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Online Display

User's Manual

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NILU

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Online Display

User's Manual

1. Introduction

Online Display 1.0 is a computer program for displaying and storing meteorological data online. It is a Windows program that runs on a PC. Data is collected from a NILU data logger every 10 seconds and displayed on a monitor. The data logger can either be connected directly to the PC's COM-port or via a modem and a telephone line.

Instantaneous wind direction is displayed using a compass like indicator. Instantaneous wind speed and temperature are both displayed using slide indicators. All parameters are displayed using digital indicators. Wind direction and temperature are also displayed in charts showing the last 3 hours of measurements. It is possible to scroll the charts backwards 4 days.

Online data can be stored in a file. It is possible to read the file in a tabular form.

The charts do not have x-axis time stamp labels although there is an indicator displaying the time stamp of the last data sample.

It is possible to make paper copies of the front panel.

2. Installing NILU online display

NILU Online Display 1.0 requires at least a 486 PC including 8 Mbyte RAM, 4 Mbyte free disk space, Windows 3.11 and a CD ROM drive.

Installing Online Display:

1. Insert the installation CD disk in the CD ROM drive.
2. Choose Run from the File menu in Program Manager or exit to DOS.
3. In the Run dialog box or at the DOS prompt write:

A:INSTALL.BAT D: C:

to install Online Display from drive D: to drive C:. Choose other drive parameters if necessary. Online Display will be copied to the ONLNDISP directory.

You should create a group window called Online Display in Program Manager and add the Online Display program icon to it. Consult your Windows manual on how to do this.

3. Hardware connections

The data logger can either be connected directly to the PC's COM-port or via a Hayes compatible modem and a telephone line. In the former case the communication parameters are 9600 baud, 8 data bits, no parity, 1 stop bit. In the latter case the baud rate is 2400. Online Display is preprogrammed to use only one of the settings. This setting can not be changed. Your setting is displayed in the About dialog box. At startup the default COM-port is always COM2. During runtime you can change it to something else. The cable connecting the PC to the data logger is a so-called PC/ PC cable having nine pin female connectors at both ends.

4. Starting Online Display

It is assumed that the Online Display program icon is installed in a group window called Online Display in Program Manager.

Starting Online Display:

- * Choose the Online Display program icon in the Online Display group window in Program Manager. Online Display goes online immediately trying to connect to the host.

5. Quitting Online Display

You should never quit Online Display by choosing Close from the File menu or from the Control-menu box. Your COM-port connection will not be properly closed.

Quitting Online Display:

1. Locate the HOST CONNECT group box. Choose command button HANGUP if you are connected to a host. Choose QUIT. The Exit Online Display dialog box appears, see fig. 1.
2. Choose OK to quit Online Display. The Service Mode password is for system programming purposes only.

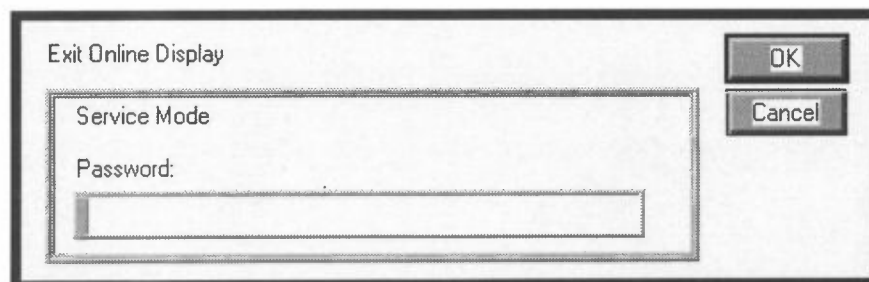


Fig. 1: The Exit Online Display dialog box.

6. Operating the front panels

Online Display consists of two front panels. You switch between them by clicking to the right and left of the horizontal scroll box (the large rectangular box in the horizontal scroll bar at the bottom of the Online Display window). When you start Online Display the Online Display front panel is displayed, see fig. 2. The system goes online and starts logging and displaying data.

