

NEW MEASUREMENT METHODS IN VIRTUAL LABORATORY

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ABSTRACT

This text is focus on new measurement projects using virtual laboratory. Virtual laboratory was expanded measurement projects in school laboratory. Virtual laboratory was composition from one measurement workplace with interface RS 232 and second measurement work place with interface GPIB.

1 AUTOMATED WORKPLACE

1.1 CONNECTION MEASUREMENT WORKPLACE WITH INTERFACE RS 232

For connection measurement instruments with interface RS 232 was used switch SW 232. This instruments witch communicate only through interface RS232 are connect to PC with simple switch serial line SW 232. It is possible connect 8 instruments through this interface. Connection is on figure 1. Transfer from proper channel 1-8 to PC indicates turn on LED over switch SW 232. Two instruments MS 2000 are connect to this switch. They have own service software which they use for measurement.

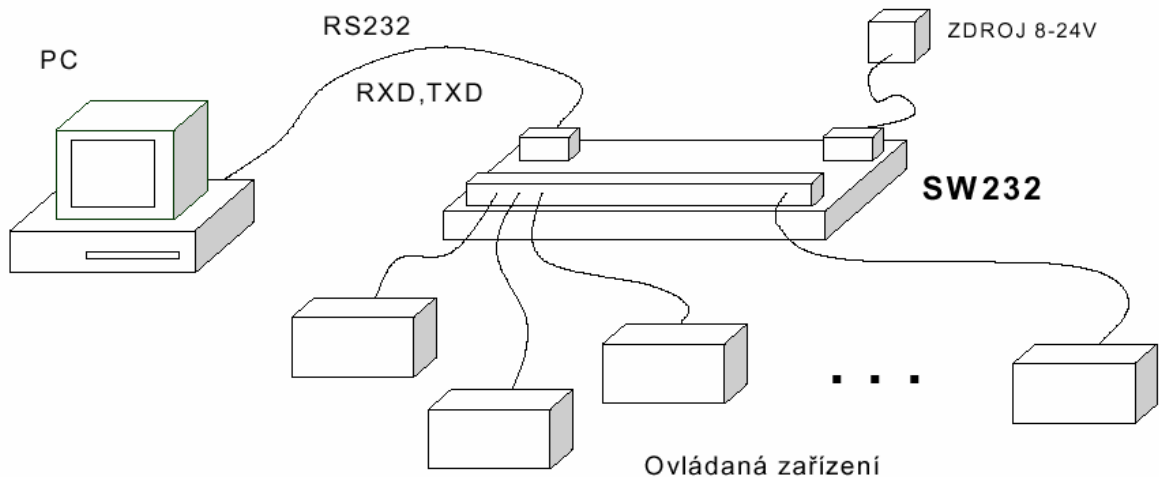


Fig. 1: *Connection instruments through serial line*

1.2 CONNECTION MEASUREMENT WORKPLACE WITH GPIB INTERFACE

Each instrument is connected to the measuring PC by the GPIB cable. Devices are controlled through the MS Excel. In this program, a program is created, using the MS Visual Basic language, which provides control of communication between devices and PC. Students can, by pressing the button "Connect devices", set which devices will be used to ensure measurements. Next, they enter the maximum value of current and the number of measurements into the table.

Into a column of voltage, they had to fill values, which will be set on the power supply. Cells that are needed to be filled are colored. Measurements are started by pressing the button titled "Start measure". During measurement, it is possible to set a type of measurement, e.g. If we change a converting characteristic, or characteristic of input or output.

Measured values are automatically represented in a graph next to the measurement values, this represents more effective work during measuring while there is visible if the measured characteristic is corresponding with the supposition. The measurement was further opened out in Ing. Stratil's GPIB Studio.

