

SV TEHS SIA

Development Tools for Java™

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**IPVES Application Note 01:**

**Hello World**

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# IPJV-ES Application Note 01: HelloWorld

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**V 1.0**

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## 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 Uvicom IP2022 Internet Processor and a Java programmable runtime environment.

The IPJV-ES Development Board based on Uvicom 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>

## HelloWorld

*Step by step instruction to create your first Java program on IPJV Development Board.*

**T**his application describe all steps, necessary to get IPJV Development Board up and running.

### Development Platform Requirements

Typical IBM compatible Pentium class computer can be used for creating, building and loading IPJV applications. This computer will be further referred as 'host'. IPJV applications can be developed on any of the Win32 operating systems (Windows 98, ME, NT, 2000, XP).

For initial setup host must have free RS232 serial port. Host must have TCP/IP software installed and configured, and have a 10Mbit ethernet link to the IPJV board in order to load applications into IPJV board. This link can go through a hub or switch, in this case all ethernet cables between PC, IPJV and Hub/switch should be straight. For direct connection between host and IPJV board use supplied crossover Ethernet cable.

Besides the operational system mentioned above, the host machine must also have the following software correctly installed:

- Java Development Environment
- IPJV Java Classpath
- Linker
- FTP client
- Terminal program

This software components described briefly in the following sections.

## Java Development Environment

SUN's Java JDK is free and available for most platforms. It can be downloaded from <http://java.sun.com/j2se/> It is also possible to use different Java IDE, such as Jbuilder or Visual Café to edit and compile IPJV applications. Personal version of Jbuilder is free and can be downloaded from

[http://www.borland.com/products/downloads/download\\_jbuilder.html](http://www.borland.com/products/downloads/download_jbuilder.html)

You do NOT need to download the Sun JDK from the Sun website if you download JBuilder since it includes the JDK. It is necessary to add (INSTALLDIR)\bin to your path, where (INSTALLDIR) is the directory where you installed JDK. If you are on windows, (INSTALLDIR) can be `c:\j2sdk1.4` or similar. There are different ways for different platforms to add a directory to path.

### Windows 2000, XP, and NT 4.0

Choose Start, Settings, Control Panel, and double-click System. On Windows NT, select the Environment tab; on Windows 2000 select the Advanced tab and then Environment Variables. Look for "Path" in the User Variables and System Variables. If you're not sure where to add the path, add it to the right end of the "Path" in the User Variables. A typical value for PATH is:

```
C:\j2sdk1.4\bin
```

Capitalization doesn't matter. Click "Set", "OK" or "Apply". The PATH can be a series of directories separated by semi-colons (;). Microsoft Windows looks for programs in the PATH directories in order, from left to right. You should only have one **bin** directory for a Java JDK installation in the path at a time (those following the first are ignored), so if one is already present, you can update it. The new path takes effect in each new Command Prompt window you open after setting the PATH variable.

### Windows 95 and 98

Open the AUTOEXEC.BAT file and add or change the PATH statement as follows:

Start the system editor. Choose "Start", "Run" and enter **sysedit**, then click OK. The system editor starts up with several windows. Go to the window that is displaying AUTOEXEC.BAT. Look for the PATH statement. (If you don't have one, add one.) If you're not sure where to add the path, add it to the right end of the PATH. For example, in the following PATH statement, we have added the bin directory at the right end:

```
PATH
```

```
C:\WINDOWS;C:\WINDOWS\COMMAND;C:\j2sdk1.4\bin
```

Capitalization doesn't matter. The PATH can be a series of directories separated by semi-colons (;). Microsoft Windows searches for programs in the PATH directories in order, from left to right. You should only have one **bin** directory for a Java JDK installation in the path at a time (those following the first are ignored), so if one is already present, you can update it. To make the path

take effect reboot your machine. To find out the current value of your PATH, to see if it took effect, at the command prompt, type:

```
C:> path
```

### Windows ME

From the Start menu, choose Programs, Accessories, System Tools, and System Information. This brings up a window titled "Microsoft Help and Support". From here, choose the Tools menu, then select the System Configuration utility. Click the Environment tab, select PATH and press the Edit button. Now add the Java JDK **bin** directory to your PATH as described above. After you have added the Java JDK **bin** directory to your PATH, save the changes and reboot your machine when prompted.

