

▪ Preface:

This manual provides the necessary information to activate the MoniTorr network correctly.

The MoniTorr is a device that monitors, constantly, the Operating Conditions of the Turbo Pump and the Controller to which it is connected.

The RS485 interface allows the connection of up to 31 pump/controllers to a network.

Using the Protocol Converter, which converts RS 485 to RS 232, it is possible to download all the Data (Pump Vibration Spectra, Power, Temperature etc) from each pump, to a single PC.

▪ Description of the connectivity kit:

This document will guide you through the procedures to activate the MoniTorr "On Board" option, which will allow the Pumps Vibration Spectra and Operating Parameters to be acquired.

The hardware is integrated in the controller and consists of a Circuit Card and an accelerometer mounted on the controller case.

To operate The MoniTorr card you will need the MoniTorr Connectivity Kit Part No 9699260.

The Kit includes the following material:

- ✓ Protocol Converter PN 9699258
- ✓ N°1 RS232 cable 3mt long.
- ✓ "**Filedownload 3.0**" and "**Serial Address Configurator 2.1**", Software on CD-ROM
- ✓ Instruction Manual

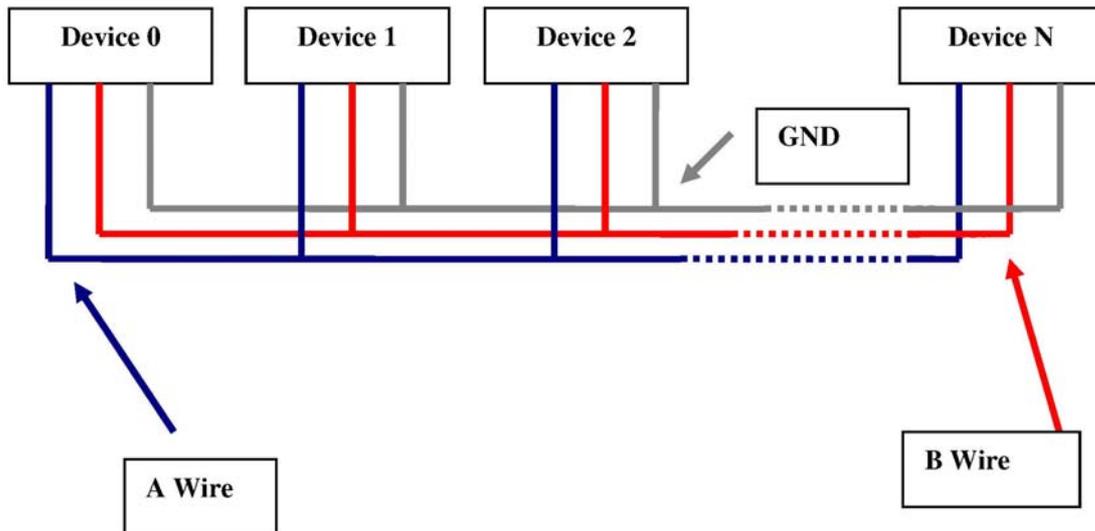
The RS485 Cable needed to complete the network is not included (see next paragraph RS485 cable).

▪ RS485 cable:

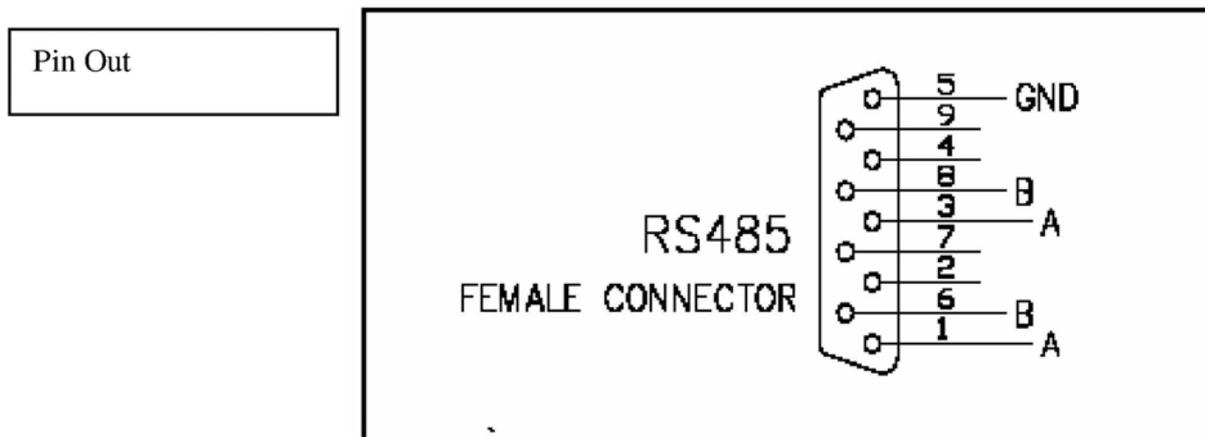
The RS485 Cable is customised for each application to accommodate the number of, and the distance between each of the pumps to be networked and to the PC in the control room. This manual gives instructions on how to auto-construct this cable and can be also ordered through Varian. For ordering, please use the "MoniTorr Network Cable Form" at the end of this document, to specify the cable lengths for your system and to your PC, once completed send it to your sales contact for the Cable to be made, to complete the Connectivity Kit.

