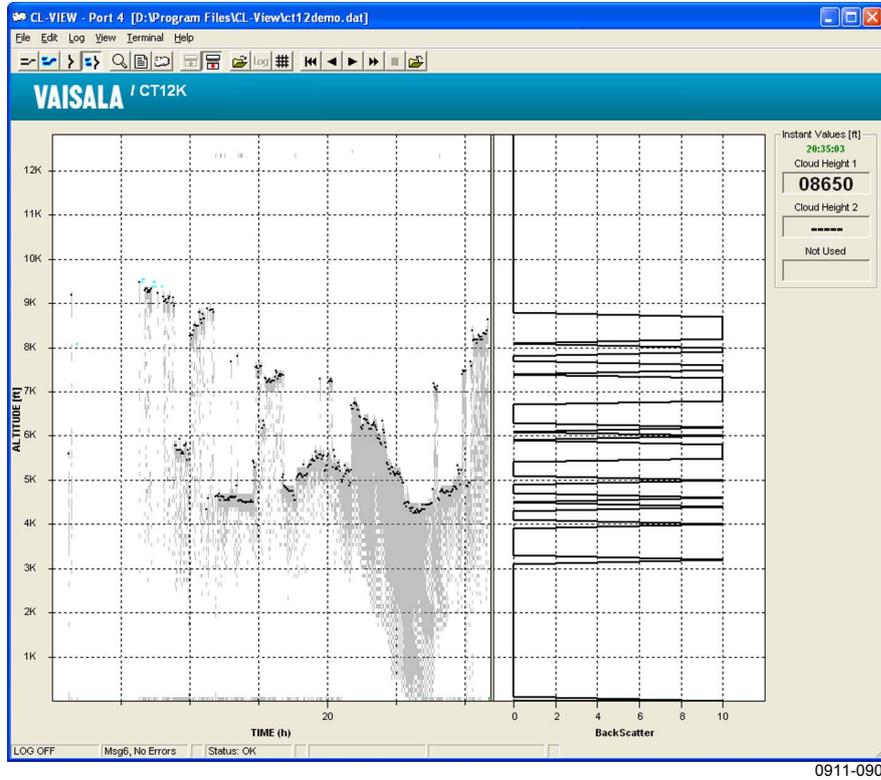
### Ceilometer Type Selection

The CL-VIEW program can be modified to the following Vaisala Ceilometer types: CL31, CL51, CT75K, CT25K, CT12K and LD40.

The Ceilometer type selection is made with the **File - Ceilo Type** dialog. The selection affects the label texts on the screen, the maximum altitude range setting and the validation criteria of the data message.

## CT12K Support

The CT12K is partly supported. The functions that can be derived from message 3 and 6 are available.



**Figure 2 CT12K Cloud Graph and Backscatter Profile**

The profile is drawn by converting the presence of backscatter bits to backscatter value  $1000 \cdot (10\,000 \text{ srad} \cdot \text{km})^{-1}$ . The cloud graph is drawn by using this threshold value. The Cloud detection graph is drawn normally by using the indicated cloud height values. Sky condition viewing is possible with message mode 6.

## User Interface

CL-VIEW is a typical Windows based program using standard practices for user interface. CL-VIEW is controlled by menus and option windows. The offline mode display is controlled by icons.

### Main Window

The main window of CL-VIEW contains a menu bar, status bar, instant values, and a display box. This is a movable and resizable window. The menu bar consists of **File**, **Edit**, **Log**, **View**, **Terminal**, and **Help**.

### Offline File Open

The offline file open selection opens the standard File Open dialog box of the Windows operating system. The extension name is .dat and the file name format is the following:

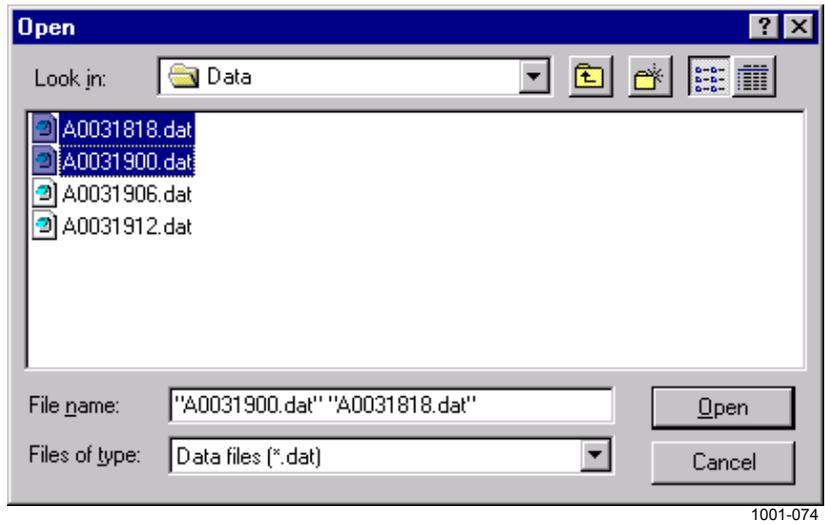
\*ymmddhh.dat

where

\* = Any valid file character  
y = Last number of year  
mm = Month  
dd = Day  
hh = Hour

The letters 'ymmddhh' describe the creation date and time of the file. The \* character can be set in the **Log - Settings** dialog.

Users can select one or multiple files.



**Figure 3 File Open Dialog**

## Viewing Files

When a file is selected in the **Offline File Open** dialog, the toolbar changes and new icons appear on the toolbar of CL-VIEW. With these buttons you can scan the file forward and backward. After the file is opened, press down the 'Forward continuously' button, and the file presentation starts automatically. If multiple files are selected from the **Open** dialog, CL-VIEW sorts them in alphabetical order (in chronological order if the file char used is the same) and displays them sequentially. This way the user can easily view long time periods from separate short files.

## Toolbar

The functions of the icons on the toolbar can be viewed by holding the mouse on each icon. Clicking the left mouse button will execute the button command in question.

