Comgraph32
data retrieval and analysis for Combilog
version 3

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Comgraph32

Data Retrieval and Analysis for COMBILOG

Version 3

COMGRAPH 32 – Data Retrieval and Analysis for COMBILOG Version 3

1. General

COMGRAPH 32 is a software for WINDOWS 95/98/NT/2000 to retrieve data from the datalogger COMBILOG and store the data in a database. The program supports datalogger types COMBILOG 1020 with firmware version U3.00 or higher and COMBILOG LT 1021 with firmware version U1.00 or higher. It is not compatible with older versions.
The program supports data retrieval by serial interface or modem as well as by PCMCIA memory cards.
Each datalogger is managed as an independent project. Data are stored in a Paradox 7.0 database and can be exported as ASCII files to provide for other applications.
In addition simple data analysis functions are possible. Data of any time interval can be selected. Data sets can be edited, added or deleted. Every parameter can be displayed graphically.
Automatic data retrieval at certain times can be configured. Connection to a datalogger via modem is possible.

System requirements:
- WINDOWS 95/98/NT/2000
- $\geq$ 64 MB RAM recommended
- processor Pentium 200MHz or higher recommended
- PCMCIA adapter incl. support for MS Flash File System (in case of using memory cards)

2. Program installation

To install the program insert the setup disk 1 into the floppy drive. Select ***Execute*** from the start menu and enter ***A:/setup***. Change the drive letter in case the diskette is placed in another drive. In case the software is delivered on CD, you'll find the setup program in the folder ***Comgraph32/Disk1***.
The setup program leads you through the installation. Please follow the program instructions, if you want to install the software in another folder than suggested by the the installation program. After the COMGRAPH 32 software has been installed successfully you can start the program by clicking the program icon in the new program group COMGRAPH 32 or via the start menu.
If you want to remove the COMGRAPH 32 software from your computer you have to deinstall it. This is accomplished by clicking the ***control panel***, ***Software***. Select COMGRAPH 32 in the list of installed programs and click to the ***add/remove*** button. If there are some files remaining after the deinstallation process you should remove them manually.

If the program is executed for the first time, the language can be selected. This selection will be stored for later program sessions, but can be changed in the menu ***additional – options***.

3. Program description

3.1.   Creating a project

To manage the data of a datalogger a new project must be created. Select *New* from the menu *File*.

At first you have to specify the source where the project information should be read from. By means of this information the program identifies a datalogger before reading the measured data in order to avoid, that data of another logger are mixed with the project opened. For differentiation the program uses some important configuration properties of the datalogger like the unit of measured data, kind of measurement and stored data etc.
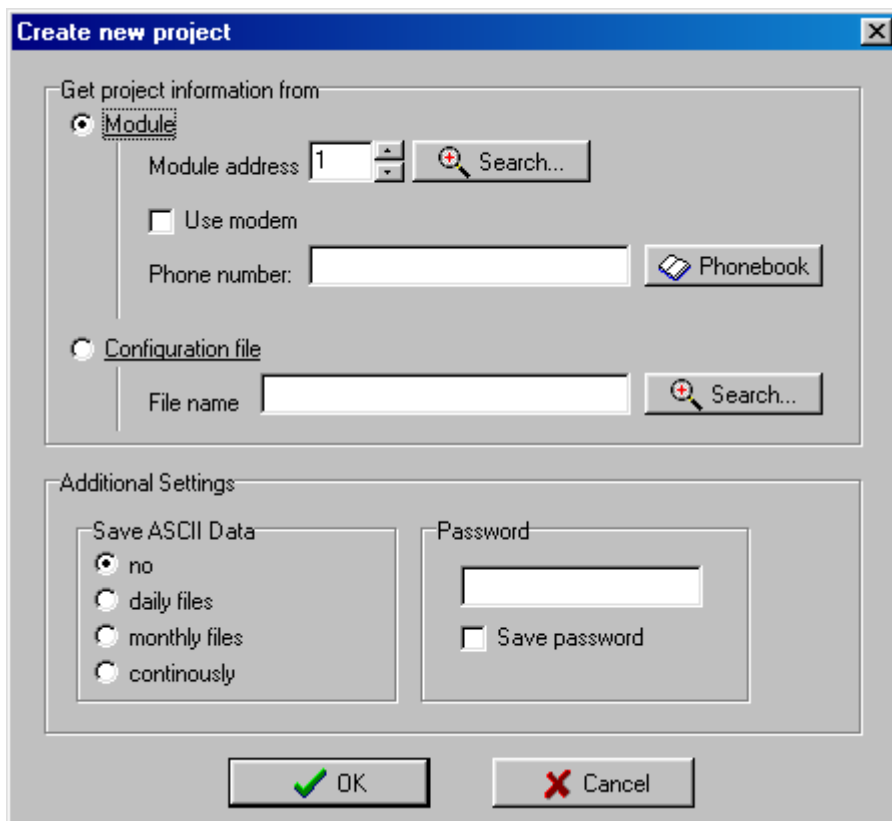
The project information can be read directly from a logger via serial interface or from the configuration file, which is created during the COMBILOG configuration.

In case of reading the project information directly from the logger you have to select the module address or click the *Search* button to get a list of connected modules. If a modem is used to communicate with the logger, you have to add a telephone number. These settings will be stored in the project file for future communication and can be altered using the project properties function.

If the configuration of the datalogger is password protected, the password must be entered before reading of the stored data is possible. If the check box **save password** is checked, the password will be stored in the project file and transmitted to the datalogger automatically before reading the data.

The program will store all data in a database. Sometimes it is usefull to have the data in text format too. In this case you can select one of the following options:
- to store all data of the same day in a daily file
- to store all data of the same month in a monthly file
- to store all data in one text file

In case of reading the project information offline from the configuration file you have to enter the according file name. These files are created by the COMBILOG configuration software and have the file extension .PRO.