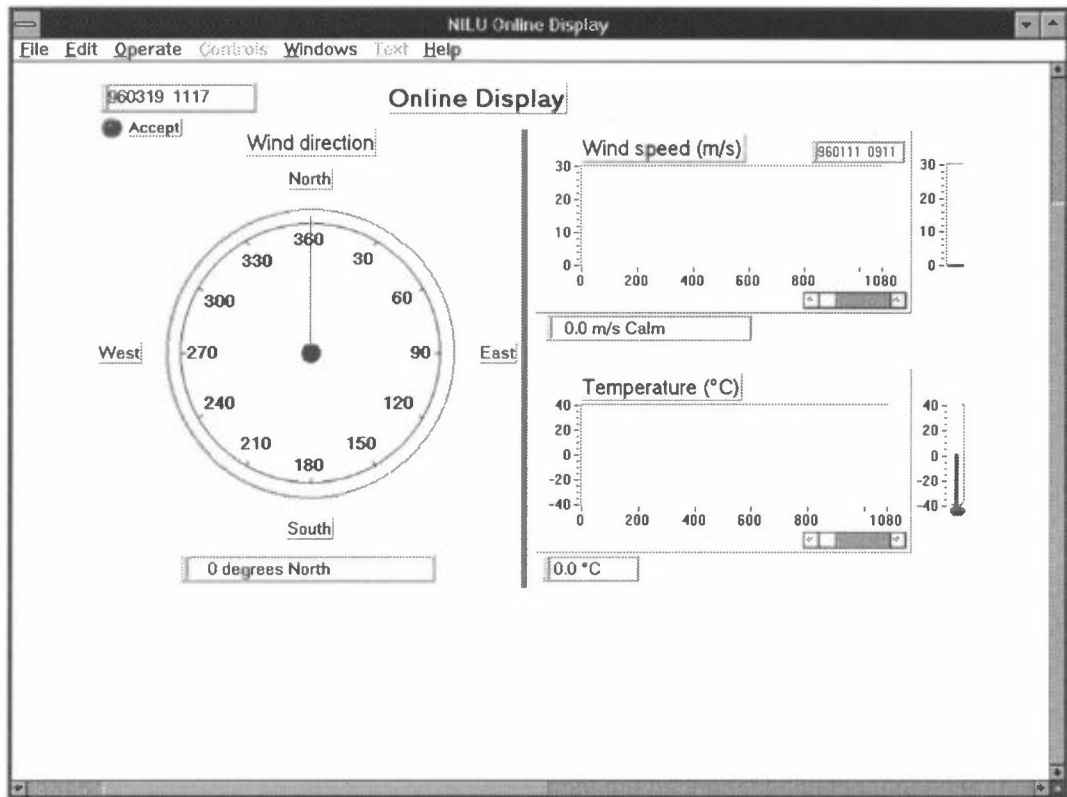


Fig. 2: The Online Display front panel.

The second front panel is called the Configurations front panel, see fig. 3. You can enter this front panel by clicking to the right of the horizontal scroll box. You use this panel to connect to the data logger, specify the data sampling and to log data to file.