-  Cloud detection graph selection button
-  Cloud intensity graph selection button
-  Backscatter graph selection button
-  Cloud graph and Backscatter selection button
-  Status of the ceilometer
-  Measurement message
-  Sky condition window show/hide
-  Open communication port and connect CL-VIEW to ceilometer
-  Close communication port
-  Open offline file selection dialog
-  Logging on/off
-  Grid on/off

## Off-Line File Viewing Toolbar Icons

-  Go to the beginning of the file
-  Backward one message
-  Forward one message
-  Forward continuously
-  Stop file forwarding
-  Close data file

# Hardware Interfaces

## Communication

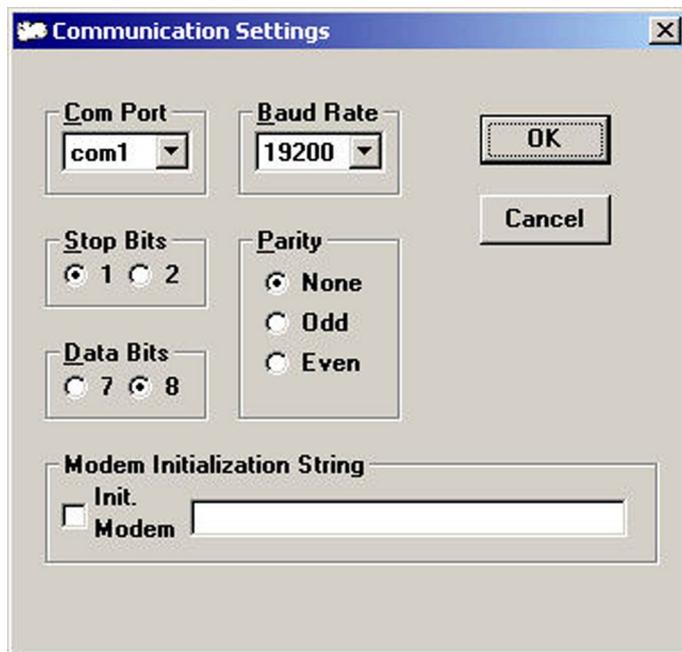
There are two communication alternatives between the ceilometer and the PC. At short distances (a few hundred meters, depending on the cable type used), a direct RS-232C serial line is applicable. At longer connection distances, modems must be used.

You must choose the communication method to be used. The default value for the program is direct RS232C COM1 19200N81.

The online mode is entered by opening the communication port. The communication port is opened by **File - Open Port** or by clicking the

**Open Communication Port** button , after which CL-VIEW starts waiting for the messages sent from the ceilometer. The online mode is closed by closing the communication port from the **File** menu or by pressing the **Close Communication Port** button .

If you want the communication port and the data logging file to be opened automatically when CL-VIEW is started, go to the **Start Up Options** window from the **File** menu.



**Figure 4**      **Communication Settings Dialog**

## RS-232C

The default communication parameters in the PC are the following:

Serial communication port	=	1
Baud rates	=	19200
Data bits	=	8
Parity	=	None
Stop bits	=	1

These values are also the default values in the Ceilometer CL31 and CL51. The baud values can be changed.

### NOTE

The data frame values are fixed in the CT-type Ceilometers CT75K, CT25K and CT12K, that is, data bits = 7, parity = Even, stop bits = 1. The CL31 and CL51 ceilometer data frame values can be chosen as either 7E1, 7O1 (odd parity), or 8N1 (default).

The settings must be made before the communication port is opened. During port opening, the following error message may appear: ERROR, DEVICE IN USE. This means that the selected communication port of the PC is already opened by another program or a serial connected mouse is connected to that port. To resume from the error state, the other program must be closed or the **Communication Port** on the **Port Settings** menu must be changed.

## Modem

Use a fixed line modem for the PC. Make sure you type the correct initialization string for the modem type used in the **Port Settings** dialog. Refer to the manual of the modem to set a fixed line communication mode. Also make sure to check the **Init. Modem** check box. If you do not check it, the initialization string is only saved for future needs but not sent to the communication port.

When the communication port is opened, CL-VIEW checks if a carrier signal is detected by the modem. If not, CL-VIEW sends an initialization string to the modem and the connection is automatically established. If the carrier signal is lost during data collection, CL-VIEW makes a new connection attempt automatically.

An example of the initialization string is the following: `AT&L1M0&D0D`

where

- `AT` = Appears at the beginning of every command line
- `&L1` = Modem is set up for leased-line operation
- `M0` = Internal speaker off (or on)
- `&D0` = Modem ignores the Data Terminal Ready signal
- `D` = Dial call in originate mode

Refer to the modem manual to set the modem to the corresponding mode. The `&D0` modem ignores the Data Terminal Ready signal. With this configuration, the modem will stay online when the communication port control is temporarily switched off.

## Software Interfaces

CL-VIEW includes the following software interfaces: graph window copying and printing and data conversion for Microsoft Excel or another corresponding spreadsheet program.

### Printing and Copying

The hard copies are produced by using the printer drivers of Windows. The printing functions are whole screen and graph printing. The whole screen printing prints the current graph and the information boxes. The graph screen printing prints the current graph only.

The resolution of the print depends on the resolution of the screen and the size of the CL-VIEW window. The picture is automatically scaled to cover the entire paper width.

If **Automatic Graph Printing** is selected, a cloud graph is printed each time the pointer in the graphics reaches the right border of the drawing area. After printing, the pointer and the graphics scroll to the left border of the drawing area. In the offline mode, printing also occurs when the end of the file is reached. With this function, all offline files can be easily printed.

It is also possible to copy the graph to the clipboard by using the **Copy Graph** menu selection.

The whole CL-VIEW window can be copied by pressing ALT + Print Screen on the keyboard. This command copies the contents of the active window to the clipboard. The whole PC screen can be copied by pressing the **Print Screen** key.

### Microsoft Excel Conversion

In the offline mode, the stored backscatter profiles can be converted into a format suitable for the Microsoft Excel spreadsheet program. This can be done by selecting the **Microsoft Excel Data Conversion** option in the **File** menu. When this option is selected, CL-VIEW produces a new file in the same directory where the stored data file is located. The name of the new file is the same as the data file name but its extension is 'txt'. For example:

Stored data file: C5012300.dat  
Microsoft Excel converted file: C5012300.txt

The altitude range of the data is similar to the current altitude range in the **backscatter** profile graphics. Select a partial altitude range for the Microsoft Excel conversion to ease data file handling in Microsoft Excel. In addition, the Microsoft Excel spreadsheet program has limitations concerning the number of columns in one row. The Microsoft Excel spreadsheet program allows only 256 data items on one row; therefore the maximum profile length that can be shown is 24 700 ft or 7410 m for the CT25K Ceilometer, and 16 200 ft or 4940 m for the CL31 and CL51 Ceilometers.

All profile data is in the .txt file, so if you use a program that can handle rows containing more than 256 data items, you will get the whole profile to your program.

All messages that are scanned forward while the **Microsoft Excel Data conversion** on the **File** menu is selected are written into the Microsoft Excel file. The converted data profile can be loaded to Microsoft Excel by reading it as a text-file and by selecting the comma to be a column separator.