If the program has read the project information of the specified logger you will be asked to enter a name for the project file. A project file has the extension CPR, that is apended automatically to the file name. Additionally to the project file the database with the same name and in the same folder will be created. It is recommended to create a separate folder for each project.

3.2. Opening a project

To open a project select *Open* from the menu *File*.
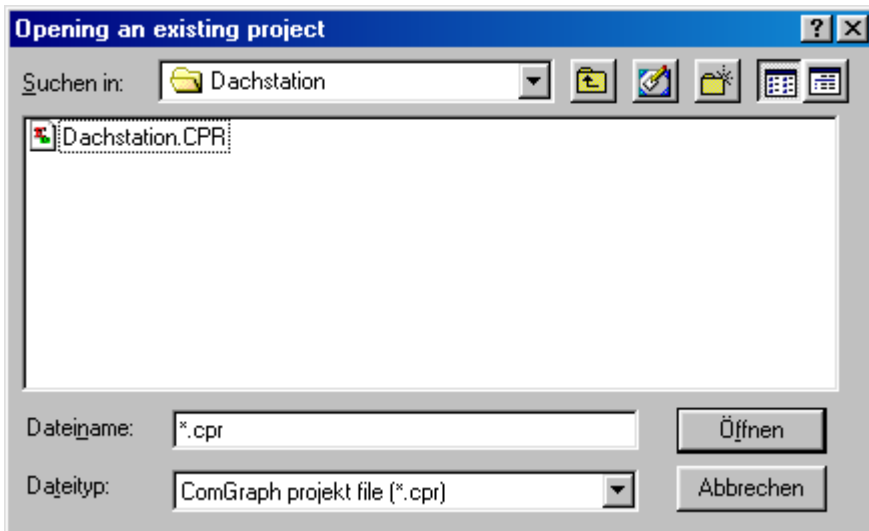
Enter the name of the project file or select it from the listed files. A project file always has the standard extension .CPR. This extension will not have to be entered manually.

Note:
If a project is opened that has been created by Comgraph32 Version 2, the module configuration must be read again from the module or configuration file. The old project file will than be converted into the new format. After that it is no longer possible to open the project with program versions lower than 3.00.
In particular all projects must be converted manually into the new version before starting the automatic mode.

Note:
If you want to rename a project, you have to rename as well all files related to this project which have the same name. Pay attention, that all files keep their correct file extensions.

3.3. Working with a project

After opening a project data can be analysed by following methods:

- selection of a time period the data should be analysed for
- report generation for all parameters
- graphical display of selected parameters
- displaying and editing the data in a table

Select a data presentation by clicking to the respective register card:

3.3.1 Selecting a time period

In order to make a selection of a specified time interval click to the button *Selected range*. In the following dialog box you can select a period data should be displayed:

all: shows all available data
random: any period can be selected by begin and end date
day: shows data of a certain day (0:00 AM to 0:00 PM)
week: shows data of one week (7 days, starting with begin date)
month: shows data of one month (from the first to the last day of the selected month)
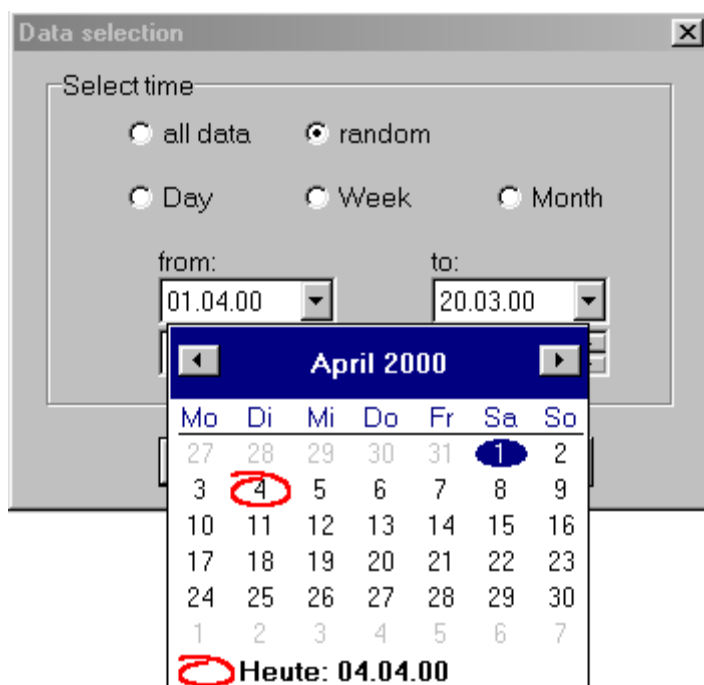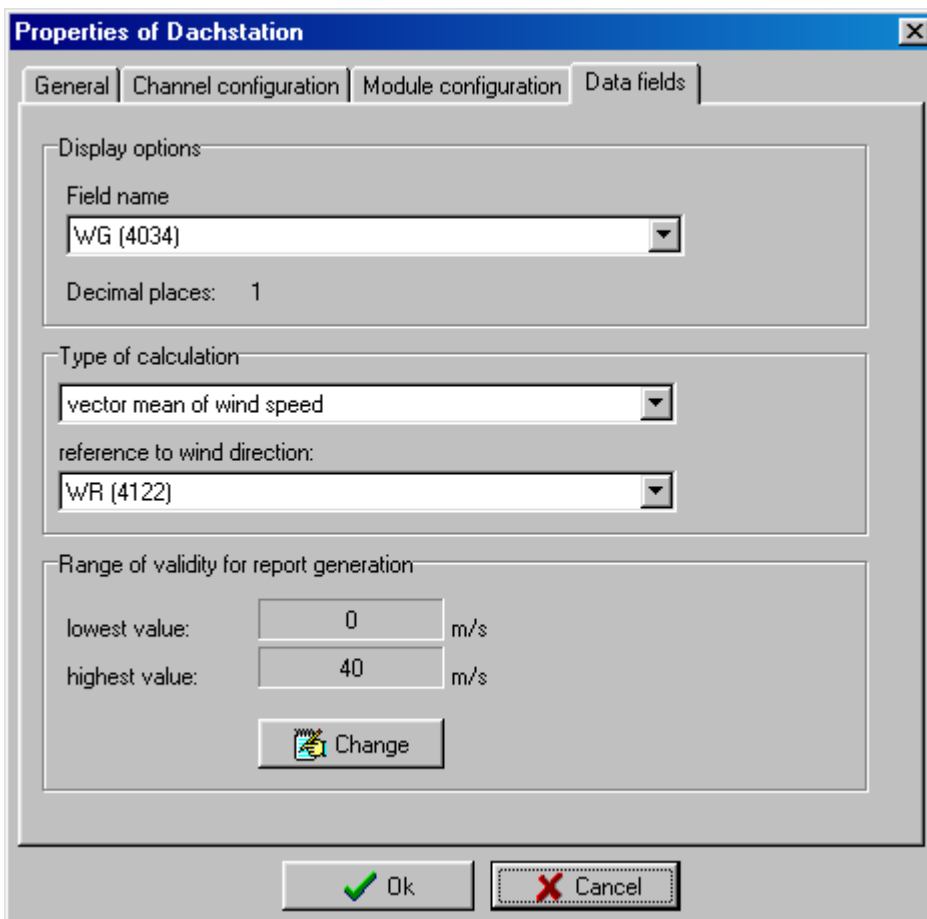

