

# sevenstax

## Web Server Demonstration for

## Embedded Devices

Using The

## sevenstax Protocol Suite

### *Installation and Setup for embedded Dial-In*

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## Introduction

This manual is given to easy get in touch with the demonstration of the Internet capabilities of microcontrollers using the Internet protocol suite sevenstaxTCP, sevenstaxPPP and sevenstaxWebServer.

These steps are to be done:

1. Flash the sevenstax demonstration code into the evaluation board the demo is designed for
2. Add a new Internet connection profile to your Windows OS as described beneath
3. Connect the evaluation board to your PC
4. Dial into the evaluation board
5. Start your preferred web browser

and then get HTML formatted web pages from the microcontroller's embedded web server.

Although only parts of the web server's capabilities are used, this demonstration code contains a PPP-dial-in, the TCP/IP stack and a web server to download the pages to the PC.

## Requirements

- Supported evaluation board with appropriate power source
- Modem cable (RS232 DSUB9) to connect the evaluation board to PC's COM port
- Windows XP (or 2000) running. If your OS is Windows98/ME, you have to install a special modem driver delivered with this demo.
- Software to download sevenstax demo application into microcontrollers Flash Eeprom (files named like "M16C62P\_java\_24MHz\_57600bd.\*"). Please see your evaluation boards documentation for details of the flash process.

## Hardware Setup

Please use the given flasher software to download the sevenstax application. See your evaluation boards documentation for details like jumper settings for the flash process.

Be sure to finish the flash process by removing/inserting the appropriate jumper and reset the board.

## Preparing Windows 98/ME

This demo can also be used with Windows 98/ME. For lack of a direct connection modem driver bundled with Windows98/ME you have to install a modem driver called "Direct Connection Dial-Up". The driver (a file named "nullmodem\_dial\_up.inf") can be found in the directory of this sevenstax web server demo.

### Modem driver installation instructions:

- Copy the given sevenstax 'nullmodem.inf' into any local directory of your PC
- Open Start/Settings/Control Panel/Modems
- Add new Modem via your local directory (don't detect modem)
- Browse for 'nullmodem\_dial\_up .inf' and install the displayed "Direct Connection Dial-Up"
- select the COM-Port the evaluation board is connected to

Now the new modem driver is installed and you can go straight forward to create a new Internet connection.

### How to create a Internet connection:

- go to the windows desktop and open "My Computer"
- browse into the Dial-up directory
- create a new connection named "sevenstax embedded device"
- select "Direct Connection Dial-Up" as modem and press "Configure" button
- in "General" tab select the connection speed specified by filename of formerly flashed demo ("M16C62P\_java\_24MHz\_57600bd.mot" for example is specified for 57600 baud, if filename does not give the information use 38400 baud) and mark "only connect at this speed"
- in "Connection" tab select 8 data bits, no parity, 1 stop bit
- press "Advanced" button and unmark "Flow control"
- go ahead and type in any phone number (7 for example) if installation procedure ask you about

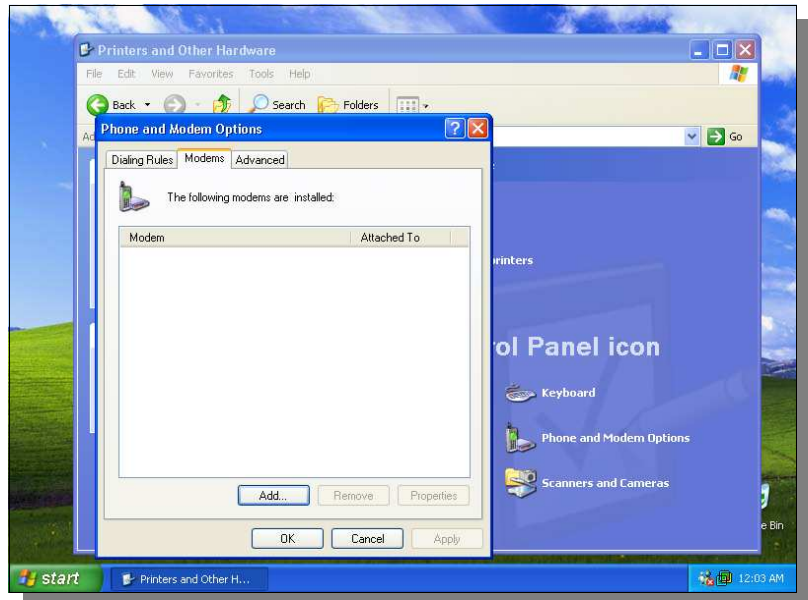
Your system is now ready for direct connection to evaluation board and you can log in by clicking on your newly created "sevenstax embedded device" icon. The login/user name is sevenstax and password internet.

