DUCATI sistemi s.p.a

Win Com 5

USER'S MANUAL

11/2003

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1. Installation

System requirements:

- an IBM compatible personal computer, using a 80486 or higher CPU

- Windows 3.xx or higher

- 8Mb RAM

- at least 2Mb free space on hard disk (plus enough space for the data files created by DAT Più)

To install WinCom5, just run `setup.exe` from WinCom5 installation disk, either with Explorer, or with Start | Run. The program will ask where to read WinCom5 files from, and where to write them. After selecting units and folders (or accepting the suggested choices), the specified folder will be created on the hard disk, and the files will be copied. After this, a new icon for WinCom5 will be created inside Windows 3.xx Program Manager, or in Windows 95 Start menu.

2. Overview

WinCom5 has been developed to give the user complete control on the DAT Più functions. It makes possible to:

- set the DAT Più configuration (number of MACHs connected, measures to be acquired, alarms, passwords and so on), only if you are administrator

- download data acquired by the DAT Più either by means of direct PC cable-connection or with modem

- download alarms received from the MACH 30 / 20, Smart Più and DAT Più

- access the MACH network through the RS485 interface (in this case the DAT Più becomes a RS485-RS232 converter), and read values in real time

- launch your favourite spreadsheet to view the data received from the DAT Più

- manage up to 98 MACHs with 9 measures each

- manage the impulse-counter built in the DAT Più assigned to the address 99, by means of special functions

- protection with a password of the Dat Più access and its configuration

This online help covers every topic of the application, and will let the user take full advantage of hardware and software features.

Throughout this guide, the DAT Più will be referred to simply as "**Dat"** and DUCATI's panel instruments will be referred to simply as "**MACH/MACHs"**.

3.   Quick start

This software offers the opportunity to indicate the user's identity at each installation, that can be either the Administrator, or a simple User. The Administrator can connect both as the Administrator and as the User, and when connected as the Administrator, he can carry out any change in the instrument's setting, while the User can only read such information.

Connecting to a DAT Più with a null-modem <u>cable</u> (direct connection)

To talk to a DAT Più through a direct connection, you have to:

1. turn on both the instrument and the PC

2. connect the PC to the instrument with the provided cable

3. start WinCom5

4. in *File | Choose language* select the language you prefer

5. as the main window appears, click on *File | Properties*; the property window will be displayed

6. on the property window, click on *Direct connection*

7. select the serial port that fits to you, and the same speed set on the DAT Più RS232 port (see instrument manual for more information)

8. now click on the *Ok* button: current configuration will be saved inside WinCom5 profile

9. at this point, just click on *Connection | Open as User or as Administrator* to open a connection with the instrument

10. now, a window could appear indicating that the DAT Più is in the Loader[i] mode. This mode indicates that the DAT Più is ready to update the internal Firmware or has just updated it. By means of this window, you can either restore the instrument's normal mode, or exit leaving things the way they are

11. if a password to access to the DAT Più was previously entered, a window asking for it will appear

12. you may now set DAT Più parameters as desired, or access the MACH network to read data in real time

Connecting to a DAT Più with a <u>modem</u>

Follow the steps 1...7 described above; then:

8. on the property window, click on *Use modem*

9. now set the serial port and speed as desired

10. set the dial properties as requested

11. now click on the *Open* button; the DAT Più site list will appear

12. click on *Add* to add a new DAT Più to the list

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[i] To update the DAT Più internal Firmware it is necessary to use the "DAT Loader" program which is not included in this software package

13. type a site description and the phone number to call

14. now click on *Ok* and then on *Close*; the current window will disappear, leaving only the property window open

15. click on *Ok* to accept the configuration

16. now, click on *Connection | Open*: on the window that will appear, double click on the description of the DAT Più that you want to call.

After a short time, the connection should be established; follow the instructions given in the prevision paragraph at 10 11 and 12.

4.   File menu
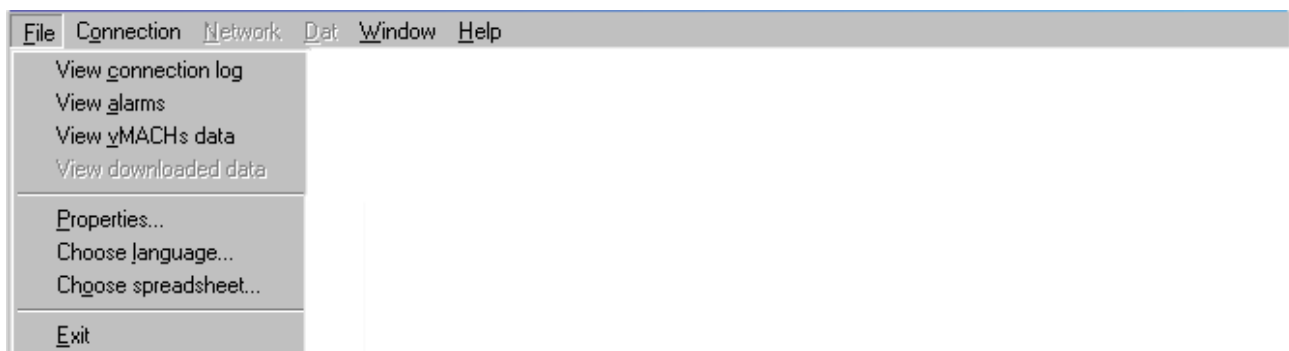
FIG. A – File menu

4.1   View connection log

This command displays a window with a listbox containing the last 5 Kbytes of the log file.
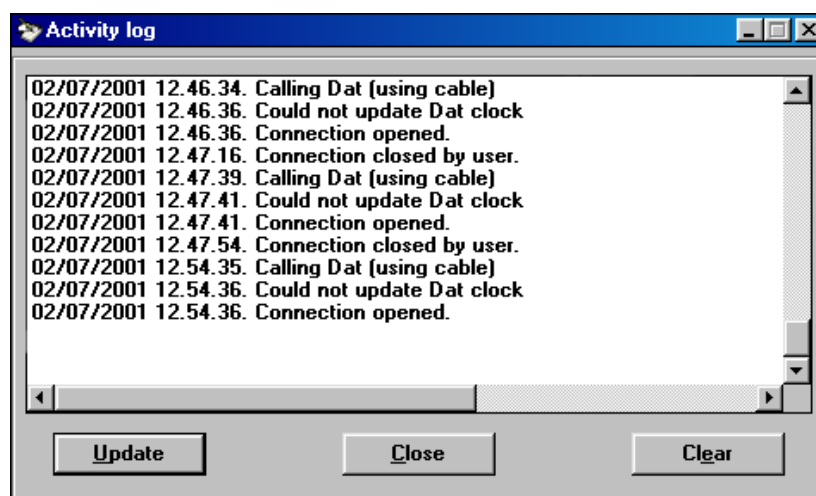
FIG. B – Activity log

Every call attempt is recorded in a log file, whose name is `WinDATpl.log`, located in the WinCom5 folder. The operations recorded are:

- modem initialisation (when auto-answer is enabled)

- call attempt (together with the dialled number)

- result of call attempt (connection opened or error reported by the modem)

- call termination

- wrong passwords entered

- start and stop of Poll connection

- received calls

- number of records downloaded, and file used

- number of alarms downloaded

- setup, memory or configuration fault

- timeout occurred during a download process

- configurations conflicts.

Every action is recorded together with date and time.

The *Update* button will re-read the log file.

Pressing the *Clear* button will wipe the file: the user will be requested to confirm the operation, and then the file will be deleted.

4.2   View alarms

This command displays a window with a listbox containing the last 2 Kbytes of the alarm file.

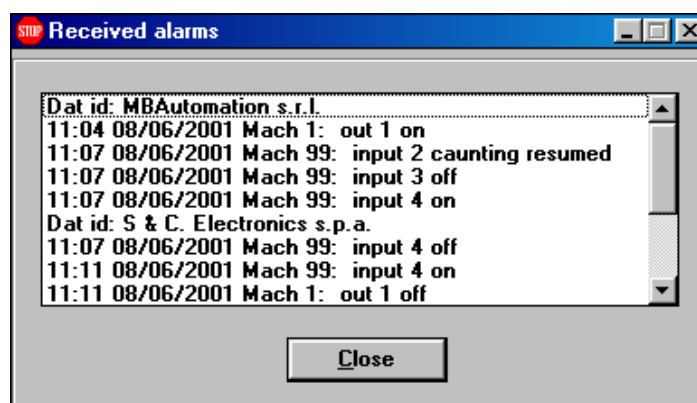**FIG. C – Received alarms**

Downloaded alarms (see Section 7.7 "Download alarms") are written in a file called `alarms.txt` in the WinCom5 folder. For every alarm is reported the MACH number (between 1 and 99) and the status (whether it has changed to on or off), together with the date and time in which it has been triggered.

The alarm file is never cleared, so it is left to the user he task of reducing its dimension or deleting it from the disk when it becomes too long and/or old.

Please note that only MACH 30 / 20, Smart Più and DAT Più have the alarm feature. In particular, see the previous figure for the two types of alarms created by the instrument 99 built in the DAT. The second alarm illustrated in the figure is the alarm created by the impulse-counter input.

4.3   View vMACHs data

This command opens the file `machdata.csv` inside the spreadsheet selected in the Choose spreadsheet dialog (See section 4.8 "Choose spreadsheet"). The file `machdata.csv` contains data collected from the MACH network through the transparency feature (see Section 6.1 "View ").

	A	B	C	D	E	F	G
1	03/04/1998	12.31.54	lab dat	Mach 1	49.9	[Hz] Freq	
2	03/04/1998	12.31.54	lab dat	Mach 1	12,805.00	[V] V12	
3	03/04/1998	12.31.55	lab dat	Mach 1	12,844.00	[V] V23	
4	03/04/1998	12.31.55	lab dat	Mach 1	12,844.00	[V] V31	
5	16/04/1998	18.00.44	lab dat	Mach 1	12,818.00	[V] V	
6	16/04/1998	18.00.44	lab dat	Mach 1	12,818.00	[V] V12	
7	16/04/1998	18.00.44	lab dat	Mach 1	12,818.00	[V] V23	
8	16/04/1998	18.00.45	lab dat	Mach 1	12,818.00	[V] V31	
9	16/04/1998	18.01.24	lab dat	Mach 3	15,370.00	[V] V	
10	16/04/1998	18.01.24	lab dat	Mach 3	12,614.00	[V] V12	
11	16/04/1998	18.01.24	lab dat	Mach 3	12,667.00	[V] V23	
12	16/04/1998	18.01.25	lab dat	Mach 3	20,882.00	[V] V31	
13	16/04/1998	18.01.26	lab dat	Mach 5	190	[kWh]kVAhr	
14	16/04/1998	18.01.26	lab dat	Mach 5	66	[kVArh]kVArh1	
15	16/04/1998	18.01.27	lab dat	Mach 5	69	[kVArh]kVArh2	
16	16/04/1998	18.01.27	lab dat	Mach 5	56	[kVArh]kVArh3	

FIG. D – MACH's Data

This is a standard ASCII, comma separated value data file, compatible with every spreadsheet able to import ASCII files.