In order to specify a certain date click to the arrow icon ▾ in the date field to open a calendar. Inside the calendar you can click the appropriate day. To change the month or year use the navigation keys left or right to the month name.
The selected period is valid for all other data related functions of the program, like graphical display, export function and printing.

3.3.2 Report presentation

The program creates automatically a report of all data for the selected time period. This report can be printed by clicking the print button 🖨 on the tool bar.

The result displayed for each parameter is calculated depending on the corresponding type of calculation. This type of calculation will be determined automatically from the datalogger configuration and depends on the type of measurement. Thus for example the sum is calculated instead of the average in case of a counter channel. Because it is not possible to determine the type of calculation in any case (e.g. for arithmetic channels), the type of calculation can be set manually. Select the menu file – properties or click to the properties button 🗒 in the tool bar. On the registercard you'll find a list of algorithms for creating the report:


By defining the *range of validity* unvalid data can be filtered. Values outside this range will not be included to the report results.

Following types of calculation can be selected:
- none: The parameter will not be considered in the report
- mean value: The arithmetic average will be calculated. Additionally the minimum and maximum together with the time of last appearance is determined.
- scalar mean value of wind direction: The arithmetic average of the wind direction is calculated using the scalar averaging method.
- minimum:The minimum together with the time of last appearance is determined.
- maximum:The maximum together with the time of last appearance is determined.
- sum: The sum of all values is calculated.
- total sum: The last available value will be taken as result, because the values are absolute counter values.
- standard deviation: The standard deviation of the selected parameter is calculated
- vector mean value of wind direction: The arithmetic average of the wind direction is calculated using the vector averaging method. Additionally the reference value containing the corresponding wind speed values must be selected.
- vector mean value of wind speed: The arithmetic average of the wind speed is calculated using the vector averaging method. Additionally the reference value containing the corresponding wind direction values must be selected.

3.3.3 Graphical display

A graphic can show maximally 2 parameters at the same time, assigned to the left and right a-xis.
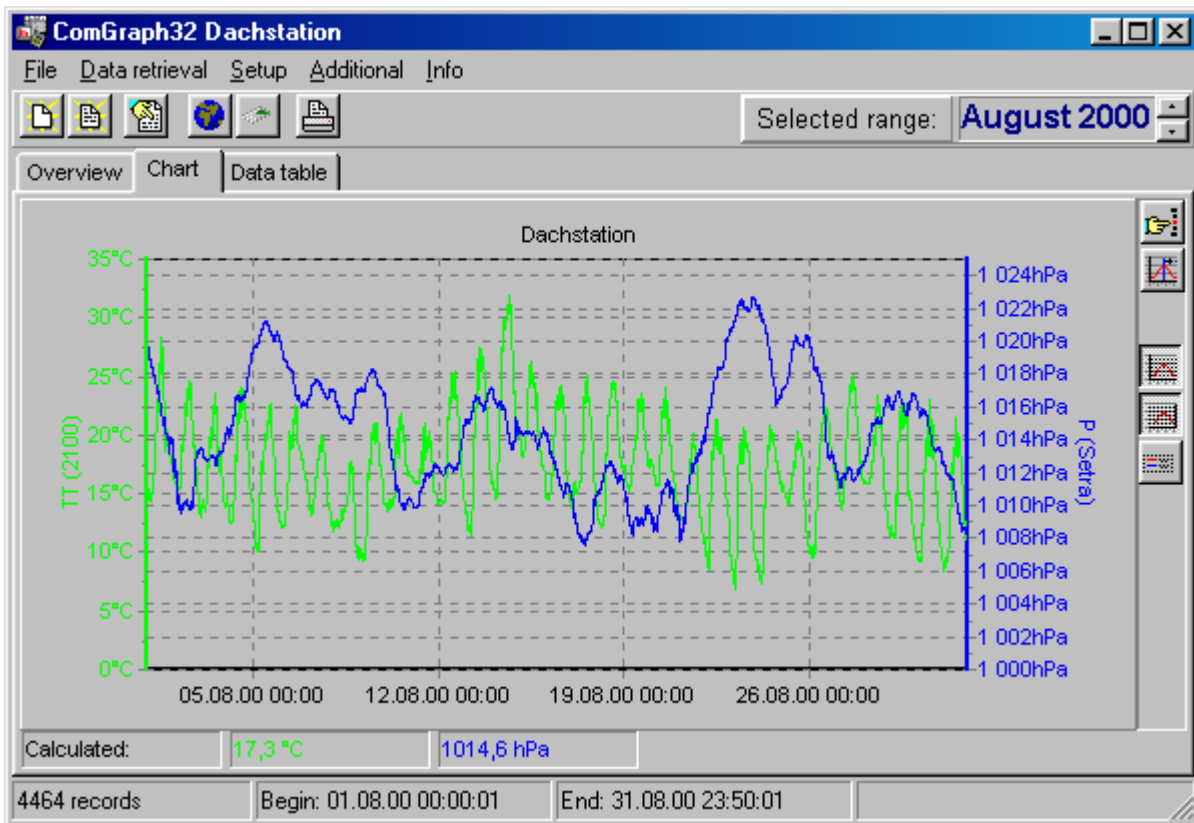
The axis color can be defined in the menu *additional – options*. You can define a constant axis color or assign an individual color for each parameter. The color of a parameter is selected in the graphics properties menu (see below).