## Preparing Windows XP/2000

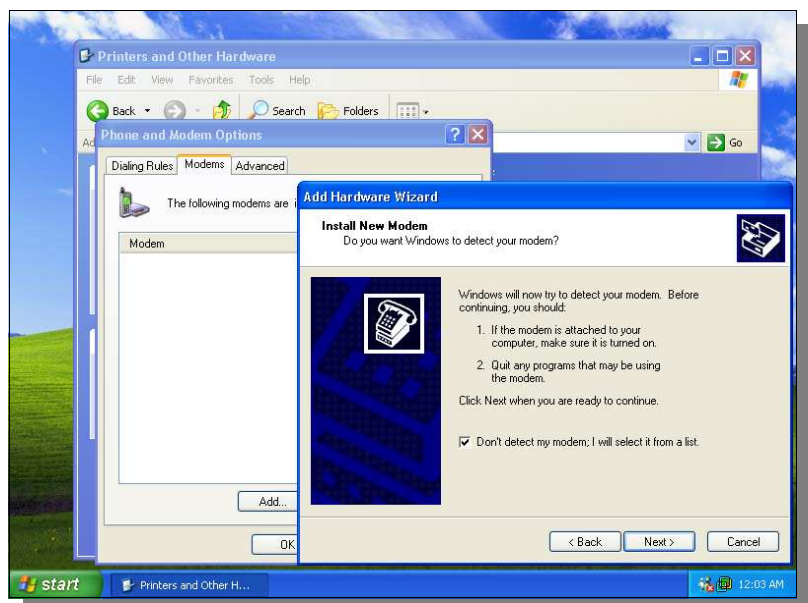
The demonstration works as a Dial-Up server. Therefore some settings have to be made. Please install the modem driver first and then create a new network connection.

### Modem driver installation instructions:

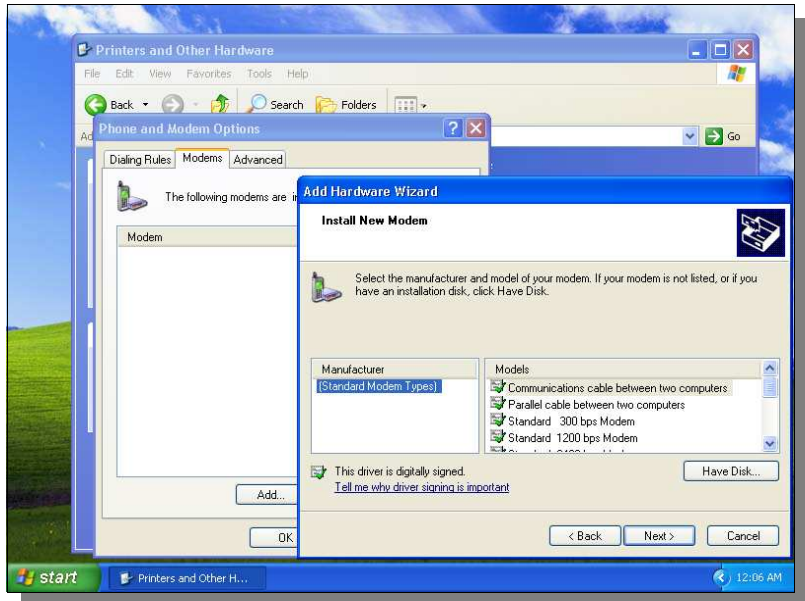
- Set up a new modem at *Start->Control Panel->Printers and Other Hardware->Phone and Modem Options->Modems* and press *Add...*



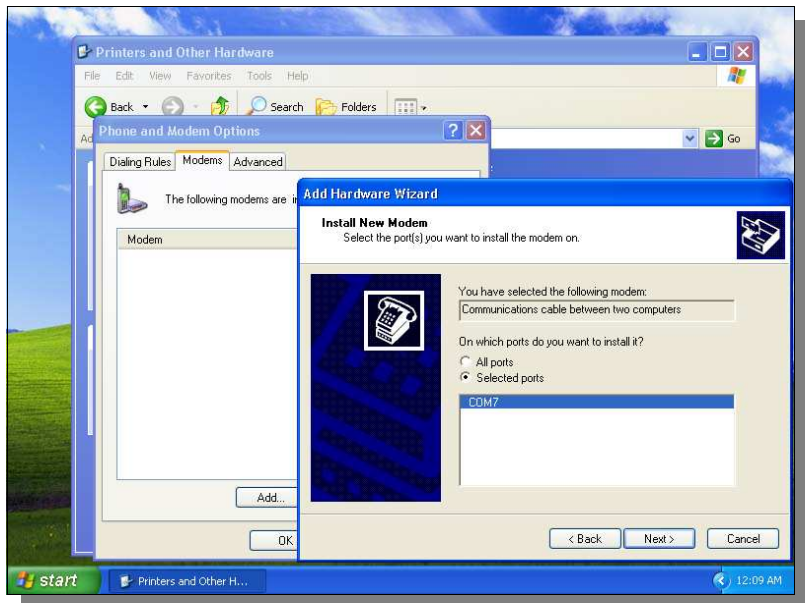
- Mark/select *"Don't detect my modem; I will select it from a list."* and press *Next*



