

ASPECTS CONCERNING THE ELECTROMAGNETIC PRINT DETERMINATION OF THE ELECTRIC DEVICE

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Abstract: The present work deals with the problem concerning the electromagnetic print determination of some different electric devices. So, we suggest the building of a scanner which could carry an electromagnetic field detector and, in the same time, serving of an acquisition plate, to be possible the command both of the scanner displace and the acquisition in real time of the values of the electromagnetic field produced by the device.

Keywords: electromagnetical print, electric devices, scanner

1. INTRODUCTION:

The electromagnetic print determination of the electric devices could be useful in more respects, such as: the determination of the areas in close proximity of the device which are subdued to a more intense electromagnetic field, the determination of the device component parts which are subdued to some electromagnetic fields or to some powerful inducted currents, the possibility of the device functioning state determination, by studying the electromagnetic print, etc.

The determination of the devices' electromagnetic print could be done by measuring the value of the electromagnetic field in a finite number of points situated in close proximity, and than, plaining the points with the same value it obtains lines, isometrical surfaces.

1.1 The description of the mechanic part

The present work concisely describes a device created for measuring the values of the electromagnetic field. This device is similar to a bidimensional scanner, which carries the derrick of an electromagnetic field detector that

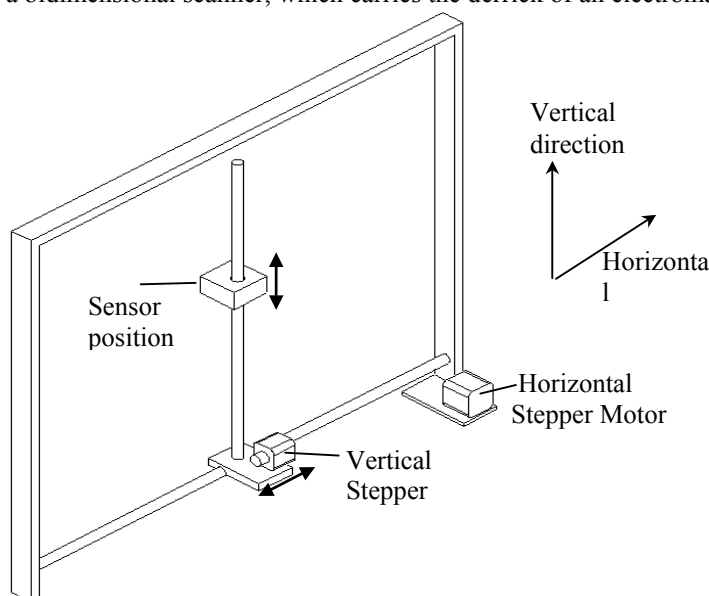


Fig. 1: Electromagnetic field scanner – schematic

measures the values of the electromagnetic field produced by the electric device, tested in a finite number of points and set like on a chess table.

Figure 1 presents the device, pointing out in the same time, the main component elements.

The device, named The electromagnetic field scanner, is operated, step by step, by two motors which displace the electromagnetic field sensor in two directions: horizontal and vertical.

The two motors and devices of the displace in the two directions are recovered from the two old printers and assembled, like in fig.1, so that it could carry out (fulfill)the suggested task.

1.2. The digital command and the data acquisition

The vertical stepper motor is bipolar, its command and supplying scheme being presented in fig.2.

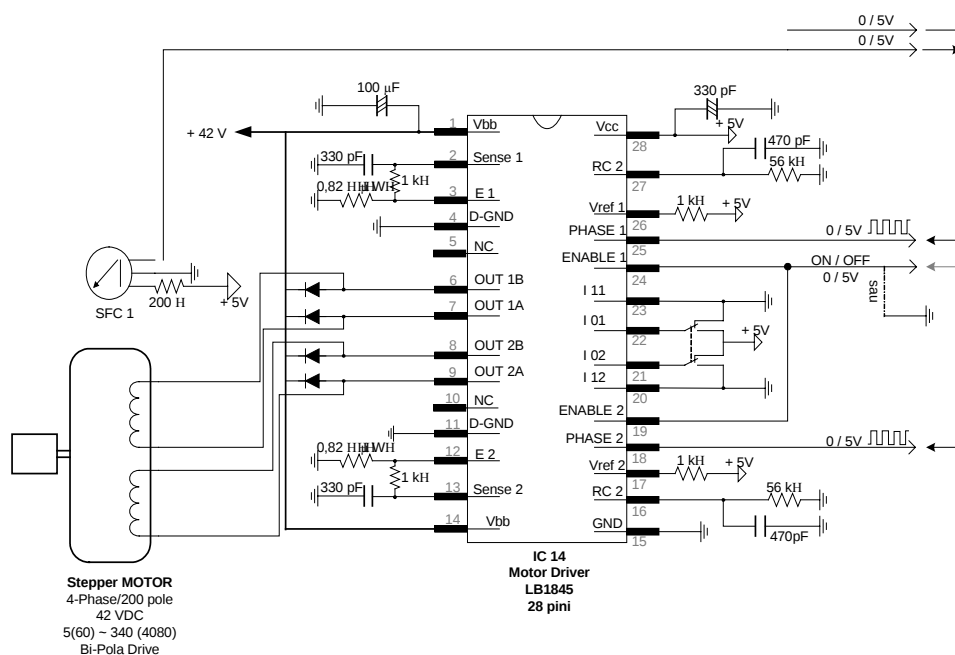


Fig 2

The horizontal stepper motor, with a median plug, is supplied and commanded with an integrate circuit UNC5804. So the stepper motors command, as the acquisition of the values measured by the magnetic field detector, are made using an acquisition given plate and are processed using some applications realized in Lab View command.

