SV TEHS SIA

Development Tools for Java™

IPJVES Application Note 02:

Blinking LED

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IPJV-ES Application Note 02: Blinking LED

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Chapter 1

Introduction

IPJV-ES Development Board can be used in different applications.

The IPJV-ES Development Board with embedded virtual machine for Java™ offers an Ethernet based connection to the Internet and numerous interface possibilities to other equipment, include serial RS-232 DTE interface, serializer module with UART, SPI, GPSI and 10BASE-T Ethernet support, 6-channel 10-bit A/D inputs, analog comparator and 16 I/O pins.

The IPJVM virtual machine for Java is a clean room implementation, that has been specially optimized to run on device with limited amount of internal memory and designed for Java™ 2 Platform, Micro Edition (J2ME™) Connected Device Configuration (CDC) Foundation Profile.

A complete development toolkit available for application development with IPJVM platform. The IPJVM platform provide system designers and software developers simple, flexible and cost-effective solution for embedded Internet application rapid development and prototyping. The platform is combination of Ubicom IP2022 Internet Processor and a Java programmable runtime environment.

The IPJV-ES Development Board based on Ubicom IP2022 Internet Processor, optimized for Internet-edge applications. It handles protocol processing in software instead of in hard-wired logic, making the whole solution more adaptable to evolving standards and allow designer to use the same solution across a wide variety of internet-edge products simply by changing the software, thereby significantly reducing nonrecurring engineering (NRE) costs.

Typical IPJV-ES applications include Includes HTTP/FTP/SMTP/SNMP/Telnet servers, PPP support on embedded UARTs, encryption, security and authentication tools, reporting and alarming via e-mail, remote monitoring, control, management and maintenance.

Updates

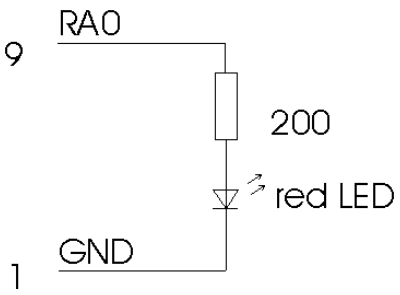
New versions of the IPJV-ES software and applications can be obtained from the manufacturer's web site at:
`http://www.svtehs.com/ipjv.htm`

Chapter 2

Blinking LED

Simple program to switch IO port on IPJV Development Board.

This application demonstrate output to the external I/O port. Connect the following components to the external connector of the IPJV board:



You need to select necessary port, bit and pin function (input/output). For details about IP2022 ports check also Chapter 2 of the IPJV User's Cuide and Ubicom IP2022 datasheet.

```
import jbvm.ip2k.PortIO;
class Blinky
{
public static void main(String[] args)
        {
        // Port RA
        byte    pPortO=PortIO.RAOUT;
        byte    pPortD=PortIO.RADIR;
        // Bit RA0
```

```
        byte    bMask=0x01;
        // Set direction out
        PortIO.clearPortBits(pPortD,bMask);
        while (true)
                {
                // Turn on LED
                PortIO.clearPortBits(pPortO,bMask);
                // Leave it on for 1/4 second
                try     {
                        Thread.sleep(250);
                        } catch (InterruptedException ie) {}
                // Turn off LED
                PortIO.setPortBits(pPortO,bMask);
                // Leave it off for 1/4 second
                try     {
                        Thread.sleep(250);
                        } catch (InterruptedException ie) {}
                }
        }
}
```

You will see LED switching on and off 2 times per second.

Extension Connector

30-pin extension connector allow different custom applications for IPJV-ES development board. Connector have the following pinout:

Pin	Name	Sense	Imax@ 3.3V	Description
1	GND	Power		Common Ground
2	GND	Power		Common Ground
3	B2	I/O	8 mA	I/O Port, External Interrupt
4	B3	I/O	8 mA	I/O Port, External Interrupt
5	B0	I/O	8 mA	I/O Port, External Interrupt
6	B1	I/O	8 mA	I/O Port, External Interrupt
7	A2	I/O	24 mA	I/O Port, High Power Output
8	A3	I/O	24 mA	I/O Port, High Power Output
9	A0	I/O	24 mA	I/O Port, High Power Output
10	A1	I/O	24 mA	I/O Port, High Power Output
11	G7	Input		ADC7 Input,
12	G6	Input		ADC6 Input
13	G3	Input		ADC3 Input, ADC Reference Input
14	G2	Input		ADC2 Input, Comparator + Input
15	G1	Input		ADC1 Input, Comparator - Input
16	G0	Input	4 mA	ADC0 Input, Comparator Output
17	F7	I/O	8 mA	I/O Port, RXD (UART)
18	F6	I/O	8 mA	I/O Port
19	F5	I/O	8 mA	I/O Port
20	F4	I/O	8 mA	I/O Port
21	F3	I/O	8 mA	I/O Port
22	F2	I/O	24 mA	I/O Port, High Power Output
23	F1	I/O	24 mA	I/O Port, High Power Output, TXD (UART)
24	F0	I/O	8 mA	I/O Port
25	VCC	Power		Rectified and filtered positive power supply. Up to 300 mA current allowed.
26	VCC	Power		Rectified and filtered positive power supply. Up to 300 mA current allowed.
27	+5V	Power		Stabilized +5V positive power supply. Up to 200 mA current allowed.
28	+5V	Power		Stabilized +5V positive power supply. Up to 200 mA current allowed.
29	GND	Power		Common ground
30	GND	Power		Common ground

For more details about IP2022 ports, refer to the Ubicom IP2022 datasheet. Latest version of this document available from `http://portal.ubicom.com`

Pins 17 and 19 of the extension connector (F7 and F5 signals) shared with build-in serial port. If you need to use this pins on the extension connector, delete SW4 jumpers 1-2 and 3-4.

I/O Ports

The IP2022 microcontroller contains one 4-bit I/O port (portA) ans six 8-bit I/O ports (port B through Port G). The four Port A pins have 24 mA current drive capability. All the ports have symmetrical drive. The following ports available for peripheral connection on the IPJV board: Port A (A0…A3), Port B (B0…B3), Port F (F0…F7) and Port G (G0…G3, G6, G7). Inputs for Ports A,B,F are 5V-tolerant. Outputs are 3.3V level for Port A,B, F and 2.5V for Port G. Port G is output-only, for input it can be used only as ADC. All other ports and corresponding registers can not be accessible from the Java program.

Each port has separate input (RxIN), output (RxOUT) and direction (RxDIR) registers, which are memory mapped. The numbers in the pin names correspond to the bit positions in these registers. These registers allow each port bit to be individually configured as a general-purpose input or output under software control. Unused pins should be configured as outputs, to prevent them from floating.

RxIN Registers

The RxIN registers are virtual registers that provide read-only access to the physical I/O pins. Reading these registers returns the state on the pins, which may be driven either by the IP2022 or an external device. RAIN, RBIN, RFIN registers can be used for IPJV applications.

RxOUT Registers

The RxOUT registers are data output buffer registers. The data in these registers is driven on any I/O pins that are configured as outputs. On reads, the RxOUT registers return the data previously written to the data output buffer registers, which might not correspond to the states actually present on pins configured as inputs or pins forced to another state by an external device. RAOUT, RBOUT, RFOUT, RGOUT registers can be used for IPJV applications.

RxDIR Registers

The RxDIR registers select the direction of the port pins. For each output port pin, clear the corresponding RxDIR bit. For each input port pin, set the corresponding RxDIR bit. Unused pins that are left open-circuit should be configured as outputs, to keep them from floating. RADIR, RBDIR, RFDIR registers can be used for IPJV applications.

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