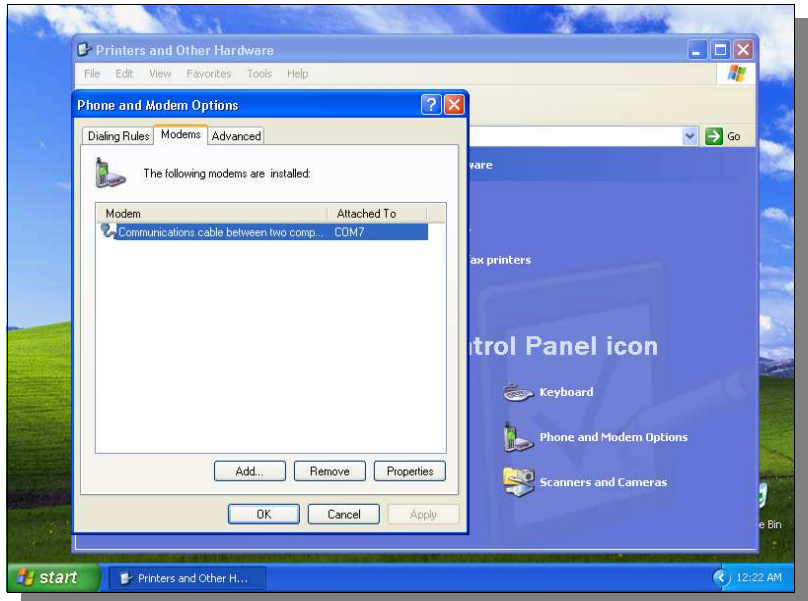
- Windows will now work a few seconds and presents then a list of possible modems
- Select “*Communications cable between two computers*” and press *Next*



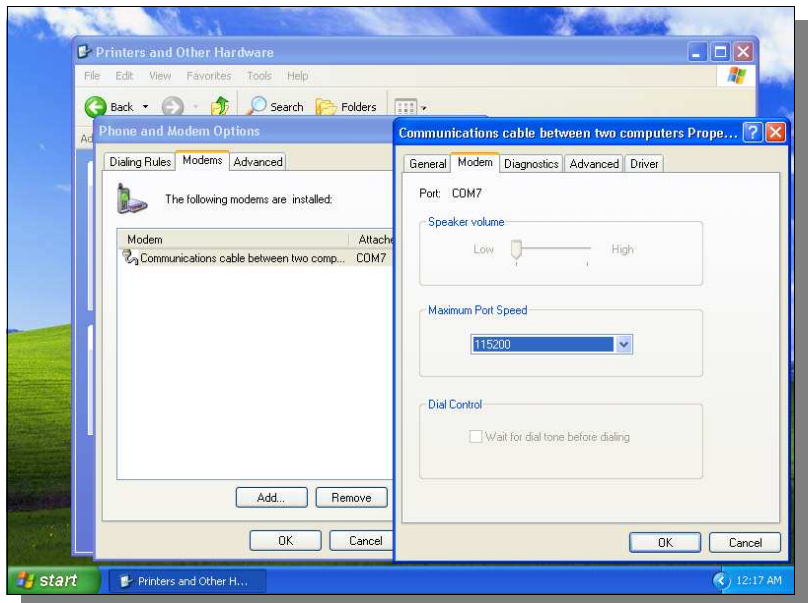
- Select the serial (Com) port on which the device is connected to and press *Next*
- Windows will now take a while to register the new modem
- To finish the modem installation procedure press *Finish* then



- The newly added modem will now be displayed in the list of installed modems
- Select this and press *Properties*

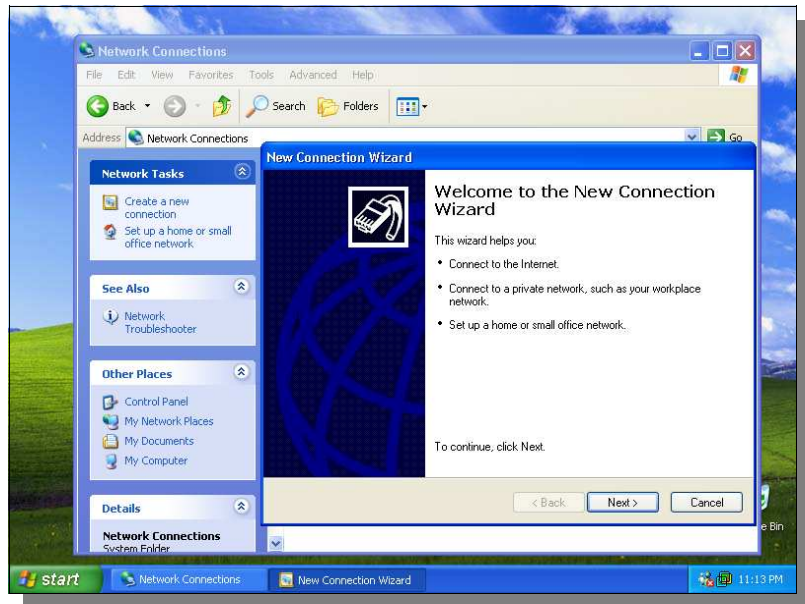


- In *Modem* tab select 115200 as *Maximum Port Speed* and press *Ok*
- Close the *Phone and Modem Options* by pressing *Ok*
- Close *Printers and Other Hardware* window to complete the modem installation procedure

