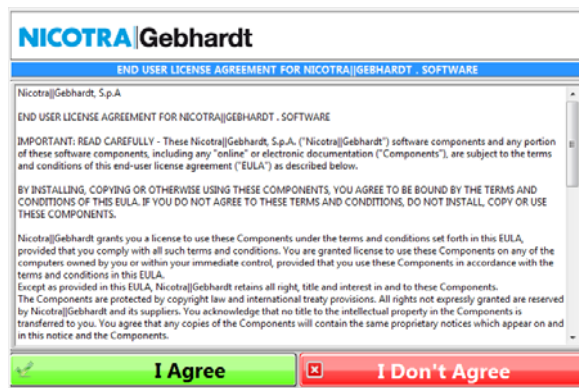


DDMP Modbus Handler Manual

Introduction

The DDMP Modbus Handler manual has been created in the R&D dept. of Nicotra|Gebhardt as a development tool, after it has been used by Sales dept. as a demo tool and now released as freeware helping tool for customers (see END USER LICENSE AGREEMENT).



The purpose of this software is making the customer familiar with the DDMP fans. With this software the customer can configure a fan and can monitor the performances inside its unit.

Observations

The software is not intended to be an homologation tool

The software doesn't measure the airflow/pressure parameters, but it estimates them through an algorithm and therefore is subjected to a precision error.

One of the most interesting features of the DDMP is the sensorless constant airflow. In this operating mode the DDMP frequency converter estimates the constant airflow through an algorithm and therefore is subjected to a tolerance (see. DDMP Manual).

The fans can have some instable regions, the displayed performance is filtered by a moving average and due to this the fan seems stable, but there is still an estimation error.

This software requires a Windows operating system (visit www.nicotra-gebhardt.com for the download)

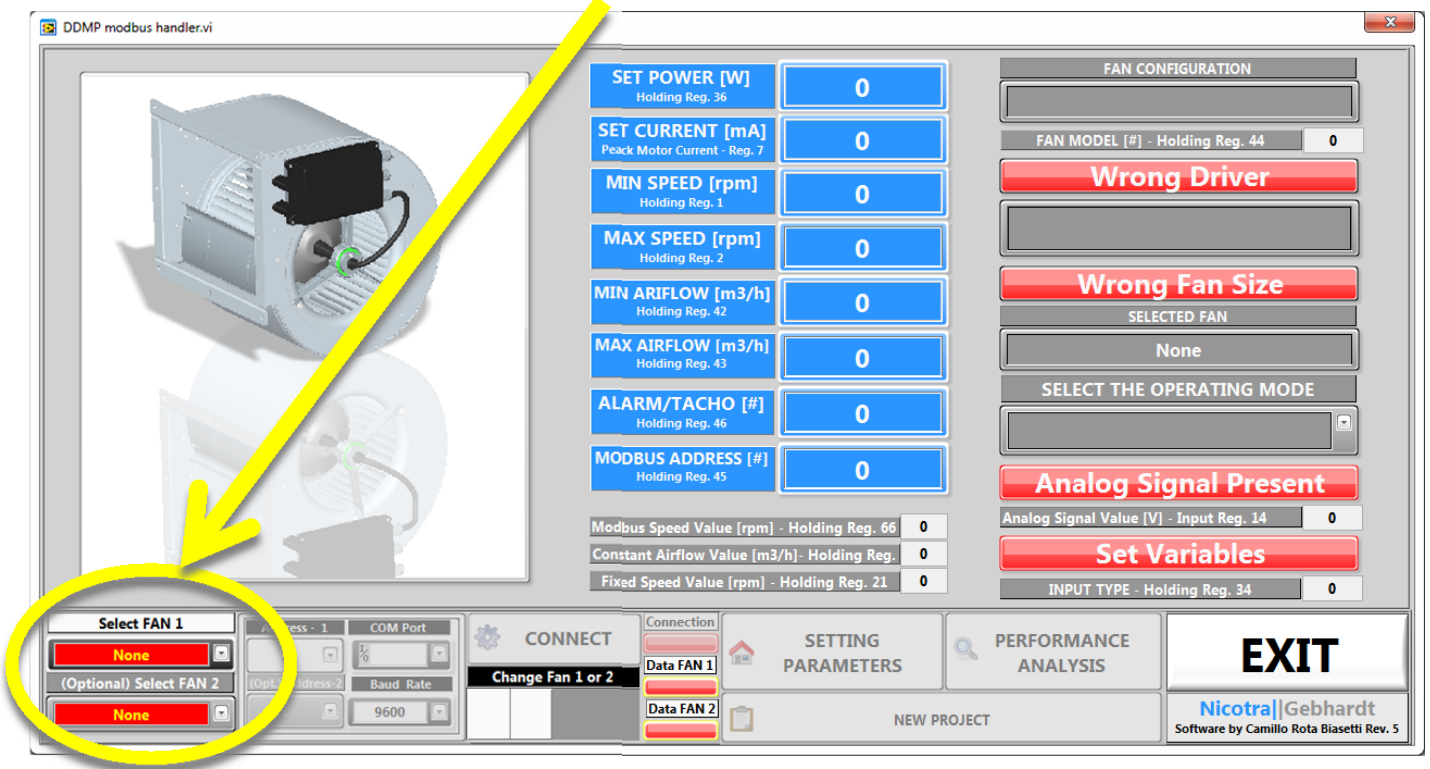
For more information about the software, the sensorless constant airflow algorithm or the software display algorithm refer to:

Nicotra Gebhardt S.p.A.
Via Modena, 18
24040 Ciserano Loc. Zingonia (BG)
Italy

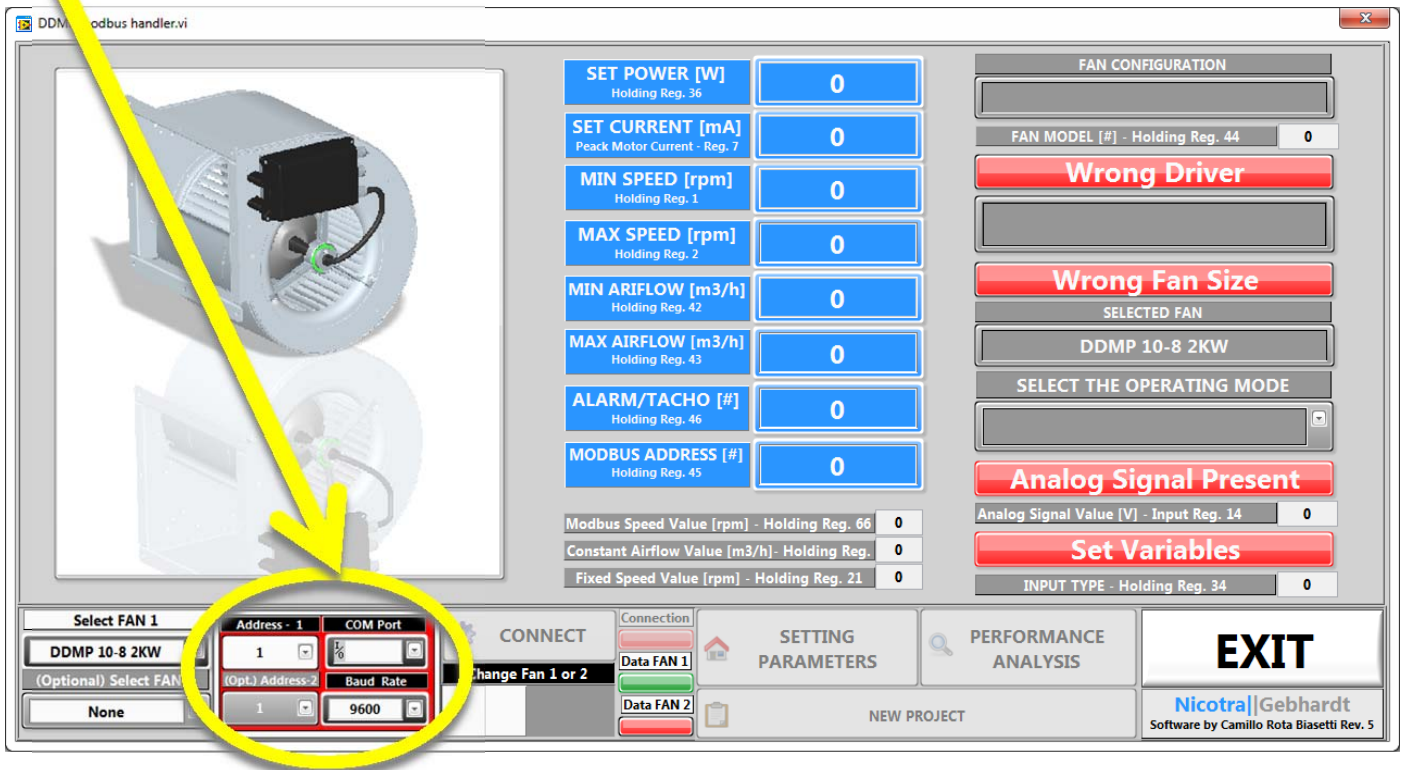
Telephon: +39 035 873 111
Telefax: +39 035 884 319
Ref. Camillo Rota Biasetti
E-mail: c.rota@nicotra-gebhardt.com

