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Advanced Remote Connectivity in Thin Client Technology

Chip PC Thin-Clients Solutions for Remote Home/Business Connectivity Using PPTP ADSL Modem

Application Note AN-112

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1 Preface

1.1 General

The number of employees working remotely, in Europe alone, has reached **80.6 million** people and is predicted to rise to **99.3 million** in the year 2004 (IDC 2003).

More and more companies realize they must enable their employees a remote, secure and easy access to their computing resources at the workplace, either from home or from any remote location when traveling for business purposes.

Many small offices or home offices rely on centralized computing applications that reside in main offices or remote sites. As broadband communications becomes a low-cost readily available solution, remote computing becomes a standard practice.

1.2 Typical Applications

Since ADSL and Cable modems are very popular and cost effective today, the range of possible applications is large. Just to mention a few examples:

- Home use of workplace desktop. This method is very efficient for software developers that require large local environments and powerful PC to compile and test their work
- Small remote office connected to centralized office or to ASP
- Remote employees, call centers, support lines
- Disaster recovery plan (stand-by system)
- Work e-mail access from home. Replacing laptop
- Progressive professional home training (insurance, banking, health-care, engineering, airlines, defence)
- Education systems (open universities, school teachers, students)
- Military reserve home access
- Computers for hotel guest rooms

1.3 Chip PC Remote Connectivity Solution

Chip PC now provides innovative, cost-effective solutions enabling employees to access their workplace computing resources, may they be Thin Clients or PCs, and work from remote locations as if they were sitting physically in front of their desktops at the workplace.

Connection is made via standard broadband Internet that is highly secure by using double-tunnel, encapsulated VPN connections. The remote connectivity is achieved by using local **Xtreme PC** plug-in software called "**VPN Remote Connection & Dial-Up**" provided for FREE (see Figures 1-3 below).

The "**VPN Remote Connection & Dial-Up**" plug-in includes an Analog, PPTP and PPPoE dialer, in addition to MS VPN Connection.

1.4 Supported Scenarios

Chip PC thin clients – the **Xtreme PC** EX series – provide support for variety of remote connectivity scenarios. The user may be connecting to Terminal Services Server (if available) or even to his/her workplace PC. The PC, off-course, must stay on and the only software needed is standard XP Operating System that includes a built-in **RDP** (Remote-Desktop-Protocol) connection.

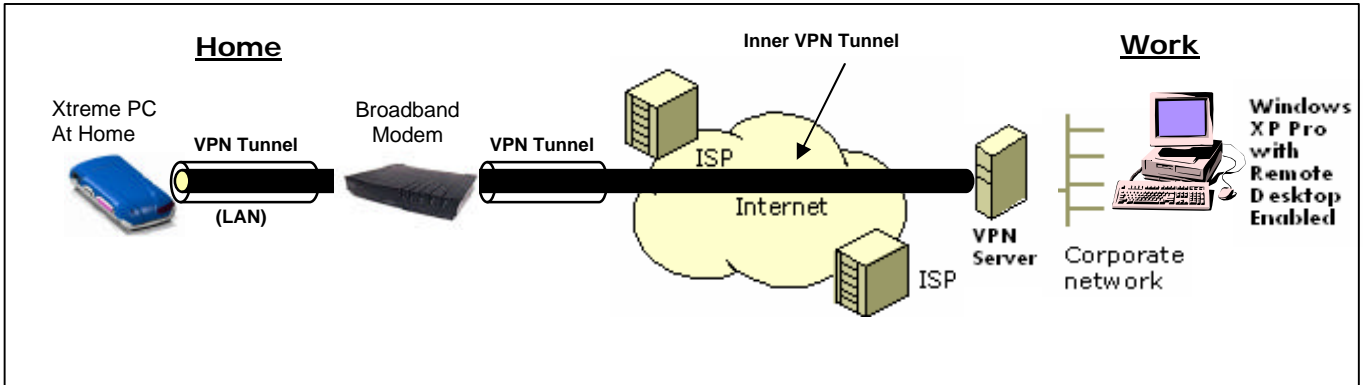


Figure 1 - Scenario 1: Connecting from home to work PC with standard XP Pro OS (RDP)

