Information Input and Output Devices Lab

NAIRI-STEM
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Overview

The Information Input and Output Devices Lab is designed as a laboratory bench for familiarization with a basics of programming of information input and output devices. The Lab stand allows students to familiarize oneself with the basics of functioning of the devices and with the features of their programming. As a control and measurement device is used myRIO-1900 controller by National Instruments Company. Each device is designed as a separate unit and can be connected to myRIO-1900. It's also possible to connect several input-output devices to the myRIO-1900 simultaneously.

Working with the lab stand allows students to analyze and learn the basics of working with the devices for information input and output. The connection of the devices is performed manually by students, allowing to study of the features of working with these devices more details.

List of Lab Devices

1. Monochrome character liquid crystal display (LCD)
2. Graphical color LCD display
3. Single-digit and four-digit seven-segment indicators
4. Light-emitting diode matrix 8x8
5. Single monochrome and three-color (RGB) LED indicators
6. Analogue joystick and push buttons
7. 4x4 matrix keypad
8. RFID reader
9. IR receiver with IR transmitter in terms of a remote control
10. Computer keyboard
11. NI myRIO controller

Hands-on Works

1. Studying of the basics of symbol coding on the computer using computer keyboard.
2. Control of the single and three-color (RGB) LED indicators.
3. The programming basics of seven-segment indicators.
4. Operating principle of the LED matrix 8x8:
   4.1. Indication of information on the LED matrix 8x8.
   4.2. Creating and indicating of arbitrary symbols on the LED matrix 8x8.
5. Basics of monochrome LCD display functioning and indication of information on it.
6. Creating, indicating and recording of the new symbols to the LCD display memory.
7. Indication of information on the LCD display received from the matrix keyboard.
8. Basics of color graphical LCD display functioning.
9. Acquisition and processing of the information from analogue joystick.
10. Data acquisition from the push buttons.
11. Programming matrix keypad.
12. Basics of RFID reader functioning. Receiving and processing of information from RFID tags.
13. Principle of information transmission through IR rays. Information transmission from IR remote control to IR receiver.

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