• RS485 Cable Production:

Varian RS485 uses a half duplex two wires balanced transmission line; the word "balanced" means that communication is done across a pair of line signals that transmits only one signal. The Communications involves two wires (named A+ and B- or simply A and B) and in the following figure you can see a typical RS485 net. To complete the net you must also connect the Ground wire.



Moreover shielding of the cable is strongly recommended especially in noisy environment. To avoid reflection problems is suggested in more application to adapt impedance in the serial line. The most common termination technique is to put one resistor between the A and B wires, at each end of the data line. The value of the resistor describes the intrinsic impedance of the transmission line and is not a function of the line length; 120 Ohm is a common value.

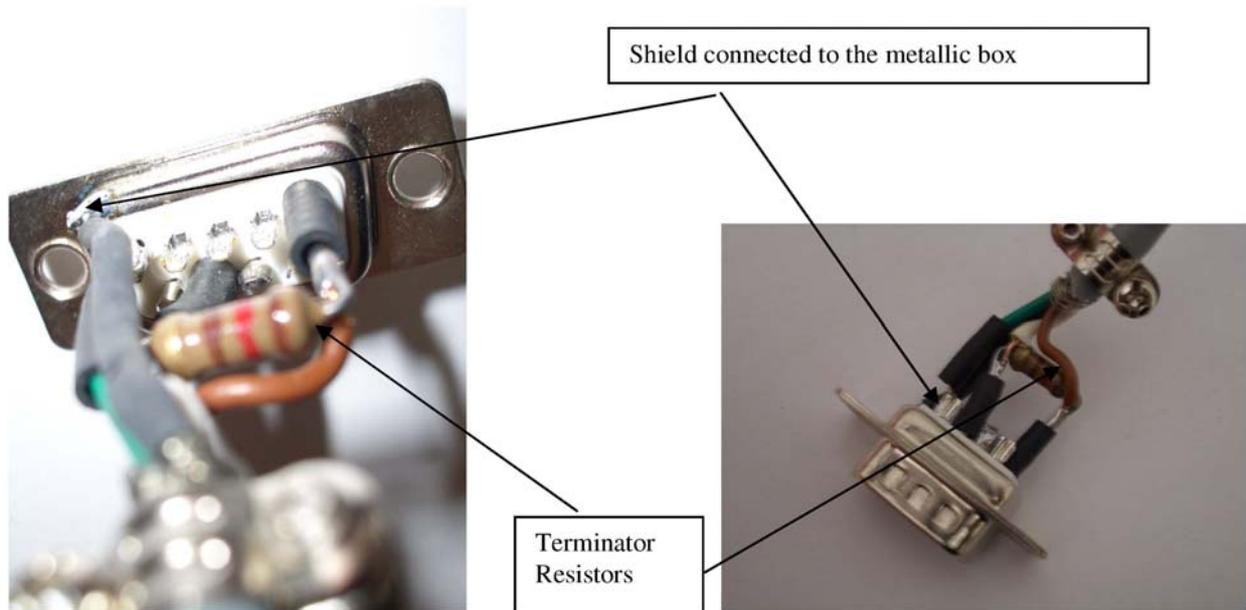


This PinOut is the same to all the MoniTorr connectors on the TV-2KG, TV-3KT and to the Protocol Converter as well.

The MoniTorr RS485 cables are often characterized by very long cables so it means that it's very important to protect the communication by electric noise:

USE ONLY SHIELDED CABLE (to be shielded the cable must have the shield connected to the metallic box on each connector).