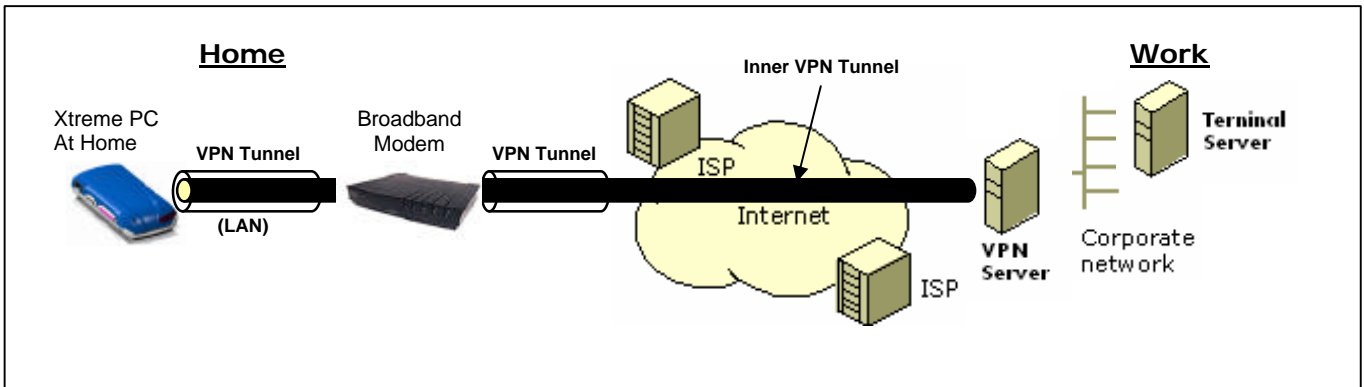


Figure 2 - Scenario 2: Connecting from home to work Terminal Server (RDP or ICA)

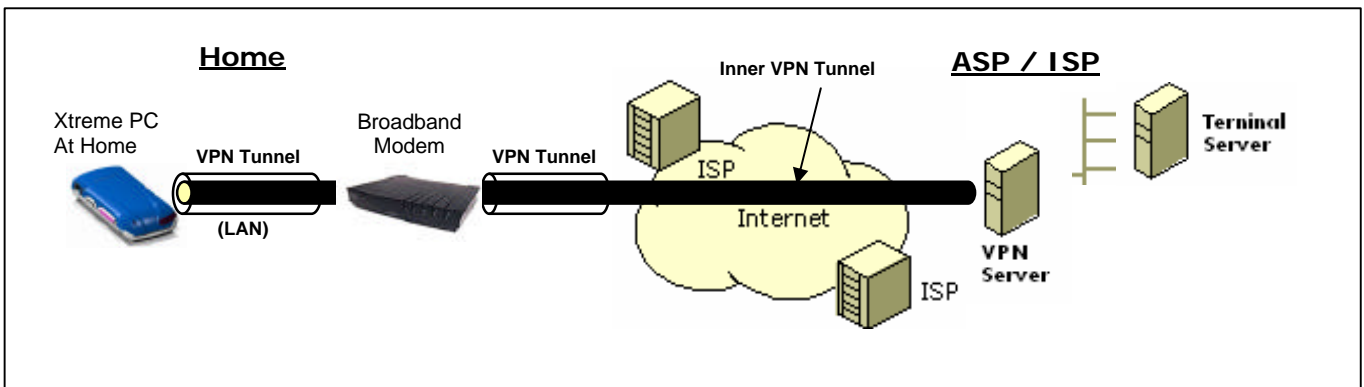


Figure 3 - Scenario 3: Connecting from home to ASP / ISP service

In any of these scenarios, you can have access to a Windows session that is running on your computer or to the organization's Terminal Server when you are using an **Xtreme PC** at home. This means that you can connect to your work computer/server from home and have access to all of your applications, files, and network resources as though you were in front of your workstation at work.

Chip PC offers Remote connectivity with the highest security standards by using double-tunnel, encapsulated VPN connection to from the thin client to the ISP and from the thin client to the organization's VPN server.

To sum up, Chip PC now joins up with a market trend aimed at enhancing remote access to computers at the workplace and promoting collaboration at the workplace:

- **Working at home/remote locations** - Access work in progress on your office computer from home, including full access to all local and remote devices.
- **Collaborating** - Bring your desktop to a colleague's office to debug some code, update a PowerPoint slide presentation, or proofread a document.

1.5 Why Work Remotely with Xtreme PC Thin Clients?

- **Flexibility:** Take advantage of the flexibility provided by a distributed computing environment. Chip PC thin clients will let you access your Windows XP computer or your organization's Terminal Server anywhere, over any connection.
- **Total Identity of Computing Environments:** with the *Xtreme PC* remote connectivity you are actually working on your PC or Terminal Server, thus gaining access to all your applications, files, and network resources—as if you were in front of your own workstation.
- **No Synchronization Needed:** with the *Xtreme PC* remote connectivity you are actually working on your PC or Terminal Server, thus there is no need to synchronize data when working from home and then reconnecting the computer at the workplace.
- **High VPN Security:** Chip PC offers Remote connectivity with the highest security standards by using double-tunnel, encapsulated VPN connection to from the thin client to the ISP and from the thin client to the organization's VPN server.
- **High Local Security:** the *Xtreme PC* thin client installed at home is highly secured as there is nothing locally installed. Thin clients in general are highly immune to viruses with no CD or Floppy Drives installed and with internal security manager. Also advanced authentication means such as smart-cards can be used exactly as they are being used at work.
- **Easy, Low-Cost Installation, Maintenance & Management (Low TCO):** Xcalibur XP Management provides full, easy and cost effective management of the *Xtreme PC* thin client installed at home. Nothing local needs to be installed and any upgrade or configuration can be performed remotely.
- **Ease of Use:** eliminates the need to carry computers (laptops) home every day.