On the right side of the graphic a tool bar is visible containing some buttons to change the appearance of the graphic. The buttons have the following meaning:

shows the graphics properties menu to select a parameter and the diagram type

shows / hides a cross cursor

shows / hides grid lines for the left axis

shows / hides grid lines for the right axis

shows / hides the legend

In case the cross cursor is activated, the actual cursor values will be displayed in the foot line. If the cross cursor is deactivated, the calculated values from the report will be displayed instead (mean value, sum etc.).

If required, any range of the curves can be zoomed. Zooming is activated by drawing a rectangle arround the chart area of interest with pressed left mouse button, beginning from top / left down to bottom down. Dragging in the opposite direction resets axis scales.
Zooming can be repeated several times.
The zoomed range can be scrolled in any direction by moving the mouse with pressed right mouse button.
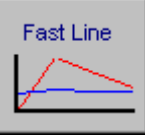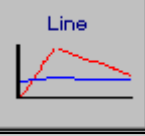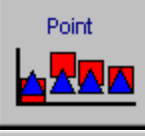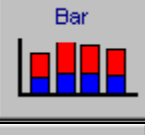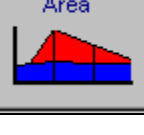
In the dialog box for selecting the graphic parameters you can
-   select a parameter to display on the left or right y-axis
-   select the type of the diagram
-   adjust the scaling of the y-axis for each parameter
-   define a title for the chart
-   enable or disable showing the legend
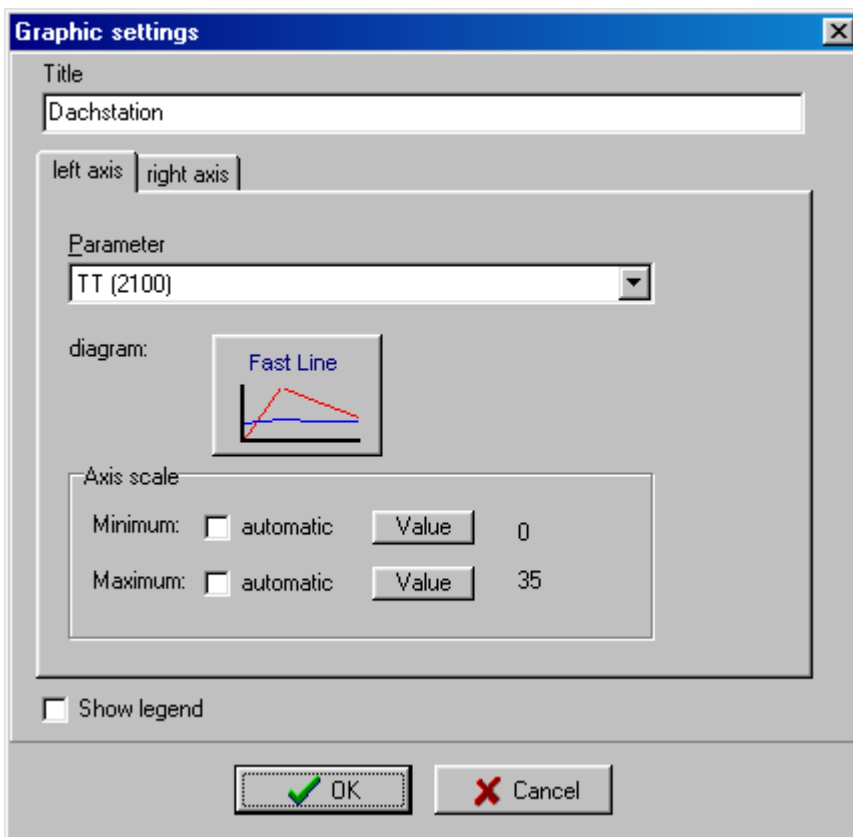
To select a type of a diagram click to diagram symbol button. The following types of diagram can be selected:

Fast Line	line diagram
Line	line diagram with additional display of data points
Point	point diagram values will be displayed as points
Bar	bar diagram values will be displayed as bars with different style
Volume	bar diagram values will be displayed as line bars
Area	area diagram values will be displayed as area

All settings will be stored and are available after restarting the program.

3.3.4 Data table

In the data table all values of the selected time period will be displayed numerically. The table contains a column with date / time values and one coloumn for each parameter. The coloumn titles are derived from the datalogger channel names.

The coloumn titles and the data format (number of decimals) can be changed by the project properties dialog.