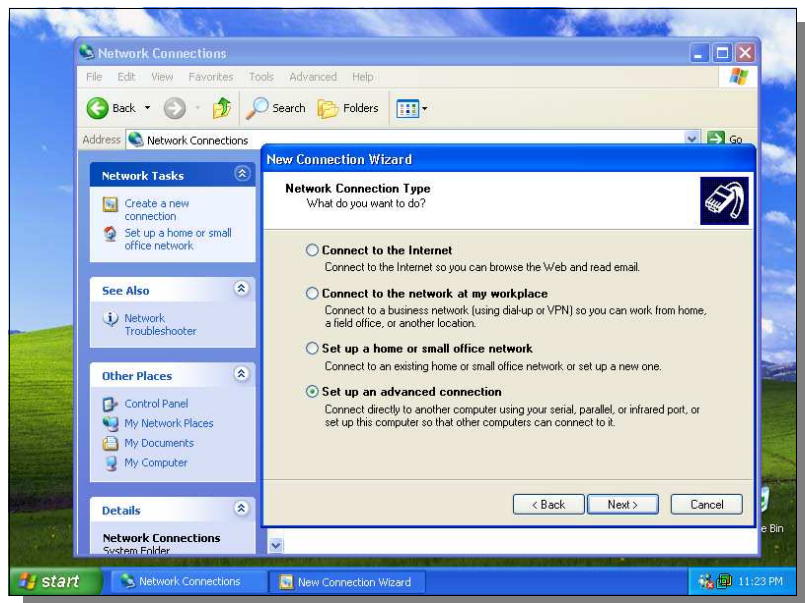


## How to create a networking connection:

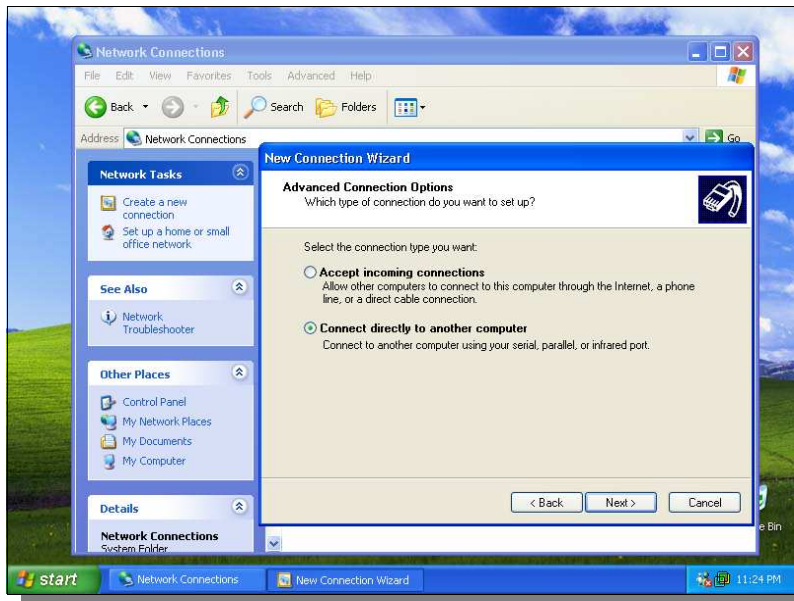
- Set up a new network connection at *Start->Control Panel->Network and Internet Connections->Network Connections->Create a new Connection* and press *Next*



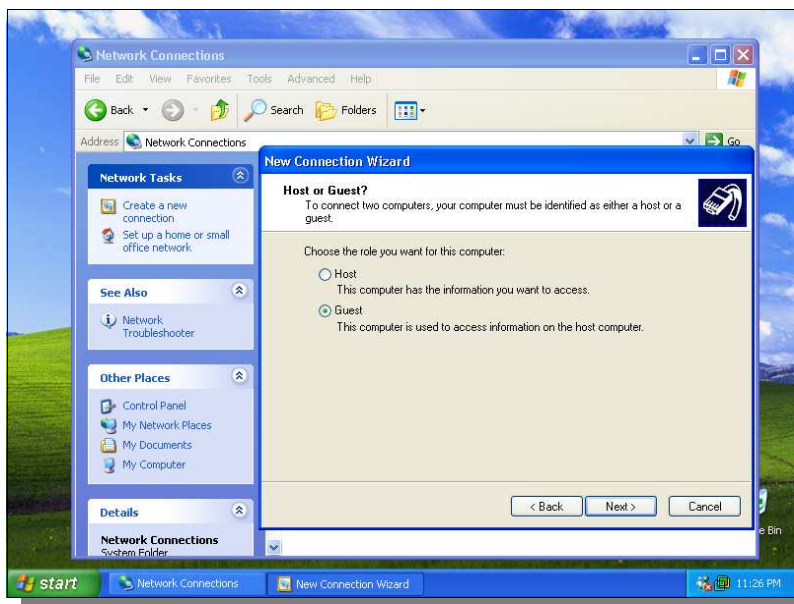
- Select *Setup an advanced connection* and press *Next*