### IPJV Java Classpath

IPJV Java classpath included on the supplied IPJV CD. Copy all files, include directories structure, from the CD to your working directory. You can always find the latest version of the classpath at <http://www.svtehs.com/ipjv>

### Linker

IPJV linker `jblink.exe` included on the supplied CD. You can always find the latest version of the linker at <http://www.svtehs.com/ipjv>

### FTP Client

Use your preferred FTP client, for example `ftp.exe`, included with all Win32 Windows versions.

### Terminal Program

Use your preferred terminal program, for example `HyperTerminal`, included with all Win32 Windows versions. Configure it in the following way:

Connect using: **COMx** (x – serial port, used for IPJV board connection)

Port settings: Bits per Second **115200**, Data Bits **8**, Parity **None**, Stop Bits **1**, Flow Control **Hardware**

## IPJV Development Board Configuration

- Connect IPJV board with supplied null-modem cable to free serial port on the host computer.
- Connect IPJV board with supplied crossover Ethernet cable directly to the Ethernet port on the host. Port used should be capable to work on 10Mbit speed. You will need to get straight Ethernet cable, if you need to connect IPJV board to the hub or switch on your local network.
- Switch jumper SW2 in the configuration mode (position 1-2).
- Connect power supply to the IPJV board, switch power on. Green LED VCC should light on.
- Run HyperTerminal program.

You should see prompt “/>” at the terminal program.

- Set necessary IPJV board IP address, for example: **ip0 10.1.1.3**
- Set necessary IPJV board netmask, for example: **msk0 255.255.255.0**
- Set default gateway, for example: **dfgw 10.1.1.1**
- Set user name for ftp access, for example: **user your\_username**
- Set password for ftp access, for example: **pass your\_password**

You have configured basic network settings for IPJV board now. Other parameters should be set in three configuration files – `hostname`, `hosts` and `resolv.conf` and two command files – `ftp.cmd` and `ftpcmd.scr`. All this files supplied on the IPJV CD.

- Change host name in the file `hostname`
- Change `hosts` and `resolv.conf` files according to your system settings.
- Change IPJV module IP address in the `ftp.cmd` command file
- Change user name and password in the `ftpcmd.scr` file

You have fully configured system now and ready to write your first program

## First Program

- Write simple Java program. You can find example `HelloWorld.java` at this directory.
- Compile this example with Java compiler together with IPJV classpath file `classes.jar`. You should obtain binary `HelloWorld.class`

HELLOWORLD

```
javac -bootclasspath classes.jar -classpath classes.jar HelloWorld.java
```

- Link example program with IPJV classpath file using `JBLink.exe` linker. You should create `Work.vm` linked binary file.

```
JBLink -c classes.jar HelloWorld Work.vm
```

- Run `ftp.cmd` command file. This file loads `Work.vm` linked binary file, `hostname`, `hosts` and `resolv.conf` files with `ftp` to the IPJV module and set loaded VM as the working VM
- Switch jumper SW2 on the IPJV board in the working mode (position 2-3).
- Press reset button on the IPJV board.

Your program should display "Hello World!" on the terminal window. You have IPJV development board up and running.

By default `System.out`, `System.err` and `System.in` assigned to the first instance of the serial interface RS232. For stream serial input/output use the following reserved names:

```
/dev/ttys0
```

```
/dev/ttys1
```

# Table of Contents

<b>1. Introduction</b>	1
Updates	1
<b>2. Hardware I/O</b>	2
Development Platform Requirements	2
Java Development Environment	3
IPJV Java Classpath	4
Linker	4
FTP Client	4
Terminal Program	4
IPJV Development Board Configuration	5
First Program	5