Use the table navigator keys above the table header to navigate inside the table or to edit data sets. The symbols have the following meaning:

◄	moves to the first data set
◄	moves to the previous data set
►	moves to the next data set
►|	moves to the last data set
+	inserts a new data set before the actual data set
−	deletes the actual data set
▲	sets the actual data set in edit mode
✓	rewrites changes of the actual datasets into the database
✗	cancels the edit mode without any changes of the dataset

In the menu *edit* you'll find the function *delete all records*. This function will delete all datasets of the selected time period.

3.3.5 Printing the results

The report as well as the graphic and the data table can be printed. Click to the printer button
🖨 in the tool bar or choose *print* from the menu *file*.

Depending on the report, the graphic or the data table is visible on the screen, data will be sent to the printer.
If you want to print a table the integrated Quickreport generator will be started. This enables to preselect number and kind of parameters that should be printed. A maximum of 9 parameters including the time stamp can be printed side by side on one page. If you have more than 9 parameters to print you must repeat the process for all other parameters. Thus it is guaranteed that on each printed page there are time stamps.
Selection of parameters is done by the following dialog box:
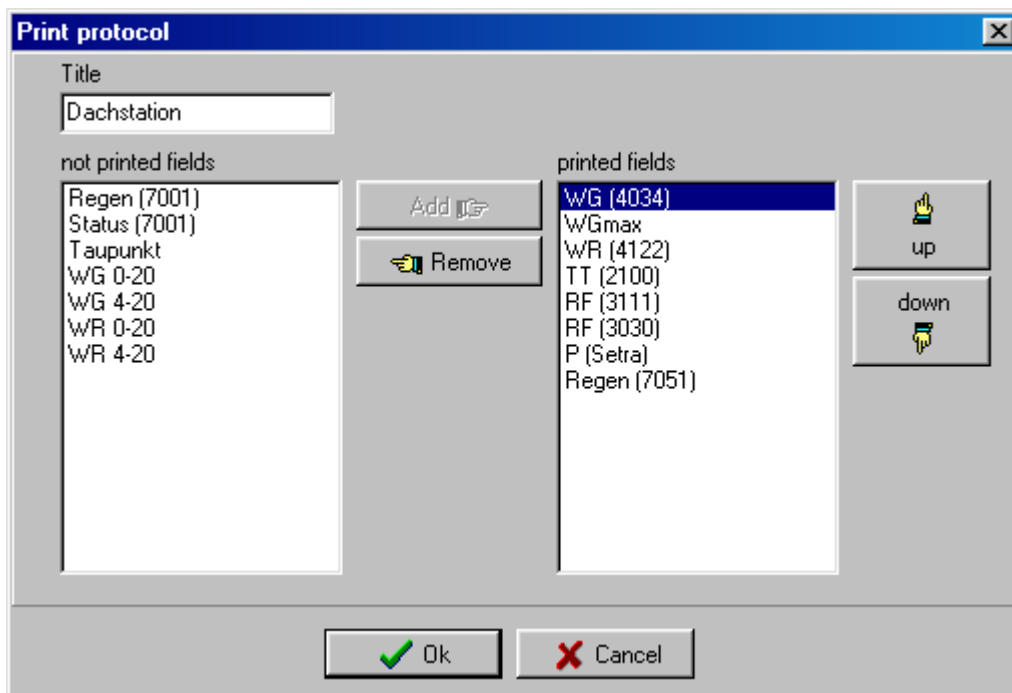
On the right side of the box you find a list of parameters already selected to be printed, on the left side a list of remaining parameters. Select an entry in one of these lists and use the *Add* or *Remove* buttons to add or remove a parameter. You can change the printing order (from left to right) using the buttons up and down. Note, that the time stamp of each record is always printed at the most left position of the paper.
After clicking *Ok* the QuickReport generator is started. The result will be displayed on the screen before printing. Thus you see a print preview and the number of pages to be printed. To print, click to the printer symbol.
Instead of printing you can save the QuickReport in a file to open it again later. Opening of any QuickReport files is also possible via this window.

3.3.6 Export of data

The program features to export all data of a selected period to text files. The data can than be imported by other applications, e.g. Microsoft Excel.
To export data select the time period at first. Choose the **Export** function in the **File** menu. Select the name and the file type of the text file. In a .*CSV* file data will be separated by a colon (";"), in a .*TXT* file by a space character.

3.3.7 Import of data

If there are data available in text format, they can be imported to the Comgraph32 database. A corresponding project must be opened at first. Choose the **Import** function in the **File** menu. Note, that the datasets in the text file must have the same structure as the data in the project. Other data will be rejected.

3.4. Project properties

After creating or opening a project the project properties can be displayed and some of them can be changed. For this purpose use the *properties* function from the menu *file*.
The register *General* shows the actual settings of the program to retrieve data from a COMBILOG via serial interface.

The module address, the telephone number of the remote modem (if available) and the password can be changed here, as well as the options to save the data in additional text files.

The register *Channel configuration* displays essential configuration parameters of each data-logger channel:

Properties of Dachstation

General | Channel configuration | Module configuration | Data fields

Type	Channel name	Format	Unit	Storage
DI	WG (4034)	##.#	m/s	yes
AR	WGmax	##.#	m/s	yes
DI	WR (4122)	###	°	yes
AI	TT (2100)	###.#	°C	yes
AI	RF (3111)	###	%	yes
AI	RF (3030)	###	%	yes
AI	P (Setra)	####.#	hPa	yes
DI	Regen (7051)	##.#	mm	yes
DI	Regen (7001)	###	%	yes
DI	Status (7001)	###	%	yes
AR	Taupunkt	###.#	°C	yes
AI	WG 0-20	##.#	m/s	yes
AI	WG 4-20	##.#	m/s	yes
AI	WR 0-20	###	°	yes
AI	WR 4-20	###	°	yes

✓ Ok   ✗ Cancel

General configuration settings you will find on the register *Module configuration*:

Properties of Dachstation

General | Channel configuration | Module configuration | Data fields

Device type:	COMBILOG 1020
Vendor:	Friedrichs
Date of configuration:	17.03.00 07:29
Configured by:	Radke
Monitor version:	M5.00
Download version:	U3.11
Language:	german
Scan rate:	1 sec.
Averaging interval:	0 sec.