TERMITATE THE CABLES (a resistor of 120 Ohm and $\frac{1}{2}$ watt must be inserted between A and B lines on the first and on the last connector of the serial network cable).

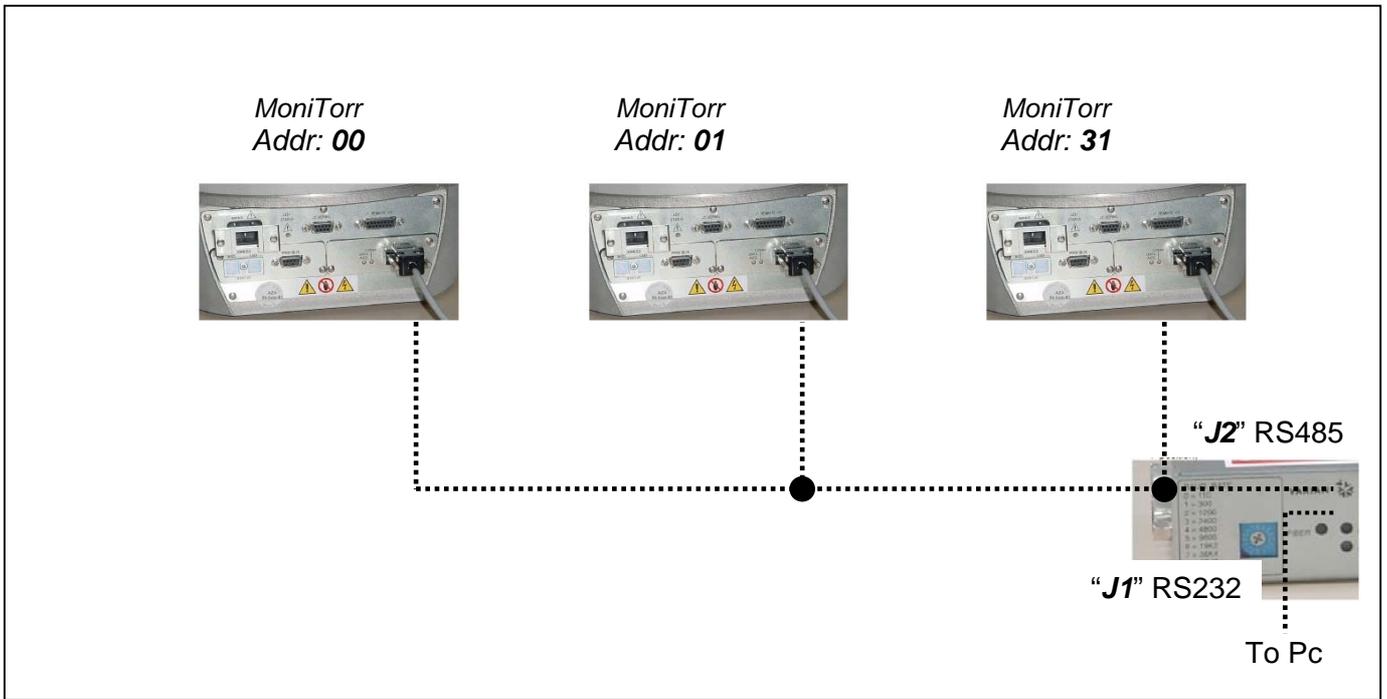


You must also use a waterproof connector (provided with pumps) for all the system where the IP54 is needed (for instance for TV 2K-G pumps).

▪ **Network Installation:**

The RS485 interface allows the connection of up to 31 pump/controllers to a network. Using the Protocol Converter, which converts RS 485 to RS 232, it is possible to download all the Data to a single PC.

Because the default address of each controller is "00" (Addr: 00), when there are 2-31 controllers, each will require a different address to avoid conflicts on the network.



Typical Network Connection

Each of the connections on the Cable is labelled, to ensure the correct connection and to ease the installation, as following:

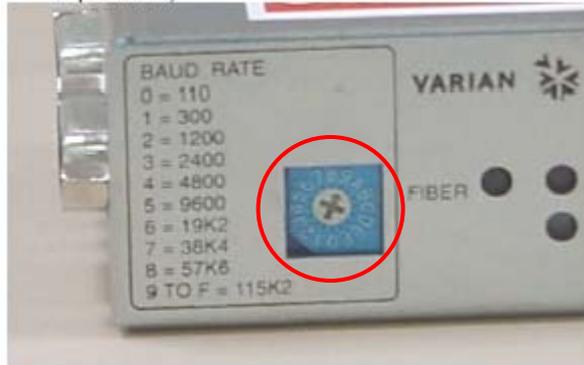
- “MoniTorr”*** for the MoniTorr connection on theTV2KG/TV3KT,
- “Protocol Converter”*** for the RS485 to the Protocol Converter.
- “RS232”*** for the RS232 cable from RS232 port on Protocol Converter to the PC

▪ **Installation Procedure:**

1. Connect all the RS485 connectors to each pump (MoniTorr connection) and Protocol Converter “J2” connector.
During this phase do not install any other connectors to the controller.