1.6 Why Not Work Remotely with a PC?

This is actually a mirror of the previous section, where all the advantages of working remotely with a thin client turn into disadvantages when using a PC.

- **No Ease of Use:** the employee will have to carry his laptop home every day or alternatively use employee's private PC, which holds legal and security problems.
- **Providing Employees with PC** is also problematic as a PC Total Cost of Acquisition (TCA) and Total Cost of Ownership (TCO) are higher than those of a thin client.
- **Low Security:** Working locally on a PC may expose sensitive company information and data.
- **No Identity of Computing Environments, Constant Synchronization is needed:** working on PC is local, therefore requiring constant synchronizations between the work and home PCs.
- **Low Local Security:** PCs, with their local storage are more susceptible to viruses and data loss than thin clients.
- **No Central Management, High Costs of Installation and Maintenance:** Most PCs are not centrally and remotely managed, they require extensive local installation, upgrading and maintenance.

2 Terms

- **Xtreme PC** – Chip PC's Thin Client.
- **PPTP** – VPN protocol that provides the means to dial and connect to a PPTP VPN server.
- **VPN Remote & Dialup Connection Plug-in** – Chip PC's PPTP Dialer (It is also *PPPoE* and *ANALOG* Dialer).
- **Broadband ADSL Modem** – for the purpose of this document – an ADSL modem which supports PPTP protocol.
- **Connection** – Client side application for connecting to Network Services (RDP, ICA, VPN ...).

3 Prerequisites

- **Xtreme PC** – EX model connected to Monitor, Keyboard, Mouse.
- **VPN Remote & Dialup Connection Plug-in** – latest version. You can download it free of charge from Chip PC's web-site.
- **Broadband ADSL modem** – We will use *Alcatel STHome Ethernet Modem* as an example but other broadband modems can be used as well. USB modems are not covered here since they require local drivers to be installed on the client.
- **Category 5 Ethernet Cable** - connected between the **Xtreme PC** and the Broadband Modem. The use of wireless (802.11b or 802.11g) models is possible but it is more complex to setup.
- **Broadband Connectivity Service** – type of service (upload – download speeds) are not critical since most programs provide relatively high bandwidth. In any case it is important to note that the quality of service (delays, drops, lost packets) may affect the work in this mode much more than the basic type of service.

Note: In this application note we will focus on PPTP type modems.
Other type of modems will be covered in future application notes.

4 Hardware Setup

1. Connect the Category 5 Ethernet cable between the Ethernet Ports of both the **Xtreme PC** and the Broadband Modem.
2. Connect the Broadband modem to the phone line using the relevant Micro-Filter provided by your Internet Service Provider. Check that both the Xtreme PC and the modem LINK lights are illuminated.

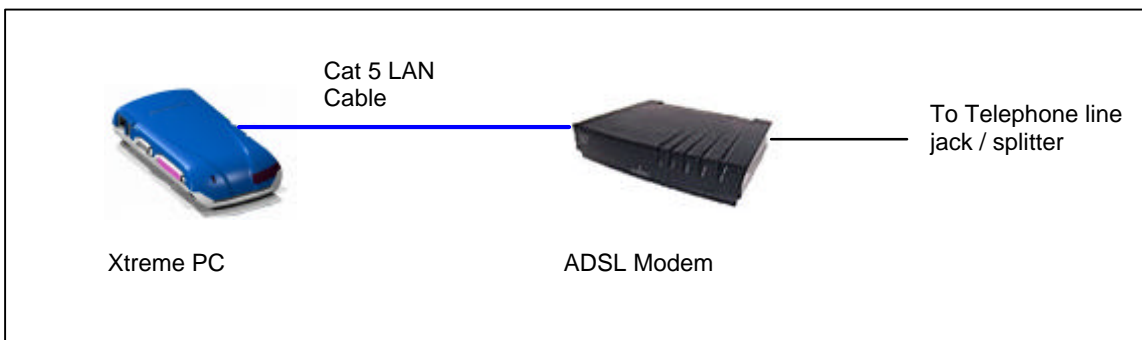


Figure 4 – Hardware setup

5 Xtreme PC Configuration

5.1 General

The configuration of the **Xtreme PC** will be made in several steps:

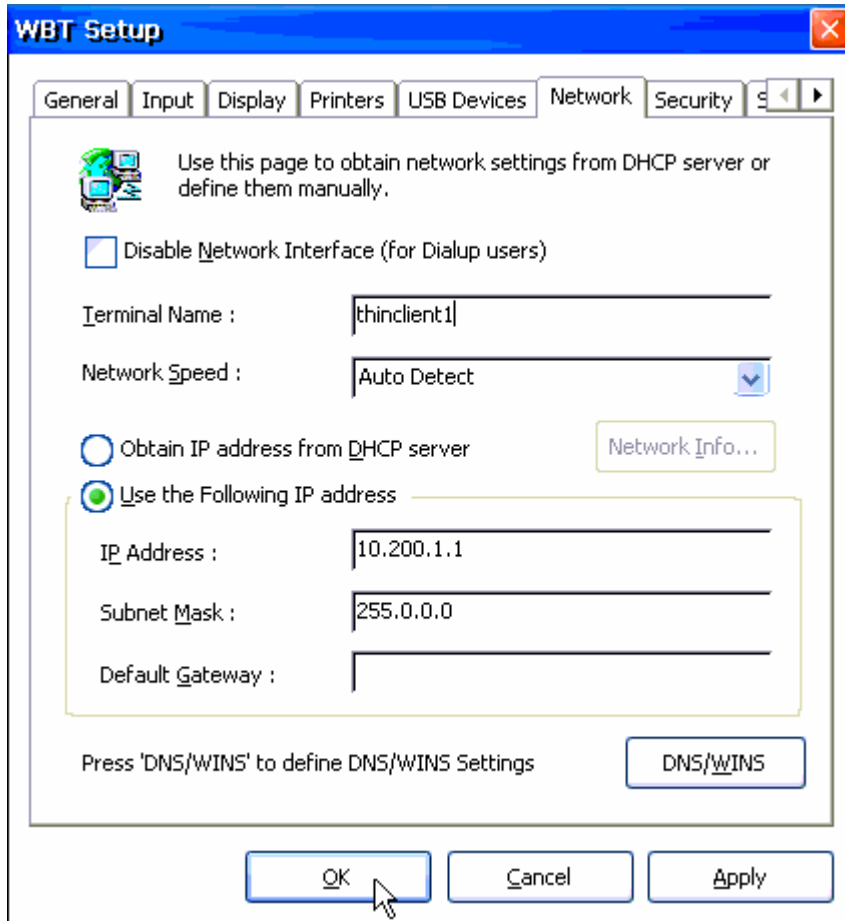
1. Configure the Local IP Address of the **Xtreme PC** with **STATIC TCP/IP** settings.
2. Verify that the latest "*Remote Connection*" plug-in is **installed** and **activated**.
3. Configure a **PPTP** Connection in the device to the Broadband Modem.

Note: The Alcatel Ethernet Broadband Modem behaves as a standard PPTP VPN server and therefore we will configure the *Remote Connection* PPTP client to connect to the Alcatel ADSL modem like it was connected to a standard PPTP server.

The modem has the following factory setup fixed static IP address: **10.0.0.138**.

5.2 Xtreme PC Local TCP/IP Configuration

1. Turn on the Xtreme PC.
2. Once the **Connection Manager** appears Press F2 and browse to the **Network** TAB. The following dialog will appear:



3. Choose the "Use the Following IP address" radio button and configure a **STATIC IP** address with the following settings:

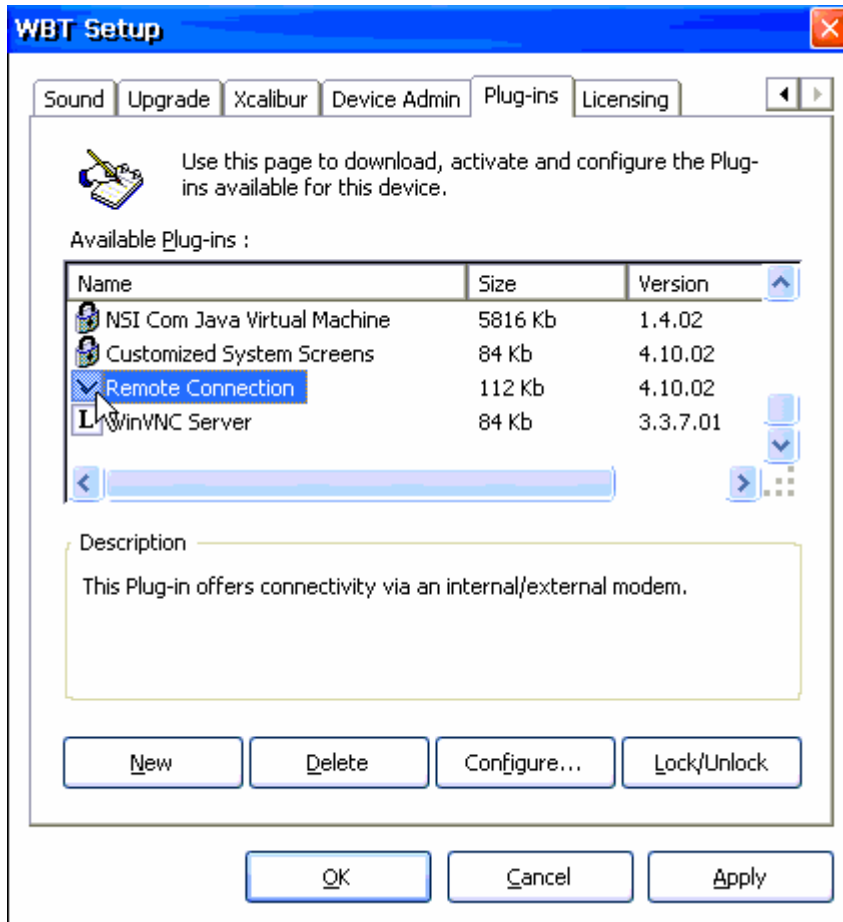
IP Address: 10.200.1.1
Subnet Mask : 255.0.0.0

