THE COMMAND BLOCK, AQUISITION SYSTEM AND SPECIALIZED SOFT USED AT THE CONNECTION OF THE IDLE THREE PHASE TRANSFORMER TO THE NET AT THE OPTIMAL TIME

Florin BERINDE, Ladislau AUGUSTINOV, Ion PIROI

berindeflorin@yahoo.com; lcaugustinov@gmail.com; i.piroi@yahoo.com

***Abstract* – This paper presents specialized software which is adapted to an application designed to connect a three-phase transformer to the net when the moment is proper. The connection is realized to prevent the over currents that can disconnect the transformer. This software is an adaptation of the Lab VIEW to the microcontroller which command the moment of the connection of each transformer phase to the net.**

***Keywords*:** *acquisition system, specialized software, Lab VIEW, microcontroller, transformer, optimal connection.*

1. INTRODUCTION

The optimal connection of the idle three-phase transformer with star connection, to the net requires well-established electrical angles dephased with the multiple or sub multiple cycle (at millisecond intervals)
Without using the electrical interlock board and micro-controller the connection would be hazardous.

This problem has been a constant concern for the team, with no evident/notable results until this technology has been used. To implement the suggested unit the flow chart in fig.1 was the starting point.

2. THE BLOCK DIAGRAM DESCRIPTION

Starting from the requirements of the application the following components were used:
The PC controls a developing system with micro controller, used to transmit the connection impulses of the electronic contactor CE in well-established moments. It processes the data offered by the data acquisition system of National Instruments type and displays the waves recorded.
The fulfillment of these requirements is offered by two soft. The first soft running on the PC is an original program made in LabVIEW background and commands the micro controller, receives, stores and interprets the data.

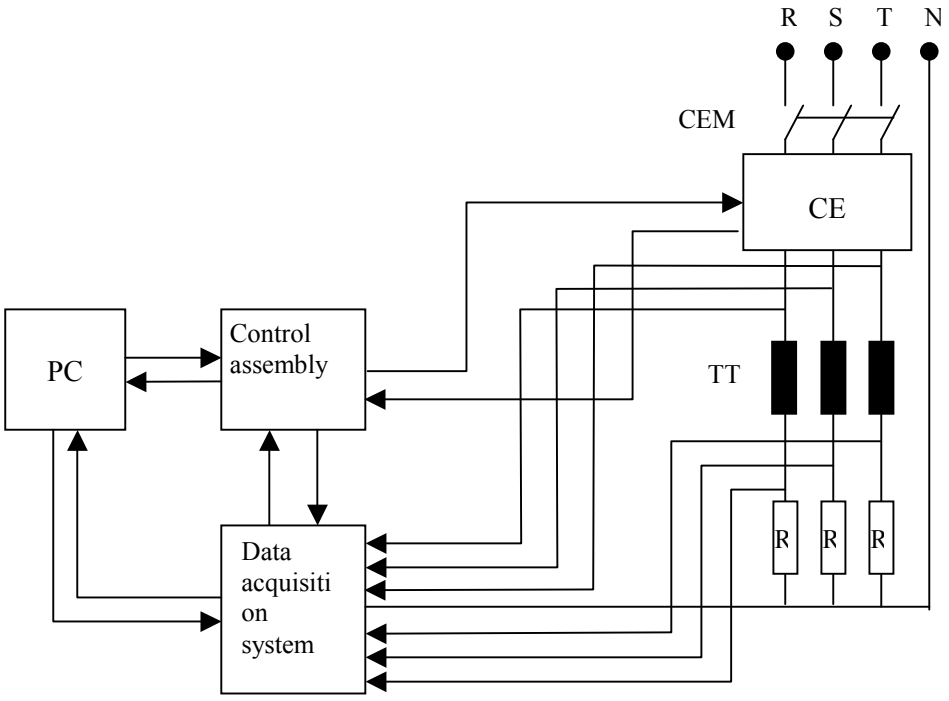

Fig.1 The flow chart of the experiment

On the basis of the received command on the serial port, the second soft that runs in the micro controller allows it a successively setting of a timer that determines the connection moments of the phases and transmits to three pins of the micro controller the connection signals. The passing through zero of the R phase information is taken over by the micro controller and it shifts the phase command with time limits according/corresponding to the electrical angles recommended by the calculator.
The program designed in type LabVIEW has the command panel shown in Fig.2

constants are related to how the connection of the transformer to the net is working (the net frequency, the micro controller frequency, the delay introduced by the alert block of the passing through zero of the R phase, some delays that may appear in the individual command of the phases)
In the right middle of the panel there are elements of pre-writing through which the electrical angular values are introduced, the soft automatically displays the numeric values that are written in the micro controller timer.
In the top central part and in the right side of the control panel there are two blocks: one to display