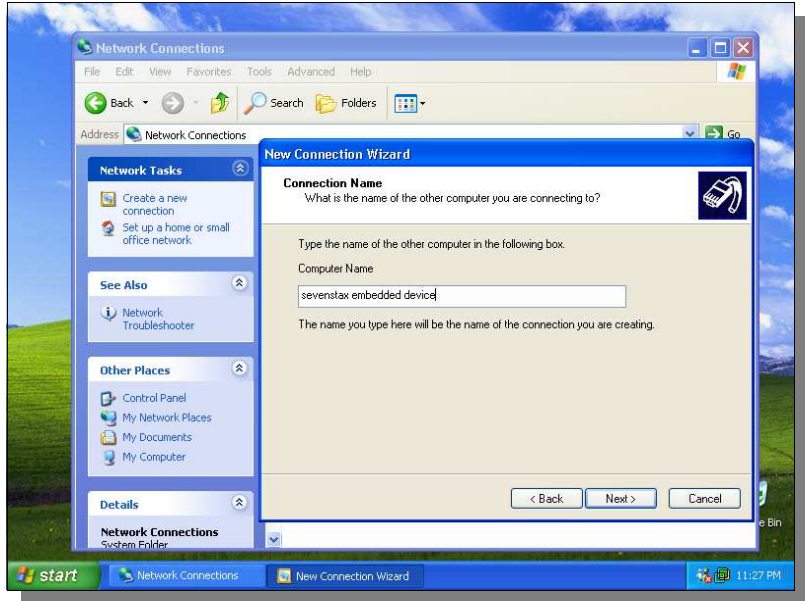
- Select *Connect directly to another computer* and press *Next*



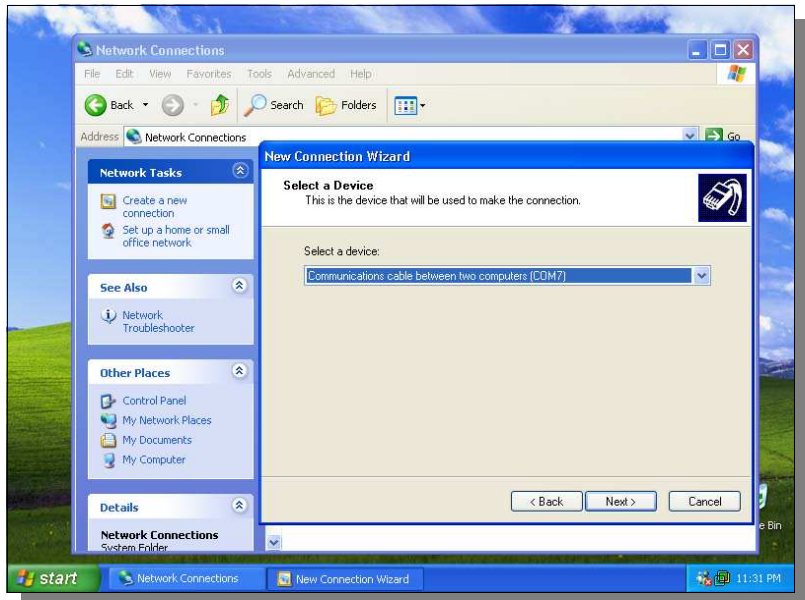
- Select *Guest* and press *Next*



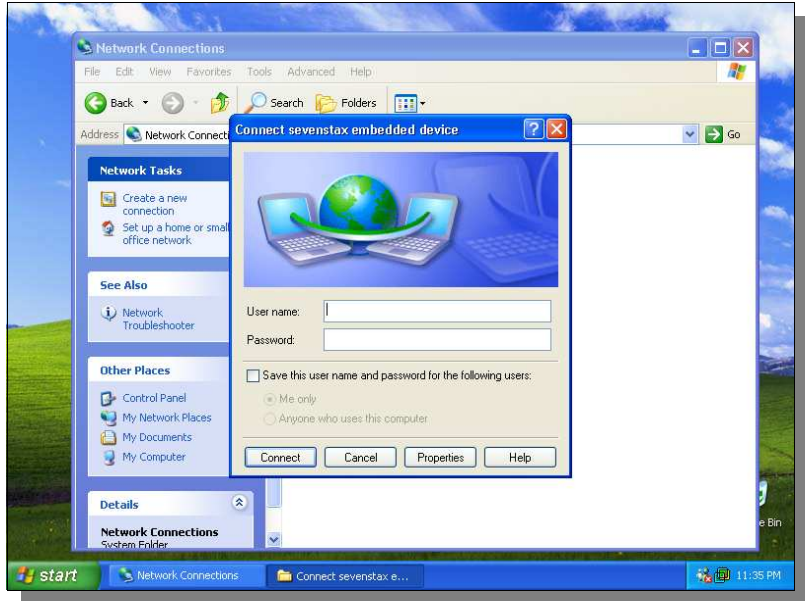
- In *Computer Name* field type in “sevenstax embedded device” and press *Next*



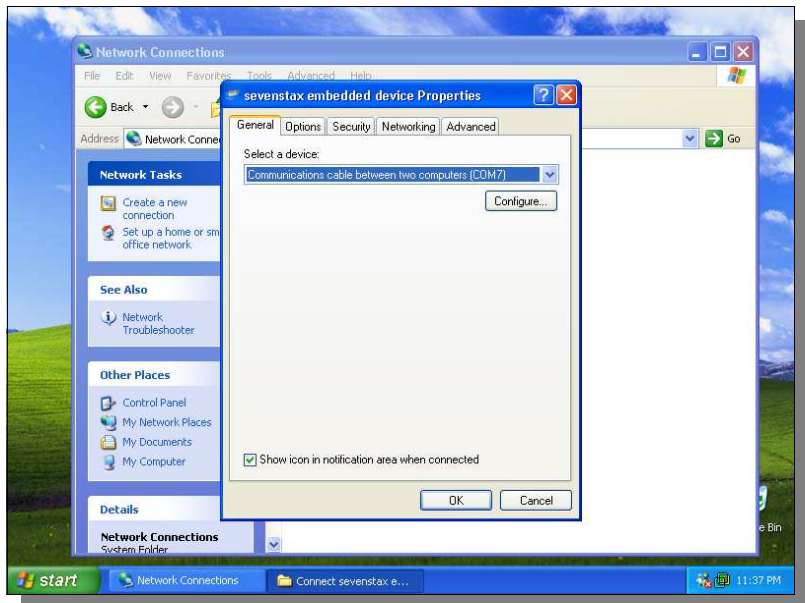
- Select your formerly created modem “*Communications cable between two computers*”, press *Next* and last but not least *Finish*