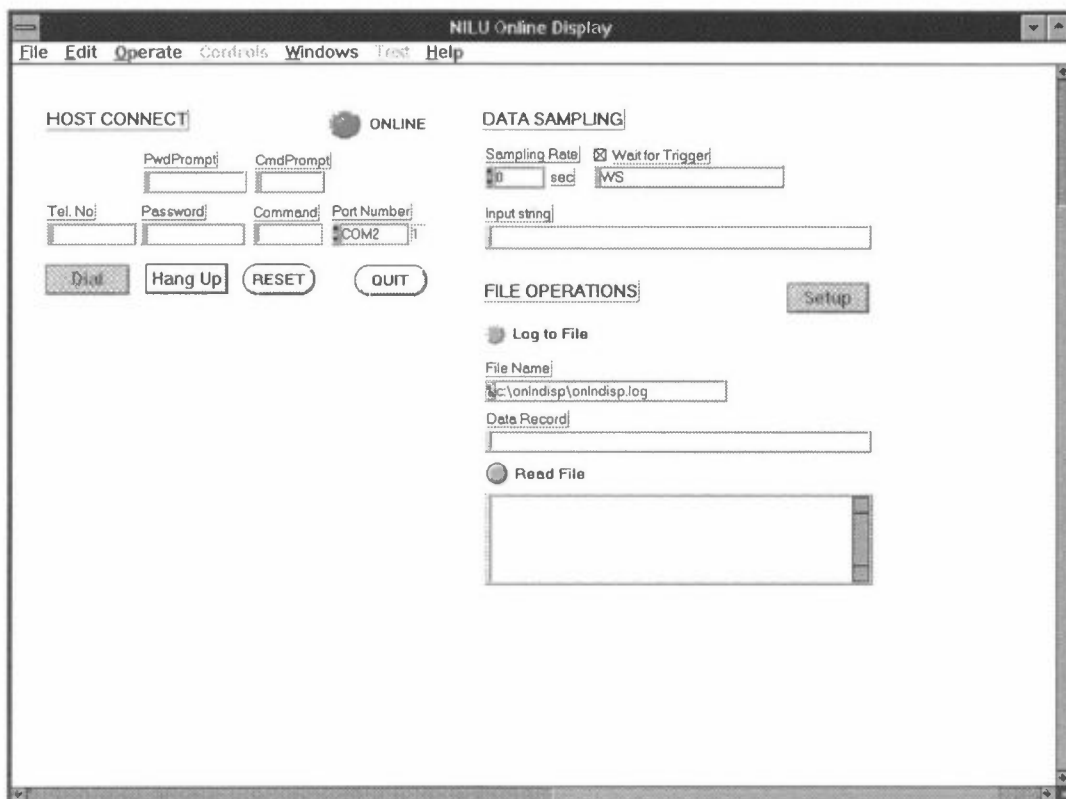


Fig. 3: The Configurations front panel. The displayed specifications are valid for a NILU data logger connected directly to the PC's COM-port.

6.1 The Online Display front panel

During a communications session data is displayed online in the Online Display front panel, see fig. 2. It consists of several indicators showing the wind direction, wind speed and temperature.

In the upper left corner of the front panel the system date and time is displayed using the format YYMMDD and HHMM respectively.

The Accept indicator is located below the system date and time. The indicator turns green if the string read from the COM-port begins with the characters specified in the Wait for Trigger text box. Otherwise the indicator turns red indicating a possible communication problem. When the system is not online the indicator is always red.

The front panel is split vertically in two halves. In the left half instantaneous wind direction is displayed using a compass like indicator. The wind direction is also displayed as text. The text includes the wind direction in degrees and a reference to the compass, such as 0 degrees North. The compass directions are North, Northeast, East, Southeast and so on. Each sector is 20 degrees wide centred around the direction. The wind blows along the needle towards the centre of the compass.

In the right half of the front panel wind speed and temperature are both displayed in charts showing the last 3 hours of measurements. It is possible to scroll the charts backwards 4 days using the horizontal scroll bars below the charts. The charts do not have x-axis time stamp labels although there is an indicator at the top right of the wind speed chart displaying the time stamp of the last data sample. The time stamp is not connected to the scroll back function of the charts.

In the upper right half of the front panel instantaneous wind speed is displayed using a slide indicator. It is also displayed as text. The text includes the wind speed in m/s and a reference to the Beaufort scale, such as 0.0 m/s Calm.

In the lower right half of the front panel instantaneous temperature is displayed using a slide indicator. It is also displayed as text. The text includes the temperature, such as 0.0°C.

It is possible to rescale the charts and slides by entering new min and max values directly into the scales and the Y-axis of the charts.

6.2 The Configurations front panel

You use the Configurations front panel, see fig. 3 to connect to the data logger, specify the data sampling and to log data to file. The front panel consists of 3 group boxes.

<u>Use group box:</u>	<u>To:</u>
HOST CONNECT	Start and end a communications session.
DATA SAMPLING	Specify the data sampling mode.
FILE OPERATIONS	Log online data to file, to read data from file and to enter the setup.

6.2.1 Starting a communications session

The HOST CONNECT group box allows you to specify the parameters necessary to call the data logger and to control the modem. It also includes the QUIT button which quits Online Display and returns the user to Program Manager.

<u>Use:</u>	<u>To Specify:</u>
Tel. No	The host telephone number. Leave this field open if the data logger is connected directly to the PC.
PwdPrompt	The password prompt to wait for before sending the password.
Password	The host password. Leave the field open if the host does not require a password.
CmdPrompt	The command prompt to wait for before sending a command. Leave the field open if the host does not send a command prompt.
Command	An optional host command necessary to enter the data logger.

Port Number The PC's COM-port number to which the data logger or modem is connected.

The HOST CONNECT group box also includes 3 command buttons to control the modem as well as the QUIT button.

<u>Use command button:</u>	<u>To:</u>
Dial	Call and establish a connection with the data logger.
Hang Up	To end a connection.
RESET	Reset the modem if it locks up. RESET ends a connection.
QUIT	Quit Online Display. QUIT ends a connection and closes the COM-port before quitting Online Display.

To establish a connection:

1. Leave the Tel. No field open if the data logger is connected directly to the PC. If the connection is made via modem enter the telephone number.
2. Enter a password and command as necessary.
3. Choose a PC COM-port.
4. Choose command button Dial. If a telephone number was entered the Modem Dialling Information dialog box appears. It shows the dialling status.