Ceilometer Measurement data profile in the Excel suitable format (comma as column separator)  
 The unit of the data is [10000\*srad\*km]^\*-1  
 File created: 04-May-05 12:18:33

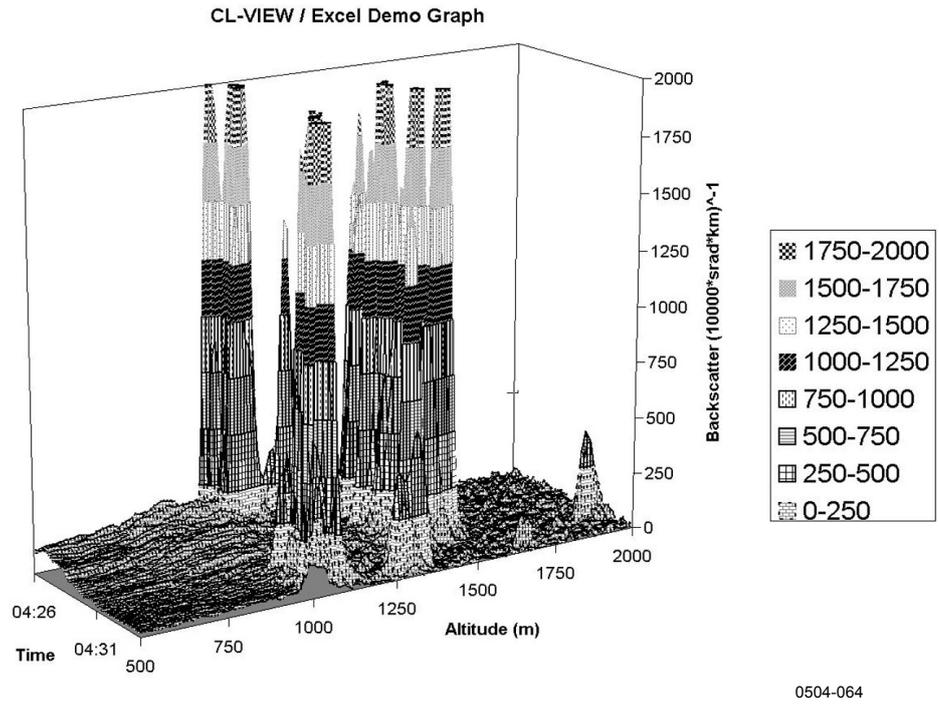
	Status	Height1	Height2	Height3	Sig. Sum	Feets	0	30	70	100	130
		Meters	Meters	Meters		Meters	0	10	20	30	40
27-Apr 04:17:50	1	1370	////	////	154		35	32	39	34	30
27-Apr 04:17:59	1	1370	////	////	156		33	30	36	32	29
27-Apr 04:18:10	1	1360	////	////	157		34	31	38	32	29
27-Apr 04:18:19	1	1360	////	////	154		31	28	34	30	29
27-Apr 04:18:29	2	1140	1360	////	167		33	30	36	32	31
27-Apr 04:18:39	2	1050	1370	////	168		38	34	42	36	33

0504-065

**Figure 5 Example of Data Fields**

Numbers refer to Figure 5 above:

- 1 = Date and time
- 2 = Status of detection
- 3 = Cloud indications 1–3
- 4 = Signal sum (for testing purposes)
- 5 = Backscatter profile (data resolution depending on message type for CL31 and CL51 ceilometers, data resolution 100 ft = 30 m for CT-type ceilometers).



**Figure 6** Example of Graph Made with CL-VIEW based on Microsoft Excel

# Operational Instructions

## Data Logging

The program can be set to automatically store the messages received from the ceilometer to a specified directory on the hard disk. The data is stored in the same format as it comes from the ceilometer. The present date and time of the PC clock is added at the beginning of the message. The format of the date and time is the following:  
year-month-day hour:minutes:seconds, for example,  
2003-10-05 16:00:00.

During system setup and testing, it may be useful to also log status messages from the ceilometer. This can be done by checking **Enable Status Message Logging** from the **Log - Settings** dialog. Status messages are requested from the ceilometer every time the alarm or warning bits of the status information field of the measurement message change, and they are stored to the disk in the same directory as the logging files with the same name, except for the file extension name, which in this case is .sta. Status messages are also shown in the **Status Message** window, which is activated when a status message is being requested.

## Filing Procedure

By default, the program opens a new file at the beginning of each sixth hour. The filing procedure is as follows: After a file is opened and the first message is written to it, the program closes the file. As the next message comes, the program opens the file for appending and writes the message to the file. Then the file is closed again. This method allows further data processing during data collection. If you want to study the current logging file, it must be saved with a new name or copied to another directory.

**NOTE**

Do not open the current logging file during logging with another CL-VIEW session or another program. If you do so, the logging will be prevented.

The default working directory is **C:\Program Files\CL-VIEW** (the directory specified when running the CL-VIEW SETUP program). This can be changed in the **Log - Settings** dialog, which also informs on free disk space of the selected hard disk. The first character of the logging file can be changed by changing the value of the file char in the **Log - Settings** dialog. The software checks free hard disk space and gives an

alarm in the **Info** box when there is approximately 24 hours of capacity left. If the Log file length is set to an even number, new log files will also be opened at even hours. For example, if the Log file length is 6 hours and logging starts at 09:10, the first logging file opens at 09:10, the next ones at 12:00, 18:00, 24:00 and so on.

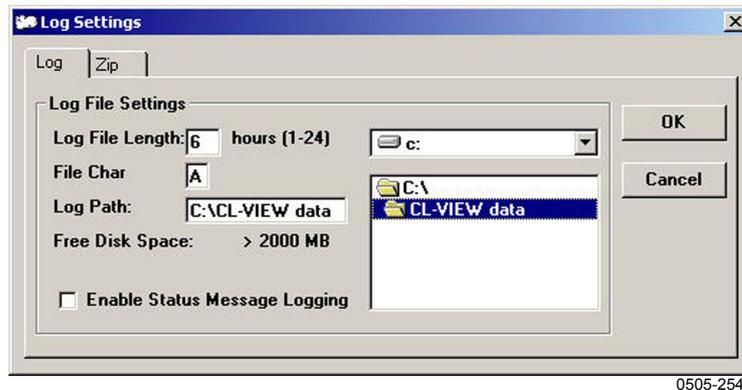


Figure 7 Log Settings Dialog, Log Tab

## Zip Archiving of Log Dialog Files

Logging files can be compressed during logging using an external zip application. Archiving can be enabled from the **Log - Settings** dialog by checking **Enable Log File Zipping**. Compression takes place between log file changing or after toggling Log off by calling the external zip application whose location is set in the **Log - Settings** dialog. Compression is to be done with the common DOS based zip application Pkzip.exe or using the Windows based WinZip software; it is not recommended to use any other compression application. The logging files are removed after compression if **Remove Log File After Zipping** is checked.

### NOTE

The zip application is not included in CL-VIEW.