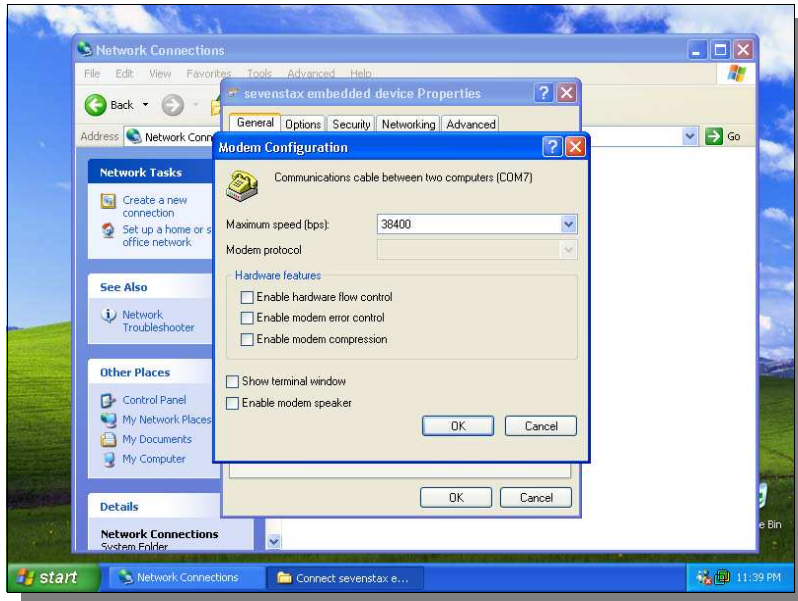
- Your new connection is now created and you will see a connect window
- To set a few parameters please press *Properties*



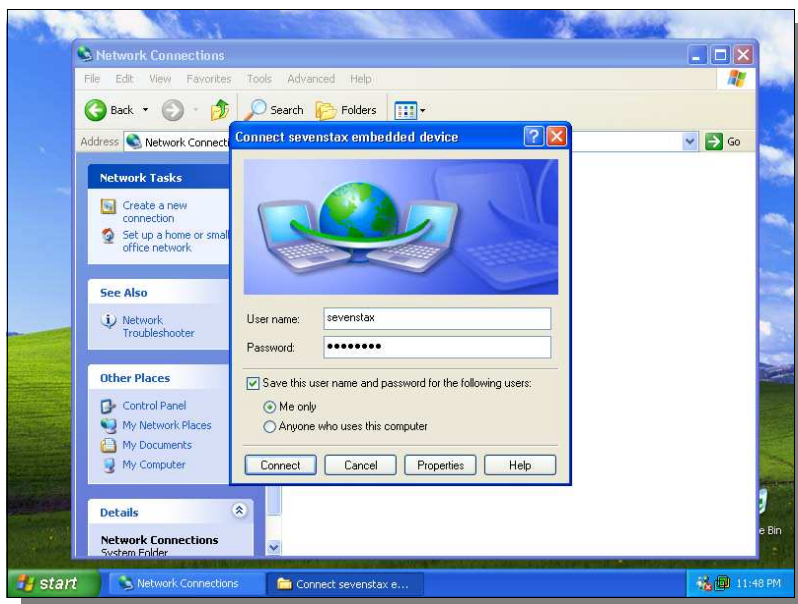
- Be sure the formerly selected device is shown in the *General* tab and press *Configure*



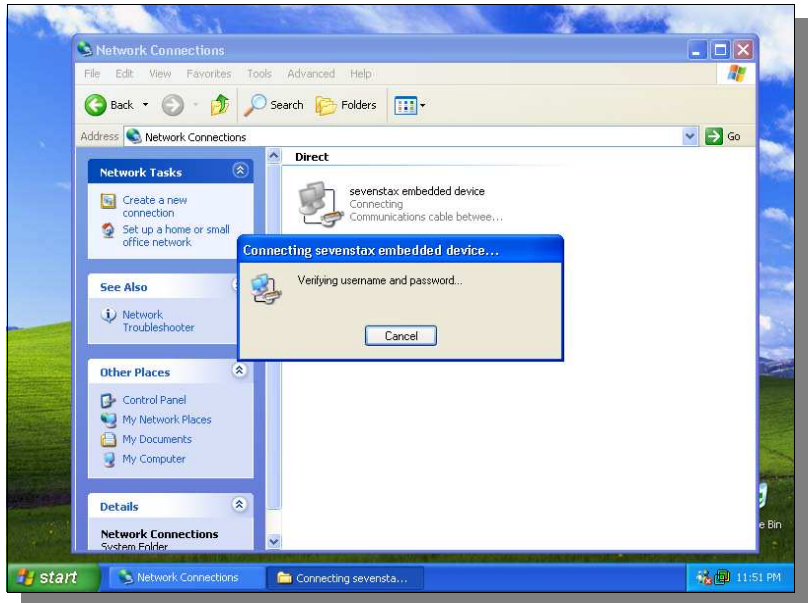
- Set the *Maximum speed* to the value your formerly flashed file specified in its name  
 (“M16C62P\_java\_24MHz\_57600bd.mot” for example is specified for 57600 bd, select 38400 if the filename contains no hint on connection speed)
- Unmark (disable) “*Enable hardware flow control*” and press *Ok*
- Close *Properties* window by pressing *Ok* again