Once the connection is made the ONLINE indicator in the HOST CONNECT group box switches to green and the Dial command button is disabled. You are now online and data will be displayed in the Online Display front panel.

6.2.2 Specifying the data sampling

The DATA SAMPLING group box allows you to specify how data is sampled from the data logger. The data logger outputs a string of data every 10 seconds although the meteorological data is changed only every 5 minutes. The string is expected to have a fixed format. You can either read the COM-port at fixed intervals and see if what you get starts with the specified trigger or you can read the COM-port continuously until the specified trigger arrives indicating that data is coming. The latter method is the preferred one. It time-outs after 15 seconds if the trigger text does not appear.

<u>Use:</u>	<u>To specify:</u>
Sampling Rate	How often the COM-port should be read. Set this value to 0 if you want to wait for the trigger. This is common.
Wait for Trigger	That you want to detect the start of the data string. It is common to select this checkbox.
Wait for Trigger text box	The Data string prefix. WS or G: are common string prefixes.

The raw data read from the data logger is displayed in the Input String text box.

To specify the data sampling:

1. Enter 0 in the Sampling Rate field.
2. Select the Wait for Trigger check box.
3. Enter WS in the Wait for Trigger text box.

6.2.3 Specifying the setup

The parameters concerning splitting of the data string and scaling of raw data values are stored in a setup file. The file is usually located in the ONLNDISP directory. You can have several setup files. The setup which file name is specified in the ONLNDISP.SYS file is automatically loaded at startup. ONLNDISP.SYS is an ASCII file located in the ONLNDISP directory. The file includes only one line of data such as C:\ONLNDISP\ONLNDISP.FMT indicating that the specified setup file will be loaded at startup.

To enter the Setup:

1. Choose the Setup button in the FILE OPERATIONS group box. The Setup Password dialog box appears, se fig. 4.

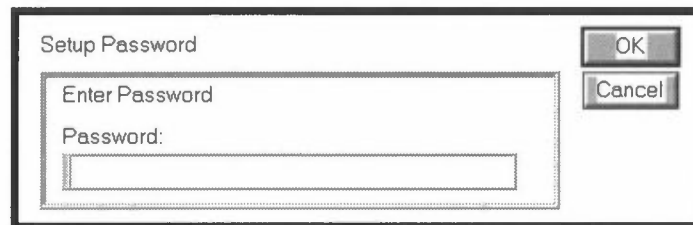


Fig. 4: The Setup Password dialog box.

2. Enter the password and choose OK. The Edit Setup dialog box appears, se fig. 5.

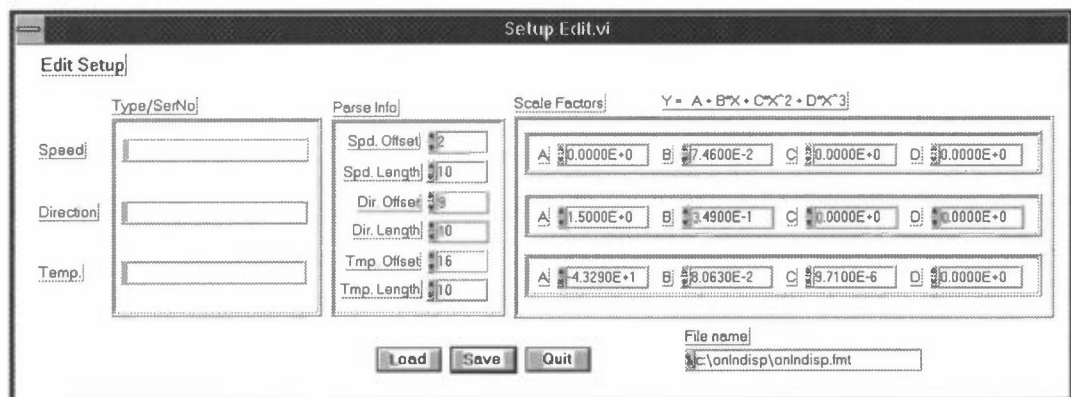


Fig. 5: The Edit Setup dialog box.

3. Fill in the dialog box.
4. Enter a new file name in the File Name text box if necessary and choose the Save button to save the setup. If you fail to save the setup before choosing Quit your changes are ignored.
5. Choose the Quit button to exit the dialog box.