Every record contains date and time of the acquired datum, the description of the Dat through which the datum has been read, the address of the MACH to which the value refers, and the measure (with its unit) acquired.

This data file is never cleared, so it is left to the user the task of reducing its dimension or deleting it from the disk, when it becomes too long or old.

Please note that `machdata.csv` may be opened only when the connection with the Dat is closed.

4.4   View `Smddhhmm.CSV`

This command opens the last data file (downloaded from the Dat) inside the spreadsheet selected in the Choose spreadsheet dialog (See section 4.8 "Choose spreadsheet"). The name of the file reflects the date and time in which the download started.

- the first 'm' is the letter corresponding to the month (A = January, B = February, etc)

- 'dd' stands for the day (01 to 31)

- 'hh' stands for the hour, and

- 'mm' stands for the minutes

	A	B	C	D	E	F	G	H	I	J	K
1	Dat: (direct connection), number called:										
2	Dat Id: Dat produz (DAT Più Ver. 2.08 - WinCom5 Rel. 2.08)										
3	Date	Time	M03 [V] V	M03 [A] I	M03 [kW] P	M03 Cos fi	M03 [kWh] kWh	M04 [V] V	M04 [A] I	M04 [kW] P	M04 Cos fi
4	15/10/2001	17.55.00	394	52	35,6	1	7478	392	0,26	0,177	1
5	15/10/2001	17.56.00	398	52	36,2	1	7478	394	0,26	0,178	1
6	16/10/2001	8.33.00	398	0	0	____	7480	394	0	0	____
7	16/10/2001	8.34.00	398	0	0	____	7480	395	0	0	____
8	16/10/2001	8.35.00	397	0	0	____	7480	394	0	0	____
9	16/10/2001	8.36.00	394	52	35,8	1	7480	391	0,26	0,178	1
10	16/10/2001	8.37.00	393	52	35,8	1	7480	392	0,26	0,178	1
11	16/10/2001	8.38.00	396	52	36	1	7482	392	0,26	0,177	1
12	16/10/2001	8.39.00	395	52	36	1	7482	393	0,26	0,178	1
13	16/10/2001	8.40.00	401	52	36,8	1	7482	398	0,26	0,181	1
14	16/10/2001	8.41.00	402	52	36,8	1	7482	398	0,26	0,181	1
15	16/10/2001	8.42.00	401	52	36,8	1	7484	397	0,26	0,18	1

FIG. E – File CSV

This is an ASCII file with standard CSV, ("comma separated value") data file, compatible with every spreadsheet able to import ASCII files.

The file contains a header, reporting the description and the phone number of the Dat from which data have been downloaded, data and time of the connection, mode of the connection if you are User or Administrator and a row with the measures being acquired. Then data follow, one instrument per line: every record contains time and date, MACH address, and acquired values. A special command allows the user to convert lines into columns, as shown in the previous figure (See Section 7.6 "Download records ")[ii]

4.5   Properties...

In this window the user may set the serial port parameters and the modem configuration; besides it is even possible to access the Dat site list. Moreover, is in this section that the user can select his identity like Administrator or simply User.

[ii] In case some stored record are inaccessible, in the output file will be appear the sequence "Invalid Record".
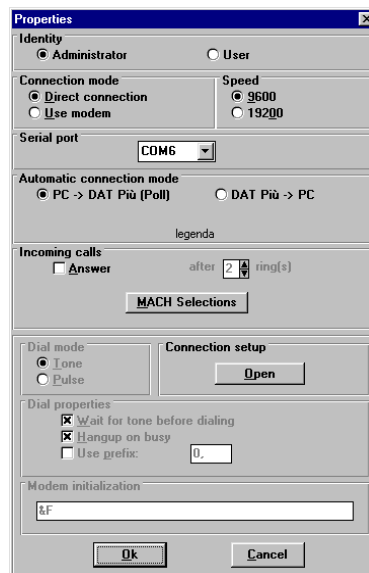
FIG. F – Properties menu

4.5.1   Identity

In this section one can choose the identity of the main user for the installed software. Once set, we recommend not to modify this option, since this could damage the files associated to installed DATs; to simulate connections with the two different identities, use "Connection" opening options (see Section 5).

- **Administrator**: when this identity is chosen and the connection as Administrator is done, the passwords used for connection are stored in memory and re-used for Poll mode.

- **User:** as in the other case, if the connection to installed DATs as user is chosen, passwords are stored in the memory for future automatic connections.

In case of a connection with an identity different from that set in this section, all the files containing information for automatic connections are not modified.

4.5.2   Connection mode

DIRECT CONNECTION

This option must be selected when the computer is connected to the instrument via a null-modem cable (in other words, when the modem is not used to establish the connection with the Dat). When this button is selected, only the controls regarding com port, communication speed, Poll configuration and incoming calls are enabled.

USE MODEM

This option must be selected if a modem is requested to establish the connection between the computer and the instrument. When this button is selected, every control in the property window is enabled.

4.5.3   Serial port

These buttons are used to specify which serial port must be used to talk with the Dat. Available ports range from Com 1 to Com 4 or from Com 1 to Com 8 with a Drop Down menu; the port may even be on a PCMCIA interface or internal modems, provided that they are correctly configured. If a Dos or Windows program is already using a port (e.g. a mouse driver or a fax manager), or if the port is not found, the corresponding button is disabled.

4.5.4   Speed

These buttons select the speed to be used when talking with the Dat or the modem. The allowed speeds are 9600 and 19200 bps. Please note that other communication options (start and stop bits, parity, protocol) are set by default and cannot be changed.

Note: To automatically monitor more than one "DAT Più", make sure that all DATs connection speeds feature the same configuration.

4.5.5   Automatic Connection mode

These options allow the mode selection for the automatic connection. In fact, it is possible to program the Dat so that it will call the supervisory PC on which the WinCom5 is running. This operating mode is available beside to the usual connection mode where the PC dials and calls the Dat units. It is not allowed to program a mixed operating mode: the download calls should be all in the same direction (either the Dat calling the PC, or the PC calling the Dat units). In case the WinCom5 is configured to make calls (Poll), and you open a connection with a Dat that is in turn, configured to call the PC (i.e. in the opposite way), a warning error is issued. Moreover please be aware that is in the user responsibility to make a **correct calling schedule** when programming this mode, so that all the managed Dat units will call at different time slots. This to avoid possible congestion on the receiving line of the PC.

The option *PC -> DAT Più* (Poll) enables the outgoing calls from the PC: all details of this mode (start call, period) should be programmed in *Connection Setup | Poll mode setup* (See Section 4.6 "Connection Setup").

The option *DAT Più ->PC* enables the operating mode where the Dat units will call the PC: all details of this mode should be programmed during the real-time connection with each single Dat which you like to be called from.

4.5.6   Incoming calls

WinCom5 may answer incoming calls arriving from a Dat, in both connection modes (direct and with modem): remember that the Dat may be enabled to call the host PC upon an alarm trigger, or upon filling the 60% of the alarm buffer. When such a call is performed, WinCom5, if enabled, will accept the call, downloading the alarm queue, and displaying it on-screen.

To enable WinCom5 to accept incoming call, the *Answer* checkbox must be checked. If a *Direct connection* is used, the *after rings* textbox will be disabled, being actually useless. If instead *Use modem* is selected, the *after rings* textbox is enabled, and the user may set after how many rings the modem is to go off-hook, whether typing in the desired number, or clicking the spin button on the right of the textbox. Please note that the rings are not counted using the ring wire of the serial cable, but by programming the appropriate modem register (it counts the strings "RING").

- In PC -> Dat mode: if enabled, it accepts calls for alarms

- In Dat -> PC mode <u>it must be enabled</u> or the system will not work. With this mode, the alarm acceptance is always enabled

MACH SELECTION
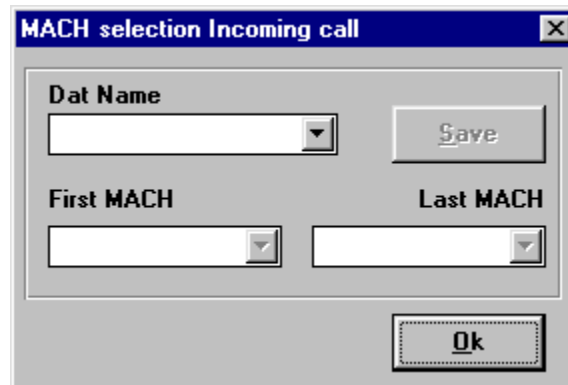
This button opens the following window:

FIG. G – MACH selection for incoming call

This window is used as a support for incoming call programming, so it is possible to select the MACHs from which data are to be downloaded. With incoming calls the Dat doesn't know which are relevant MACHs, therefore this window has to be used:

- **Available Dats:** all registered Dats with ID allocation.

- **First MACH:** the first MACH in the list of instruments which are to be downloaded during incoming call transfer.

- **Last MACH:** the last relevant MACH.

Therefore, all MACHs having address comprised between First MACH and Last MACH boxes are downloaded.

- **The Save pushbutton** allows you to apply changes for the single modified DAT.

4.5.7   Dial mode

TONE

If this option is selected, the modem uses tones when dialling phone numbers.

PULSE

If this option is selected, the modem uses pulses when dialling phone numbers.

4.5.8   Dial properties

WAIT FOR TONE BEFORE DIALING

If this check box is marked, the modem will wait for the dial tone before dialling. Please note that the dial tone changes among countries, and not all modems may be able to detect it.

HANG-UP ON BUSY

If this check box is marked, the modem will hang up the line after detecting the busy tone, returning the "Busy" error.

If this check box is not marked, when dialling a busy phone number, the modem will wait for the number of seconds stored inside the S7 modem register, and then will return the "No carrier" error.

USE PREFIX

This feature is useful when it is necessary to dial a prefix in order to get the line (e.g. if a PBX is present). If this check is marked, WinCom5, when opening a modem connection, will dial first the specified prefix, and then the requested number.

After marking the checkbox, the textbox on the right becomes enabled, and it is possible to type the desired prefix. It is even possible to insert commas (","), if a pause is desired between dialling the prefix and the actual number. Note that the pause length depends on the value stored in the S8 modem register.

Prefix examples:

0, 42,,

4.5.9   Modem initialisation

This textbox may contain any valid AT-string, which will be sent to the modem during initialisation. Please note that the actual string sent will contain an AT prefix, user initialisation (as typed in this textbox), and WinCom5 initialisation commands. In the previous example being the user string "**&F**", WinCom5 will issue the following command to the modem:

AT**&F** <other modem initialisation commands such as V1 etc>

Please note that sometimes it could be useful to set here the command **&F** in case you want to reset the modem to the factory default configuration when using the WinCom5 program.

This command string is sent to the modem when exit the *Properties* window, in case you have programmed to answer to incoming calls, or when starting a call towards a Dat unit by means of a modem, before dialling the number (see in the menu bar the command *Connection | Open*).