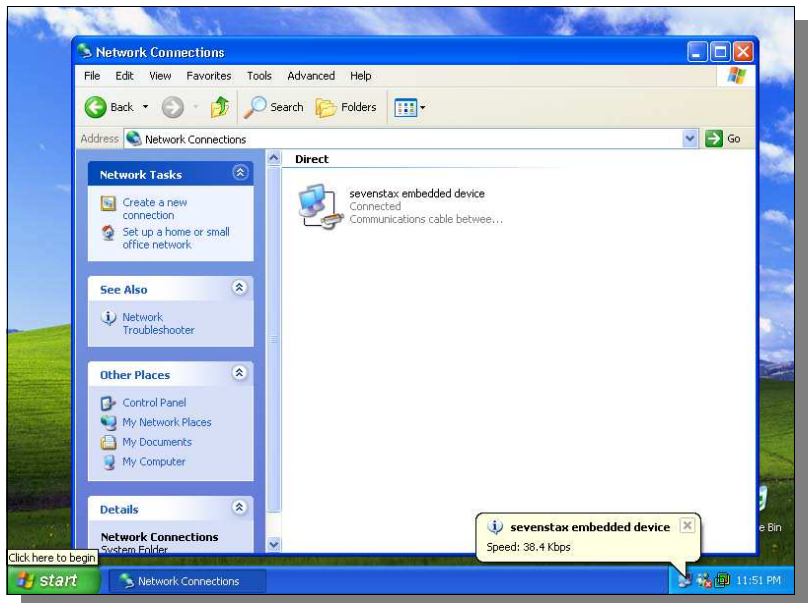
- Enter “sevenstax” as *User name* and “internet” as *Password*
- To finally connect to the connected board/device press *Connect*



- The connection will now be established



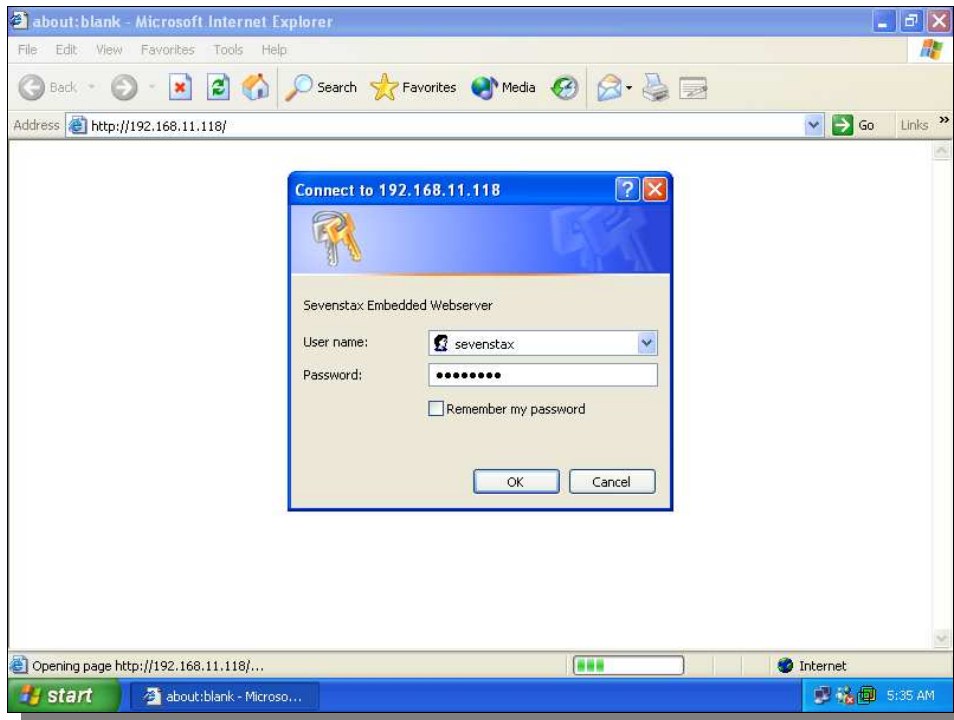
- After successfully connected to the board/device there will be shown a little network icon at the taskbar



## Running the Demo

Just start your preferred web browser. Be sure not to use any Proxy Server, please check the Browser settings for this.

Type the following URL into your browser: `http://10.1.1.1`. After having successfully started the sevenstax demo application you will see a HTTP authorization dialog in your browser delivered via TCP/IP and PPP by the controller hardware.



Simply enter *sevenstax* as user name, *internet* as password and last but not least press *OK* to load the first web page.