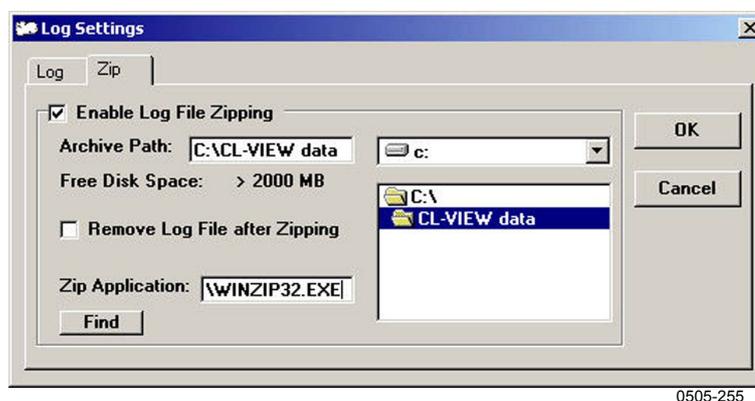


Figure 8 Log Settings Dialog, Zip Tab

## Graphics

The alternative graphic presentation modes are cloud intensity mode, cloud detection mode, and the range and sensitivity normalized backscatter mode. The graphic window can also be divided between cloud and backscatter mode. In all modes, numerical cloud height information, the status of the ceilometer, the status of logging, and time and date are also displayed on the screen. If data messages containing an additional sky condition line are logged, sky condition information can also be viewed on the screen. For messages that do not contain any backscatter profile information, such as the CL31 and CL51 base messages and the CT25K data messages 1, 3, and 6, the only available graphic presentation is the cloud detection mode.

The measured backscatter profile sent by the ceilometer is the signal path profile which is not angle corrected. The Cloud Intensity and the Backscatter graphics are drawn according to this profile. Therefore, true altitude levels are shown in the graphics only when the ceilometer is not tilted. The Cloud Detection mode uses the angle corrected cloud height detection values for plotting and always displays true altitude levels. If the tilt angle of the ceilometer is more than 13° from vertical, the text of the left axis is DISTANCE, otherwise it is ALTITUDE.

The grid for the graphic screen can be toggled on and off in all graphic modes. This can be done by using an icon button or the graphics settings dialogs.

**NOTE**

In the online mode, resizing the window will also resize the graphic window, but in the offline mode the contents of the graphic window are lost. The graph can be restored by playing the data again.

## Altitude Units

CL-VIEW reads the altitude units used from the status bits of the measurement message and changes automatically to the same units that are used by the ceilometer.

## Message Interval

CL-VIEW uses automatic message interval detection. In the online mode, message interval seeking is done each time the message port is opened. In the offline mode this is done each time a new offline file is opened. The time axis in the cloud graphics is scaled according to the message interval.

When message interval seeking is performed, the program waits for three messages, reads them and compares their arrival times. If the intervals between messages are equally long, the interval is accepted. If the intervals deviate from each other, the program takes new messages until the intervals between three successive messages are the same. If the message interval changes inside an offline file, a new message interval seeking procedure can be started by clicking the time text at the bottom of the screen.

## Time Scale Compression

The time scale used in the cloud graphics can be compressed to half or one third the size of the original scale. By this function, a longer measurement period than in the normal scale can be shown on the screen. In the normal mode, each measurement profile is drawn using one vertical pixel line of the screen. In the compressed mode, there are two or three messages drawn to the same vertical pixel line. The settings can be changed in the **View - Cloud Graph Settings** dialog.

## Cloud Intensity Graphics

The data is presented as a point graph where the intensity/color is proportional to the strength of the return signal from that altitude. The color versus intensity settings can be changed in the **View - Cloud Graph Settings** dialog.

The horizontal axis in the picture presents time, whereas the vertical axis presents altitude. It is also possible to select only part of the altitude scale to be presented on the screen. The selection can be done in the **View - Cloud Graph Settings** dialog.

If in the online mode the measurement message does not arrive at the interval defined in the message interval seeking procedure, the **Info** box shows the text NO MESSAGE, and in the **Instant Values** box the clock will stop showing the arrival time of the latest message. After that, as a new message arrives, the time axis shows the time that elapsed in the status of missing messages. A red line along the axis indicates this. The red line is also drawn in the offline mode, if there are time jumps in the arriving times of the messages in the stored data file.

## Cloud Graph Settings

The settings for the cloud height graphical window are done in the **View - Cloud Graph Settings** dialog. The settings apply to both cloud intensity and cloud detection graphics since they use the same graphic window. The altitude scale can be linear or step linear. The step linear altitude scales are predefined, the linear scale range is user definable. The colors of cloud graphics can be changed by selecting colors from a palette with the mouse and dragging them to the desired target box on the left side.

### NOTE

The default threshold values for the Cloud intensity graph are optimized for CL31 and CL51. For CT75K the lowest limit should be decreased due to its higher Signal-to-Noise ratio. On days with bright sky CL31, CL51 and CT25K intensity graphs show some daylight noise. In order to filter this noise away from the graph, the lowest limit for colors can be increased from 1.0 to 1.5  $(100 \cdot \text{srad} \cdot \text{km})^{-1}$ . The best value can be defined by using the backscatter profile graphics. Zoom the X-axis range so that the noise is clearly visible (for example range -2 to 2  $(100 \cdot \text{srad} \cdot \text{km})^{-1}$ ). Define the lowest threshold level so that most of the noise spikes stay below that level.