Connection

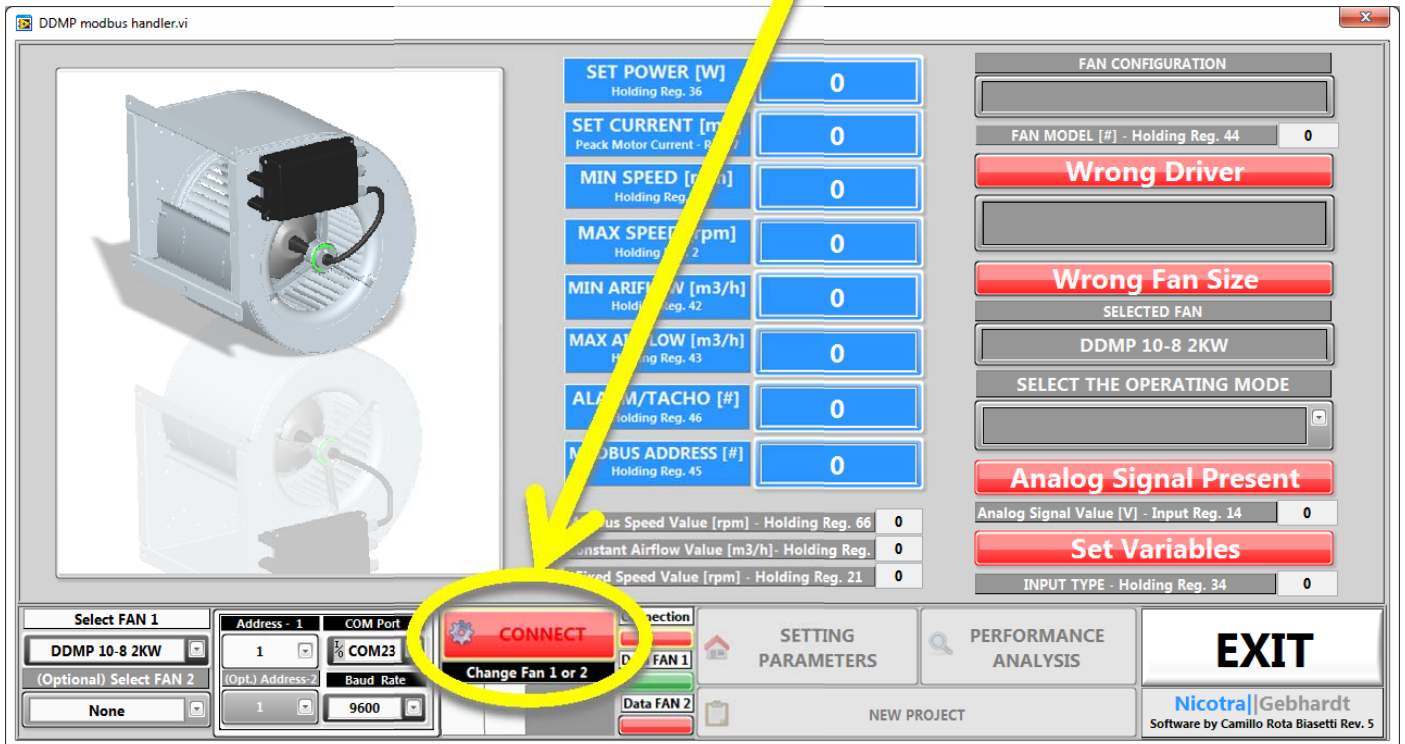
Select the fan sizes connected to the computer.



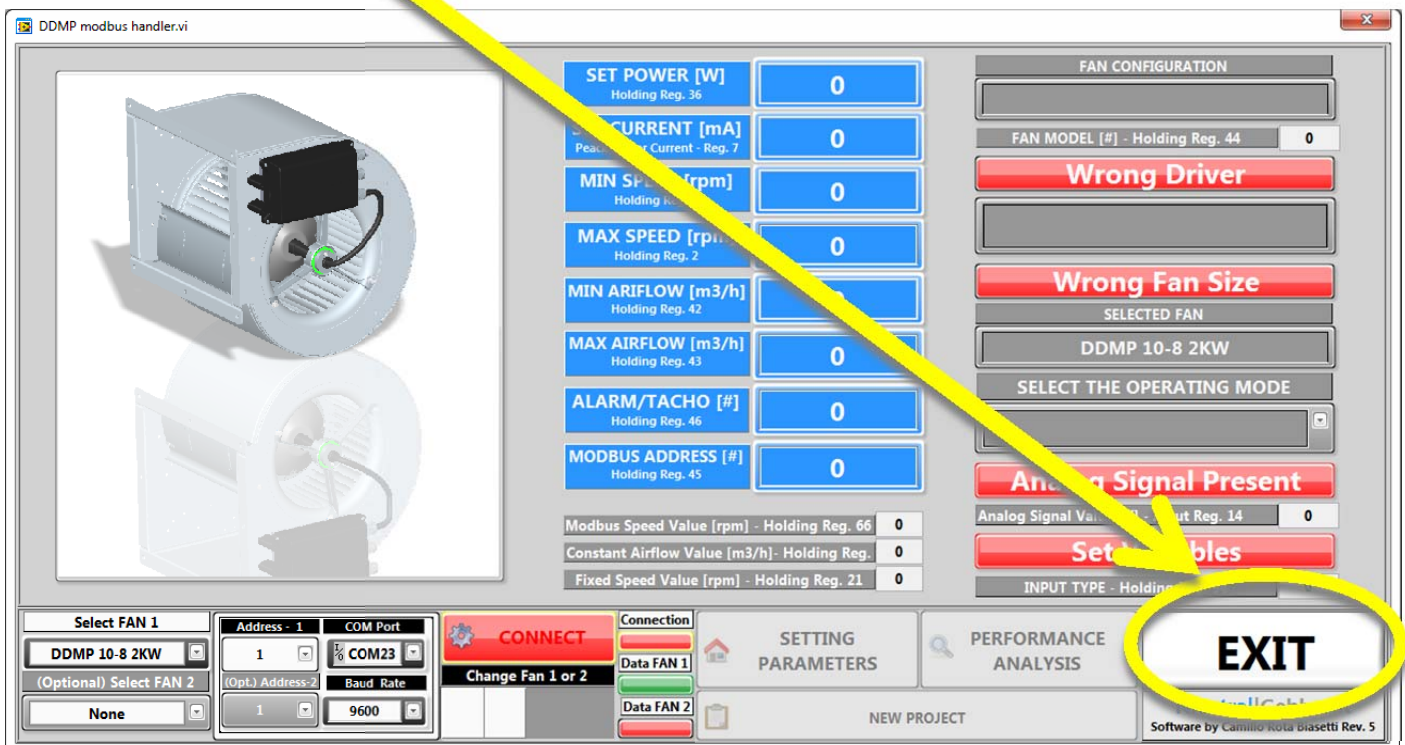
Select the COM port and the Slave address if different from default.



Press the "CONNECT" button



The EXIT button closes the program.



SETTING PARAMETERS WINDOW

The fan is connected and ready to be tested.

The BLUE registers are readable and writable:

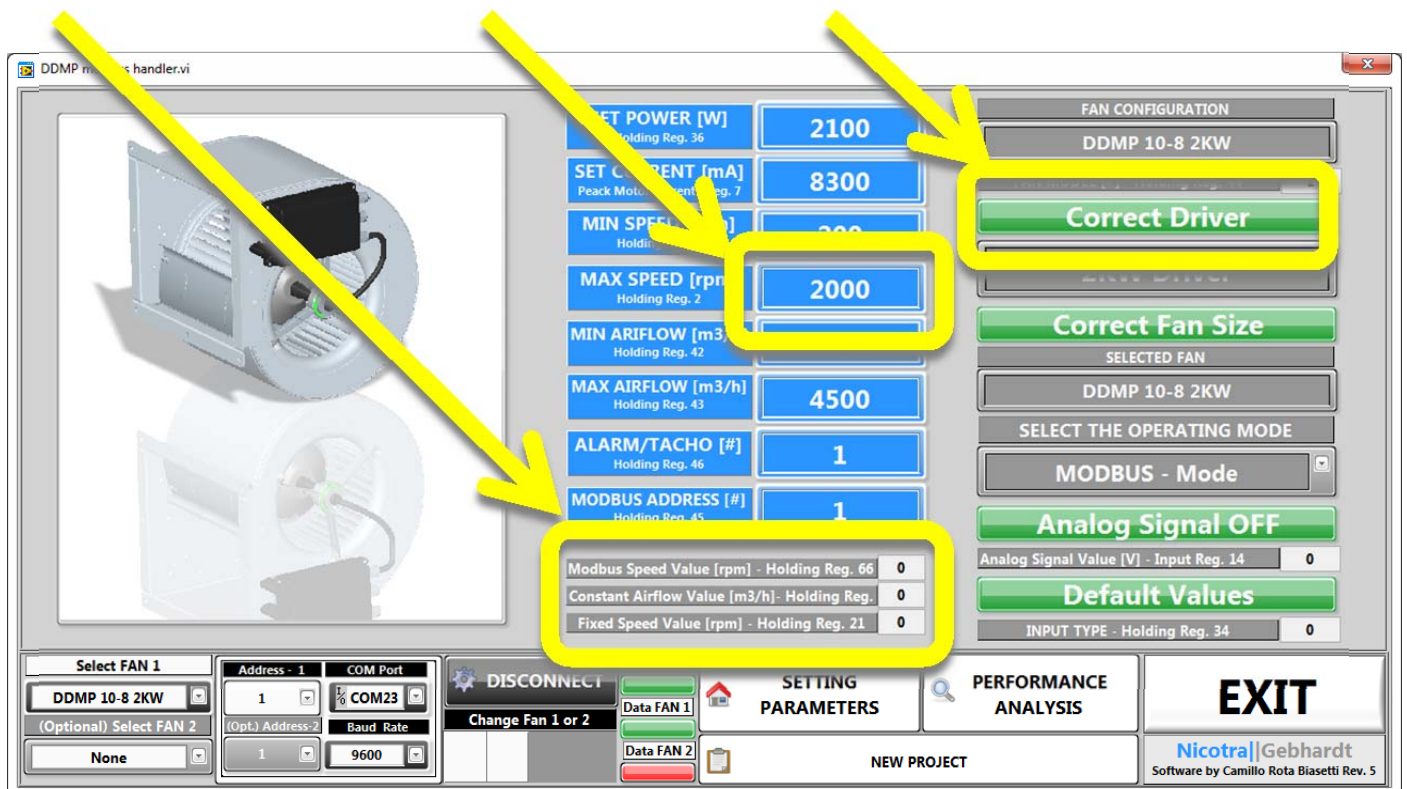
- SET POWER register 36 → [W]
- SET CURRENT register 7 → [mA] (peak value)
- MIN SPEED register 1 → [rpm]
- MAX SPEED register 2 → [rpm]
- MIN AIRFLOW register 42r → [m3/h]
- MAX AIRFLOW register 43 → [m3/h]
- ALARM/TACHO register 46 → [#]
- MODBUS ADDRESS 45 → [#]

The GREY registers are only readable:

- Modbus Speed Value (*Switch to PERFORMANCE ANALYSIS to set this register*)
- Constant Airflow Value (*Switch to PERFORMANCE ANALYSIS to set this register*)
- Fixed Speed Value (*Switch to PERFORMANCE ANALYSIS to set this register*)