4. Browse to the "Plug-ins" TAB and verify that the latest **Remote Connection** plug-in is **Installed** and **Activated**.

In case that the plug-in is **NOT** installed browse to the following link:

<http://www.chippc.com/support/kbase> and look for the following subject in the *Knowledgebase*:
"How To Perform XPI Installation - Locally"

Note: the modem doesn't act as a DHCP server and therefore the **Xtreme PC** must be configured with a Static IP address from the same subnet (10.x.x.x).



5. Click OK and restart the device.

The device will be restarted and the Connection Manager will be displayed at the end of the boot process.

5.3 Configure the PPTP Client on the Xtreme PC

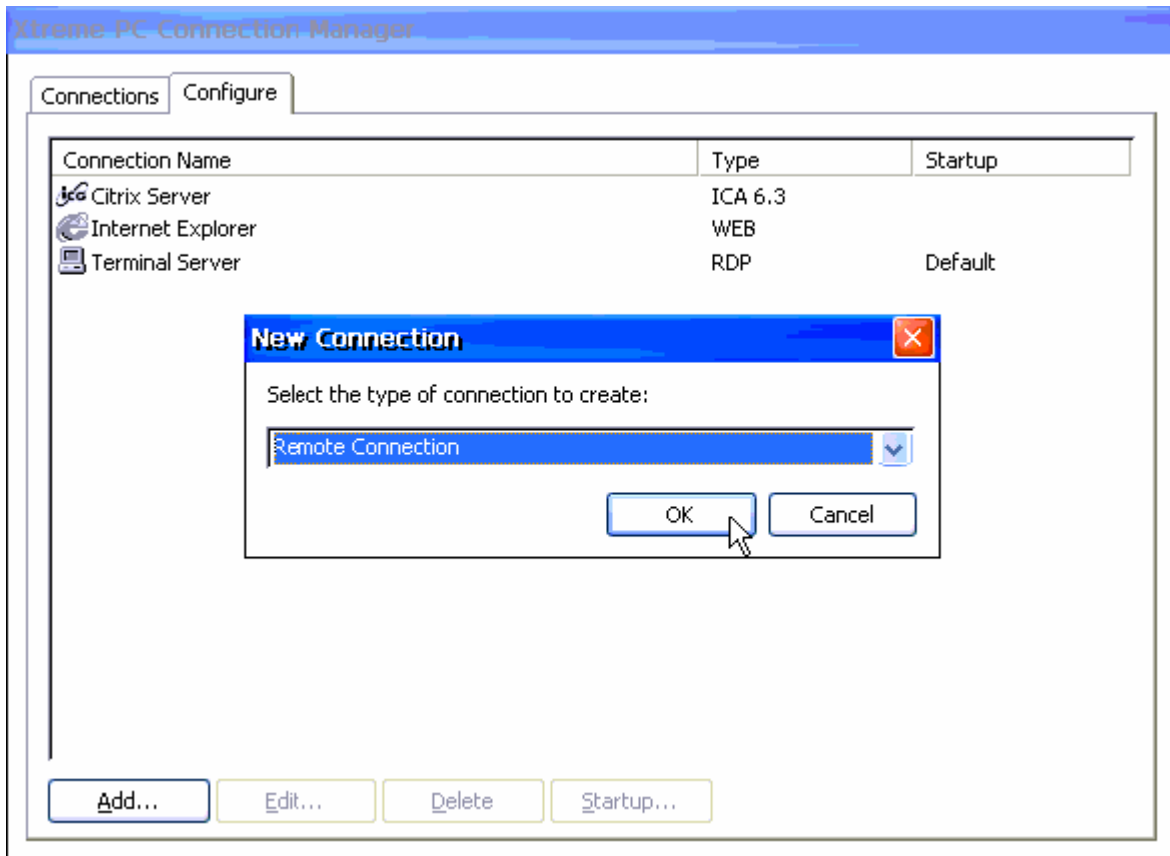
5.3.1 General

The **Remote Connection Plug-in** is a VPN Dialer which provides three types of Dialers:

1. **Dial-Up Connection** – Analog Modem Dialer.
2. Virtual Private Network – PPTP VPN Dialer.
3. **PPP over Ethernet [PPPoE]** – PPPoE protocol Dialer.