✓ Ok   ✗ Cancel
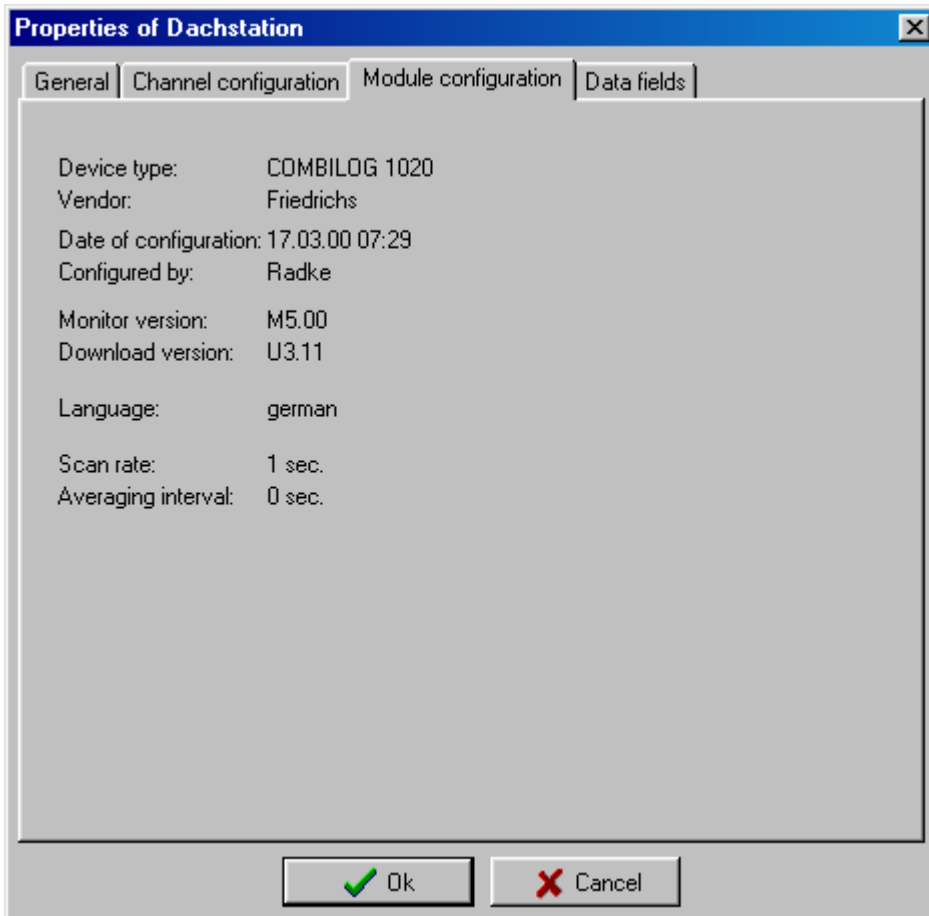
On the register *Data fields* the following settings of all data fields can be changed:
- name of parameter
- number of decimals
- the type of calculation for the report (see 3.3.2 Report presentation)
- the range of validity of each parameter

To change a field name, the number of displayed digits or the range of validity select the parameter from the drop down list and click to the *Change* button.

3.5. Data retrieval from the COMBILOG

There are two options to get data from the COMBILOG to the PC:
- via serial interface (resp. modem)
- via reading the data from a PCMCIA memory card

To retrieve the data online from the COMBILOG proceed as follows:
- Open the project the data should be assigned to.
- Select the function *from module* from the menu *Data retrieval*
- Enter the time range from which the data should be transmitted. Normally you will select the option *all data since last readout*. The other options are usefull in case of multiple access of different users to the datalogger.
- Enter a password if necessary

The program will establish the connection to the datalogger and check if it is in accordance with the project information. If it doesn't correspond the function is aborted without any data transmission. Otherwise all data will be transmitted from the datalogger to the database.

In case the additional data recording in text format is enabled (during creating the project or in the property settings), the following data files will be generated:

daily file: *yyyymmdd.csv*
monthly file: *yyyymm.csv*
continously: *projectname.csv*

where *yyyy*, *mm* and *dd* correspond to the year, month and day the datasets are generated.
In these files each line represents one dataset, beginning with the date and time, followed by the measured data itself, separated by a separation mark (";").
Note, that all datasets will be appended at the end of the corresponding data file, regardless of the chronological order.

In case of using a memory card insert the card into the slot of your PCMCIA drive. Select **from PCMCIA card** from the menu **Data retrieval** and enter the path and the name of the file containing the logger data. (Normally named COMBILOG.LOG)
The program will also check the configuration information before reading the data.
If data will be found containing a time stamp which is already available in the database, you will be asked, how it should be handled. You can ignore or add the data to the database.

3.6. Additional functions

Independent of an opened project there are some additional functions in the menu *additional*.