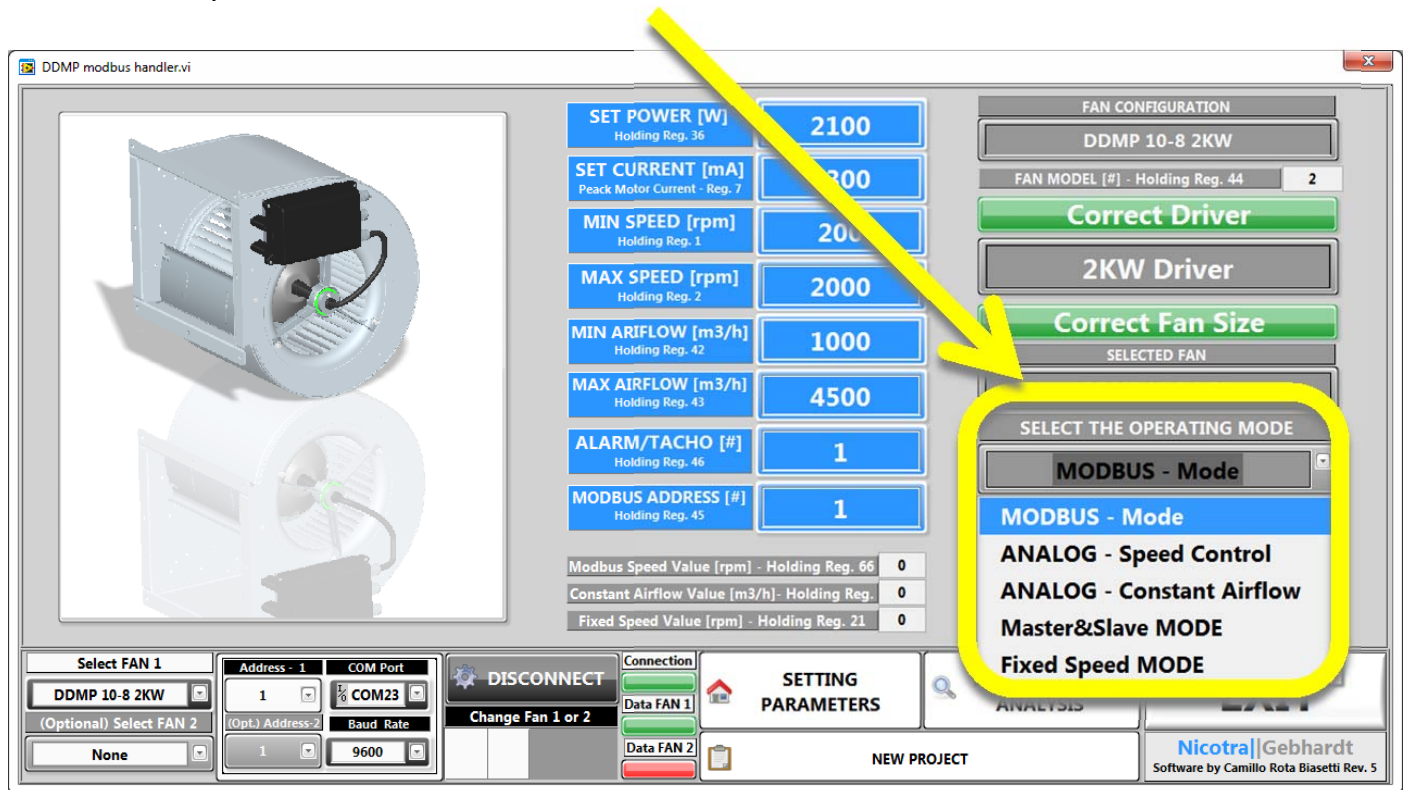
The GREEN/RED indicators indicate the driver parameters and status.

Refer to the DDMP manual for details on the Holding Register.

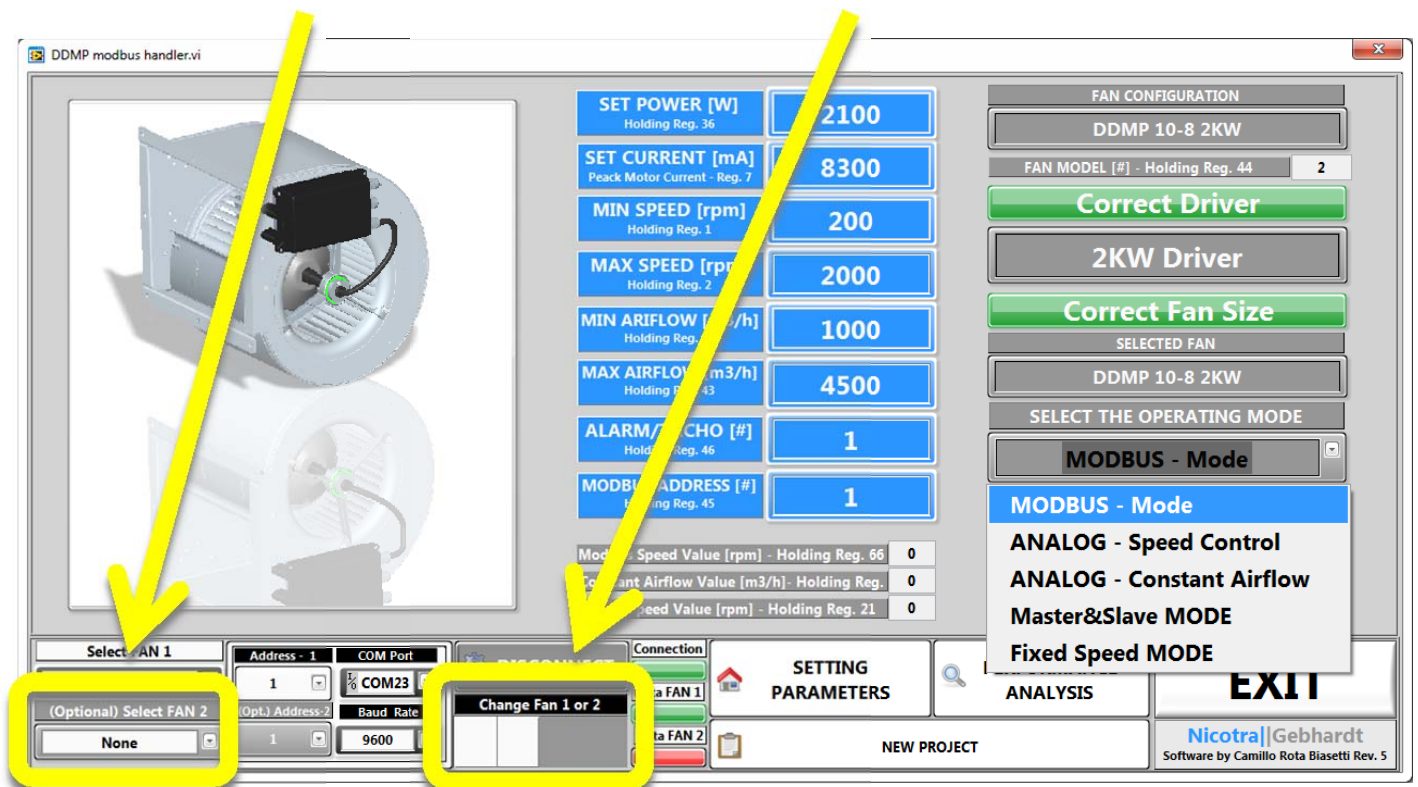


Through the GREY combo box is possible to set the desired mode:

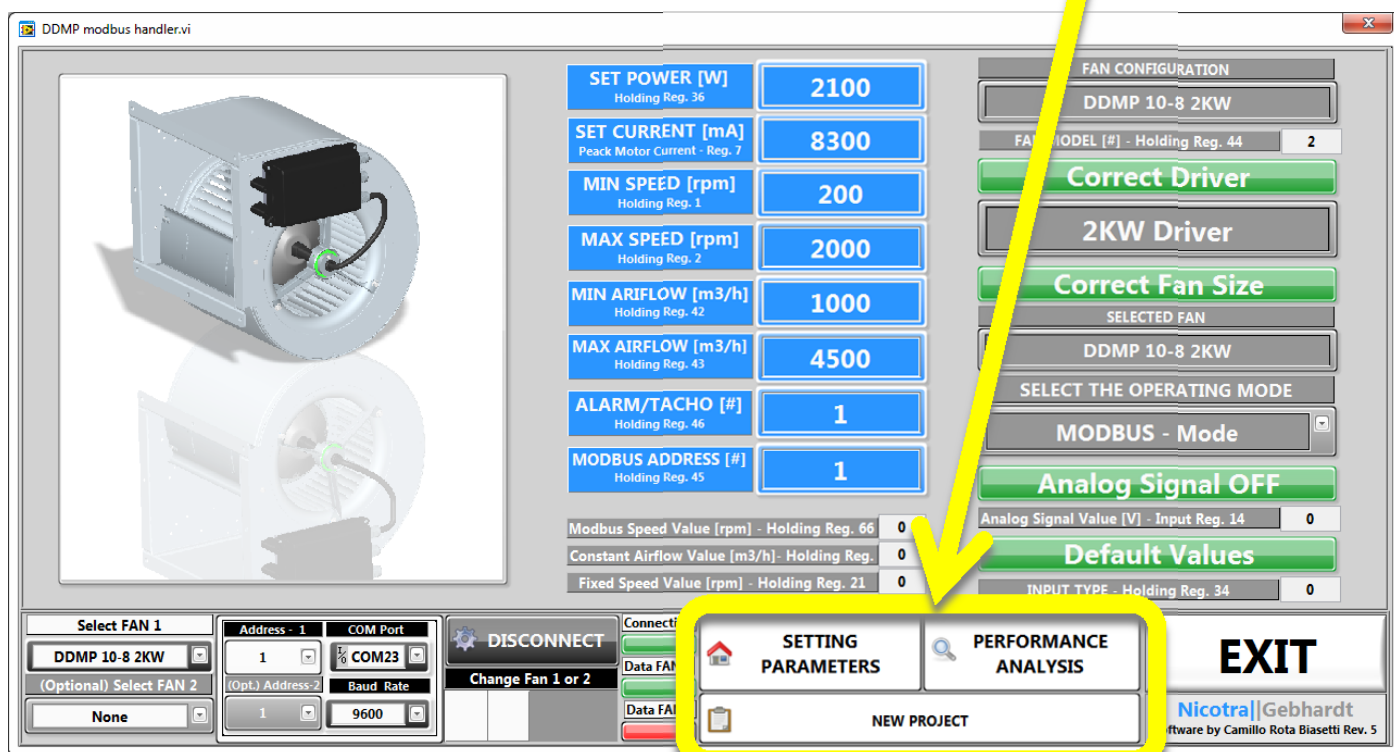
- MODBUS Mode
- ANALOG – Speed Control
- ANALOG – Constant Airflow
- Master&Slave MODE
- Fixed Speed MODE



As option can be selected another fan to monitor and can be selected through the switch.