In fig 3, it is presented a part of the block diagram of the vertical stepper motor. The main used variables are:

- the cycles number- represents the distance gone by the sensor between the two measurements - that is we have the length of a step, of a cell.
- Number FOR- represents the distance gone by the sensor that is represented by the area's size in which we want to measure the electromagnetic field.
- Wait 1 [ms] – represents the necessary time for the measurement and for the acquisition of the measured size- it will be experimentaly determined.
- SENS 1- the displace sense in which the electromagnetic field measurement will be done.
- SENS 2- the return sensor sense at the initial position.

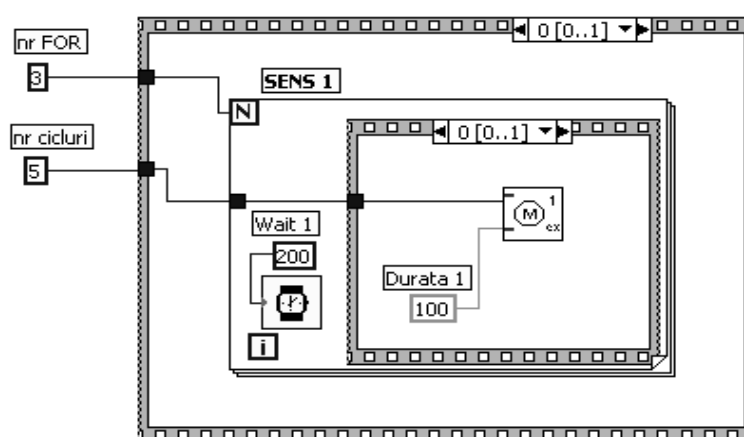


Fig. 3: The Block Diagram pentru comanda Vertical Stepper Motor.

In fig.4, it is shown a sequence from the Block diagram for the horizontal stepper motor command.

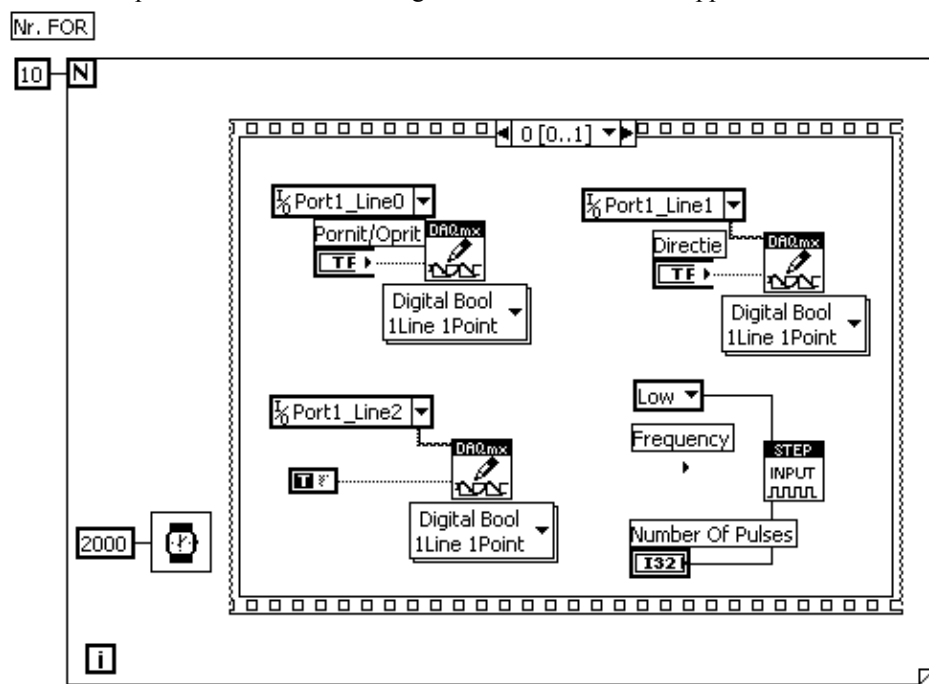


Fig. 4: The Block Diagram pentru comanda Horizontal Stepper Motor.

The measurement and the acquisition of the electromagnetic field will be done only in one-way sense of the sensor's displace. This will be done for making easier the subsequent data processing, and for an easier stocking of the data.

The values will be stocked in a bidimesional matrice.

2.CONCLUSIONS:

This is an experimental device and its role is that of allowing the measurement of the electromagnetic fields values produced by the current passing through different equipments and electric plants of gauge sizes that could be integrated in the 300x 350 mm limits.

The intensity measurement of the electromagnetic field produced by the electric devices can be useful for:

- the pollutant electromagnetic emissions that could affect so the human being, as other electric devices situated in close proximity.
- the drawing of the electromagnetic map of the electric plants and devices.
- the determination of the areas and of the constructive components of the devices and of the electric plants which are subdued to some intense values of the electromagnetic field produced by the current passing through itself.

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