The command string is:

AT <user string if available> &D2 V1 Q0 S0=0 W2[iii] (DTR closes the connection, Verbose listing, Response codes enabled, No auto-answer, Info on line connection speed)

[iii] The command W2 is not fundamental, even if this command is not accepted by the modem, the system works as well.

4.6   Connection setup

This button opens the following window:

FIG. H – Connection setup

In this window the user may edit the Dat site list (when a modem connection is selected, the number to call is chosen from this list). The list may contain up to 300 numbers, and it is possible to add, edit and delete the entries. The limit is given by the Dat ID, used to uniquely identify the Dat calling the host PC. Every entry of the list contains a description, a phone number, and the *Enabled for polling* checkbox, which is used during Poll mode. It is also possible to set the Poll mode connection parameters (Poll). If direct connection is set, it will appear only the frame for the Poll's configuration for the only one connected Dat.

The *Close* button saves changes and closes this window.

4.6.1   Edit Dat site list

ADD

This button lets the user add a new entry to the site list, provided that there is still enough space for it.

When this button is pressed, the controls *Description*, *Number* and *Enabled for polling* are enabled, together with the *Ok* and *Cancel* buttons. The user may now input a new entry: *Description* is a string describing (for example, the location of the Dat), while *Number* is the phone number to call in order to establish the connection. The *Enabled for polling* checkbox is used in Poll mode: if checked the Dat is called and data are downloaded, otherwise it is skipped. This is useful if an instrument has to be left off-line for some reason (e.g., for maintenance), but we do not want to remove its entry from the site list.

After the textboxes have been filled, the entry may be recorded with the *Ok* button; the operation may be aborted clicking the *Cancel* button.

When an entry is added, the list is sorted by the *Description* field.

EDIT

This button is enabled when an entry of the site list is selected. If it is pushed, the data of the highlighted entry are copied to the textboxes, and the user is allowed to modify them. Changes may be accepted with *Ok*, or refused with *Cancel*.

After the changes have been accepted, the list is sorted by the *Description* field.

DELETE

This button is enabled when an entry of the site list is selected. If it is pushed, the highlighted entry is removed from the list; no confirmation is requested, and data cannot be recovered.

4.6.2   Poll mode connection *PC* ➜ *DAT Più*

WinCom5 may be programmed to call every (enabled) Dat recorded in the site list or, if direct connection is set, only the installed DAT, in order to download the acquired data: this feature is called *Poll mode connection* (or automatic connection). It is possible to set when the sweep must begin, and the sweep period (interval between two series of connections).

WinCom5 will try to dial a Dat up to two times, if a connection cannot be established; when the Dat answers, WinCom5 will transmit the password, if any, and will begin downloading the records acquired (the alarms will not be downloaded); then, it will close the connection as soon as the Dat memory is empty. Please note that in case of timeout (due for example to noise along the line), WinCom5 will ask data up to 4 times, and then, if a correct answer is not received, will hang up the line. If the password is not correct, the communication is aborted and the event is logged. For all Poll session if a call can't be performed the software puts the number in a secondary list and at the end of the first Poll list, starts to make the calls of the secondary list. The software do this operation two time and then stops the Poll.

To decide which instrument is to be downloaded, carry out a manual connection and download data. For that DAT, the Poll data transfer performs exactly the same data download, changing the download beginning date only. Said date is calculated as the one following the date of the last record successfully downloaded with an automatic connection.

Every modem operation, and the number of records downloaded from each Dat, is recorded in the log file (see in the menu bar *File | View connection log*) in order to let the user know what happened during a Poll connection.

Data downloaded from each Dat are stored in a file, located in the WinCom5folder, whose name is:

D<*id*>AA*mm.csv*

where *id* is the 3-digits Dat identifier code, as set in the Dat configuration window (See Section 7.5 "Assign new ID"): in the file datplid.INI you will find the association between the physical 3-digits ID and logical name), AA is the year and *mm* is the month when data are acquired: this means that the same Dat will generate 12 different files during the year. The file will contain the description and the phone number of the Dat called, a row containing the measures acquired, and then the data records. Subsequent calls performed in the same month will append new data to the correct file - there will be no file overwrite.

This file, like every other .csv file created by WinCom5, may be read with every spreadsheet able to import text files.

POLLING PERIOD

This textbox, together with the *hours* and *days*, specifies the interval between subsequent series of calls. The period cannot be shorter than 4 hours, or longer than 7 days. To set the polling period, select the time measure unit (between hours and days), and then type in the textbox the number corresponding to the period you want to set.

START ON

This textbox sets the starting date and time of the Poll connection.

ENABLE

If this box is checked, the Poll connection will be carried out on the date and time indicated, for the set period. To disable the Poll connection, just uncheck this box.

4.6.3   Selection of the Folder for files archives

Usually WinCom5 saves all the files with the downloaded data in the "DATA" folder, which is located inside the WinCom5 installation folder. It is possible, however, to change this setting to get the files in a different user selectable folder, just modifying the WinDATPL.INI file located in the same folder where the installation have been done (usually \WINDATPL). To do this modification, open the file using a normal text editor (e.g. Notepad) and add in section [Misc] the item SavePath: for example:

[Misc]

...

SavePath=D:\DatSave

...

In this way all the downloaded files will be saved in the folder D:\DatSave.

4.7   Choose language

In this window it is possible to set the language to be used by WinCom5. Just click on the button of the desired language; WinCom5 configuration will be updated automatically.

FIG. I – Language selection

4.8   Choose spreadsheet

This command displays a dialog window that is used to specify where is the spreadsheet executable (for example Ms Excel) is located. The selected spreadsheet is used to open the data file created by WinCom5.

5.   Connection menu

FIG. J – Connection menu

5.1   Open connection as User or Administrator

When this option is chosen, WinCom 5 tries to open a connection with the Dat. If a direct connection has been set, WinCom 5 will look for a Dat on the specified serial port: if the instrument does not answer within 2 seconds, WinCom 5 will report an error. If a modem connection has been set, WinCom 5 will display a window containing the Dat list.
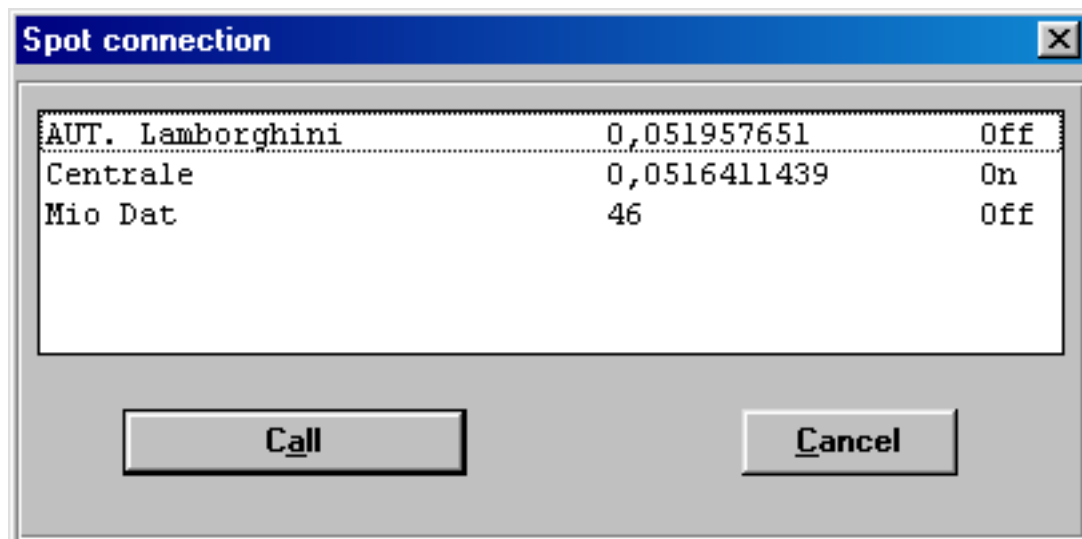

FIG. K – Spot connection menu

The *Cancel* button will close this window without making any call.

Please note that it is possible to call even the Dat that are set as disabled in the Connection setup.

After selecting an item of the list, click the *Call* button: WinCom5 will try to establish a connection with the selected instrument. A status window will be displayed, showing the call progress: it is possible at any time to abort the operation clicking on the *Cancel* button.

Please note that, while making a call, the menu bar is disabled, and the focus is forced to remain on the status window.
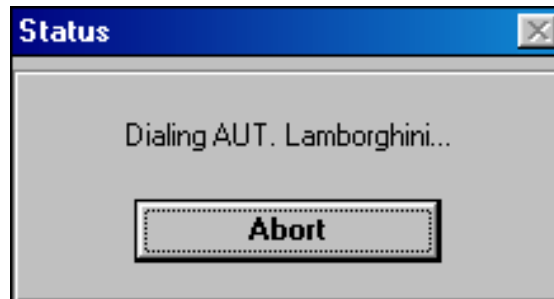
FIG. L – Connection status

As soon as the connection is established, the Dat status is checked. If the Dat is in the "Loader" mode, before this window is displayed, a choice is given (See Section 3 "Quick start "). Once the connection is established, the real transmission speed is indicated. If a password was previously set, the following window will appear:

FIG. M – Verify Password

To continue the program execution it is necessary to enter the correct password. Otherwise, the connection is aborted and it is necessary to repeat the operation.

Then, the Dat internal clock will be automatically updated according to the settings (See Section 7.3 "Set Dat clock"); should this operation fail, a warning message will be reported in the connection register.

CONNECTION AS ADMINISTRATOR

If this mode is chosen, the program user is able to completely modify the DAT configuration setting, and therefore this connection must be protected by a password (See section 7.1.5).

CONNECTION AS USER

If this mode is chosen, the program user cannot modify the DAT configuration setting, and even if he tries to do so, the DAT would prevent it by refusing commands.

We remind you that an Administrator can carry out connections as a User <u>without changing his identity</u>. This is useful, for instance, to check a Dat setting without the risk of changing it.

5.2   Close connection

When this option is chosen, WinCom5 closes the connection (whether via cable or via modem) opened with the Dat.

WinCom5 does not reset its state (*Closed connection*) by itself after the carrier is lost; it will rather show a message inviting the user to execute the *Connection|Close* command.

When a connection is open and a *File|Exit* is requested, the connection is automatically closed.