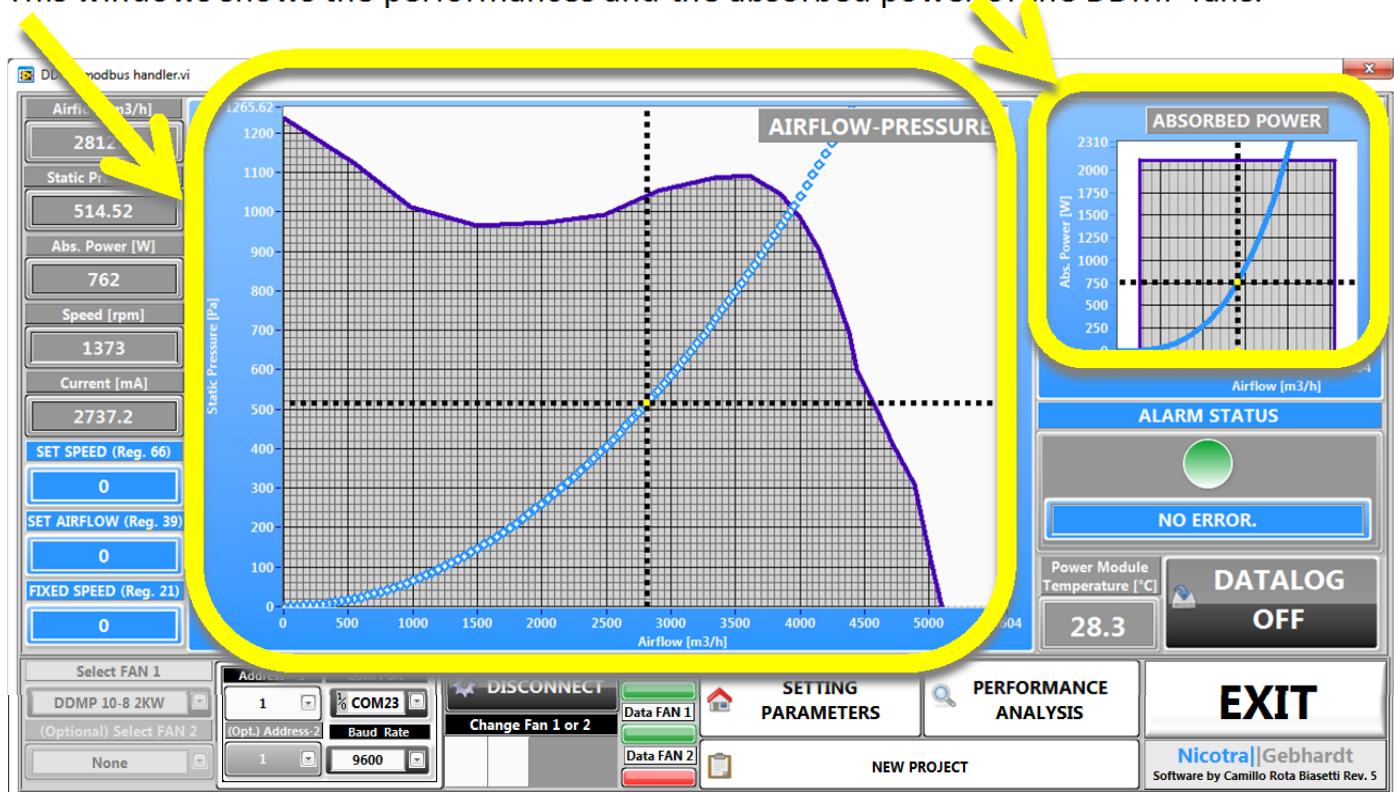


The WHITE buttons open three user windows. The default is “SETTING PARAMETERS” then is possible to check the performances of the fan clicking on “PERFORMANCE ANALYSIS”. The “NEW PROJECT” button access to a protected window for handling and analyzing new fan sizes. The Sensorless Constant Airflow Algorithm has been completely developed by R&D Dept. of Nicotra | Gebhardt and protected by copyrights.



PERFORMANCE ANALYSIS WINDOW

This window shows the performances and the absorbed power of the DDMP fans.



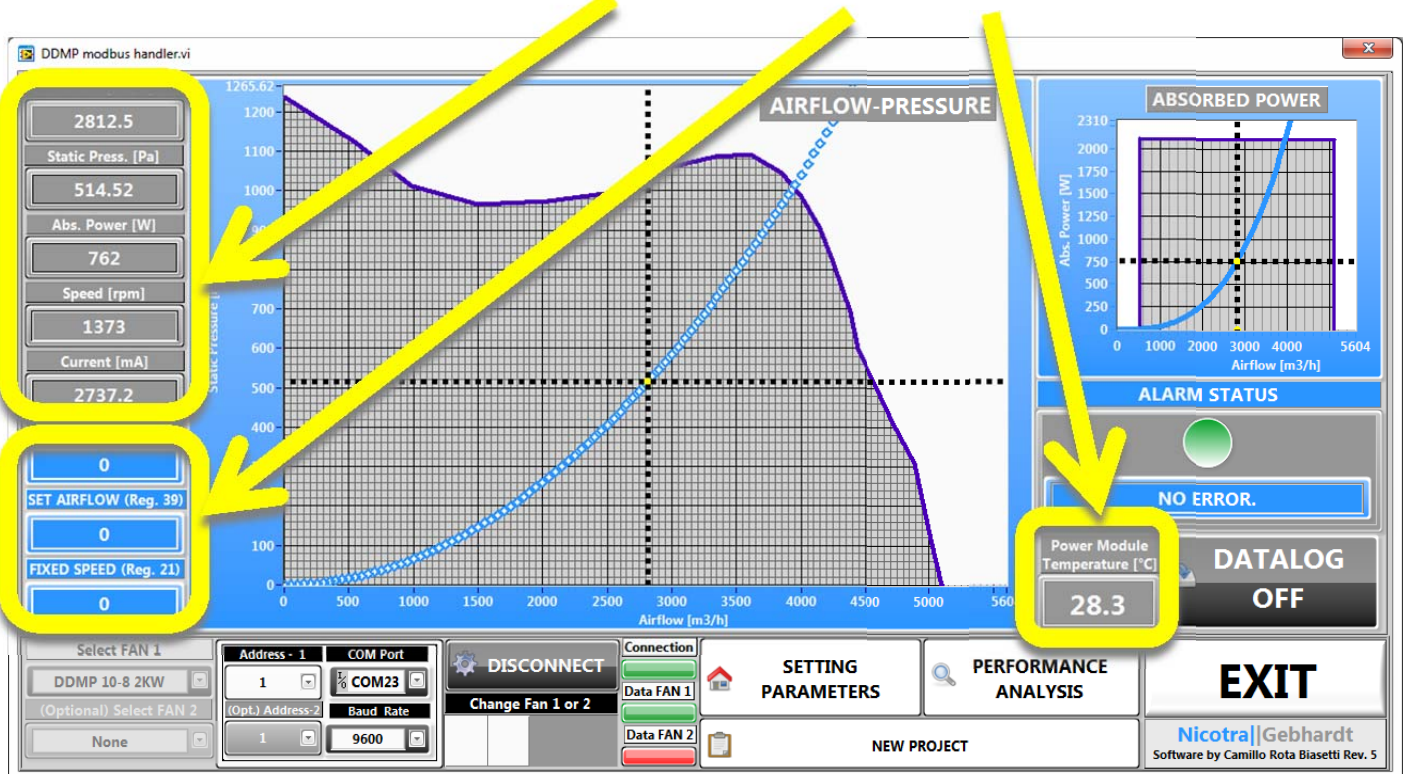
The BLU registers are readable and writable:

- SET SPEED register 66 → [rpm]
- SET CONSTANT AIRFLOW register 39 → [m3/h]
- FIXED SPEED register 21 → [rpm]

Refer to the DDMP manual for details on the Holding Register.

The GREY register are only readable:

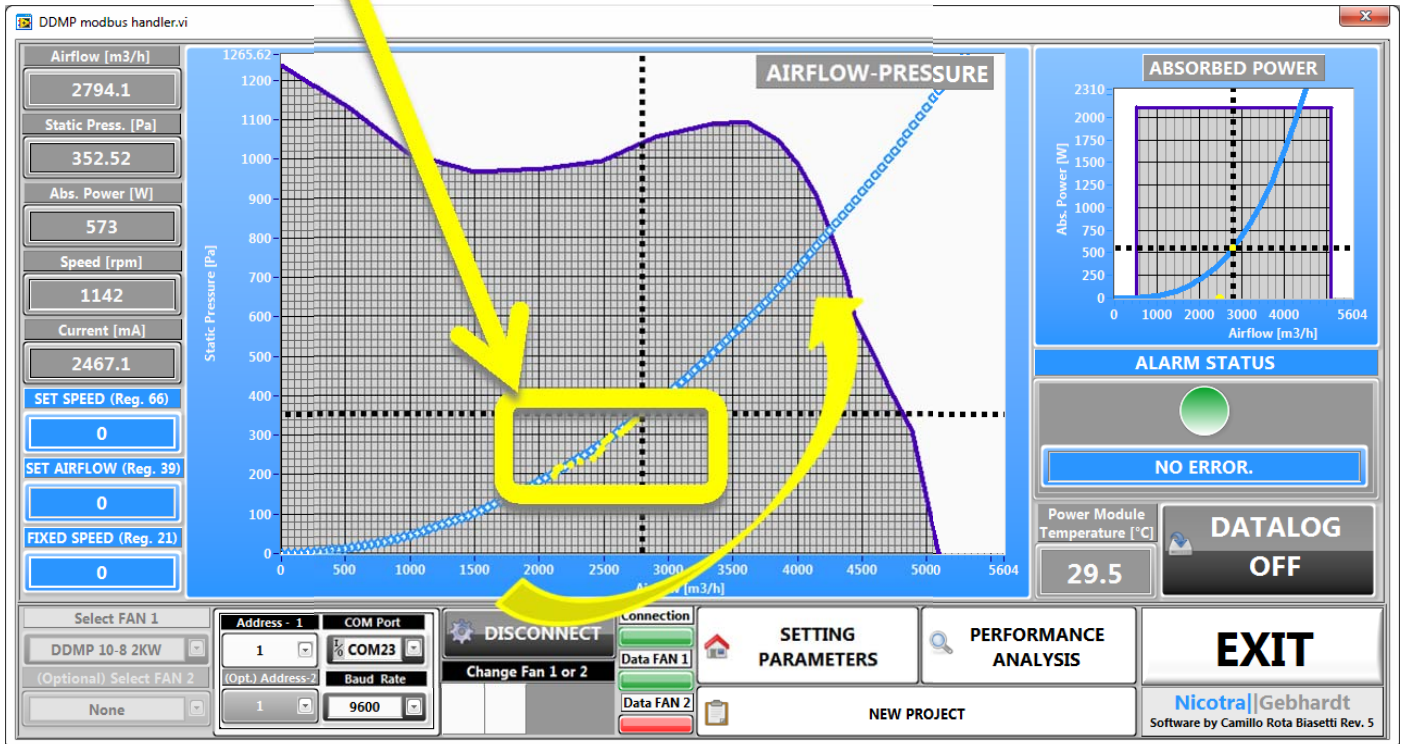
- Airflow → [m3/h]
- Static Pressure → [Pa]
- Absorbed Power → [W]
- Speed real → [rpm]
- Current on motor windings → [mA] (peak value)
- Power Module Temperature → [°C]