2. Set the Baud rate of the Protocol Converter to 115K2 by turning the rotary switch to the “A” position.

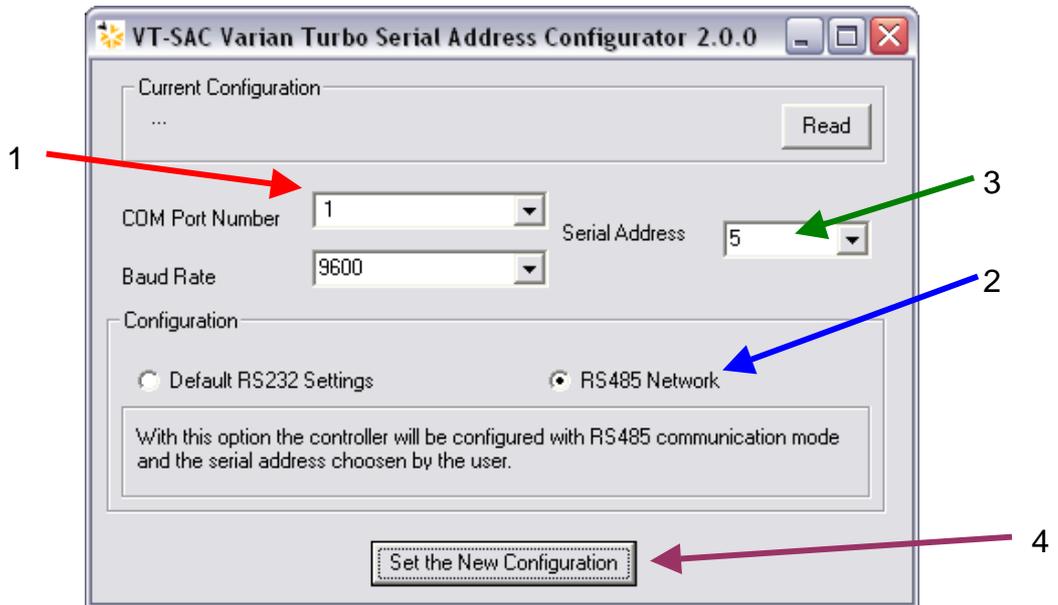


3. Each pump is shipped with the default serial address “00”. To identify each pump on the network, each pump needs to be configured with a different address.
4. Install the “**File VT Serial Address Configurator (S.A.C.)**”, available on the CD-ROM, on your own laptop.
5. Connect the RS232 cable between the laptop serial port and the first pump “Serial” connector, as showed in the picture here below.



Connect the RS232 cable here

6. Apply power to the first pump (the pump, however, should not be started).
7. Launch the VT Serial Address Configurator program on your laptop, and proceed as follows:
 - a. Select the COM port number on your laptop for the RS232 cable (**Arrow 1**)
 - b. Choose the option “**RS485 Network**” (**Arrow 2**)
 - c. Choose a Serial Address (**Arrow 3**). Please remember to use a different serial address for each Turbo /Controller on the network, and record which Turbo / controller has what address.
 - d. Click the “**Set the New Configuration**” button (**arrow 4**)
 - e. After a few seconds a Message Box with the new configuration confirmation will appear on the screen.



Close the “**VT Serial Address Configurator**” program, disconnect the RS232 cable from the pump and repeat the operation for each of the other pumps on the network from point 5 on. Please remember to choose a different address for each pump (otherwise the system will not work) and record which address belongs to which pump.