We will use the Virtual Private Network dialer in our scenario.

1. From the **Connection Manager** window Browse to the **Configure** TAB.
2. Click on the ADD button, choose the **Remote Connection** from the drop down menu and click OK.



The following dialog will appear:

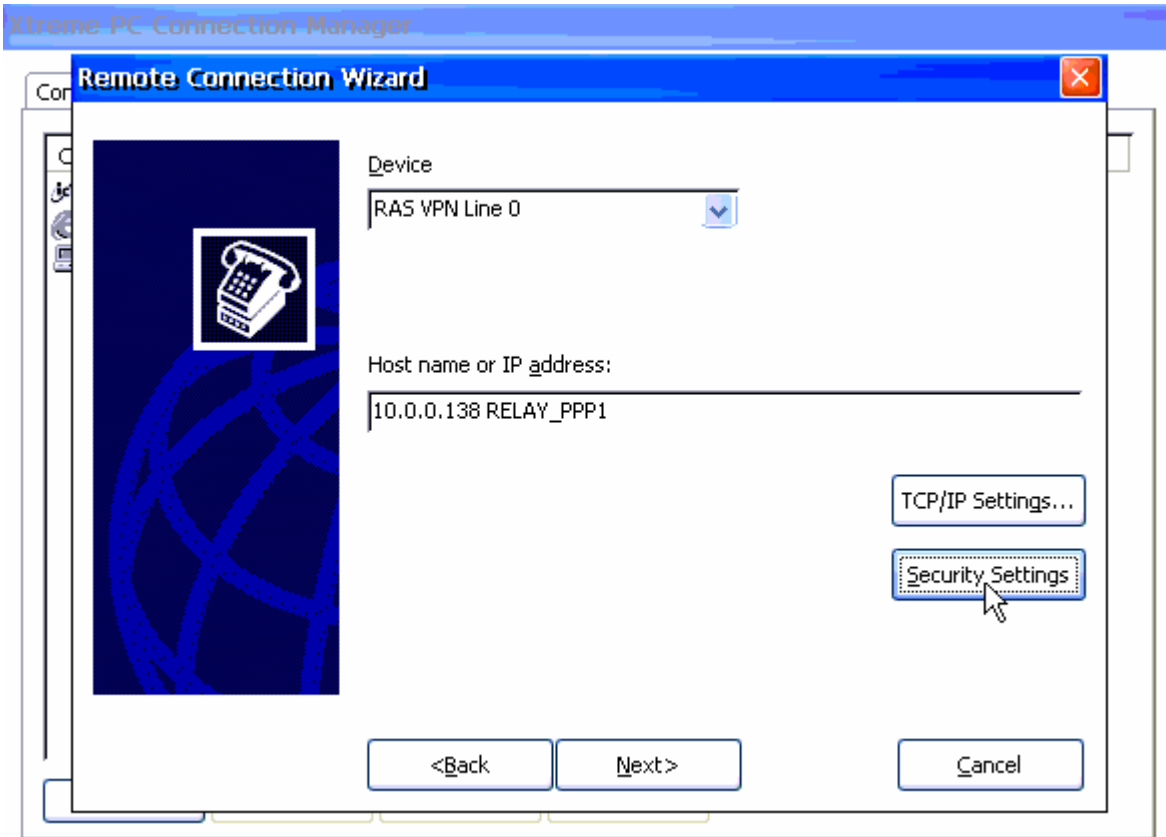


3. Define a *Name* for the connection.

Note: this is the name that will be displayed to the user in the Connection Manager at the end of the device boot process.

4. Choose the **Virtual Private Network** radio button and click NEXT.

The following dialog will appear:



5. Type in the "**Host name or IP address**" text box exactly the following:

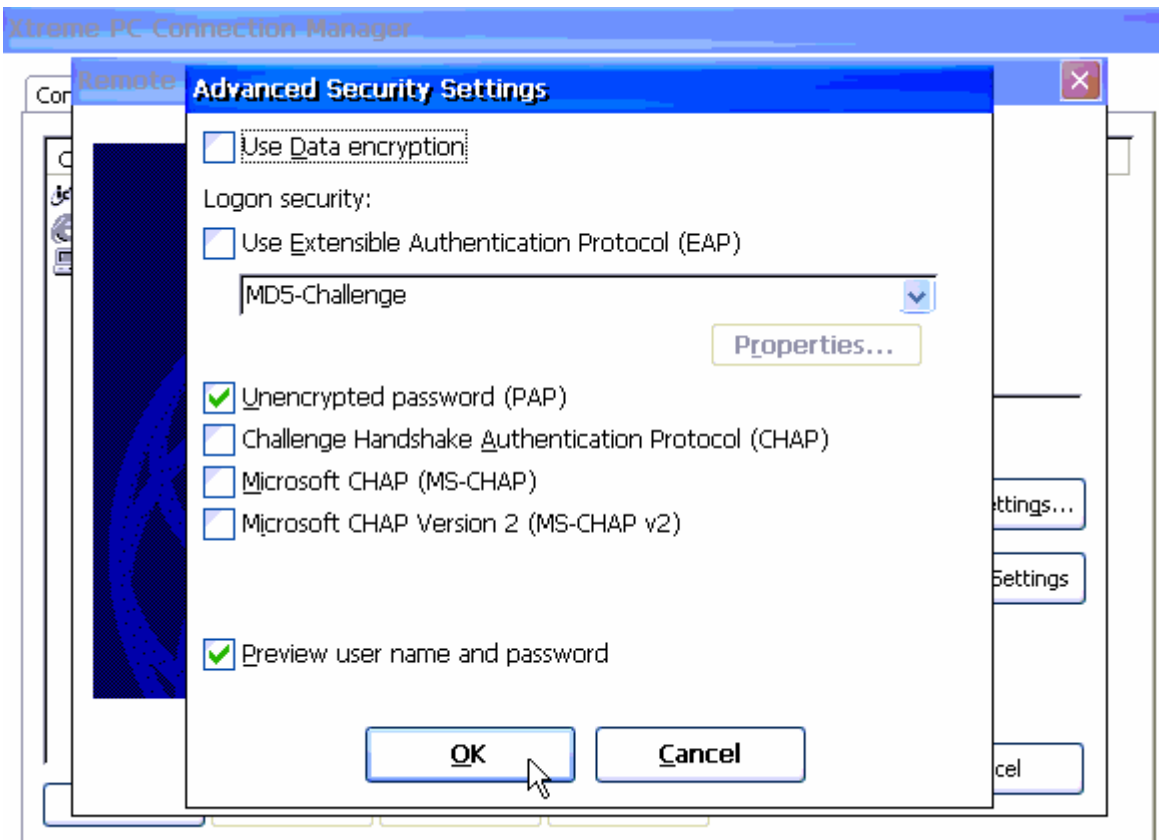
10.0.0.138 RELAY_PPP1

Note: This is the Fixed address of the Ethernet Port of the modem.
There is **space** between the 138 and the RELAY.

6. Press on the **Security Settings** button.

7. The Advanced Security Setting dialog will appear.

This dialog provides the option to define the Authentication Protocols and Encryption methods.