EXAMPLES

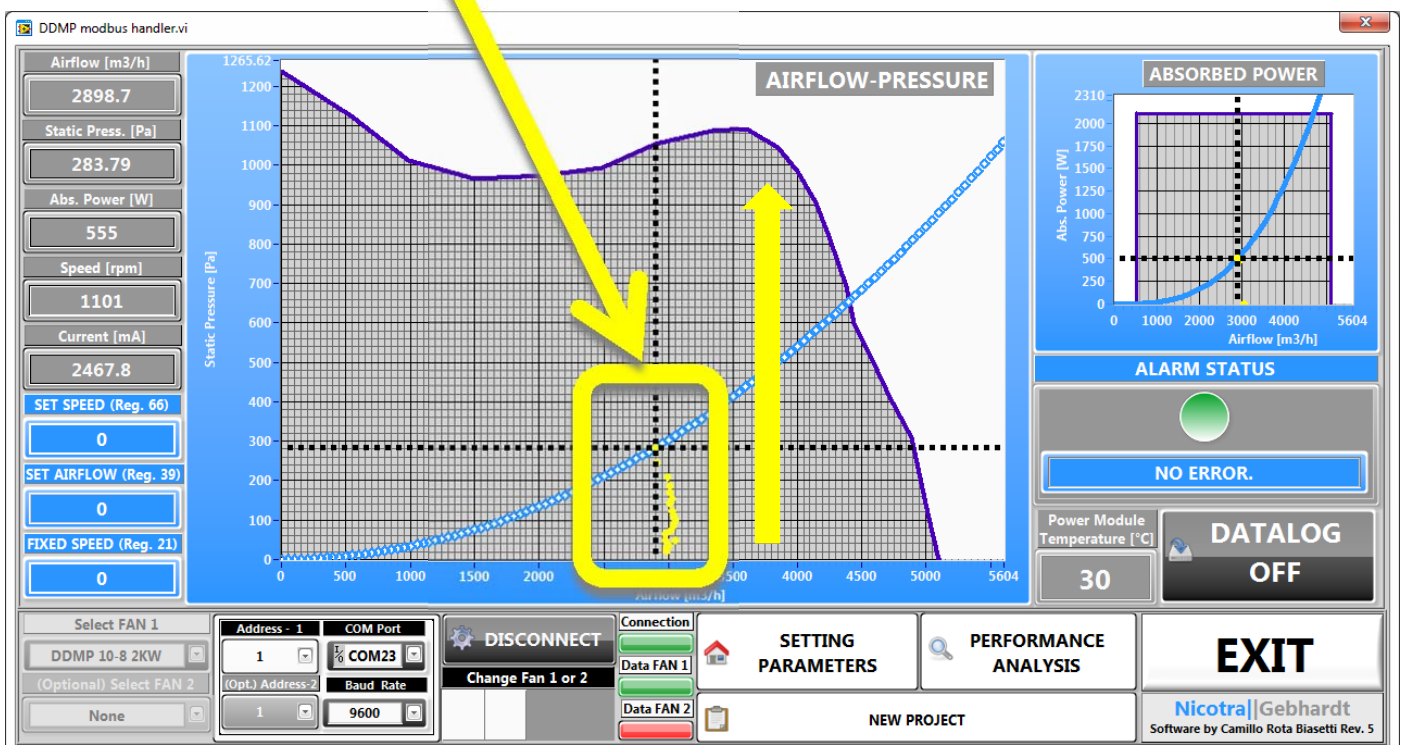
Analog – Speed Control

The yellow points are old displayed points on the same load curve and increasing the analog signal input.



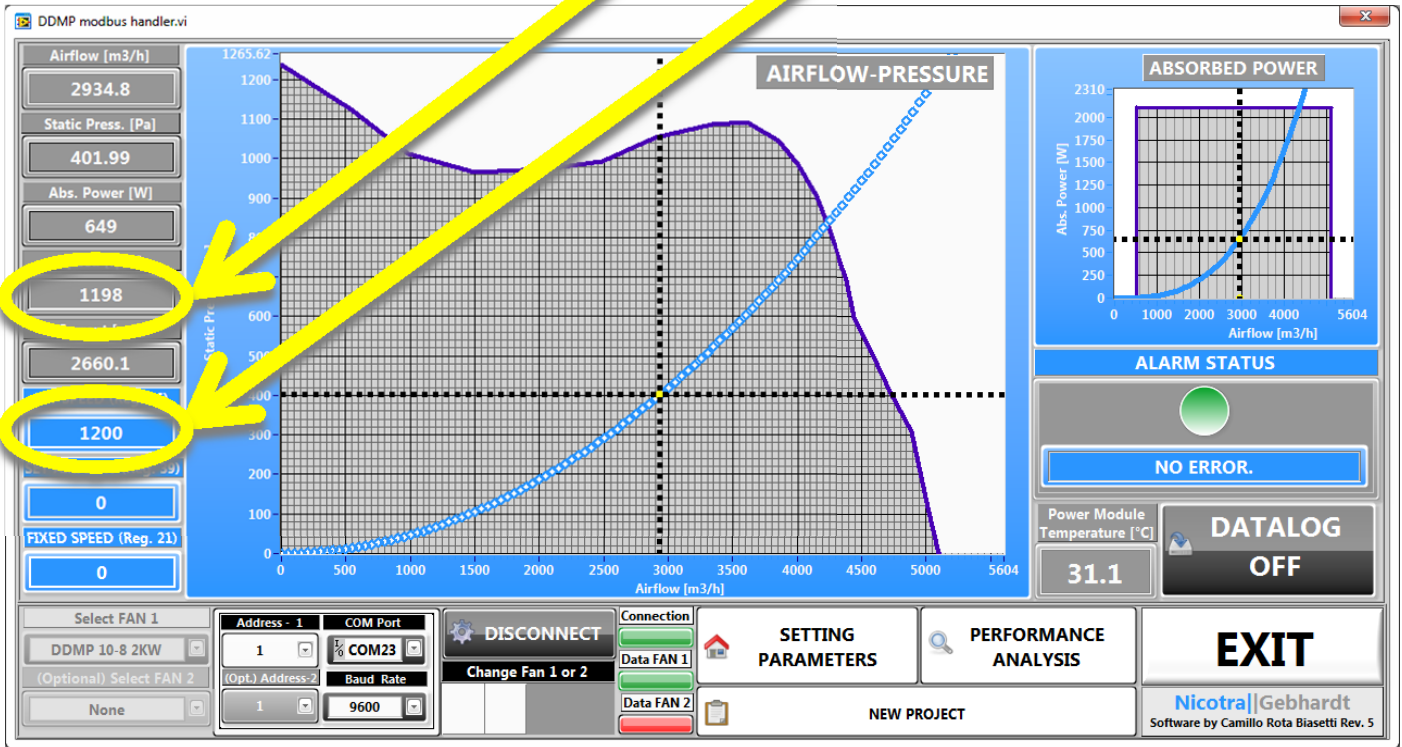
Analog - Constant Airflow: set 3000m3/h

Points from free outlet and gradually closing the damper (obviously can be done also in opposite direction).



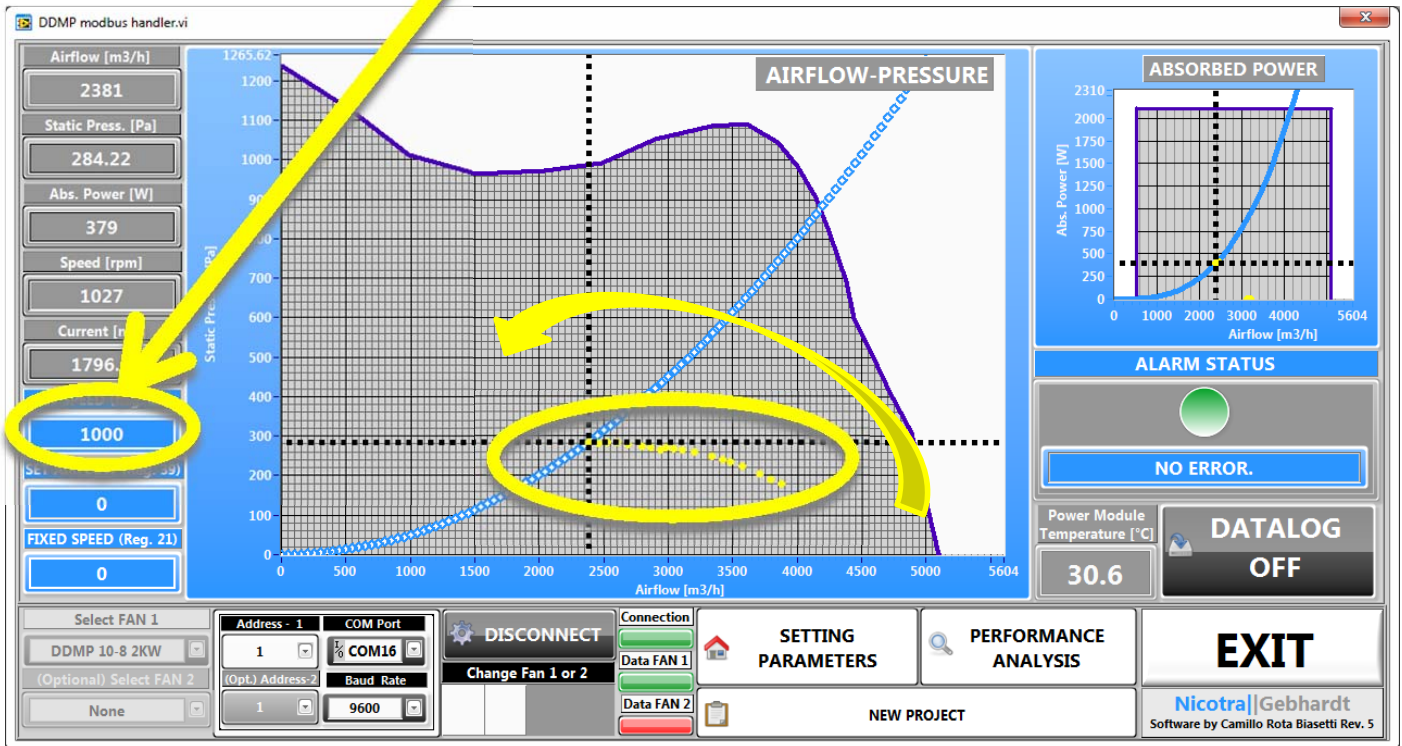
MODBUS Mode (SET SPEED): set at 1200rpm

The speed is set through the register 66. In this case once the driver is powered off the speed value is reset. The set speed can be compared with the real speed read from the driver.