6.   Network menu

FIG. N – Network menu

6.1   View

This command lets the user access the transparency feature implemented in the Dat. With this feature the user is able to read **any** measure from **every** MACH that may be connected through the RS485 interface to the Dat in real time (actually, data are refreshed every 30 seconds). This means that there is not any more the limit of 9 measures acquirable from MACHs.
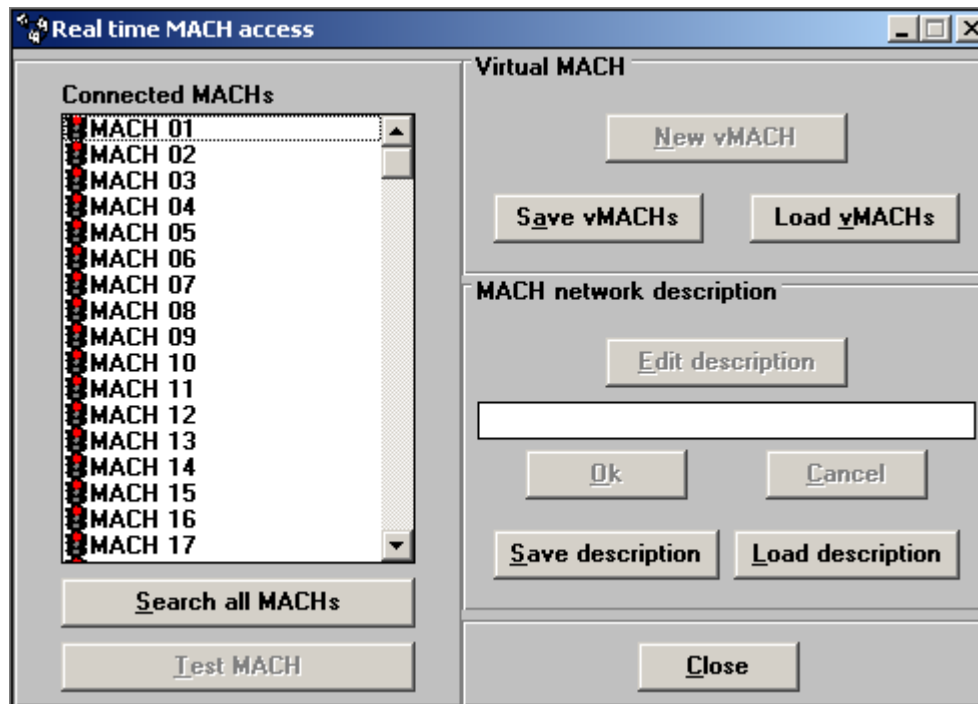
FIG. O – Mach selection menu

Note that, when this window is open, the Dat configuration window cannot be opened.

When the *Close* button is pressed, WinCom5 will check to see if MACH descriptions or the vMACH layout have been changed (See Section 6.1.3 "Virtual instruments: vMACHs"), and if so will ask if changes are to be saved or discarded.

6.1.1   Connected MACHs

CONNECTED MACHS

This list contains 99 items, referring to the addresses available for the MACHs. After the window is opened, the traffic light on the left of each item will be red, and there will be no description for the MACH. Some buttons of this window are enabled only when an item of this list is selected. The last one, the instrument # 99, is indicated as "Pulse Counter" since it is a "Virtual" instrument contained in the DAT to be used as a pulse counter for an external counter reading.

SEARCH ALL MACHS

When this button is pressed, WinCom5 will begin scanning all the MACH addresses, looking for connected instruments. The search may take a couple of minutes, during which a status window will report the search progress. Every time that a MACH is found, the traffic light of the related item in the listbox described above will be changed to green, to sign that the MACH is connected. The operation may be aborted at any moment pressing the *Cancel* button.

TEST MACH

This button will test the connection of the MACH selected in the listbox above; the same operation may be started double-clicking the traffic-light icon of the MACH under test. After the test, the traffic light icon will be changed to reflect the actual state of the MACH connection, and a message box will be shown, reporting the test result.

6.1.2   MACH network description

EDIT DESCRIPTION

This button will let the user enter or edit a description for the MACH selected in the listbox. After clicking on this button, the *Ok* and *Cancel* button will be enabled, and the current description (if available) will be copied in the textbox to be changed. If no description has ever be entered for the selected MACH, the textbox will be blank. Press the *Ok* button to save the new description.

SAVE DESCRIPTIONS

This command lets the user save the MACH descriptions. A dialog box will be presented, in order to assign the folder and the file name. If *Cancel* is pressed in this dialog box, descriptions are not saved.

LOAD DESCRIPTIONS

This command lets the user load previously saved MACH descriptions. A dialog box will be presented, in order to select the description file. If *Cancel* is pressed in this dialog, descriptions are not loaded. WinCom5, before loading a MACH description file, checks whether the current descriptions have been changed since last save, and if so it first prompts the user whether he wants to keep or discard changes. If necessary, the *Save descriptions* process will automatically be invoked.

6.1.3   Virtual instruments: vMACHs

Virtual MACHs (or vMACHs) are virtual instruments whose data are read from the associated real instruments every 30 seconds. A vMACH may show up to 4 measures, chosen from the list of the MACH acquirable measure. Any number of vMACHs may be opened for a single MACH, and on the screen may be displayed vMACHs related to different real instruments. Data shown may be saved in the file `machdata.csv`, located in the WinCom5 folder.

NEW vMACH

When a MACH has been selected from the listbox *Connected MACHs*, press this button to create a new vMACH on the screen. The caption of the created vMACH will report the address of the MACH from which data will be read, and the description (if present).

When a new vMACH is created, its 4 measures are empty. (See Section 6.2 "Virtual MACH ")

Note that a vMACH may be created even if its connection has not been tested (e.g. its traffic light icon is still red): however, if the MACH is not actually connected, when trying to read its data, the WinCom5 will signal a timeout error.

SAVE VMACHS

This command lets the user save vMACHs, acquired measures, and the status of the *Save data* flag. A dialog box will be presented, in order to assign the folder and the name of the file to be saved. If the user presses *Cancel* in this dialog, the file will not be created.

LOAD VMACHS

This command lets the user load previously saved vMACH layouts. A dialog box will be presented, in order to select the file to use. If the *Cancel* button is pressed in this dialog, descriptions are not loaded. WinCom5, before loading a vMACH layout file, checks whether the current layout has been changed since last save, and if so it first prompts the user whether he wants to keep or discard changes. If necessary, the *Save vMACHs* process will automatically be invoked.

If vMACHs descriptions are present (because a description file has been loaded), every vMACH created by this command will contain also the relevant MACH description.

6.2 Virtual MACH

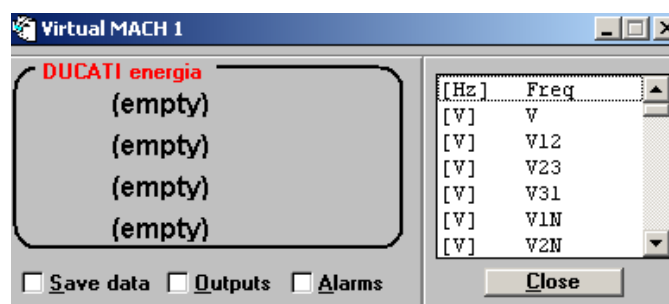When a new vMACH is created, the following window appears:

FIG. P: Virtual MACHs window

As far as the instrument # 99 is concerned, a special window is provided, containing only relevant measures. This instrument, which is built in the DAT Più, can be used to read the energy from energy meter, making the measures displayed in the following figure:
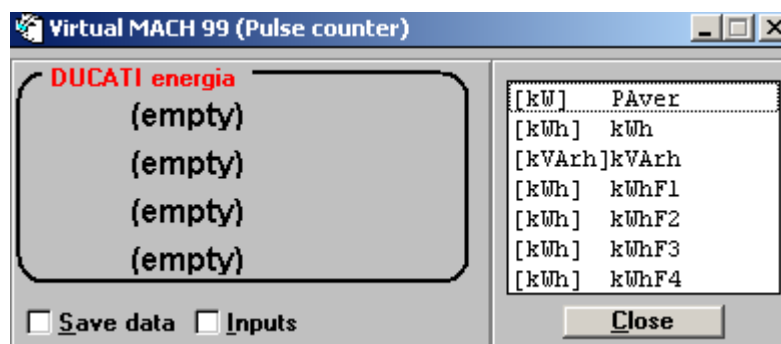

FIG. Q: Pulse counter (instrument # 99) window

A vMACH may display up to 4 measures. To add a measure, just drag it from the list on the right to a measure placeholder on the left. After starting the drag & drop operation, the cursor changes into [image] , and the 4 measure placeholders will be highlighted.
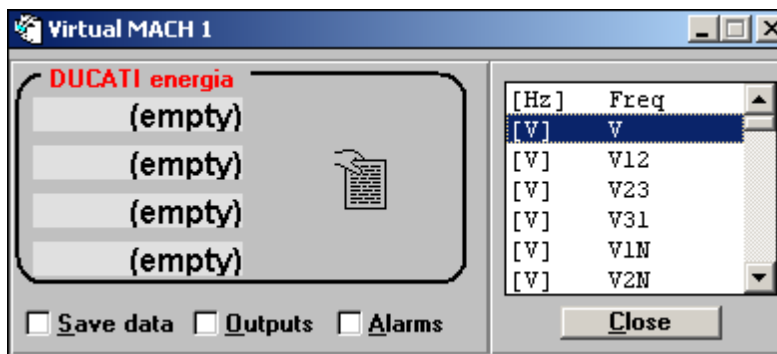
FIG. R – Measurements Drag&Drop

When the cursor is over a placeholder, it will change into [image] , and the measure may be dropped. Dropping a measure elsewhere will have no effect.
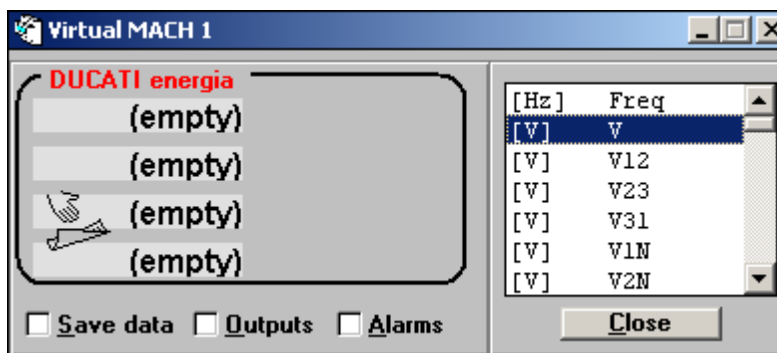
FIG. S – Measurements Drag&Drop

It the user wants to change a displayed measure into a new one, it is enough to repeat the drag&drop with the desired measure. To remove a measure, just drop it back into the available measure list.
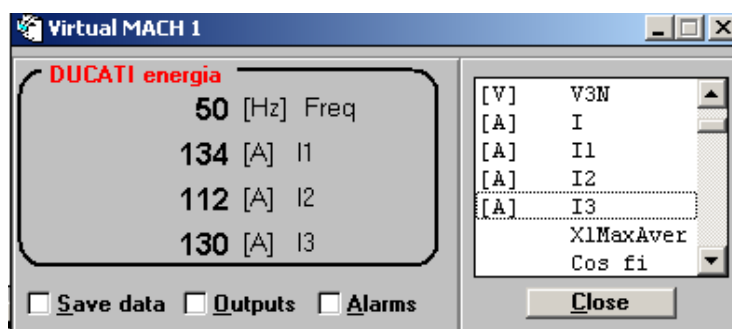
FIG. T – Adding Measurements

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Every measure placeholder may contain one of the following strings:

String	*Meaning*
Number	value of the measure read from the MACH instrument
(wait)	WinCom5 is about to read a new value from MACH, or the instrument is not connected (timeout)
(empty)	no measure has been assigned to the placeholder
(???)	the requested measure is not available by this type of MACH

If the *Save data* flag is checked, values read will be saved into `machdata.csv`.