3.6.1 Measurement

The function *measurement* allows to view the actual measured data of any COMBILOG connected to your PC directly or via modem. Enter the modul address and the telephone number if necessary.
After establishing the connection to the logger all channels will be displayed with continous update:

#	Typ	Name	Value	Unit	State
1	DI	WG (4034)	1.4	m/s	o.K.
2	AR	WGmax	2.5	m/s	o.K.
3	DI	WR (4122)	255	°	o.K.
4	AI	TT (2100)	13.2	°C	o.K.
5	AI	RF (3111)	76	%	o.K.
6	AI	RF (3030)	3	%	o.K.
7	AI	P (Setra)	988.3	hPa	o.K.
8	DI	Regen (7051)	0.0	mm	o.K.
9	DI	Regen (7001)	0	%	o.K.
10	DI	Status (7001)	0	%	o.K.
11	AR	Taupunkt	9.0	°C	o.K.
12	AI	WG 0-20	1.7	m/s	o.K.
13	AI	WG 4-20	1.6	m/s	o.K.
14	AI	WR 0-20	261	°	o.K.
15	AI	WR 4-20	258	°	o.K.

Measurement dialog:
Module address: 1
serial no.: 090279
Location: Dachstation
configuration date: 17.03.00 07:29
by:
Vendor: Friedrichs
Device type: COM1020
Monitor version: M5.00
Download version: U3.03
Scan rate: 1 sec.
Averaging interval: 10 min.
stored datasets: 16
Logger time: 04.04.00 11:12:41
Synchronize logger with PC
Clear memory
Close

You can synchronize the logger time with the PC real time by clicking the corresponding button. This has no influence on the data already stored in the internal data buffer of the logger.
The internal data buffer can be cleared by pressing the button *Clear data buffer.* As a precaution you will asked a second time before this action is carried out. Hereafter all data will be erased irretrievably.
Time synchronization and clearing the data buffer is password protected, provided that the logger is configurated with a password protection.

3.6.2 Automatic data retrieval

Sometimes it is useful to retrieve data from one or more loggers automatically, e.g. in case of unattended operation for a longer time.
The program provides such a function.
At first you have to configure the automatic data retrieval function:
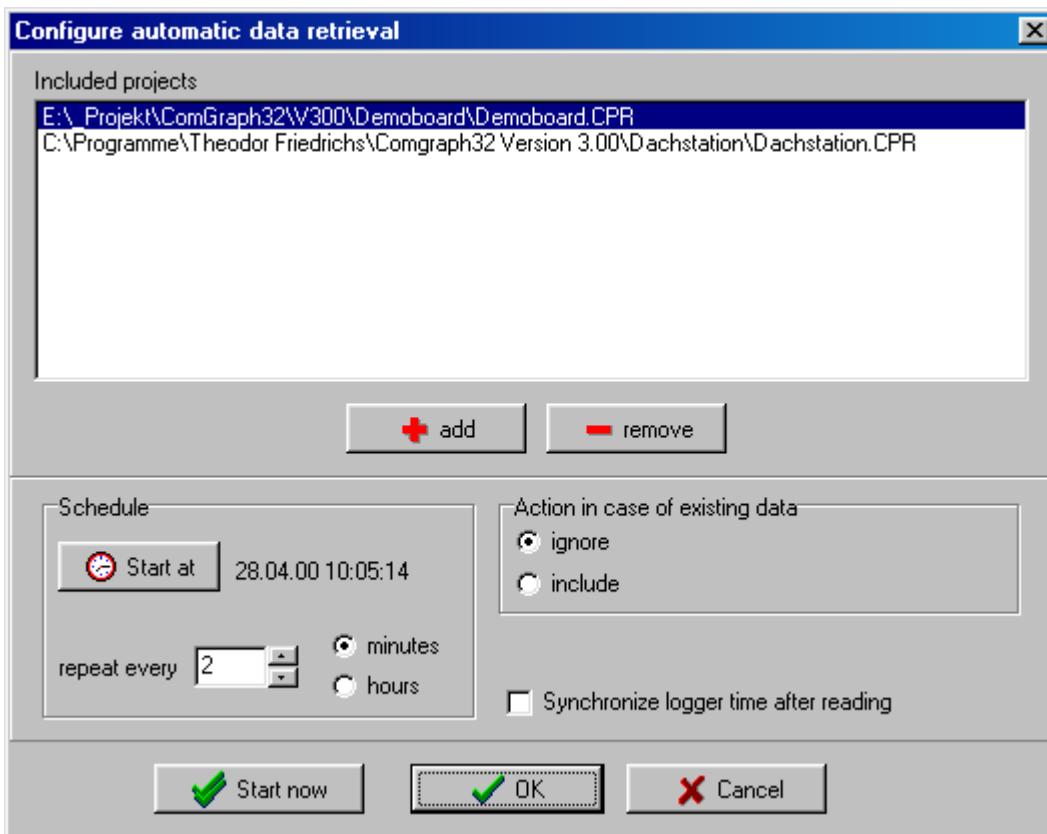
Select all the projects that should be included to the automatic function. You can add projects as many as you want, but only projects that already exist on your PC. Use the *Add* or *Remove* buttons to change the list of selected projects.

The period of data retrieval can be set in units of minutes or hours. Specify the handling of data with existing time stamps.
If the option Synchronize logger time after reading the datalogger time will be set to your PC's date and time. This function can be bolt by a password in the menu *additional – options*.

Click to Ok to save the settings. The automatic data retrieval than can be executed by the menu *additionals – start automatic data retrieval* or after restarting the program, if the option *program start always in automatic mode* is enabled.

Click to *Start now* to start the automatic function immediately.