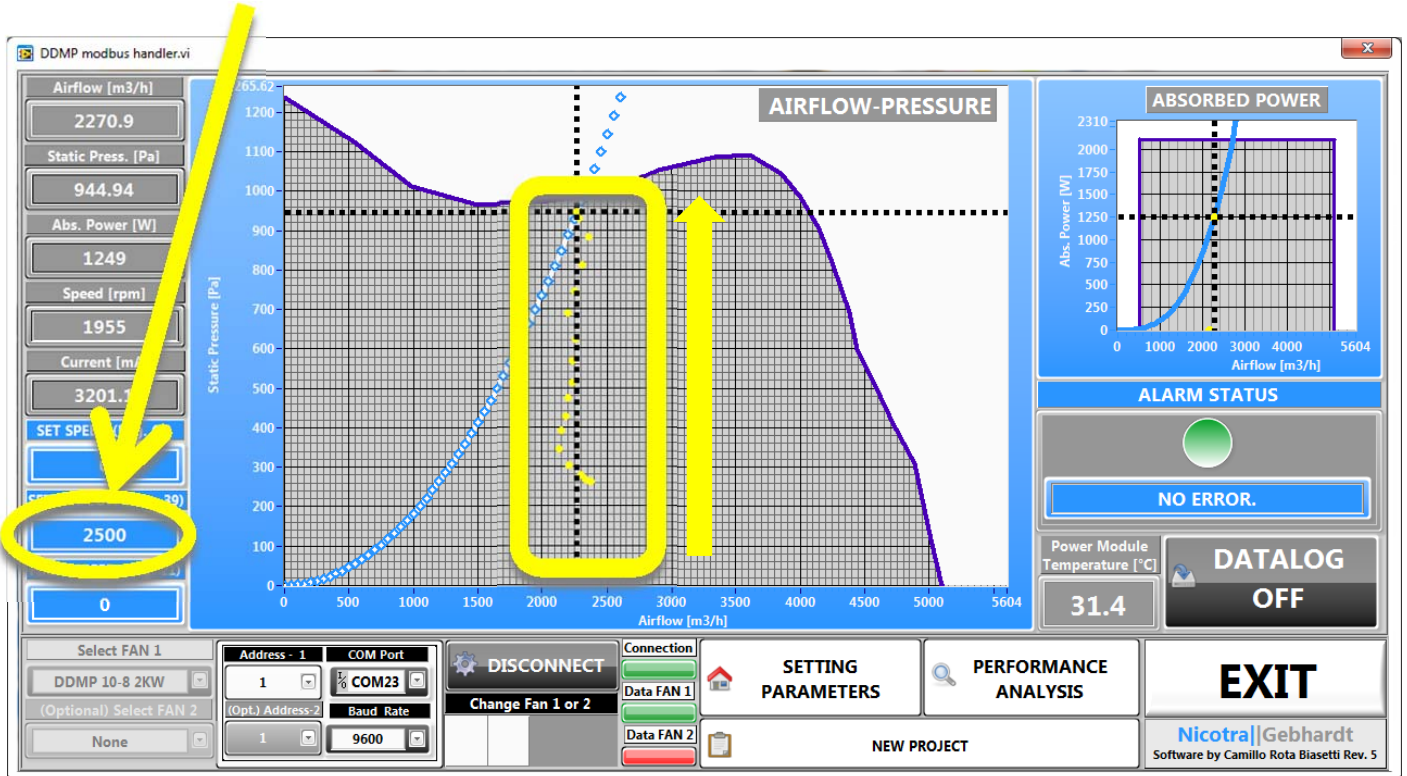
MODBUS Mode (SET SPEED): set at 1000rpm

Points from free outlet and closing the damper.

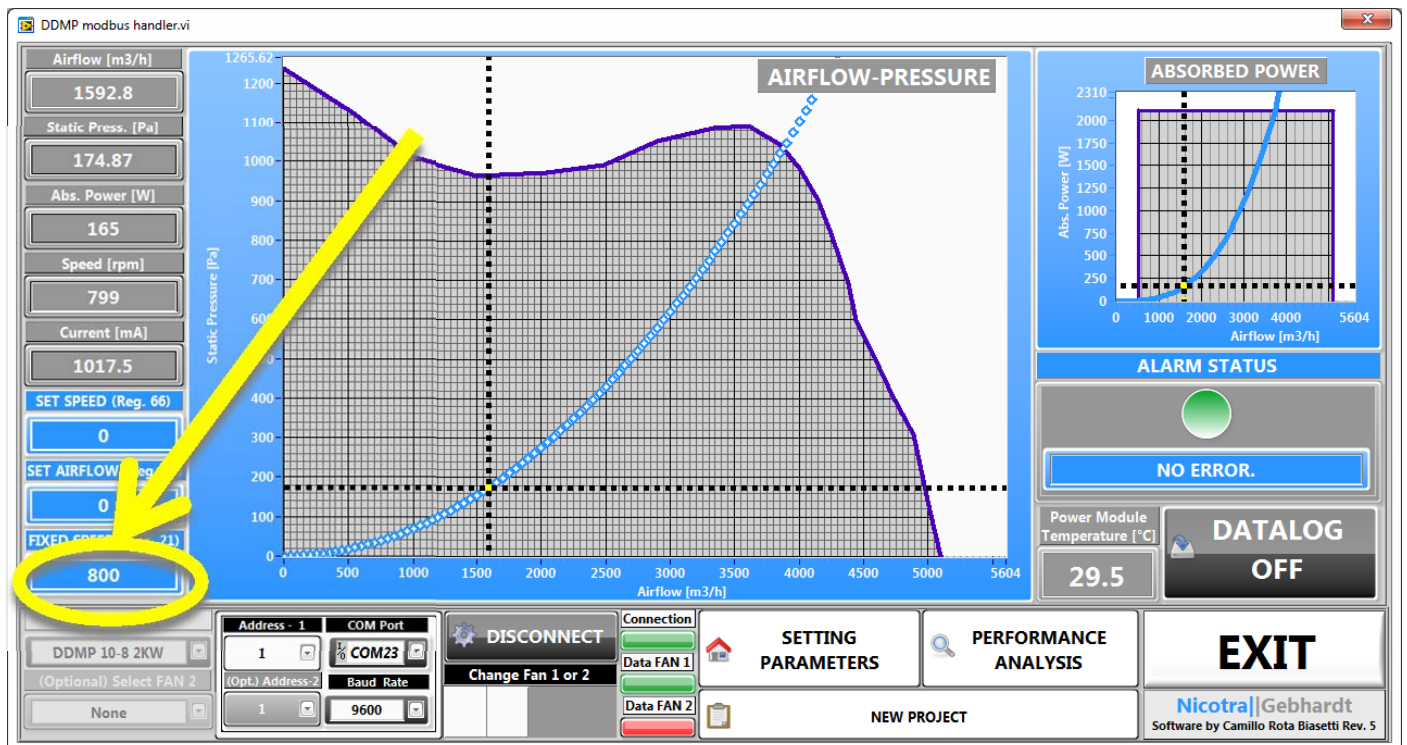


MODBUS Mode (SET AIRFLOW): set at 2500m³/h

Points from free outlet and gradually closing the damper (obviously can be done also in opposite direction).



Fixed Speed Mode (FIXED SPEED): set at 800rpm



Master&Slave MODE

Refer to the DDMP manual for details.

DATA LOGGING

It is possible to create a LOG file labeled with the date and hour.

The screenshot displays the 'DDMP modbus handler.vi' software interface. On the left, there are several data readouts: Airflow [m3/h] (1587.6), Static Press. [Pa] (174.92), Abs. Power [W] (165), Speed [rpm] (799), Current [mA] (1016.8), and control buttons for SET SPEED (0), SET AIRFLOW (0), and FIXED SPEED (800). The main area features two graphs: 'AIRFLOW-PRESSURE' and 'ABSORBED POWER'. A yellow callout box highlights a file icon with the text 'Data LOG-File 11-11-2015 14.15.xls'. Another yellow callout box points to the 'DATALOG ON' button in the 'ALARM STATUS' section, which also shows 'NO ERROR'. The bottom panel includes fan selection, connection status (DISCONNECT), and navigation buttons like 'SETTING PARAMETERS', 'PERFORMANCE ANALYSIS', and 'EXIT'. The software is identified as 'Nicotra|Gebhardt Software by Camillo Rota Bassetti Rev. 5'.

DRIVER ALARM

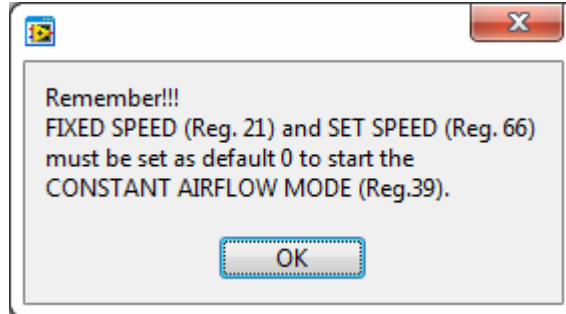
The driver alarms are indicated in this box.
Refer to the DDMP manual for the technical details.