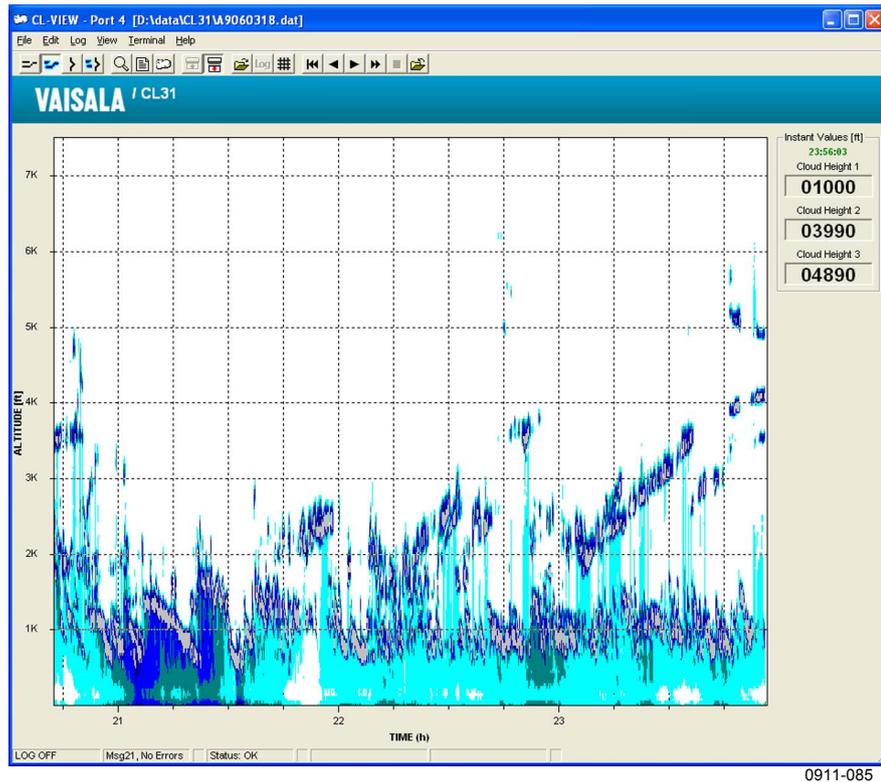


Figure 9 Example of Cloud Intensity Graph

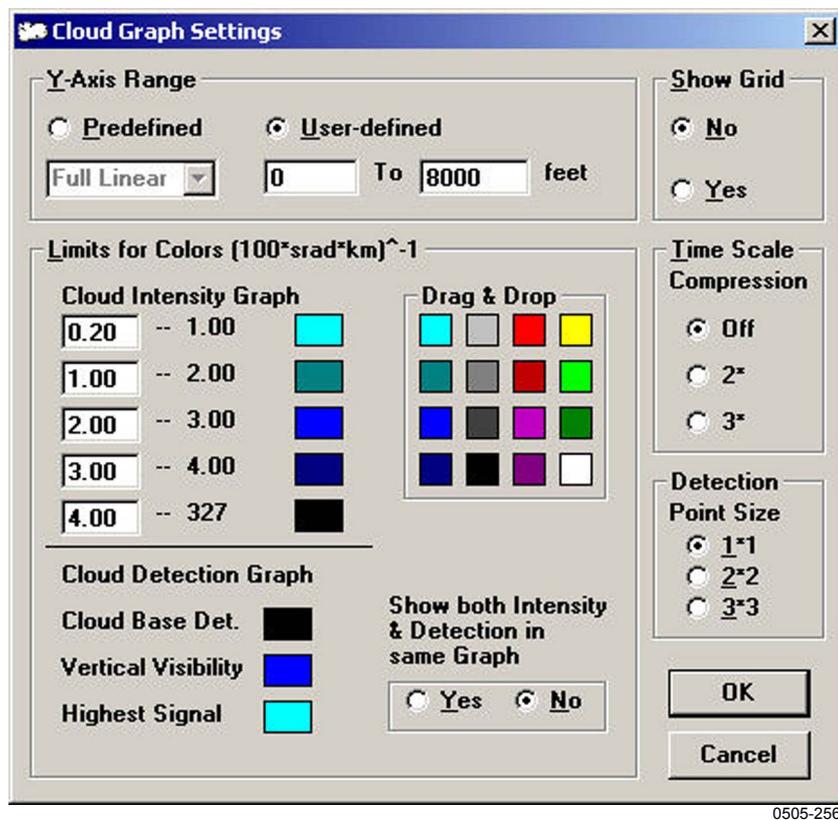
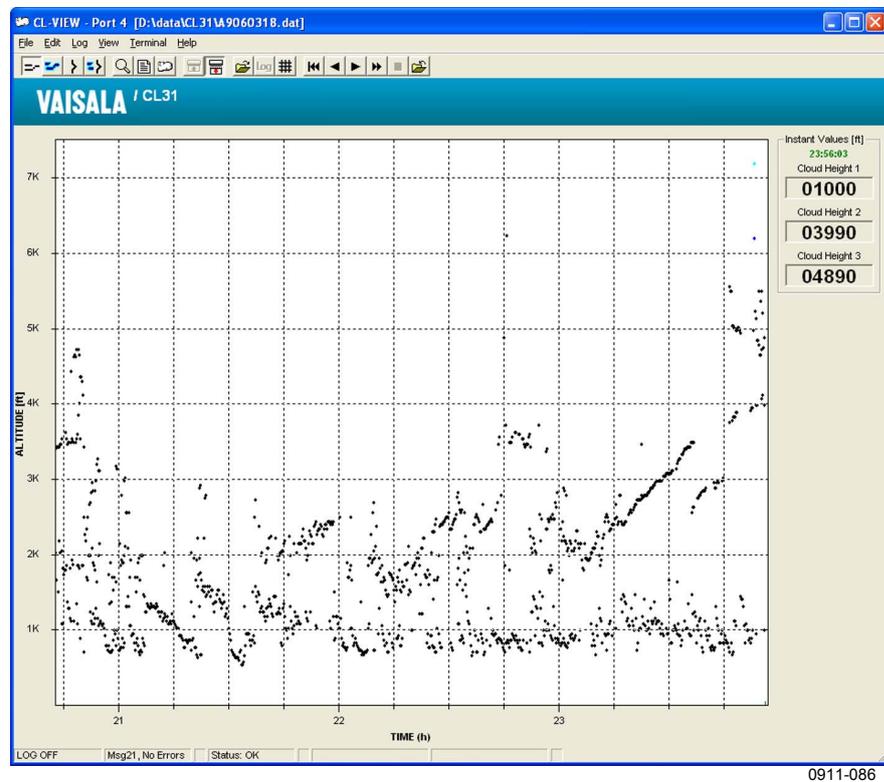


Figure 10 Cloud Graph Settings Dialog

# Cloud Detection Graphics

The cloud detection graphics is drawn according to the detection line of the measurement message. The cloud detection graphics uses the same graphical window as the cloud intensity graphics. The detected cloud height data is presented as points at the corresponding altitude level on the screen. This graphic mode is an alternative for the cloud intensity graphic mode and can be used if the only subject of interest is data of the detected cloud height level.

The window settings are similar in the cloud intensity and cloud detection modes. The size and the color of the plotted point can be changed. Settings can be changed in the **Cloud Graph Settings** dialog.