During automatic data retrieval mode the only visible window shows the state of the program. Here all actions will be recorded:
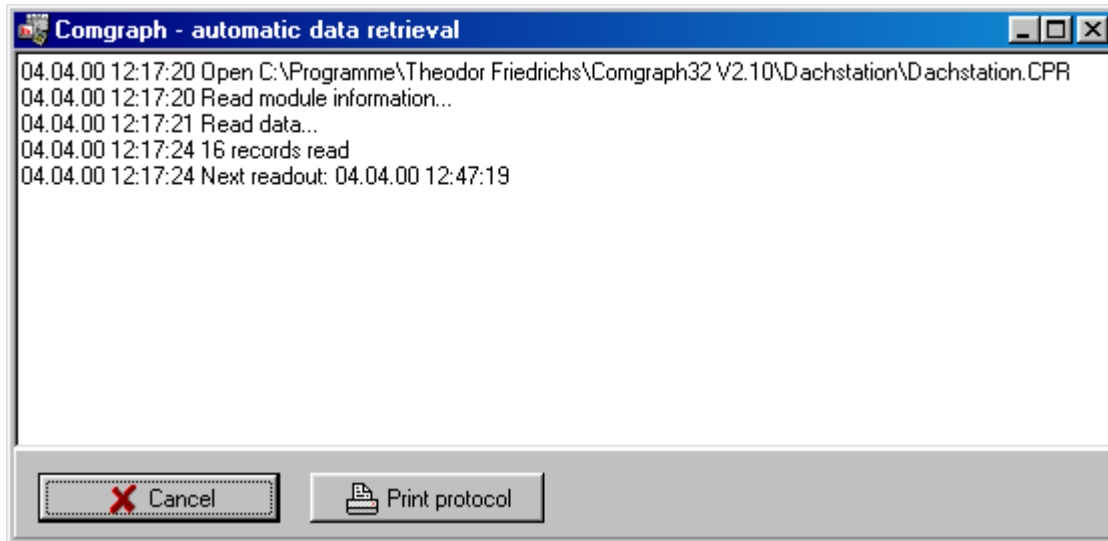
If you click to *Cancel* the main window appears and you can work with normal program functions. Note, that all projects are closed at this time.

3.7. Program options

In the menu additional – options some general settings can be changed:

- *Language*: The program can be started in german as well as in english. In case the setting has been changed, it is necessary to restart the program.

- ***program start always in automatic mode***: If this option is enabled, the program will start the automatic data retrieval immediately. This is useful to retrieve data automatically after booting your PC. For this you must create a link to the Comgraph32 program in your auto-start folder.

- *Graphic options*: Defines the axis colors of the chart. This can be set to predefined colors for both axis or to individual colors, depending on the assigned parameter.

- ***Password protection***: A password can be defined to save some program settings against unauthorized changings. If this option is enabled, a password is requested, if one of the actual setting is changed (e.g. in case of changing the option of synchronizing the datalogger in automatic mode).
  Note: If the password is entered correctly the first time, no further password requests will be executed. This will be activated only after restarting the program.

3.8. Setting the communication parameter

To communicate with a datalogger the correct setting of communication parameters is required.

The program is able to communicate with the logger via RS232 port directly or via telephone modem.

In both cases the COM port (COM1 – COM8) and the baud rate must be set. In case of using a telephone modem the initial command must be specified, e.g. **AT&FX3** (For further settings refer to your modem manual).

4. Further information
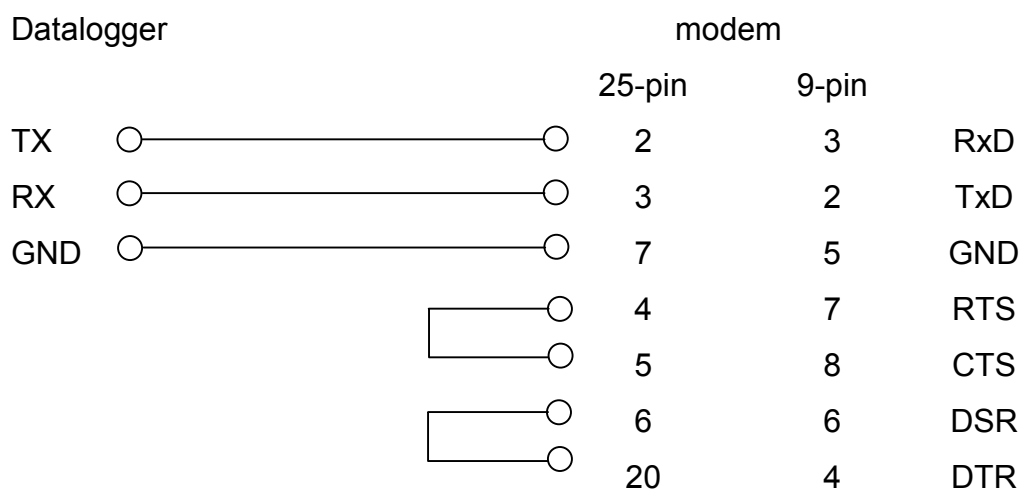
4.1. Modem settings for datalogger

In case of using a modem to communicate with a COMBILOG this must be configured at first by AT commands. Use a terminal program and execute the following steps:

- Connect the modem with your PC and run the terminal program
- Set the communication parameters of the terminal program to the datalogger parameter (e.g. 19200 Baud, no parity) **Note**: Most modems work without parity. Make sure, that the datalogger has the same settings!
- Enter the following AT commands:

meaning	command
load default settings	AT&F
set baudrate to 19200 bps	depending on modem type, see modem manual
enable automatic answering	ATS0=1
DSR on	AT&S0
ignore DTR	AT&D0
save configuration	AT&W0

Further settings may be necessary, e.g. for error correction. Refer to your modem manual to define the corresponding AT commands.

Cable connection between modem and datalogger:

Datalogger   modem

                                        25-pin   9-pin

TX   O————————————————O   2   3   RxD

RX   O————————————————O   3   2   TxD

GND   O————————————————O   7   5   GND

                              O   4   7   RTS

                              O   5   8   CTS

                              O   6   6   DSR

                              O   20   4   DTR

4.2.   Using a PCMCIA flash memory card

To read data from a PCMCIA memory card a PCMCIA adapter is nessecary. Additionally a driver for the MS Flash File format must be installed.
For further information refer to the online help of Windows under the topic

PCMCIA, flash memory cards

or consult the supplier of your PCMCIA hardware.