This screenshot shows the same software interface as above, but with a driver alarm triggered. The 'ALARM STATUS' section now displays a red alarm indicator and the text 'INPUT VOLTAGE OUTSIDE LIMITS!'. The 'DATALOG' button is now 'OFF'. The 'AIRFLOW-PRESSURE' graph shows a different data set, and the 'ABSORBED POWER' graph also displays data. The bottom panel remains the same, showing fan selection, connection status, and navigation buttons. The software version 'Nicotra|Gebhardt Software by Camillo Rota Bassetti Rev. 5' is visible at the bottom right.

SOFTWARE WARNINGS

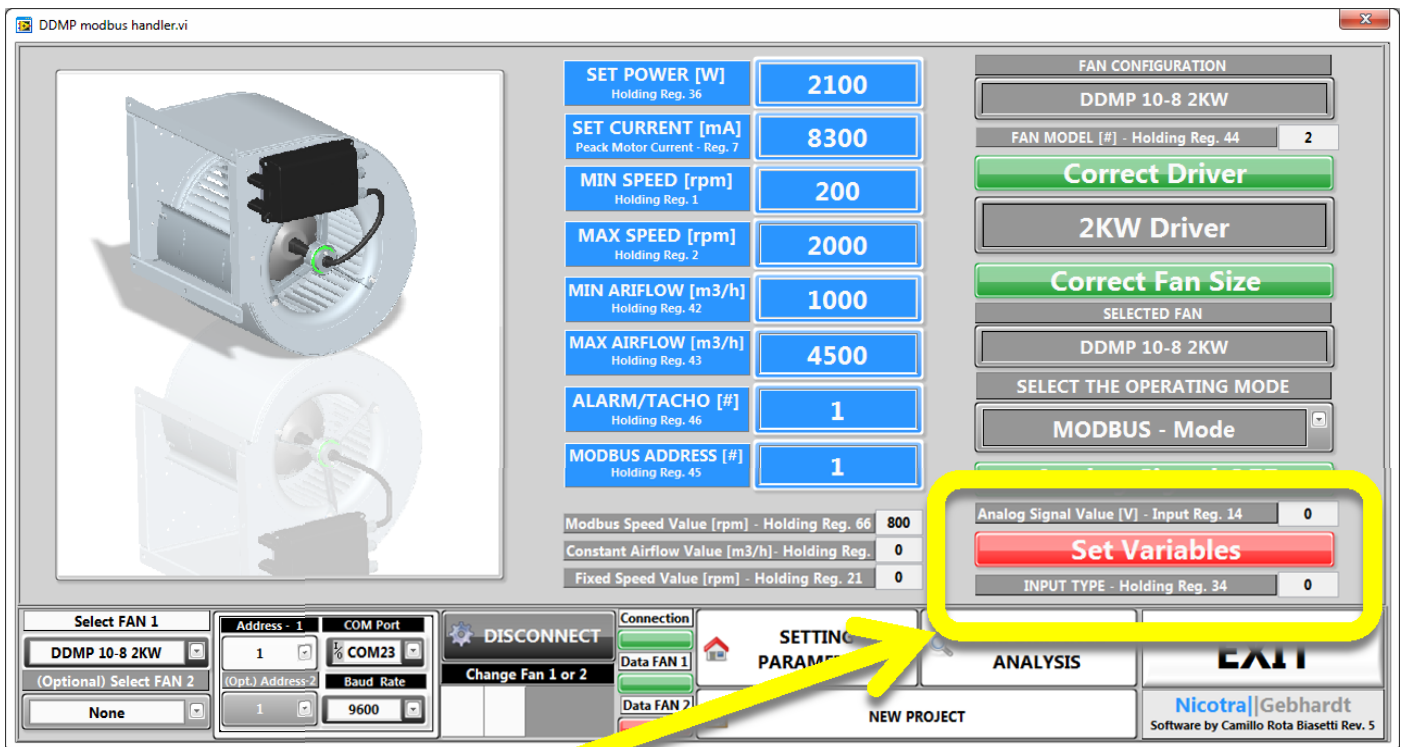
WARNING 1 *(automatically done by the program)*

Before changing a variable value in MODBUS Mode, all the other variables must be put to 0 and the analog signal must be put to 0V.



WARNING 2 *(automatically done by the program)*

- 1- Before changing the Operating Mode , all the variables must be put to 0, the analog signal must be put to 0V.
- 2- Must be restored the default operating mode = MODBUS mode
- 3- And changed to the desired operating mode



INPUT TYPT register 14 →[#]

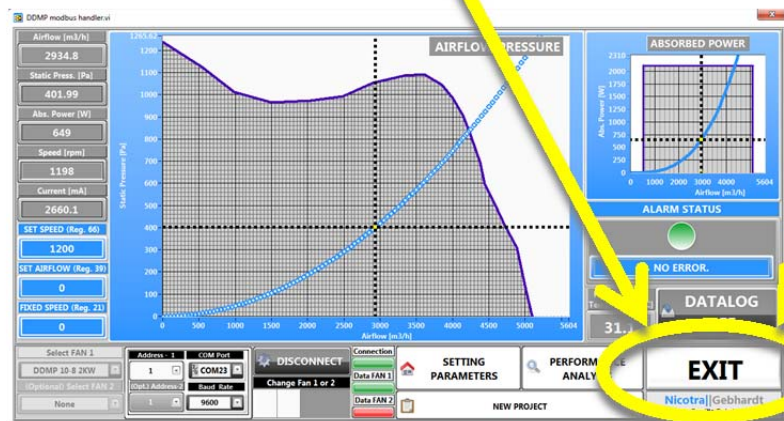
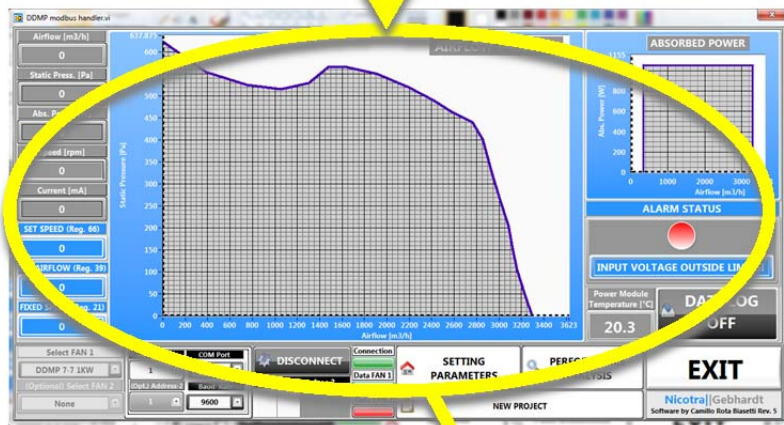
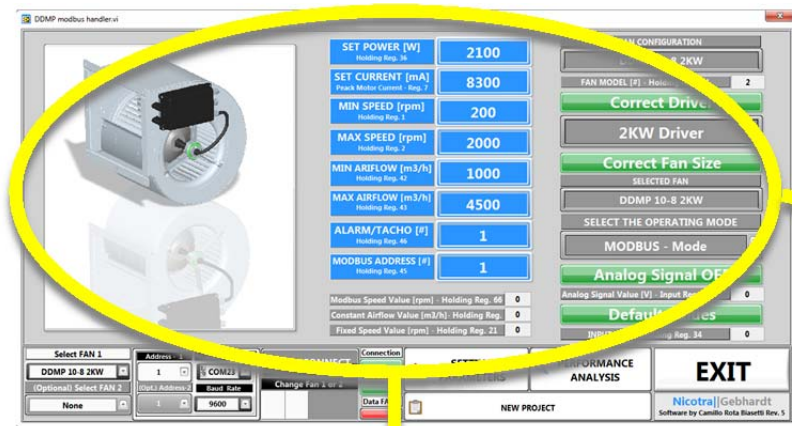
CONSIDERATION

The warning 1 and 2 are automatically set by the program, this must be taken in consideration if this program is used to set the parameters for production.

Therefore the steps for configuring the fan for production are:

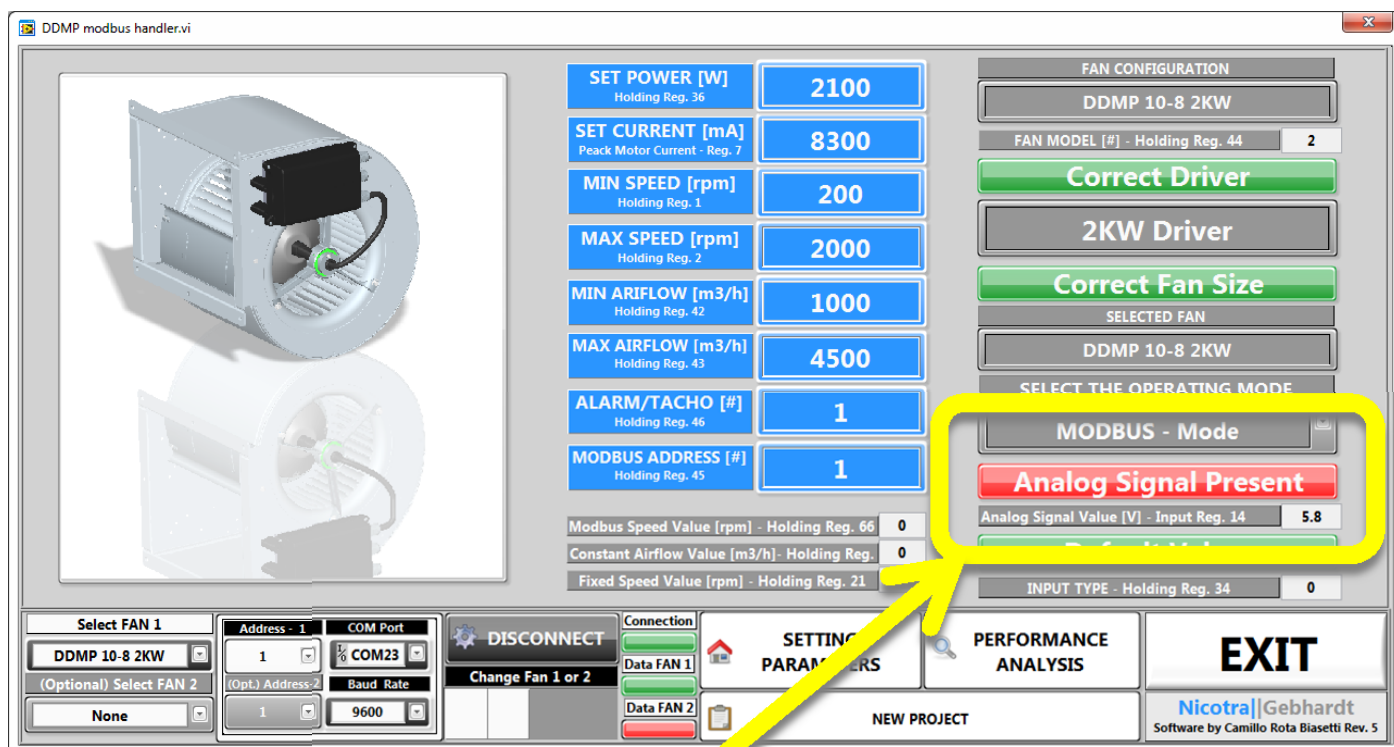
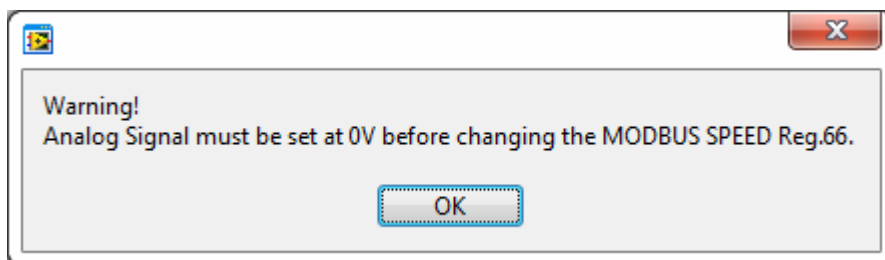
- 1) Set all the desired parameters in SETTING PARAMETERS and the desired operating mode.
- 2) Basing on the selected mode set the parameters FIXED SPEED or CONSTANT AIRFLOW in PERFORMANCE ANALYSIS or EXIT from program
- 3) Check the performance.
- 4) EXIT from the program.