The *Outputs* checkbox is described in Section 6.2.1 "MACH outputs".

The *Alarms* checkbox is described in Section 6.2.3 "Alarms"

The *Close* button will close the current vMACH.

6.2.1   MACH outputs

Every vMACH may show a window reporting the MACH output status. Marking the *View out* checkbox will make the lower window appear:
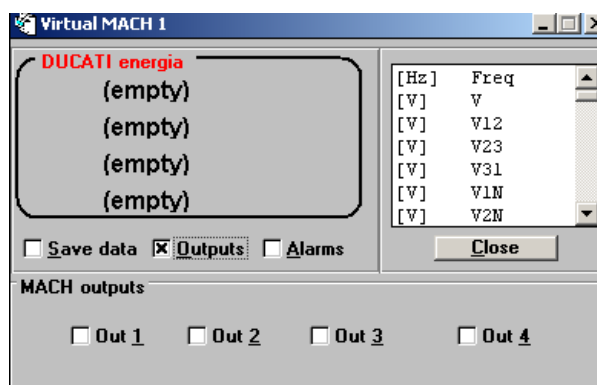

FIG. U – MACH's Output

As soon as the frame is opened, the MACH output status is read by the WinCom5, and the checkboxes *Out x* are updated: if an output is on, the checkbox is marked, otherwise it is left cleared. In the previous example, outputs 1 and 3 of the MACH whose address is 5 are on.

After the status has been read, it is possible to set or reset an output simply by clicking on the desired *Out* checkbox: the appropriate command is sent to the MACH, and then the new output status is immediately read. Please note that:

• when the MACH 30/20 or Smart Più alarms are not programmed, the output status may be freely set or reset
• when the MACH 30/20 or Smart Più alarms are programmed, an output may be forced to be on, but CANNOT be turned off by WinCom5; if an output set by a MACH alarm is reset, the checkbox will be automatically marked after being cleared by the user
• when the MACH 30/20 or Smart Più outputs are programmed for pulses, they cannot be controlled and after marking the checkboxes, they will be automatically cleared

- when a vMACH is linked to a MACH Smart (which does not have outputs), the output status will always be off, and after marking the checkboxes, they will be automatically cleared
- when a vMACH is linked to a MACH Smart 96 (which has a pulse output), the output status is automatically unmarked, and the output cannot be controlled by means of the WinCom5

Even if it is possible to open the output frame on every vMACH, even if linked to the same real MACH, it would not make much sense, because only one of the output frames would be updated. For this reason it is suggested to enable only in one vMACH per MACH the output frame.

The MACH output status is not recorded into the `machdata.csv` file.

6.2.2 "DAT Più" inputs

The DAT Più features a pulse counter. This instrument is linked to two inputs: *input 1* and *input 2* for pulse counting. Moreover, another two digital level inputs are available (*input 3, input 4*) and can be monitored. The following figure shows the window dedicated to this instrument, to which the address 99 is reserved.
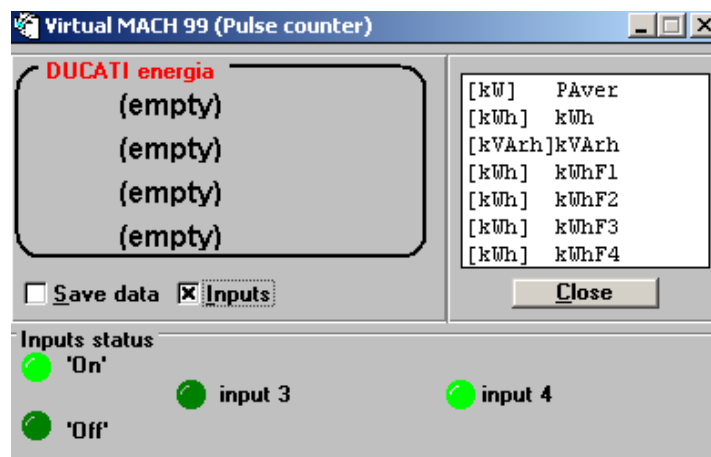
FIG. V – DAT Più Inputs

Two LEDs indicate input status:

- LED 'On': input enabled (shortcut to common)
- LED 'Off': input disabled (open input)

These are updated when the frame is opened, then they are updated together with the other measures.

6.2.3 Alarms

This section allows you to program the new generation of Ducati instruments[iv] possessing alarm functions (e.g. Smart Più). By checking "Alarms" a menu is activated, which allows you to program the outputs of the instrument connected to the Ducati network. Besides the alarm function, you can also set the pulse generator output.

[iv] This functionality is not right for MACH 30 alarms programming.

FIG. W – MACH's Alarms

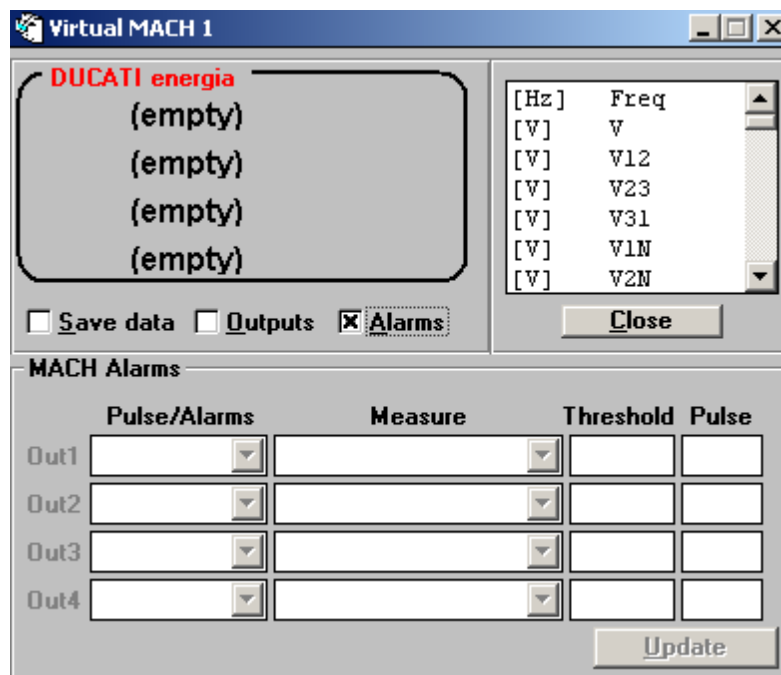In the **Pulse/Alarm** section you can choose the programming to be associated to the output. There are three possible options:

_[v]: No programming, therefore freely usable from the overlying panel

Pulse: Output 1 can generate pulses related to Active Power, Output 2 can generate pulses related to Reactive Power. For further details see the instrument's instruction manual. Following this choice, the last text box is activated, so one can enter the power value related to each pulse (KWh / pulse) and (KVarh / pulse)[vi].

Alarms: After having activated this function, measures and alarm threshold can be chosen. Measures relevant to the Smart Più[vii] are the following:

No.	Measure
1	Voltage phase 1 – neutral [V]
2	Voltage phase 2 – neutral [V]
3	Voltage phase 3 – neutral [V]
4	Three-phase equivalent voltage [V]
5	Current line 1 [A]
6	Current line 2 [A]
7	Current line 3 [A]
8	Three-phase equivalent current [A]
9	Active power line 1 [W]
10	Active power line 2 [W]
11	Active power line 3 [W]
12	Three-phase equivalent active power [W]
13	Reactive power line 1 [VAr]
14	Reactive power line 2 [VAr]

---

[v] Under Score.
[vi] The value is dependent by the KA and KV programmed on the instrument.
[vii] The value is dependent by the KA and KV programmed on the instrument.

15   Reactive power line 3 [VAr]

16   Three-phase equivalent reactive power [VAr]

17   Power factor line 1 (unit with three decimals)

18   Power factor line 2 (unit with three decimals)

19   Power factor line 3 (unit with three decimals)

20   Three-phase equivalent power factor (unit with three decimals)

21   Mean active power line 1 [W]

22   Mean active power line 2 [W]

23   Mean active power line 3 [W]

24   Mean three-phase equivalent active power [W]

25   Mean reactive power line 1 [VAr]

26   Mean reactive power line 2 [VAr]

27   Mean reactive power line 3 [VAr]

28   Three-phase equivalent mean reactive power [VAr]

29   DF: Mean three-phase active power, calculated at $2/3$ of the mean time [W]

30   DF: Mean three-phase apparent power, calculated at $2/3$ of the mean time [VA]

31   DF: Mean three-phase active power, calculated at $1/2$ of the mean time [W]

32   DF: Mean three-phase apparent power, calculated at $1/2$ of the mean time [VA]

33   DF: Mean three-phase active power, calculated at $1/3$ of the mean time [W]

34   DF: Mean three-phase apparent power, calculated at $1/3$ of the mean time [VA]

To make changes, just modify data and press the **Update button** to re-program the instrument.
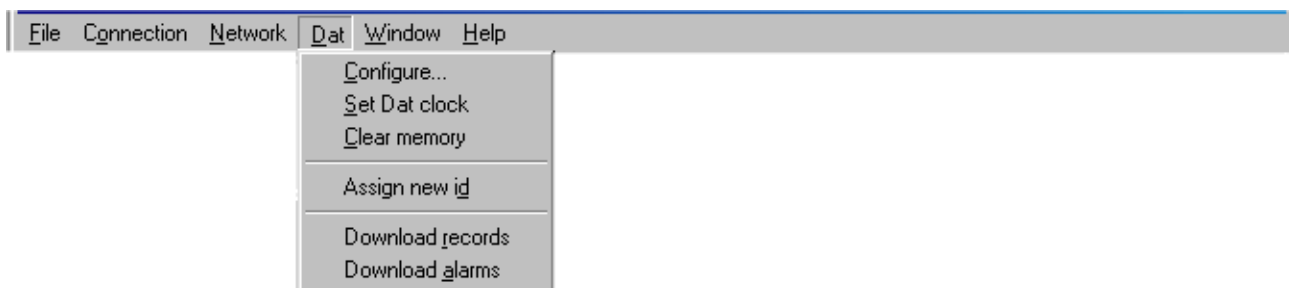
7.   Dat menu