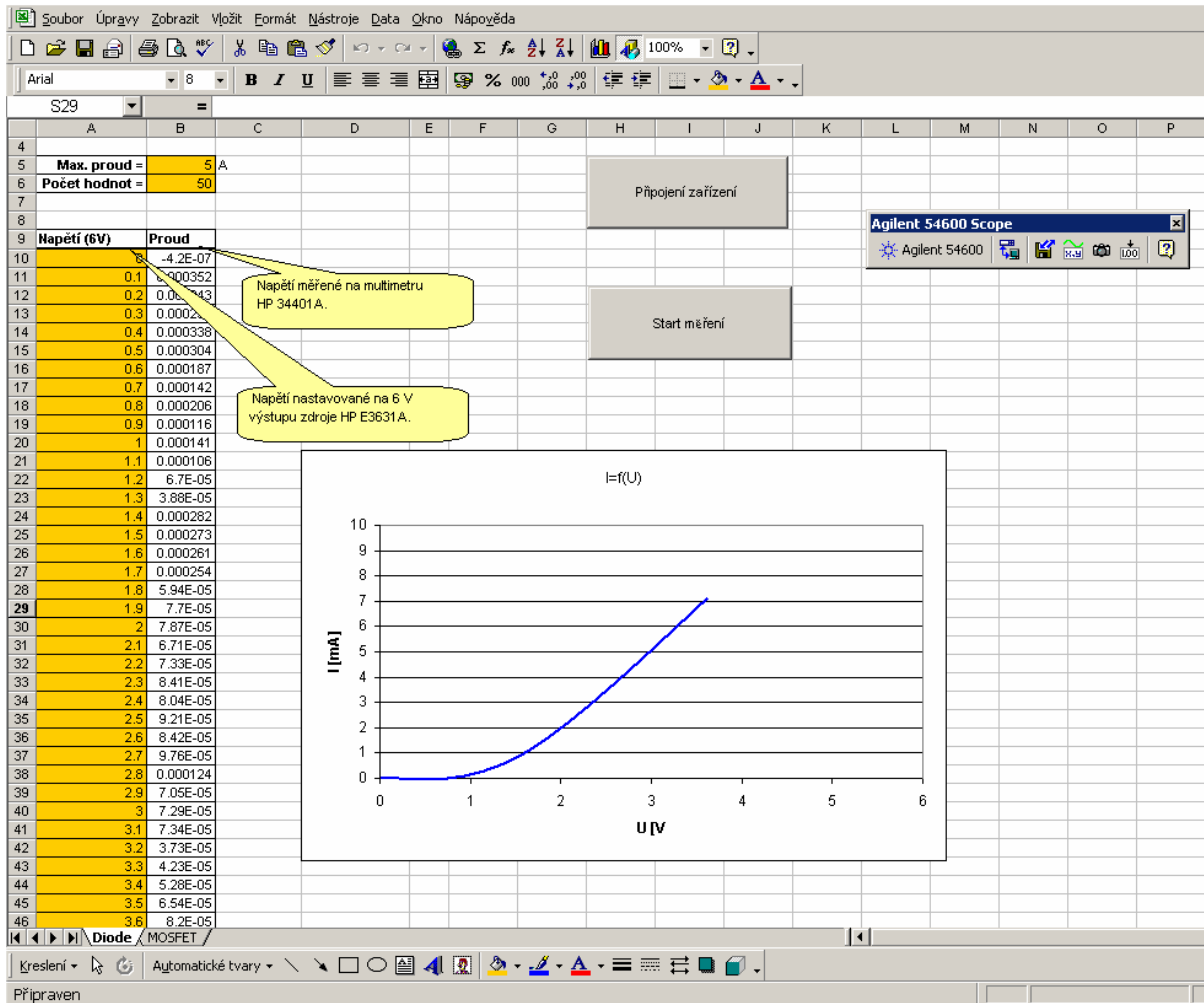


Fig. 2: Sample of measurement environment

Measuring PC contains measurement GPIB card Agilent type 82350B. Instruments are connect with this card through GPIB cables.

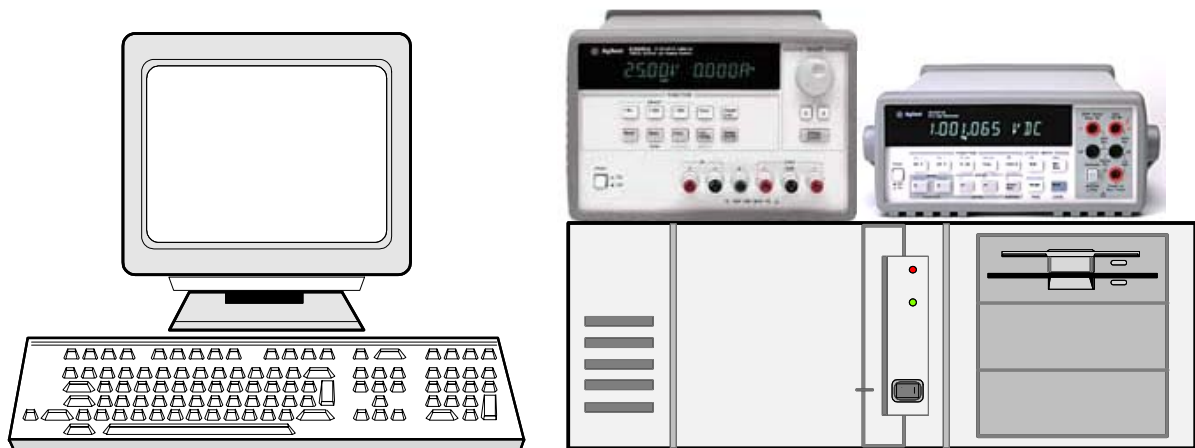


Fig. 3: Sample automated workplace

Measurement workplace uses next options of GPIB interface: conversion GPIB to TCP/IP. This makes possible to observe measuring on mobile device as for example iPAQ Pocket PC H3870.

2 CONCLUSION

Purpose of project was creating new concept for laboratory lessons, so upcoming engineers could practice their practical experiences with modern measurements devices. Students can improve in different ways of controlling measurements device during time spent in laboratory, through SW equipment as for example Lab Window, but also MS Excel and Ing. Stratil's HPIB Studio, that was adapted for education purpose.

ACKNOWLEDGEMENTS

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REFERENCES

- [1] Vrba, R., Kuchta, R., Legát, P., Mikel, B.: Digitální obvody a mikroprocesory. Přednášky. Elektronické texty, Brno, FEKT VUT 2003, 200 s.
- [2] Vrba, R., Skočdopole, M., Fajcik, L., Kuchta, R.: Digitální obvody a mikroprocesory. Cvičení. Elektronické texty, Brno, FEKT VUT 2003, 36 s.
- [3] Automatizované pracoviště v systému HPIB Studio. Popis a návod užívání automatizovaného pracoviště v Laboratoři elektronických přístrojů a mikroprocesorů, UMEL FEKT VUT v Brně, 2003, 21 s.
- [4] Papouch s.r.o.: Jednoduchý osminásobný přepínač RS232.
- [5] <http://www.papouch.com/sw232.html>