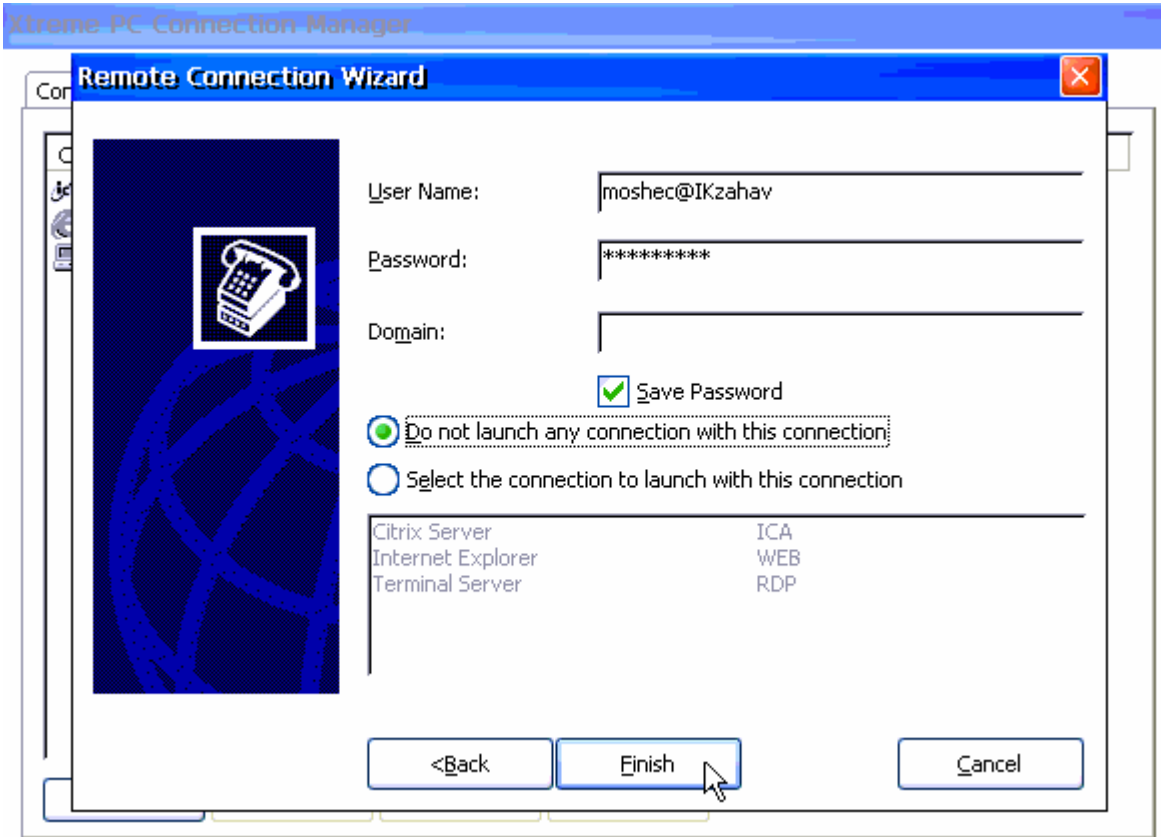


Make sure that only the **Unencrypted password (PAP)** checkbox is checked.

Note: in case that the **Preview user name and password** checkbox is checked the “User Name and Password” dialog will be presented to the user each time the CONNECTION is used.

8. Press OK and then press NEXT.

The following dialog will appear:



9. Fill in the exact USER NAME and PASSWORD that was assigned to you by your ISP.

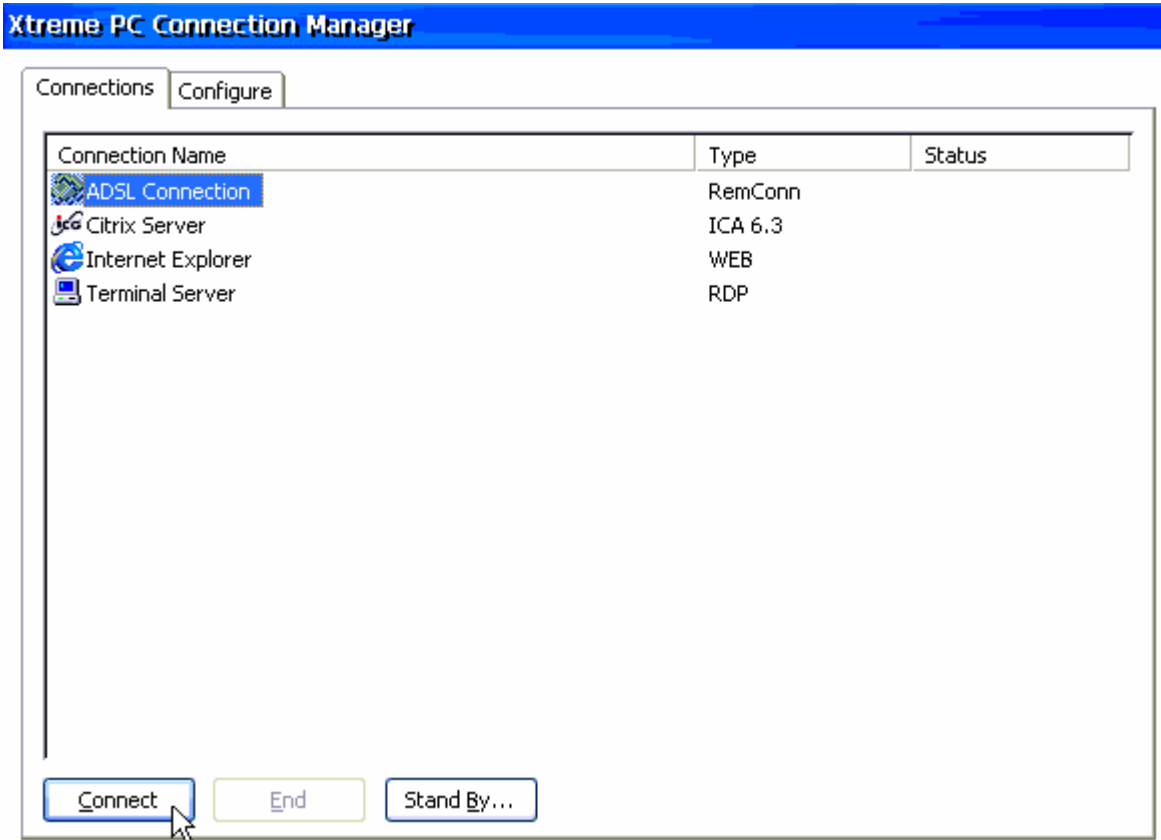
Leave the DOMAIN text box empty.

Note: a predefined connection can be selected to open automatically after the ADSL connection with the ISP is established successfully.

10. Click **FINISH** to finalize the creation of the connection.

Note: At this stage the **Xtreme PC** is configured and ready for use with the Alcatel ADSL Broadband modem.

The **Connection Manager** will be displayed.



11. Choose the newly defined ADSL Connection and click CONNECT in order to connect to your ISP.

Note: you will be displayed with the progress status of the connection process from the beginning to the stage that you are connected to your ISP.

In case that there is a problem with your USER NAME or PASSWORD you will be displayed with a dialog to enter your user credentials again.