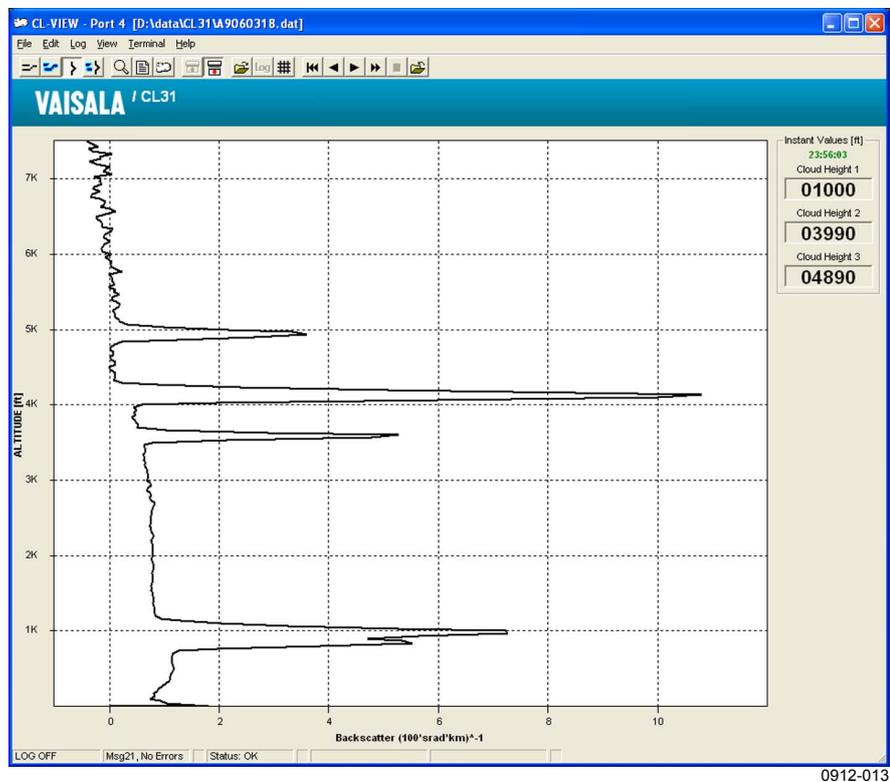


**Figure 11** Example of Cloud Detection Graph

## Backscatter Profile Graphics

There are two modes for the presentation of the backscatter. These modes are instant mode and averaged mode. The user can select the number of averaged messages between predefined alternatives. The data is presented as a line graph. You can select both, a graph based on an instant value and a graph based on an averaged value, to be presented on the screen, or only one of these. The line for the instant value based graph is drawn in black and the line for the averaged value based graph in green color.

On the horizontal axis there is the backscatter intensity, and on the vertical axis there is the altitude. It is also possible to select only a part of the altitude or backscatter range to be presented.



**Figure 12** Example of Backscatter Profile Graph

## Backscatter Profile Settings

The settings for the backscatter profile graphics are done in the **View - Backscatter Profile Settings** dialog.

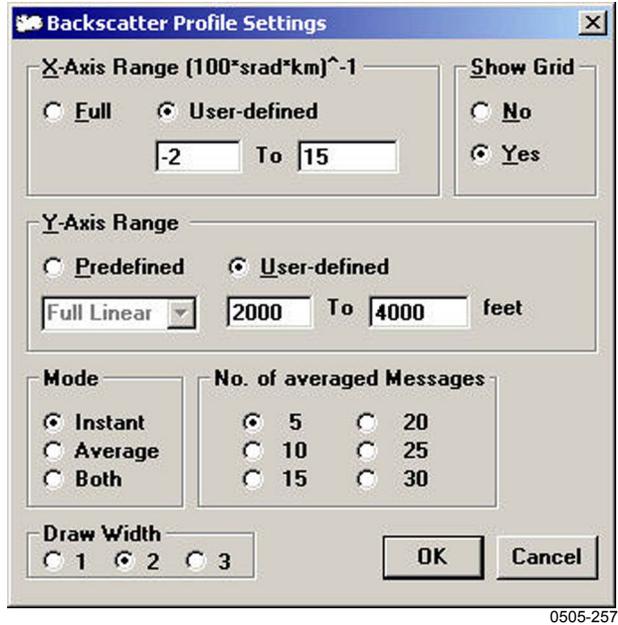
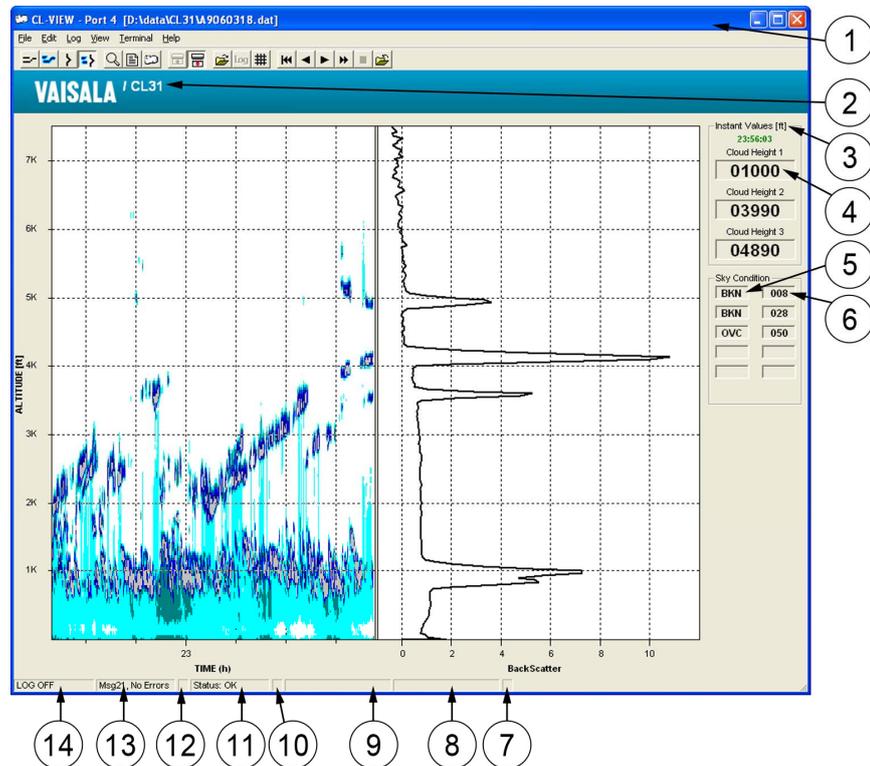


Figure 13 Backscatter Profile Settings Dialog

## Information Boxes

On the right side of the graphic there is a box for numerical cloud height instant values and an optional box for sky condition. At the bottom of the screen there is a status bar which shows the status of logging, the ceilometer status, the program state and the battery.



0911-088

**Figure 14 Information Boxes**

Numbers refer to Figure 14 above:

- 1 = Current port number and logging files
- 2 = Ceilo type
- 3 = Units
- 4 = Cloud heights
- 5 = Cloud amounts
- 6 = Layer heights
- 7 = Battery status light
- 8 = Battery box
- 9 = Program state box
- 10 = Ceilo status light
- 11 = Ceilo status box
- 12 = Info light
- 13 = Info box
- 14 = Logging status box

When the communication port is not opened to a ceilometer and no stored files are studied in a graphical form, the **info light** box turns red as an indication that no connection was established to the ceilometer. The **info** box and **info light** will also inform the user about the cases when a message is not received from a ceilometer or the type of the message received is incorrect.