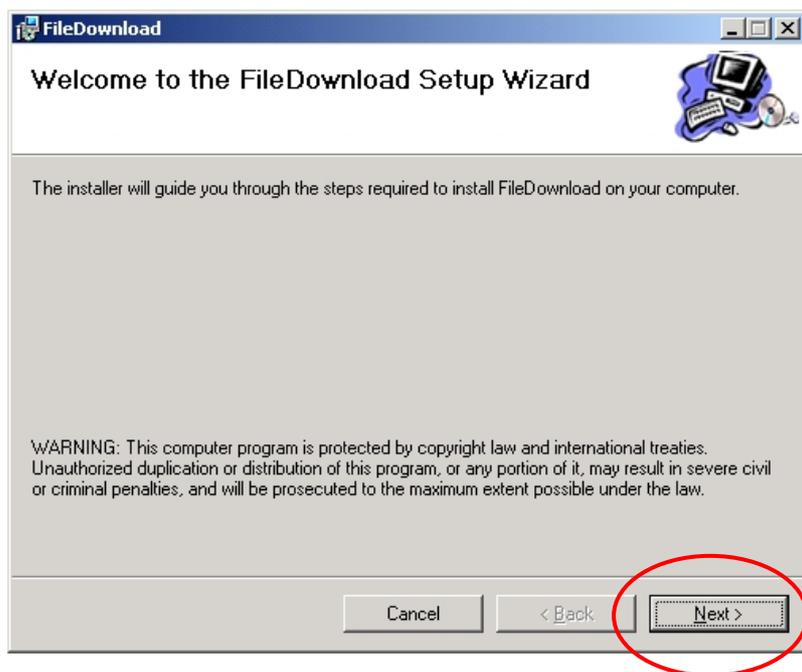
When all pump addresses on the network have been successfully assigned:

1. Connect the RS232 cable between “**J1**” Protocol Converter and PC.
2. Connect the power supply to the Protocol Converter.

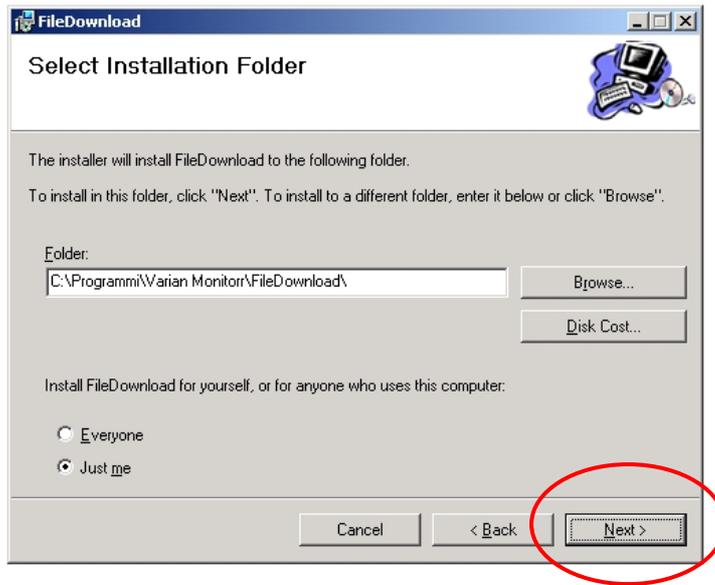
▪ **Installing” FileDownload” Software:**

“FileDownload” is the software needed to transfer, via RS485, all the data stored in the MoniTorr cards. To install the Software, simply insert the CD in the CD or DVD drive on the PC and run the “**Setup**” program.

- 1) Click on “**Setup.exe**” on CD-Rom and the following screen will appear on the PC