FIG. X – Dat menu

7.1   Dat Configuration

This command opens a window showing the current configuration of the Dat and modem. This window is displayed automatically as the computer is connected to the instrument. The configuration of the instrument may be changed as desired, and written back to the Dat.
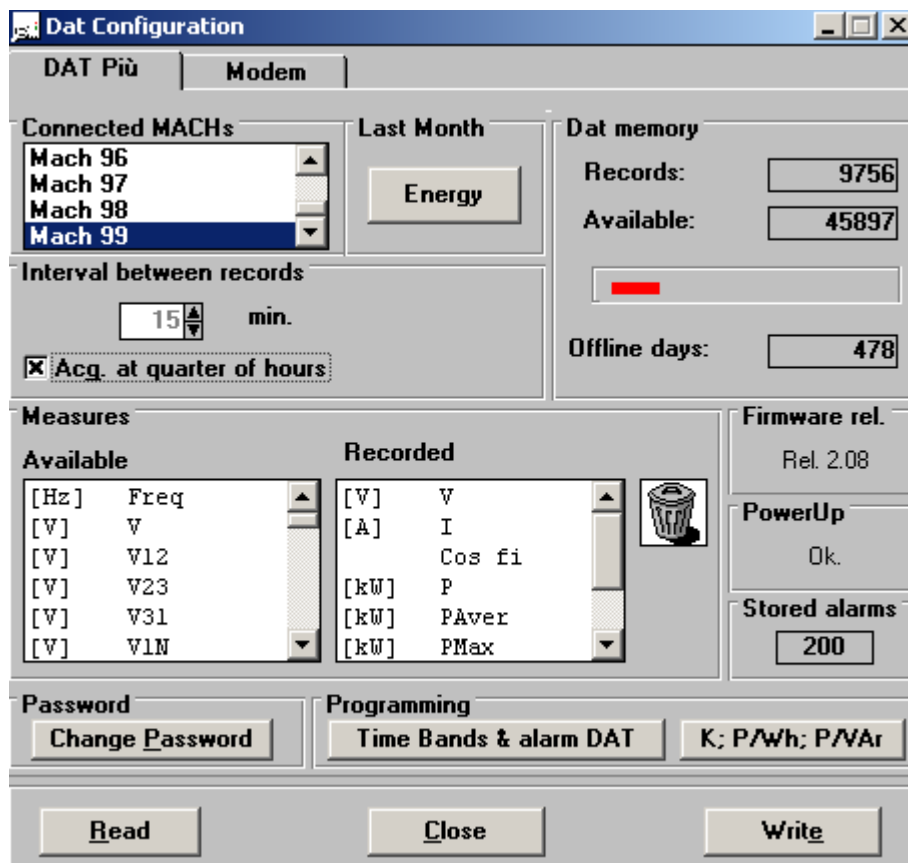
FIG. Y: Acquisition configuration window

When the Dat configuration window is open, it is not possible to access the MACH network with the transparency feature.

Pressing the *Read* button the Dat configuration window will be updated.

Instead when the *Write* button is pressed, the configuration displayed on screen is written to the Dat. If writing the new configuration forces a memory clear (because MACHs connected and/or measures recorded have been changed), user is prompted to confirm the operation. When finished, the memory status is read back and updated on screen.

> **Note: when changing Dat configuration, do not forget to <u>save</u> it into the Dat unit by pressing the <u>WRITE</u> button before closing.**

7.1.1   Connected MACHs

When a line is highlighted a MACH instrument is connected to the Dat and it must be set, to answer, to the indicated address.

The selection of connected MACHs (1 to 99) is done by means of a listbox. To select a MACH, just click on the desired MACH. The number is the analyser's address. The user is completely free to elect any MACH even with non subsequent addresses. In the following example, a selection of MACHs with address 9, 10 and 12 is shown.
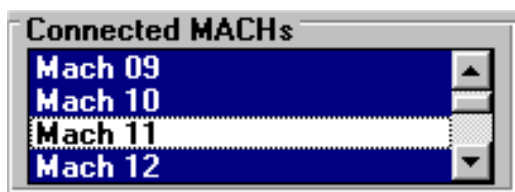
FIG. Z – Connected MACH

It should be remembered that if two or more instruments share the same address number, no one of them will be able to send data when polled.

7.1.2   Last month

In this section the key button *Energy* is present; this command button offers the possibility to view immediately the time-band energies consumed in the previous month.

7.1.3   Interval between records

This value specifies the time between subsequent acquisitions of data measured by the connected MACHs. It may range from 1 to 60 minutes, and can be set either typing directly the desired value inside the textbox, or clicking on the spin control on the left of the textbox. By selecting the "*Acq. at quarter of hours*" checkbox, the acquisition every 15 minutes at the quarter of the hour is activated (e.g. the acquisition will be done at 12:00, 12:15, 12:45 etc). In this case the box for the time interval selection is disabled. In case an acquisition cannot be completed (e.g. the Dat is turned off) the Dat unit re-schedules the acquisition at the next quarter; as an example, in the case the Dat is turned off at 12:15, the data acquisition will NOT be done, and the next acquisition will occur at 12:30.

In this case, a special attention shall be paid to the time interval for acquisition as to the number of values selected and the number of MACHs. In fact, if the number is too high, it could happen that not all acquisitions are done and therefore data are lost.

The following table shows some typical DAT Più programming, and for each of them a maximum acquisition time is indicated. Time values refer to the worst case, i.e. acquisition contemporary to the PC connection and record download in progress.

Number of instruments	Recorded values	Time passed (worst case)	Minimum "Time interval" recommended
99	9	00:10:45	12'
99	1	00:01:15	2'
70	9	00:07:40	9'
50	9	00:06:25	7'
31	9	00:03:25	4'
31	1	00:00:24	1'
20	9	00:02:20	3'
20	1	00:00:15	1'
12	9	00:01:20	2'
12	1	00:00:10	1'
6	9	00:00:40	1'
6	1	00:00:06	1'
1	9	00:00:09	1'
1	1	00:00:01	1'

N.B. The time indicated is the time required by the DAT to query all programmed instruments and save the relevant record. If a time shorter than the time necessary to complete the acquisition is programmed the query cycle is stopped and restarted from the beginning and therefore the record is skipped.

7.1.4   Measures

The controls in this box are used to select the measures to be stored in the Dat. Up to 9 measures may be chosen: note that the measures selected are acquired from all the connected MACHs, in other words it is not possible to have different measures recorded from different MACHs connected to the same Dat.

The *Available* list contains all the measures computed by the MACH instruments: note that not all of the measures are available for every type of MACH instrument: if a measure is not computed from a MACH, it will answer with an undefined symbol (_____) when asked such a measure.

The *Recorded* list contains the measures to be acquired from the connected MACHs. As reported above, up to 9 measures may be selected; WinCom5 doesn't let the user record more than once a given measure.

To add a measure to the *Recorded* list:

double-click on the desired measure in the *Available* list, or

select the desired measure from the *Available* list and press the Enter key, or

drag the desired measure from the *Available* list onto the *Recorded* list. When dragging starts, the cursor changes into . When the cursor is over the *Recorded* list, it changes into , and the measure may be dropped just by releasing the mouse button.

To remove a measure from the *Recorded* list:

double-click in the *Recorded* list on the measure to be removed, or

select the desired measure in the *Recorded* list and press the Enter key, or

drag the desired measure onto the trash bin. When dragging starts, the cursor changes into .

When the cursor is over the trash bin, it changes into , and the measure may be removed just by releasing the mouse button.

7.1.5   Password

By means of this function it is possible to modify or add an access password, to prevent the use of the DAT Più by unauthorised personnel. It must be noticed that the User can't modify his own password, only the Administrator can modify both passwords.

CAUTION: once the access password is entered, the "DAT Più" configuration cannot be changed any more, <u>even manually, by means of the front panel keyboard</u>[viii]. Therefore, this function shall be enabled with caution.

[viii] Once the password is entered, some display functions are only locally available. For further details, see the DAT Più user's manual.

After a connection to the instrument as Administrator, (see 5.1 Open connection as User or Administrator) press the password button to activate the following window:

FIG. AA – Administrator Password

By means of this window it is possible to enable, change or remove the Administrator's password.

- To pass from free access to protected access, just leave the "old password" box blank and enter the new password twice in the "new password" and "confirm password" boxes

- To change the existing password, first enter the current password in the "old password" box, then enter the new password twice in the "new password" and "confirm password" boxes

- To remove any protection, just enter the current password in the "old password" box, then leave the "new password" and "confirm password" boxes blank

- Pressing the "cancel" button , the situation remains unchanged and it is possible to proceed with the User password

After the Administrator password is entered, the User password can be changed or eliminated by means of the following window:

FIG. BB – User Password

- To pass from free access to protected access, or to change the existing password, just enter the new password twice in the "new password" and "confirm password" boxes[ix].

- To remove any protection, just leave the "new password" and "confirm password" boxes blank.

- To leave the situation unchanged, press the "cancel" button.

Note: Once the "OK" button is pressed, settings are enabled and sent to the Dat even if the "_Write_" button is not pressed.

[ix] Is not necessary for the Administrator to remember the User's password for modify it, but is a good thing to note it.

7.1.6   Dat memory

This box reports information about the Dat memory status.

The *records* field tells how many records are stored inside the Dat, while the field *available* reports how many records may still be stored without overwriting previously acquired data. The gauge drawn just below these fields displays graphically the same information (note that *records + available* = Dat memory). The *off-line* field tells for how many days the Dat is able to record data without overwriting old records.

Please note that the number of records which may be stored without overwrite depends on how many MACHs are connected, and on how many measure are recorded; the interval between acquisitions influences the number of days that the Dat may run without overwriting older data.

7.1.7   Miscellaneous

FIRMWARE RELEASE

This box reports the release of the Dat firmware.

POWER UP

This box reports the Dat power-up status: it may be

Ok	no problem
Data Lost	Acquisitions data have been lost, while setup configuration is ok. Data may be lost on a low-battery condition
All Lost	Both acquisitions and setup have been lost
Mem Conf KO	There is a problem when writing the configuration into the non-volatile memory of the Dat unit. Please contact Ducati Sistemi for assistance

The Log file is updated every time one of these error conditions occur. Also, if the connection is manual, the user is also warned by a POP UP message.

STORED ALARMS

This box reports the number of alarms stored inside the Dat.

7.1.8   Programming

In this section there are two options: one for the "Time Bands and alarms" and one for the transformation factor. In both the windows there're the same two button "Exit" and "Update".

UPDATE

When the button is pressed the program will try to update the configuration displayed in the window. At the end the attempt the value will be read from the DAT so if the user had insert a wrong value it can see immediately if the value was accepted from the DAT.[x]

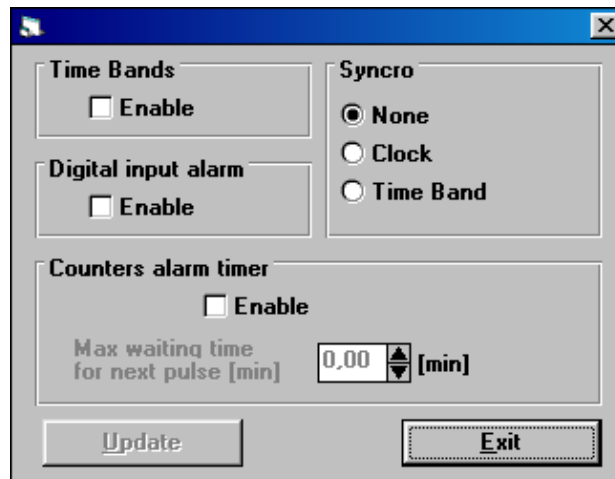[x] This button become active when any value of the windows is modified.

EXIT

When this button is pressed the situation remaining as was at the last pression on the Update button.