The **cloud height** box shows date and time and the instant cloud base heights. The **sky condition** box shows current cloud amounts and the corresponding altitudes. The **sky condition** and **cloud heights** can also be viewed in a separate window.

The status box shows the ceilometer status. The normal status text is OK. If any alarms or warnings exist, the text changes to ALARM or WARN and a red status light appears. In case of alarms, a default beep sound is also heard, which can be modified in the Windows **Control Panel - Sounds**. All warnings and alarms can be viewed by invoking the status window. If no new message has arrived at the defined message interval, the info box text changes to NO MESSAGE and the clock in the **Instant Values** box stops showing the time of the last arrived message.

The battery box shows whether the ceilometer is working from battery or not. If the unit uses the battery as a power source, then a message WORKING FROM BATTERY appears to the battery box and a red battery status light is turned on.

## Status Window

In the Status window, the contents of the status bits of the measurement message are presented. The Status window is updated when it is opened or when CL-VIEW reads a message either from a ceilometer in the online mode or from a data file in the offline mode. The complete Status message can be requested from the ceilometer by pressing the corresponding icon button. CL-VIEW then opens the ceilometer command state and asks for one status message. After that it closes the command state. The incoming status message is inserted to the Status message window. A full status message is not supported with CT12K.

**CAUTION**

If a full status message is requested from the ceilometer when it tries to send a normal message, the normal message may be lost. This function is meant to be used during system setup and testing, not during data collection!

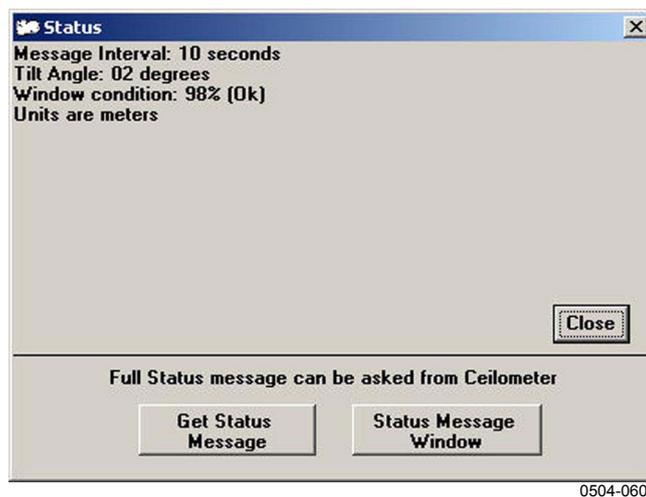


Figure 15 Status Window

# Message Window

The received message from the ceilometer can be viewed in the **Message** window as illustrated in Figure 16 below.

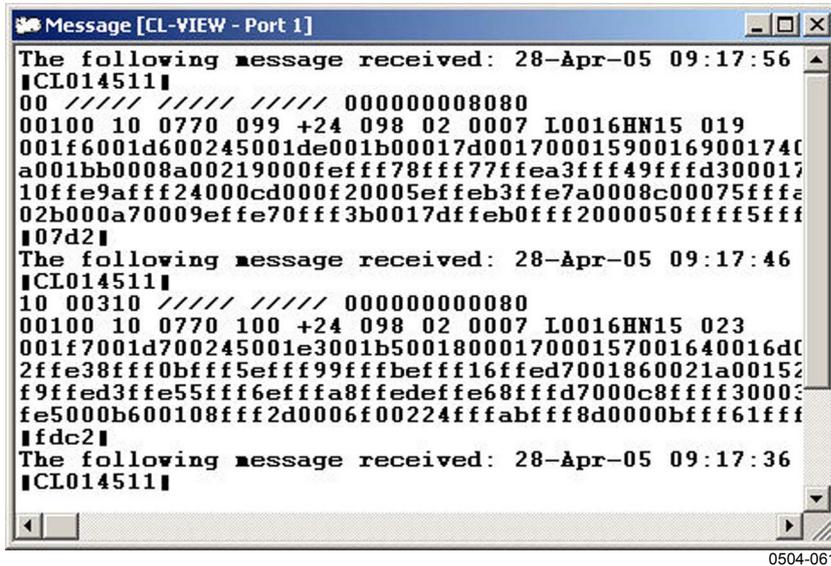
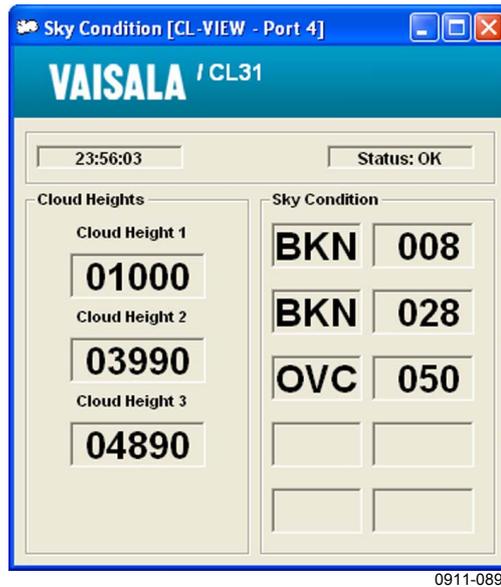


Figure 16 Message Window

# Sky Condition

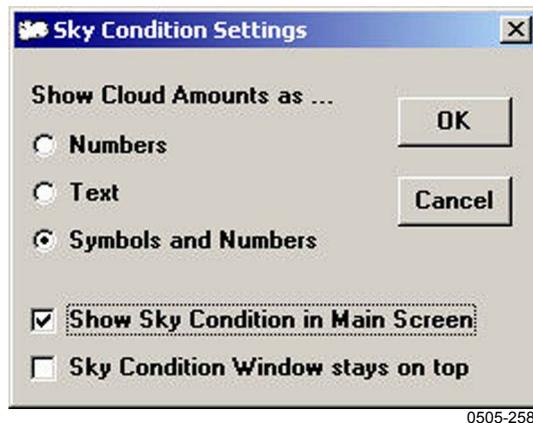
Sky condition is an optional feature in CL31, CL51 and CT25K, and it can be viewed on the main screen if a msg2-type data message has been chosen for the CL31 or CL51, or if the data message is 6 or 7 for the CT25K.

The sky condition and cloud heights can also be viewed in a separate window. This can be done by choosing **View - Sky Condition Window** from the menu.