The Edit Setup dialog box consists of 3 group boxes. Each group box includes one line of parameters per sensor. The sensors are Speed, Direction and Temperature.

<u>Use group box:</u>	<u>To:</u>
Type/ SerNo	Identify the sensors.
Parse Info	Specify the position of the data fields in the raw data string and to specify the length of the data fields in the scaled data string.
Scale Factors	Specify the scale factors which convert the raw data to scientific units.

You load and save the setup specified in the File Name text box.

The Type/ SerNo group box

You use the Type/ SerNo group box to identify the sensors. It is only for information purposes. Enter the sensor type and it's serial number separated by a slash (/).

The Parse Info group box

You use the Parse Info group box to specify the position of the data fields in the raw data string and to specify the length of the data fields in the scaled data string. Each sensor uses two parameters.

<u>Use parameter:</u>	<u>To:</u>
Offset	Specify the start of a field in the raw data string. The first position in a string is number 0. The field starts immediately after the last character of the preceding field. The values must be right aligned in the fields.
Length	Specify the length of a data field in the scaled data string.

If a field in the raw data string is empty (only spaces) the next field will be identified as the current field. This is of course an error but it is not likely to occur since each field always includes a value of some sort.

The Scale Factors group box

You use the Scale Factors group box to specify the scale factors which convert the raw data to scientific units. Each value in the raw data string is scaled according to the following polynom:

$$Y = A + B*X + C*X^2 + D*X^3$$

6.2.4 Logging online data to file

The FILE OPERATIONS group box allows you to log online data to file and to retrieve the data in a tabular form. You can turn data logging to file on and off at any time. You can also read the data file at any time.

The user can choose the name and location of the data file. If the data file exists, new data is appended to it. Online Display never deletes the file. Data is stored in an ASCII file. Each line of data is a record having the following format:

Date Time Wind speed Wind direction Temperature

Each parameter is aligned right at fixed positions. The date and time stamp formats are YYMMDD and HHMM respectively. Since the time stamp only includes the hours and minutes, e.g. 0935 a sample rate of 10 seconds produces 6 consecutive records having identical time stamps. In addition the meteorological data is updated only every 5 minutes resulting in 30 consecutive records having identical values. The time stamp is set using the PC's system time and relates to when the data was captured.

<u>Use:</u>	<u>To:</u>
File Name	Specify path and name of file.
Log to File	To turn data logging to file on and off. When data logging is on the button turns green.
Read File	Read data from file. Data is displayed in the table below the button.

The Data Record text box displays online data in the data file format.

To log data to file:

1. Enter a path and name of the data file in the File Name text box.
2. Choose the Log to File button. The button turns green indicating that data logging is on.

To switch off data logging to file:

- * Choose the Log to File button. The button turns grey indicating that data logging is off.

To read data from file:

1. Enter the path and name of the data file in the File Name text box.
2. Choose the Read File button. The contents of the file is displayed in the table below the button. You can scroll forwards and backwards using the vertical scroll bar to the right of the table.

7. Making printouts of the front panels

It is possible to make printouts of the front panels. Unfortunately both panels are printed on the same page making them very small. Usually only the Online Display front panel is of interest.

To make a printout of the front panels:

- * Choose Print Window from the File menu.

You can choose landscape printing etc. by choosing Printer Setup from the File menu.

8. The Online Display menus

The menu bar includes several menus but only a few commands are of interest. Online Display was developed using the LabVIEW software and most of the menu items are related to the LabVIEW environment or are disabled. The menu bar was included only to get access to the Printer Setup and Print Window commands on the File menu. All other menus and commands are of no interest.

Never quit Online Display by choosing Close from the File menu. It does not close the connection and COM-port properly.

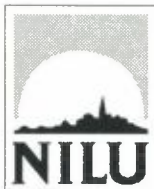
Appendix A

Data flow in Online Display

Data flow in Online Display

At startup Online Display reads the name of the default setup file from the file ONLNDISP.SYS. The default setup file is loaded into memory and control is given to the user. ONLNDISP.SYS must reside in the same directory as the program file ONLNDISP.EXE. The default setup file can reside in any directory.

During a communication session data can be logged to an ASCII file. The name and location of the file is specified in the Configurations front panel. The file can be read in a tabular form at any time.



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ABSTRACT (in Norwegian) Denne rapporten er en brukermanual. Den beskriver programvaren Online Display som viser og lagrer meteorologiske data i sann tid.			

* Classification

A Unclassified (can be ordered from NILU)

B Restricted distribution

C Classified (not to be distributed)