7.1.8.1   Time Bands and Alarms

When the *"Time Bands and alarms DAT"* button is pressed, the following window is displayed:

FIG. CC – Time band and alarms selection

In this window the user can program the alarms pertinent to two digital inputs (input 3 and 4), count alarms (input 1 and 2), enable time band management and set the synchronisation mode.

TIME BANDS

This option allows the user to enable time band management using inputs 3 and 4 (for further details, see the DAT Più user's manual).

DIGITAL INPUT ALARMS

When this checkbox is marked, every time one of the two inputs changes its status, an alarm is generated.

COUNTER ALARMS TIMER

This function manages the alarms related to the DAT Più two inputs 1 and 2 and due to count loss. When the waiting time is set (in minutes) if after that time the DAT still hasn't received any pulse on each of the two inputs, the relevant alarm is generated. When the count restarts, a new alarm is generated as well to indicate that the situation is resumed.

SYNCHRONISATION

This option allows the user to enable the instrument network synchronisation (to compute measure means) with a sample event. Following are the options:

- **None**: no synchronisation

- **Clock**: when the DAT time reaches 4:00 a.m. a "Reset mean values" command is sent to all linked instruments

- **Time band**: when the time band passes from F4 to any other band (time: 6:30 a.m.), the DAT synchronises its clock and sends a "Reset mean" command to all linked instruments. Note that the Dat internal clock synchronisation only pertains to minutes and seconds, while the other fields remain unchanged and will hold the values set by the PC

7.1.8.2   Transformation factor

When the *"K; P/Wh; P/VArh "* button is pressed, the following window is displayed:

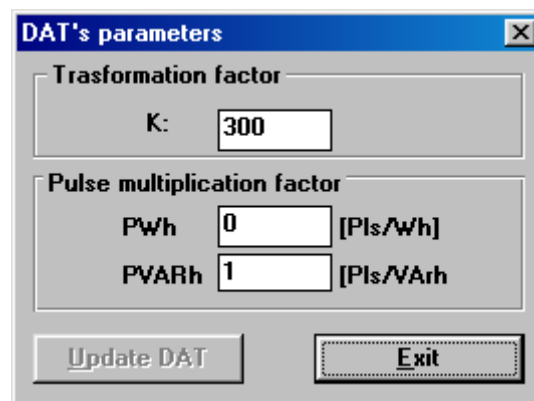**FIG. DD – Transformation Factor**

In this window the user can program the transformation factor used by DAT.

K

Indicate the constant value that include both the amperometric and voltmetric factor K = TA x TV

P/WH

Indicate how many pulse it must receive for one Wh of active energy.

P/VARH

Indicate how many pulse it must receive for one VArh of reactive energy
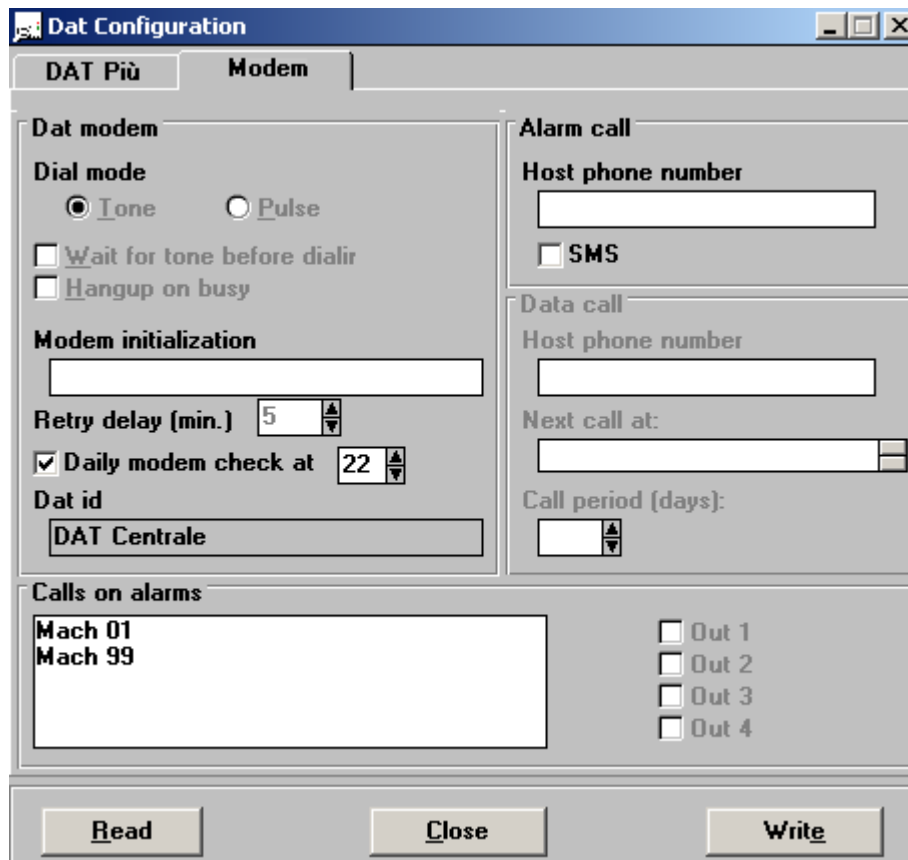
See Dat's manual for more details.

7.2   Modem

FIG. EE: Modem configuration window

These controls are used to configure the modem connected to the Dat.

7.2.1   Dat Modem

The *Dial mode* option allows the user to choose between pulse and tone.

Wait for tone before dialling: the modem must wait for the tone before dialling. Not all modems can detect this tone.

Hang-up when busy: the modem immediately hangs up when the line is busy. If this checkbox is not marked, when the line is busy, the modem will wait for the time indicated in one of the S registers of the modem before hanging up. Not all modems can detect this tone.

Modem initialisation: to send further initialisation commands. Don't send commands not strictly linked to dialling.

Retry delay indicates the time between calls made by the Dat to the PC, in case the connection cannot be reached. It can range from 1 to 10 minutes. The Dat tries three times, then the operation is aborted.

Dat Id is necessary to identify the Dat (See Section 7.5 "Assign new ID").

Then, telephone numbers follow.

Daily modem check at ... This function makes the Dat send an initialisation string every day at a fixed time. Normally, the time chosen is a couple of hours before the usual call time. The purpose of this function is to avoid any modem malfunctioning due to glitches or other causes. We recommend the usage of this function particularly with the modem switch-off timer.

7.2.2   Calls on alarm

When one of the MACH 30/20 or "Smart Più" are connected to the Dat, or when the Dat alarms are enabled, the instrument can carry out a call to the PC if the alarm status changes. This can be set in this section. Please note that the displayed list contains only the connected MACHs selected in the previous frame (See Section 7.1.1 "Connected MACHs ").

Select a MACH from the list of connected MACHs to access alarm setup. Checkboxes on the right, when marked, indicate that the Dat must call the PC upon a variation of alarm in the selected MACH. The call can be programmed upon variation of one or more inputs of a MACH, or it is possible to ignore all the outputs of a MACH. In the following example, the Dat is programmed to execute a call upon the variation of alarms 2 and 4 of MACH at address 3.
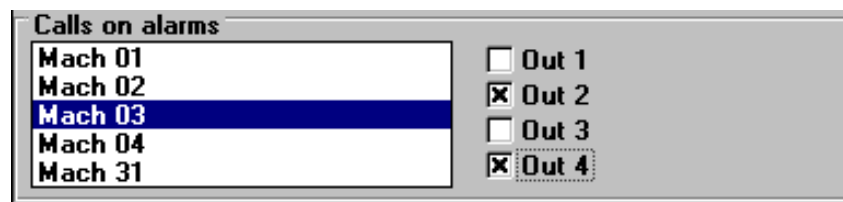

FIG. FF – Calls on alarm menu

Please note in order to get an alarm record and optionally a call on alarm, the alarm feature must be first enabled on the Mach instrument. Note that even if no alarm is set for immediate call, the Dat will still try to call the PC after occupying 60% of the memory reserved to alarms. This is true provided that a telephone number is entered in the *Alarm call* box

7.2.3   *Alarm call*

Host telephone number. It is the number that the Dat dials when trying to connect to the PC to upload alarms. This number can contain digits and commas (if a pause is requested during dialling). If the Dat shall never try to call the PC, this box must be blank. As an alternative, in this frame a "SMS" checkbox is available, allowing the user to send an SMS to the number indicated above. This function is available only if a GSM modem is connected to the DAT Più and if the number corresponds to a cellular phone.

7.2.4   *Data call*

Host telephone number. It is the number that the Dat dials when trying to connect to the PC to upload alarms. This number can contain digits and commas (if a pause is requested during dialling). This box must be checked when the automatic call mode for data upload from the Dat to the PC is to be enabled. When a telephone number is entered, the following options are enabled:

Next call at: to display and program date and time of the next call that the Dat is carrying out to upload data.

Call period (days): to set the interval between calls for data upload (1 to 15 days).

Note that if WinCom5 was configured to call Dats in the automatic mode (Poll: PC -> DAT), *Data call* fields are disabled. Also, if in this case a Dat enabled to call the PC is detected, an error is signalled and the user is prompted to erase the telephone number in the *Data call* box to disable the Dat->PC connection.

Regarding the characteristics of the file where data are stored, the instructions given for the other call mode apply (See Section 4.6.2 "Poll mode connection *PC* ➜ *DAT Più*").

7.3   Set Dat clock

When this option is chosen, WinCom5 writes to the Dat the current time of the PC. Note that if the "Time band" synchronisation is enabled, neither minutes nor seconds are updated. (See Section 7.1.8.1 "Time Bands and Alarms")

7.4   Clear Dat memory

After choosing this command, the user will be prompted for confirmation, and then WinCom5 will **clear both memory areas** (acquisitions and alarms) of the Dat.

7.5   Assign new ID

Each Dat unit should be assigned an identifier (Dat ID). The maximum ID is 300 and is automatically managed by WinCom5 so that to create an association between the *physical* ID and a *logical name*. In other words, the user can assign a name to a specific Dat unit (e.g. "Ducati Production") which will be connected to an ID number assigned to the Dat by WinCom5 and stored in the file DATPLID.INI (located in the installation folder). From this moment on, the connection register always displays the logical name each time operations concerning the Dat are performed.

To assign a new ID during the connection with the Dat: select the option *Assign new ID* from the Dat menu: a window box will open allowing to write a new *logical name*, while proposing the actual name of the currently connected Dat (which can be modified). This new name will be automatically associated to the first free *physical* ID (to do so, the WinCom5 program first examines the association file and then gets a free ID). Press the OK button to save the new name (to do so the WinCom5 program first send the *physical* ID to the Dat unit, then updates and writes the association file). When first installing a DAT Più (or after a "Setup Lost" condition) the Dat ID is set to 1; this value is therefore assigned by default to a standard name in order to remind the user to make an *ID assignment*.

In case you wish to remove an association, open the file DATPLID.INI with a normal text editor and remove the line containing DAT_IDxx = *<name to be removed>*.