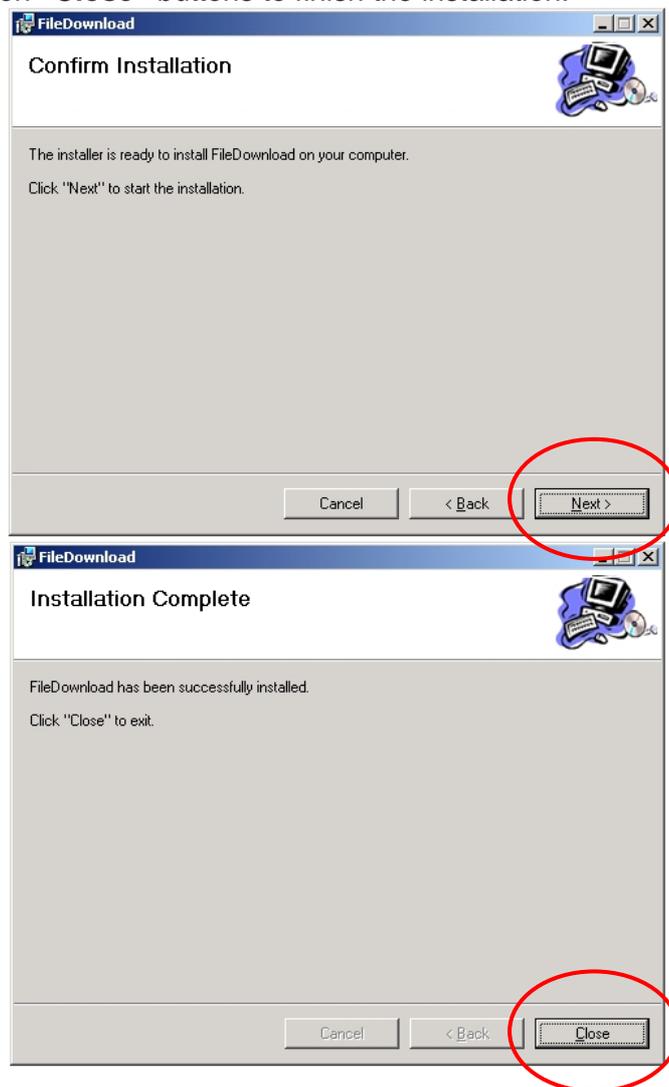


- 2) Close all other applications and select “**Next**”. The following screen will automatically appear on the PC monitor:

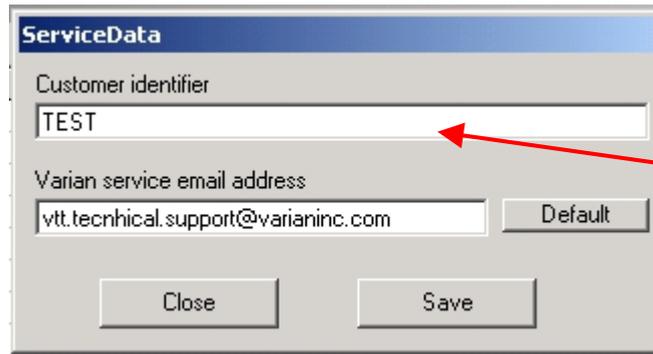


- 3) It is recommended to keep the proposed directory and path. At this point click on “**Next**” again.

- 4) The following two pictures will be displayed, sequentially, on the PC screen. Click on “**Next**” and then on “**Close**” buttons to finish the installation:



5) The Software will automatically ask for a “Customer Identifier”, as showed in the picture:



ServiceData

Customer identifier
TEST

Varian service email address
vtt.technical.support@varianinc.com Default

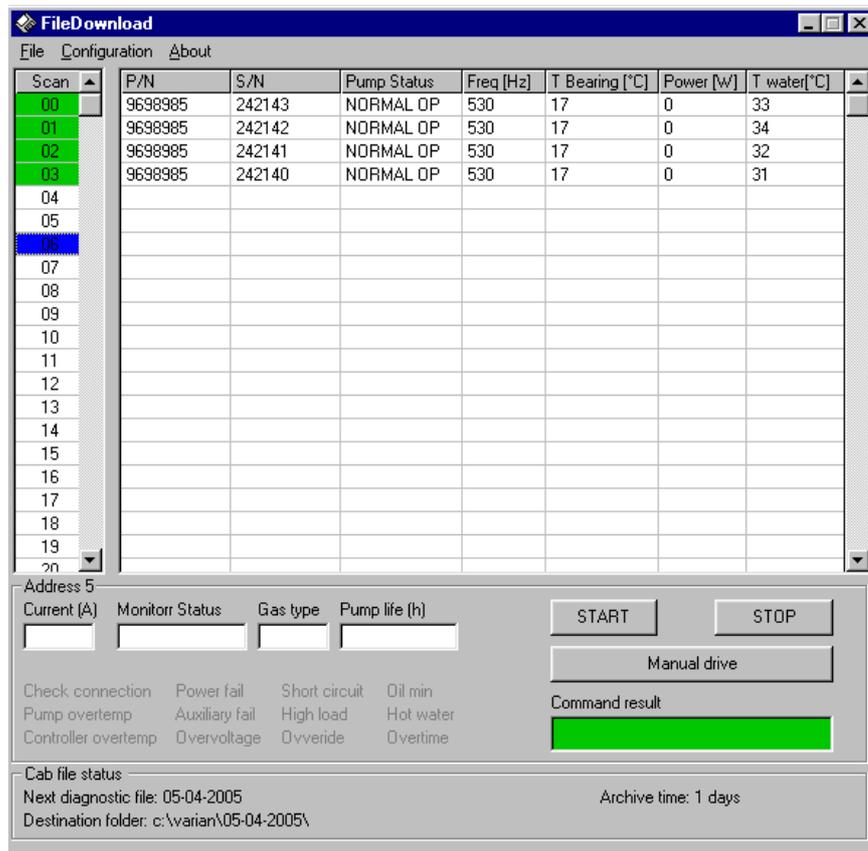
Close Save

Insert the name of your company and / or Machine here

6) Click on the “Save” button. The system will ask for a password to close this operation. The password is “VARIAN” IN UPPER CASE.

7) The “FileDownload” starts automatically.

8) As soon as it is activated, the Software establishes the connection with the MoniTorrS available on the network:



FileDownload

File Configuration About

Scan	P/N	S/N	Pump Status	Freq [Hz]	T Bearing [°C]	Power [W]	T water[°C]
00	9698985	242143	NORMAL OP	530	17	0	33
01	9698985	242142	NORMAL OP	530	17	0	34
02	9698985	242141	NORMAL OP	530	17	0	32
03	9698985	242140	NORMAL OP	530	17	0	31
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

Address 5

Current (A) Monitrr Status Gas type Pump life (h)

START STOP

Manual drive

Check connection Power fail Short circuit Oil min
Pump overtemp Auxiliary fail High load Hot water
Controller overtemp Overvoltage Override Overtime

Command result

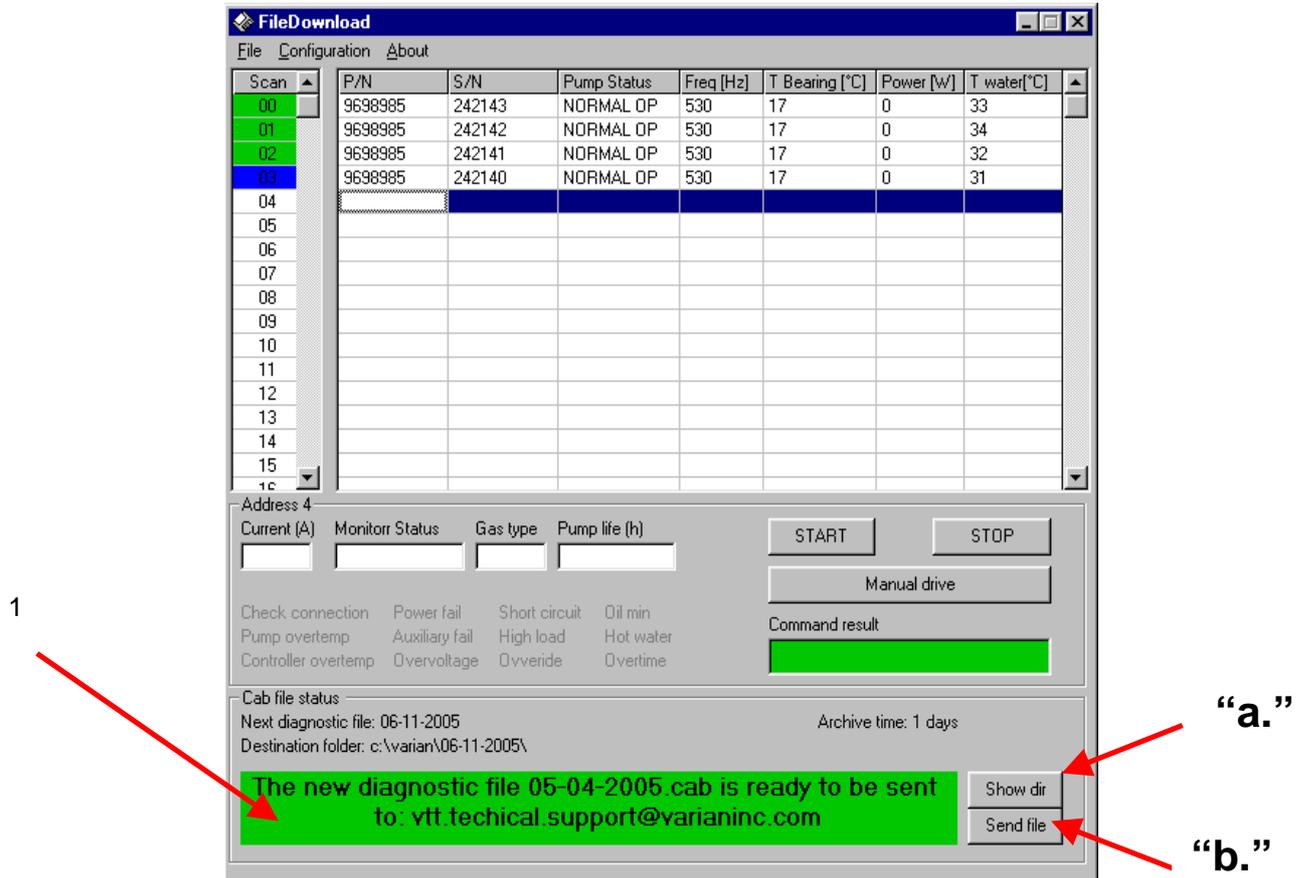
Cab file status
Next diagnostic file: 05-04-2005
Destination folder: c:\varian\05-04-2005\