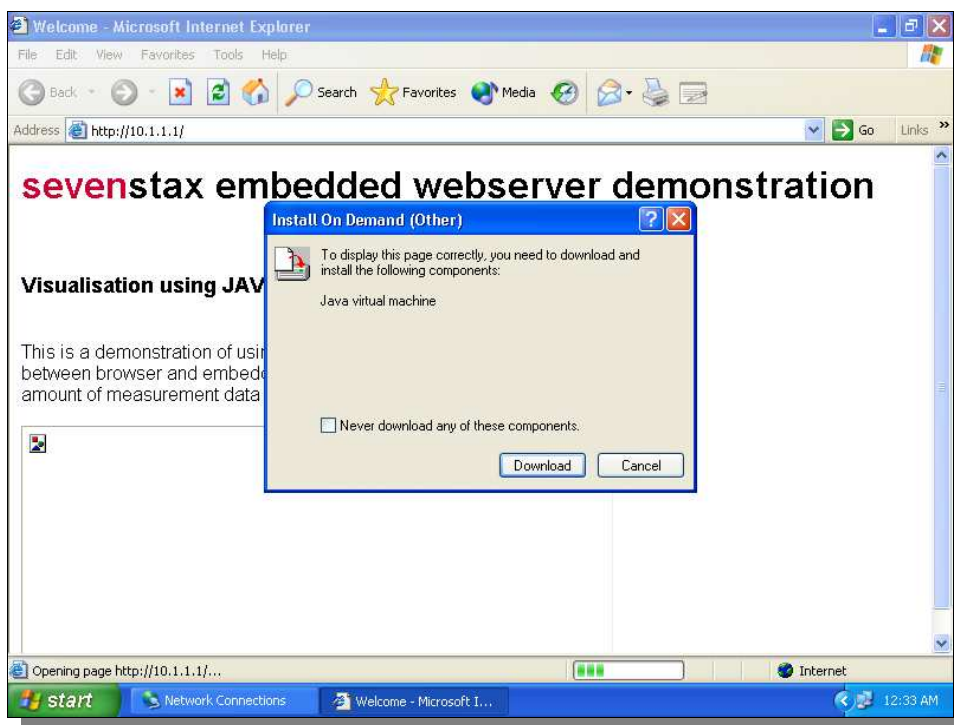
If the access to the embedded system is permitted, you will see the index page of the sevenstax embedded web server. Have fun while trying the demo and navigating through the pages.

## If the demo does not work

First check the **WebBrowsers Proxy Server settings**: Disable the proxy server.

Some **PC's COM ports** have problems using serial lines which do not have any control signal connected. The serial communication is sometimes – not permanently – disturbed so that the connection will brake down infrequently. You can detect that problem by watching the modem taskbar icon coming up and disappearing. In this case, please first try to connect using another PC's COM port (if there is any) or use a USB-COM-Port adapter. If this does not help, please see the given sevenstax manual at the end of this document to get an improved COM-port adapter cable. This helps in any way!

A couple of demonstrations using the java programming language to visualize in the web browser (real time transmission demos are using java). If your browser is not capable running java programs (**JDK 1.1** standard and higher) the installation of a appropriate plugin or component will be necessary.



You can get java plugins for the most common web browsers at <http://java.sun.com/>.

Please feel free to contact sevenstax if you get any problems with this demonstration. And take a look for demonstration code update on our web site:

info@sevenstax.de and <http://www.sevenstax.de>

Thank you.



## Serial adapter cable modifications to minimise connection problems

### **PROBLEM**

Communication between embedded device and Windows PC might be disturbed: Establishing a connection and getting HTTP authentication might work, but mostly requesting the embedded devices web pages will result in a disconnection.

### **CAUSE**

The embedded devices serial connector has not been designed as a modem interface. But the Windows PC expects some logical signals of the serial connection to be right, to recognize that there is a modem ready to receive data and that a connection has been established. As these pins are not connected at the embedded device (no Pull Up/Down), they are floating!

But the PCs hardware should have such pull-up resistors to get a determined signal at these pins. If they are missing, it is only a matter of time, until the PC detects a connection error.

### **SOLUTION**

These pins of the DSUB9 cable are responsible:

- 1 - CD - CarrierDetect - from Modem
- 4 - DTR - DataTerminalReady - from PC
- 6 - DSR - DataSetReady - from Modem

If these 3 pins are connected directly together, the PCs logical 'Ready' state (DTR) is directly looped back to the PC as the logical 'Ready' state of the modem (DSR) and as the signal for an established connection (CD). The PC gets 'the feeling' like the modem is ready and connected all the time.

### **MANIPULATION**

We have three methods to get an easy manipulation for this:

- a) Manipulate a serial DSUB9-cable
- b) generate a small DSUB9 adapter
- c) Manipulate the embedded device

to a) Open the DSUB9 cable (conventional modem cable)  
at the PCs side and directly connect the pins 1,4,6 together.

to b) Directly solder a male and a female DSUB9 connector back to back  
with all pins (they are mirrored!). Then connect the pins  
1,4,6 together.

to c) Find out the pins 1,4,6 at the embedded devices lower side (get the  
pin number from the DSUB9 connectors front view) and connect  
the pins on the embedded device.

Please use your mostly preferred method.