7.6   Download records

This command is used to move the acquired data from the Dat memory to the host PC disk. WinCom5 first ask for the mode of data transfer:
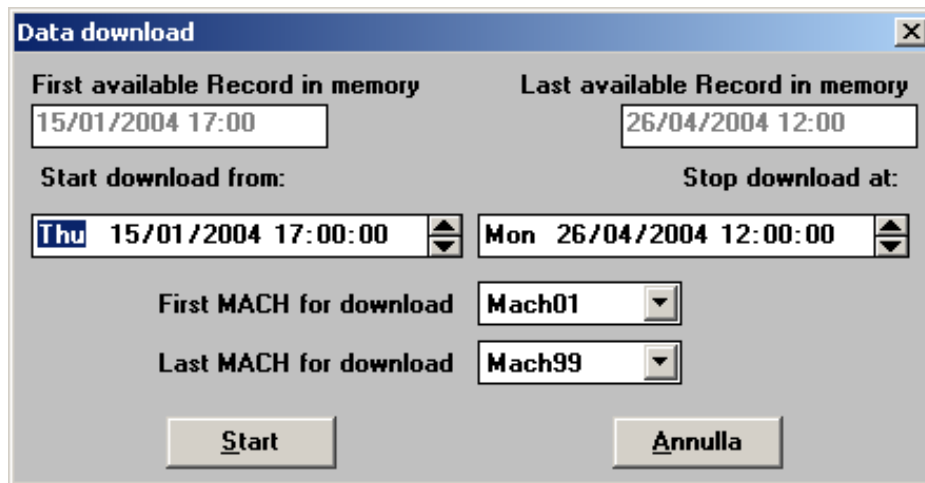
FIG. GG: Download configuration window

This window contains two main sections:

- the first is the time window

- while the second concerns the set of MACHs to be viewed.

The two upper boxes contain the first and the last date in the DAT archive memory. In the two others you can enter the start and end of the requested time interval. Logically, dates can be neither previous to the acquisition start date, nor subsequent to the last stored record.

The last selection concerns the MACH to be viewed: just choose the first and the last desired MACH from the list. All the MACHs comprised between the first and the last chosen will be downloaded from the DAT.

After refreshing some configuration data, WinCom5 will begin to download the records from the Dat, saving them into a file, located in the WinCom5 folder. The name of the file created depends on the date and time in which the download began, thus being unique. On screen, a status window will be displayed, showing the operation progress.
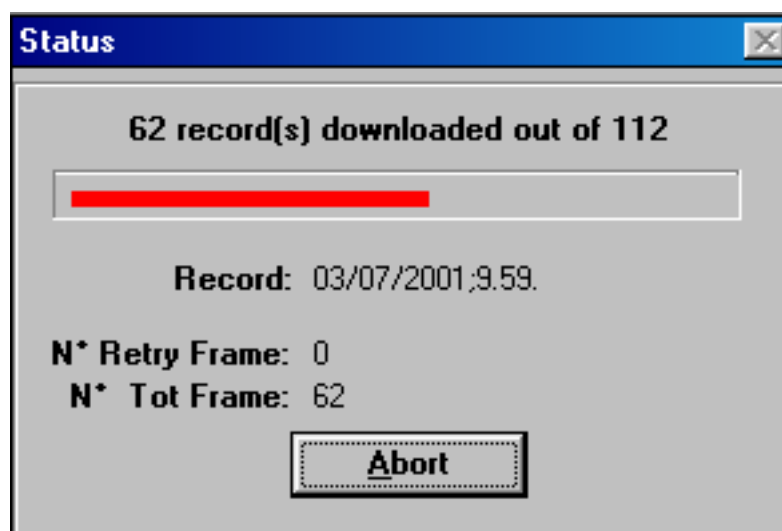

FIG. HH – Download status

The window also contains two items. The first one, *"N° Retry Frame",* concerns the number of corrupted frames received through the PC RS-232 interface which were discarded and therefore repeated by the Dat; the second one, *"N° Tot Frame",* is the total number of received frames. These two parameters evaluate the quality of the Dat-PC connection. The more the packages repeated out of those downloaded, the poorer the line[xi].

It is possible at any moment to abort the download, simply by pressing the *Abort* button on the download status window.

The following table provides indicative download times:

DIRECT CONNECTION AT 9600 BPS

MACH number	Number of measures	Record	Download time
1	1	1000	0.00.51
1	9	100	0.00.07
6	9	1000	0.05.16
20	9	100	0.01.19

MODEM CONNECTION AT 9600 BPS

MACH number	Number of measures	Record	Download time
1	1	1000	0.02.23
1	9	100	0.00.21
6	9	1000	0.11.14
20	9	100	0.02.27

DIRECT CONNECTION AT 19200 BPS

MACH number	Number of measures	Record	Download time
1	1	1000	0.00.29
1	9	100	0.00.05
6	9	1000	0.03.23
20	9	100	0.01.01

MODEM CONNECTION AT 19200 BPS

MACH number	Number of measures	Record	Download time
1	1	1000	0.01.53
1	9	100	0.00.15
6	9	1000	0.09.17
20	9	100	0.01.41

[xi] The displayed number of the downloaded records is only a valuation of the records effectively present in the time window.

7.7   Download alarms

This command is used to move the alarms from the Dat memory to the host PC disk. Alarms are always added to a file, located in WinCom5 folder, named `alarms.txt`. When this option is selected, WinCom5 will read the number of alarms present in the Dat memory, and then will download the alarms, saving them in the file described above[xii].

7.8   Measure list

WinCom5 Symbol	Dat Symbol	Description
Freq	Fre	Mains frequency
V	ΣV	Three-phase equivalent voltage
V12	V12	Linked voltage between lines 1 and 2
V23	V23	Linked voltage between lines 2 and 3
V31	V31	Linked voltage between lines 3 and 1
V1N	V1	Voltage line 1
V2N	V2	Voltage line 2
V3N	V3	Voltage line 3
I	ΣI	Three-phase equivalent current
I1	I1	Current line 1
I2	I2	Current line 2
I3	I3	Current line 3
X1MaxAver	X1x	Max of X1 mean value
Cos fi	ΣC	Three-phase equivalent power factor
Cos fi 1	C1	Power factor line 1
Cos fi 2	C2	Power factor line 2
Cos fi 3	C3	Power factor line 3
P	ΣW	Three-phase equivalent active power
P Aver	ΣWM	Mean three-phase equivalent active power
P Max	ΣWX	Maximum three-phase equivalent active power
P1	W1	Active power line 1
P2	W2	Active power line 2
P3	W3	Active power line 3
P1 Aver	WM1	Mean active power line 1
P2 Aver	WM2	Mean active power line 2
P3 Aver	WM3	Mean active power line 3
P1 Max	WX1	Maximum active power line 1
P2 Max	WX2	Maximum active power line 2
P3 Max	WX3	Maximum active power line 3
VA	ΣA	Three-phase equivalent apparent power
VAAver	ΣAM	Mean three-phase equivalent apparent power
VAMax	ΣAX	Maximum three-phase equivalent apparent power
VA1	A1	Apparent power line 1
VA2	A2	Apparent power line 2
VA3	A3	Apparent power line 3
VA1 Aver	AM1	Mean apparent power line 1
VA2 Aver	AM2	Mean apparent power line 2
VA3 Aver	AM3	Mean apparent power line 3
VA1 Max	AX1	Maximum apparent power line 1
VA2 Max	AX2	Maximum apparent power line 2
VA3 Max	AX3	Maximum apparent power line 3
VAr	ΣR	Three-phase equivalent reactive power
VAr Aver	ΣRM	Three-phase equivalent mean reactive power

[xii] If the connection mode is as User, the Alarms are normally downloaded but not removed.

VAr Max	ΣRX	Three-phase equivalent maximum reactive power
VAr1	R1	Reactive power line 1
VAr2	R2	Reactive power line 2
VAr3	R3	Reactive power line 3
VAr1 Aver	RM1	Mean reactive power line 1
VAr2 Aver	RM2	Mean reactive power line 2
VAr3 Aver	RM3	Mean reactive power line 3
VAr1 Max	RX1	Maximum reactive power line 1
VAr2 Max	RX2	Maximum reactive power line 2
VAr3 Max	RX3	Maximum reactive power line 3
PMaxAver	WxM	Maximum mean three-phase active power
VArMaxAver	RxM	Maximum mean three-phase reactive power
VAMaxAver	AxM	Maximum mean three-phase Apparent power
X2MaxAver	X2x	Max of X2 mean value
KWh	ΣKW	Three-phase equivalent active energy
KWh 1	KW1	Active energy line 1
KWh 2	KW2	Active energy line 2
KWh 3	KW3	Active energy line 3
kVArh	ΣKA	Three-phase equivalent reactive energy
kVArh1	KA1	Reactive energy line 1
kVArh2	KA2	Reactive energy line 2
kVArh3	KA3	Reactive energy line 3
THDF V1	TV1	Line 1 voltage distortion (crest factor)
THDF V2	TV2	Line 2 voltage distortion (crest factor)
THDF V3	TV3	Line 3 voltage distortion (crest factor)
THDF I1	TI1	Line 1 current distortion (crest factor)
THDF I2	TI2	Line 2 current distortion (crest factor)
THDF I3	TI3	Line 3 current distortion (crest factor)
X1	X1	Analog input value 1
X2	X2	Analog input value 2
P1MaxAver	WA1	Line 1 maximum mean active power
P2MaxAver	WA2	Line 2 maximum mean active power
P3MaxAver	WA3	Line 3 maximum mean active power
VAr1MaxAver	RA1	Line 1 maximum mean reactive power
VAr2MaxAver	RA2	Line 2 maximum mean reactive power
VAr3MaxAver	RA3	Line 3 maximum mean reactive power
VA1MaxAver	AA1	Line 1 maximum mean apparent power
VA2MaxAver	AA2	Line 2 maximum mean apparent power
VA3MaxAver	AA3	Line 3 maximum mean apparent power
KWhco	ΣKw	Active energy generated by the three-phase system
KWh1co	Kw1	Active energy generated by line 1
KWh2co	Kw2	Active energy generated by line 2
KWh3co	Kw3	Active energy generated by line 3
KVArhco	ΣKa	Reactive energy generated by the three-phase system
KVArh1co	Ka1	Reactive energy generated by line 1
KVArh2co	Ka2	Reactive energy generated by line 2
KVArh3co	Ka3	Reactive energy generated by line 3
X1Aver	X1M	Mean of X1 measure
X2Aver	X2M	Mean of X2 measure
X1Sum	X1S	Integral of X1 measure
X2Sum	X2S	Integral of X2 measure
Temp	TMP	Temperature
KWhF1	ΣF1	Three phase Active energy of time band 1
KWhF2	ΣF2	Three phase Active energy of time band 2
KWhF3	ΣF3	Three phase Active energy of time band 3
KWhF4	ΣF4	Three phase Active energy of time band 4

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This documentation may be subject to modification without prior notice.

This User's manual refers to WinCom5 software, release V. 2.08 and later versions. In relation to Dat Più firmware release V. 2.00 or later versions.

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