**Figure 17 Sky Condition Window**

Cloud amounts can be displayed in three different modes: numbers, text or symbols. When symbols are used, cloud amounts are also displayed in numbers. The display mode can be changed by choosing **View - Sky Condition Settings**.



**Figure 18 Sky Condition Settings Dialog**

See Table 4 below on how the display modes correspond to each other.

**Table 4      Display Modes**

Number	Text	Symbol	Meaning
0			Sky clear
1,2	FEW		Few
3,4	SCT		Scattered
5,6	BKN		Broken
7	BKN		Broken
8	OVC		Overcast
9	VV		Vertical visibility
99	Na		Not enough data
-1	Miss		Data missing

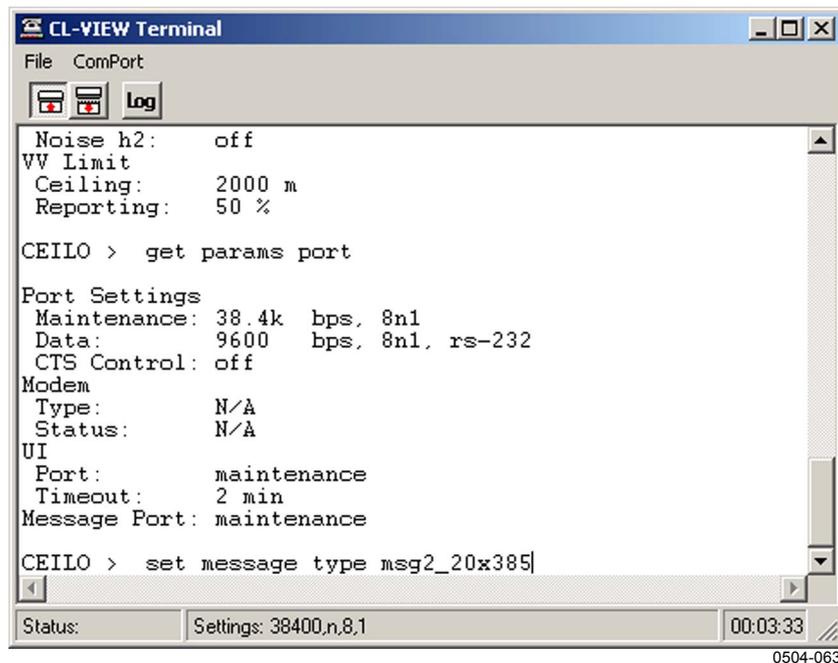
In the main screen, only up to three symbols are displayed indicating the sky condition. The upper symbol indicates the condition of the higher layer of the first two layers, the second symbol indicates the condition of the higher layer of the next two layers, and the third symbol indicates the condition of the fifth layer (only available in CL31, CL51 and CT25KAM data messages). The lowest symbol displayed indicates thus the total cloud amount.

## Off-Line Mode

With the offline function, you can study the stored files in a graphical form on the screen. In the offline mode, the same presentation modes are available as in the online mode assuming that the data needed is available in the file. During offline operation, the online data collection mode is blocked. The offline mode is operated with a toolbar that contains Step-Forward, Step-Backward, Play, Stop, Go to Start and Close buttons. For more information, see section Off-Line File Viewing Toolbar Icons on page 23.

## Terminal

CL-VIEW has an internal terminal program that can be launched from the **Terminal - Open** dialog. It is used for changing ceilometer parameters. The terminal uses the same port settings and port state than the normal CL-VIEW operation. If port settings are changed from the **Terminal Window** they are also changed in normal operation.



**Figure 19 Terminal Window**

Terminal sessions can be logged by selecting **File - Open Log File** from the menu. After this the selection program requests a name for the log file. If the file already exists, a new session can be appended to the old one, or it can be overwritten. Logging can be terminated by selecting **File - Close Log File**. Text can be copied from the terminal window by selecting text and then pressing the right mouse button.

### NOTE

Messages from the ceilometer are blocked from the normal operation while in Terminal mode so graphs and instant values are not updated or logged during a Terminal session.

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## CHAPTER 6

# TROUBLESHOOTING

This chapter describes common problems, their probable causes and remedies, and contact information.

## Technical Support

For technical questions, contact the Vaisala technical support by e-mail at [helpdesk@vaisala.com](mailto:helpdesk@vaisala.com).

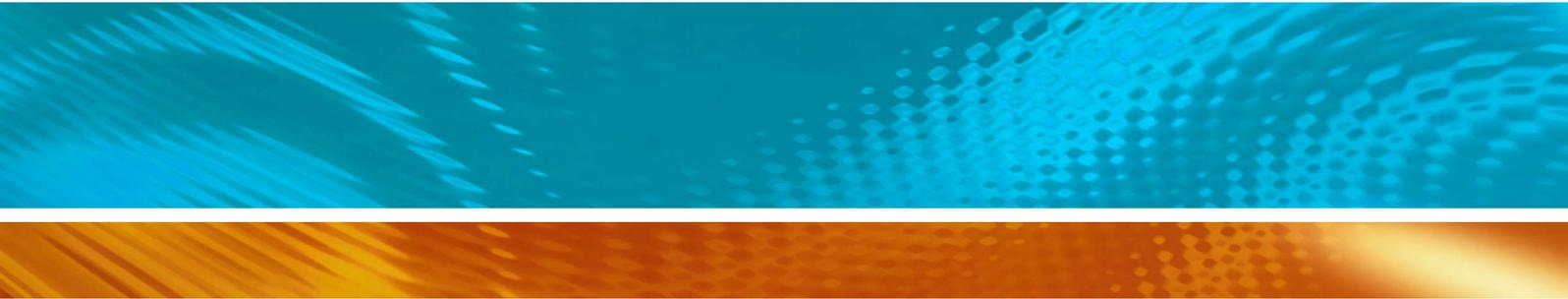
For contact information of Vaisala Service Centers, see [www.vaisala.com/services/servicecenters.html](http://www.vaisala.com/services/servicecenters.html).

## Instructions

If the product needs repair, please follow the instructions below to speed up the process and avoid extra costs.

1. Read the warranty information.
2. Write a Problem Report with the name and contact information of a technically competent person who can provide further information on the problem.
3. On the Problem Report, please explain:
  - What failed (what worked / did not work)?
  - Where did it fail (location and environment)?
  - When did it fail (date, immediately / after a while / periodically / randomly)?
  - How many failed (only one defect / other same or similar defects / several failures in one unit)?
  - What was connected to the product and to which connectors?
  - What was done when the failure was noticed?
4. Include a detailed return address with your preferred shipping method on the Problem Report.

Vaisala Oyj  
Contact person / Division  
Vanha Nurmijärventie 21  
FIN-01670 Vantaa  
Finland



[www.vaisala.com](http://www.vaisala.com)