Archive time: 1 days

Example of “FileDownload” Software main windows

▪ **CAB File sending procedure:**

As soon as the “FileDownload” Software is launched it starts to scan the network and continually downloads all the pump parameters (Power, Current, Unbalance...). Periodically (every Archive Time interval) the Software automatically creates a compressed data file (.CAB) with the date of the registration day (arrow 1) in the name (for example “15-04-2005.cab”) Typically the Archive Time is set at 15 days (you can change this value by the menu File\Archive Time but we recommend a period less than 15 days to be able to make a more reliable data analysis)



If a new datafile.CAB has been generated, in the main window a green text on the bottom will automatically appear. On the right side of the field two buttons “Send File” and “Show Dir” are available.

- a. By clicking on the “Send File” button, the Software automatically will attach the File.CAB just created to an e-mail that already has been addressed to vtt.technical.support@varianinc.com. You can use this button if your PC can send emails.
- b. By clicking on the “View Dir” button automatically an explore window appear on the screen with the compressed archive file named according to the registration day (date. CAB). All files are automatically stored in the directory C. \varian\... The file must be sent by e-mail the compressed (.CAB) file at the following address: vtt.technical.support@varianinc.com

For further information about “FileDownload” Software functioning, please refer to the MoniTorr paragraph in the instruction manual.

DISPOSAL

Meaning of the "WEEE" logo found in labels

The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.

This symbol (**valid only in countries of the European Community**) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.

The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.



MoniTorr Network Cable Form

Originator Name _____
 (Name of the person filling in this form)

Customer Name _____
 (Name of the Company where the system will be installed and a Machine Identifier)

Number of pumps on the net (31 MAXIMUM) _____

All the distances are expressed in: Feet Meters

Distance from Protocol Converter and the First Pump: _____
 (The Protocol Converter must be placed close to the PC station)

Distances among the several pumps	
(Please compile only for the number of pumps on the net you've indicated before)	
Distance between the 1 st and the 2 nd pumps	
Distance between the 2 nd and the 3 rd pumps	
Distance between the 3 rd and the 4 th pumps	
Distance between the 4 th and the 5 th pumps	
Distance between the 5 th and the 6 th pumps	
Distance between the 6 th and the 7 th pumps	
Distance between the 7 th and the 8 th pumps	
Distance between the 8 th and the 9 th pumps	
Distance between the 9 th and the 10 th pumps	
Distance between the 10 th and the 11 th pumps	
Distance between the 11 th and the 12 th pumps	
Distance between the 12 th and the 13 th pumps	
Distance between the 13 th and the 14 th pumps	
Distance between the 14 th and the 15 th pumps	
Distance between the 15 th and the 16 th pumps	
Distance between the 16 th and the 17 th pumps	
Distance between the 17 th and the 18 th pumps	
Distance between the 18 th and the 19 th pumps	
Distance between the 19 th and the 20 th pumps	
Distance between the 20 th and the 21 st pumps	
Distance between the 21 st and the 22 nd pumps	
Distance between the 22 nd and the 23 rd pumps	
Distance between the 23 rd and the 24 th pumps	
Distance between the 24 th and the 25 th pumps	
Distance between the 25 th and the 26 th pumps	
Distance between the 26 th and the 27 th pumps	
Distance between the 27 th and the 28 th pumps	
Distance between the 28 th and the 29 th pumps	
Distance between the 29 th and the 30 th pumps	
Distance between the 30 th and the 31 st pumps	