Switching from PREFORMANCE ANALYSIS back to SETTING PARAMETER the OPERATING MODE is restored to “MODBUS –Mode” and the variables are reset, therefore the procedure must be repeated from point 1.



WARNING 3

Before changing a variable value in MODBUS Mode the analog signal must be put to 0V.



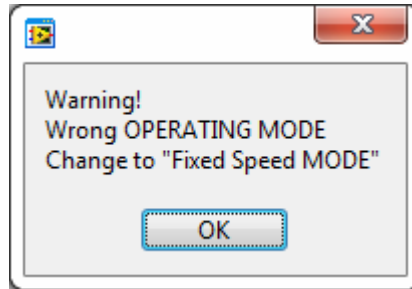
Analog Signal Value register 34 →[V]

WARNING 4

Before turning on the voltage signal in ANALOG Speed Control or ANALOG Constant Airflow Mode, all the other variables must be put to 0.

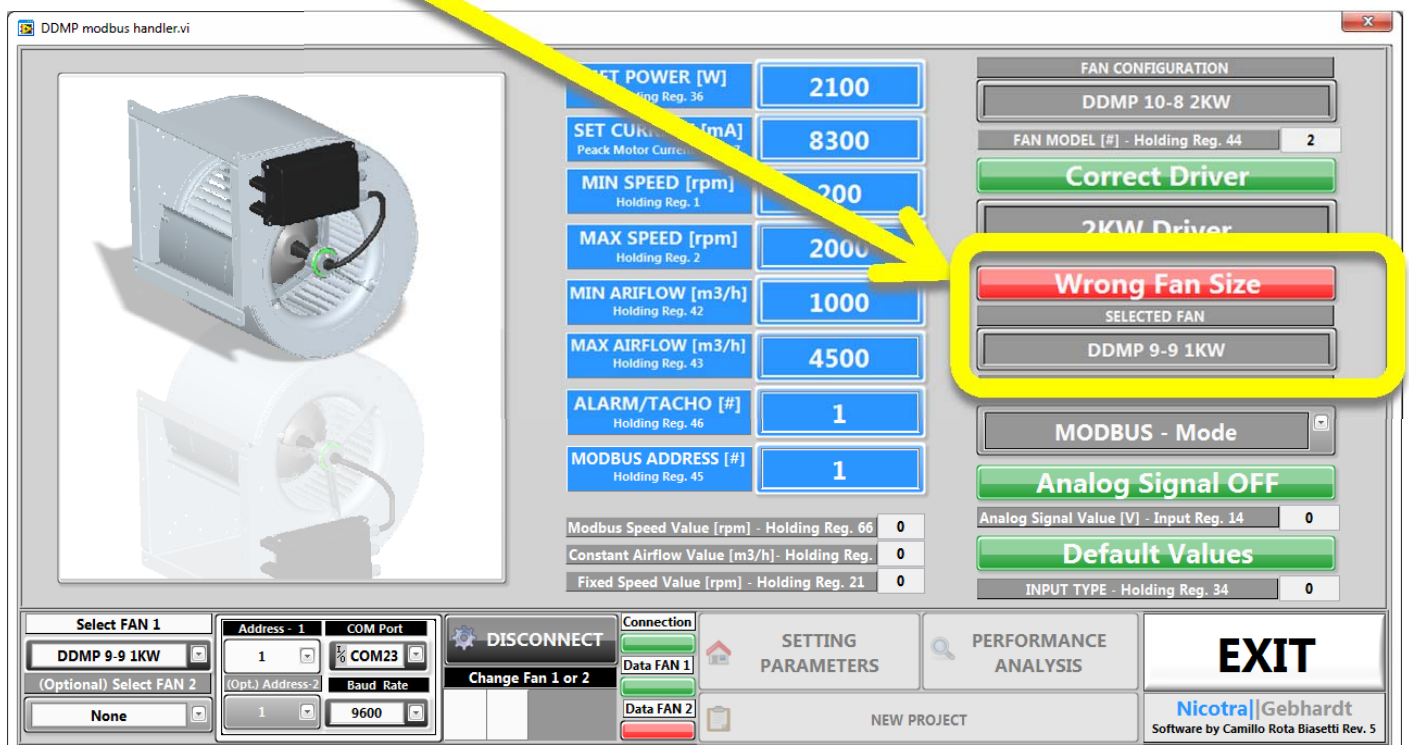
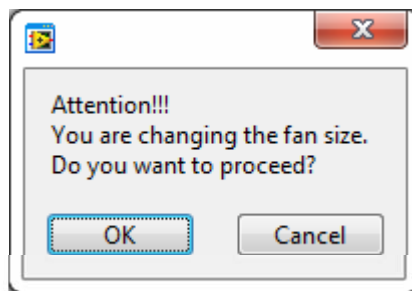
WARNING 5

The operating mode must be correct when modifying the variables.



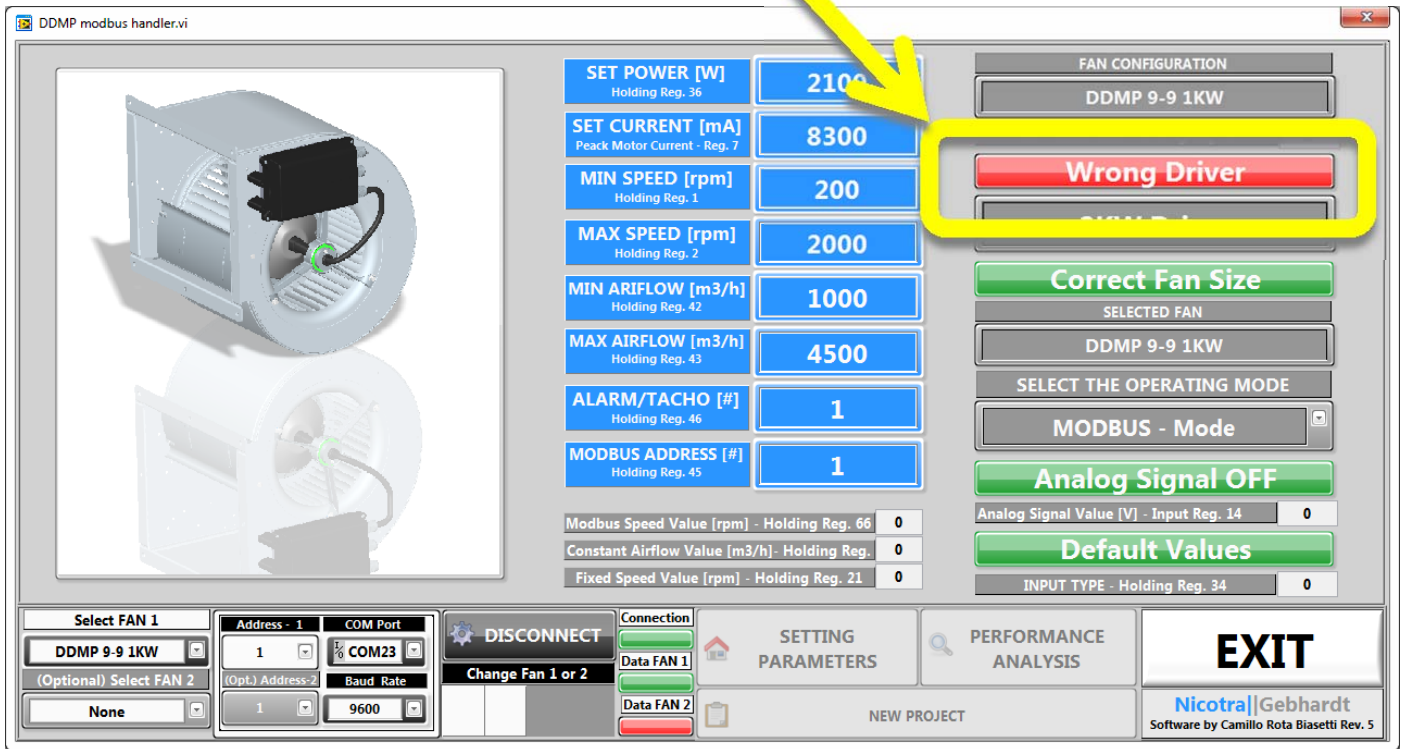
WARNING 6

The fan selected must be correct before changing it.



WARNING 7

The DDMP Modbus FAN TYPE must not be modified by the end user (with other programs). If the driver is not correct for the chosen fan size there is an indication.



WARNING 8 (automatically done by the program)

All the variables must be set within the limits found on the DDMP manual.