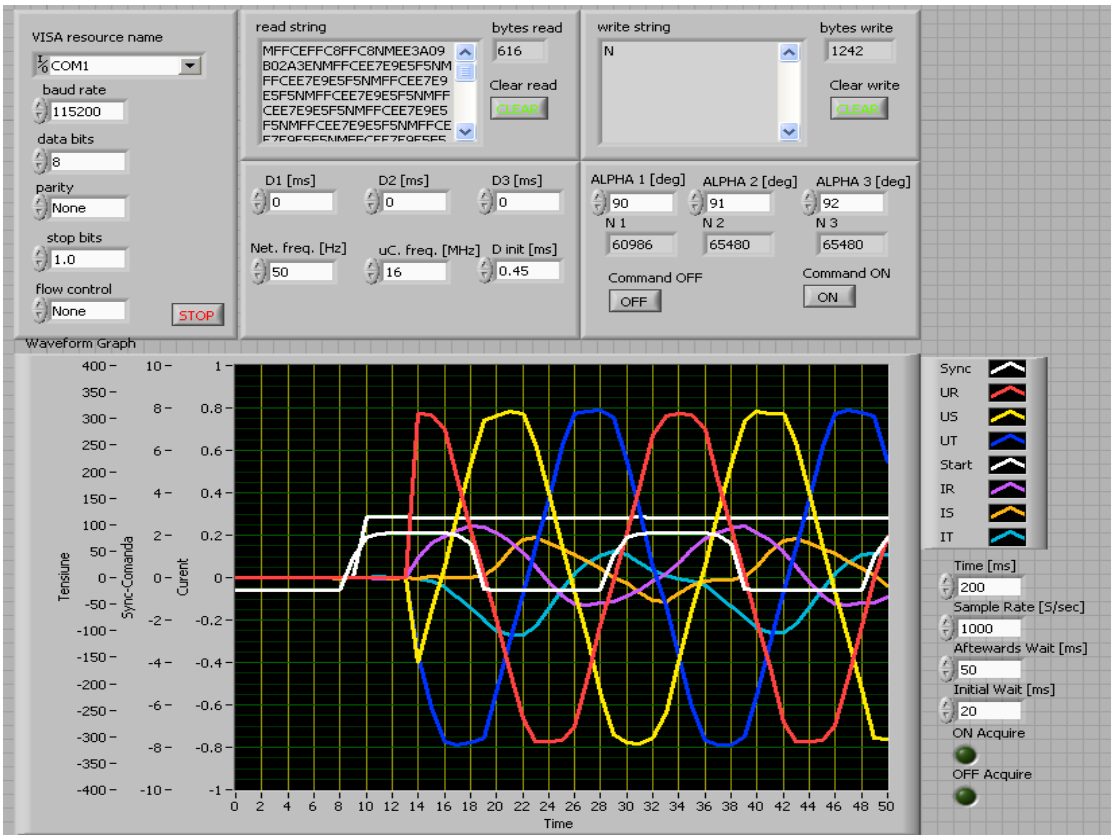

Fig.2 The command panel of the experimental programmed

A functional block that fulfills the command on the serial port of the micro controller can be seen on top of the panel and a functional block that displays the shapes of the obtained waves at the bottom of the panel
For the command of the micro controller, on the left side of the superior block , there is a sub-block meant to set the serial communication parameters.
To calculate the input values in the micro controller's timer , in the middle of the command panel, values for constants can be introduced and modified. The

information received on the serial port, the other one to transmit the working information of the micro controller.
In the bottom half of the command panel is displayed eight wave shapes – two for reference of the command system, three for the phase voltages, and three for the currents through the windings. Next to it are control elements of the displayed wave settings (color, name, etc), as well as setting elements of the acquisition parameters: acquisition duration, sampling frequency, previous and next acquisition waiting times, the display of the running acquisition (ON – OFF)

For details and exemplification Fig. 3 shows the sub-program that creates the PC message to the micro controller.

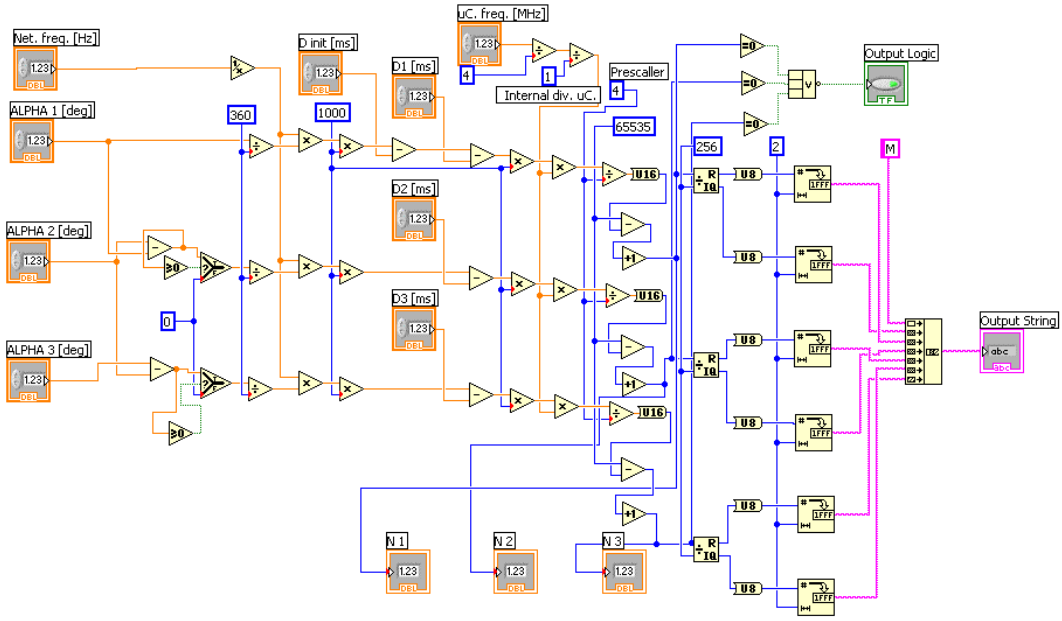

Fig.3 T he sub-program that creates the PC message to the micro controller.

4. CONCLUSIONS

The experimental assembly accomplished for the desired aim was implemented with a micro controller because:

- it allows the commanding in the optimal moments in successively connection of the phases;
- it represents a prototype for a future industrial product;
- the quality of the communication in real time between the PC , micro controller and the acquisition system, as well as the physical accomplishment of the whole assembly results from the accuracy of the displayed waves, presented in the command panel from fig.1.

References

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