

Remote Maintenance with WinCC flexible
Communication via a Wide Area Network (WAN)

Communication via Port Forwarding

Issue 12/04

Foreword

This document describes the option of communication via port forwarding.

If several operator panels in a system have to be connected to the Internet via a router connection, this can be done using the port forwarding function, for example.

Port forwarding is a technique for forwarding requests, which have been sent to certain external ports on the router, to internal IP addresses within the local network.

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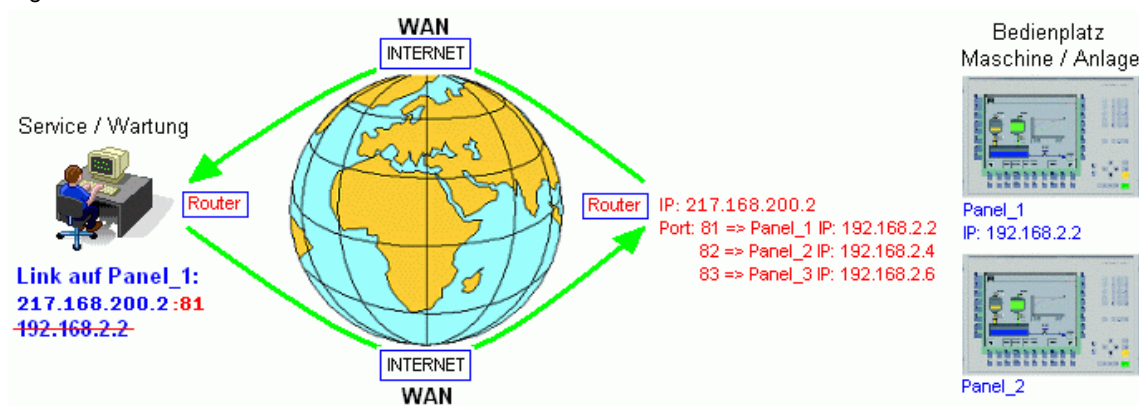
1 Communication via Port Forwarding

1.1 Accessing panels via port forwarding

1.1.1 Introduction

In communication via port forwarding, you do not contact the operator panel directly via the Internet, you only contact the IP address or the name of the router in connection with the defined port.

Fig. 1-1



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Kommunikation_ueber_Port_Forwarding_e.doc

This option only comes into consideration if there are several HMI systems that you wish to access externally within the local network that is being called using a standard router connection.

In the case of port forwarding, only pay attention externally to the ports specified previously in the router for the destination network; only use the router's external IP address for addressing. The name of the router can also be used instead of the IP address (see also WinCC_flexible_remote_maintenance_DSL_with_router.pdf, section 2.3.1).

At the local network end, the router from the destination network addresses the devices via their local IP address. The router redirects an external request to a local IP address with the aid of the specified port.

This can be illustrated by comparing it with a phone system. The switchboard number corresponds to the IP address, the extensions/direct lines correspond to the ports.

1.1.2 Sample application

Point your Internet browser to the following destination:

<http://winccflexiblerouter1.dyndns.org:81>

In our router, this address is then forwarded to port 80 at local IP address 192.168.1.20.

The HTML page for our MP270 6" appears on your screen.

Note:

When you assign ports, take care to ensure that they are not already occupied on the Internet by certain services or protocols.

If they are occupied twice, this may cause errors or malfunctions.

Example:

You are using ... to address port 80 externally (this port is normally reserved for http communication). Port 80 is forwarded to a permanent IP address and also externally from this IP address again.

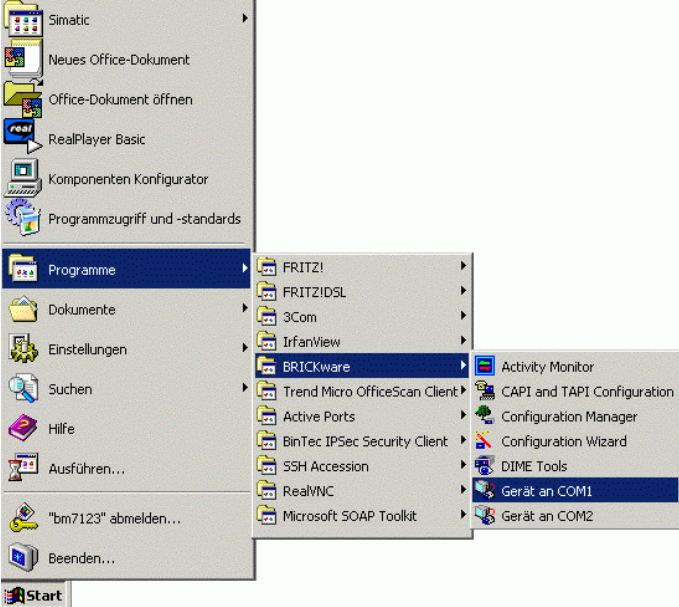
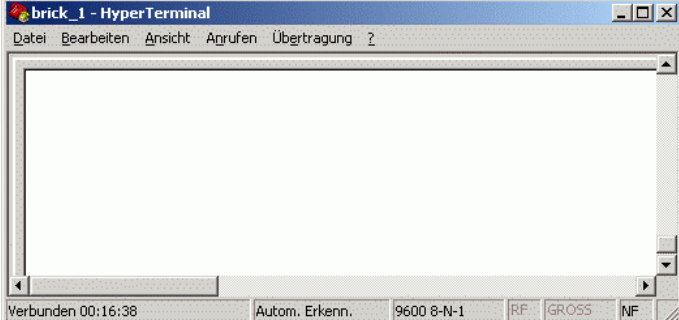
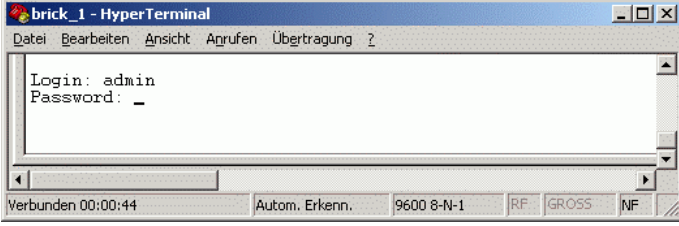
As a result of this link, no other device can access information from the Internet/Intranet because the information from the Internet/Intranet is only routed to a local IP address.

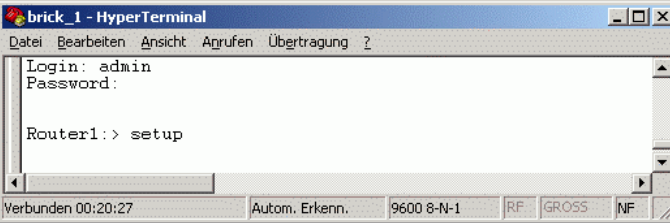
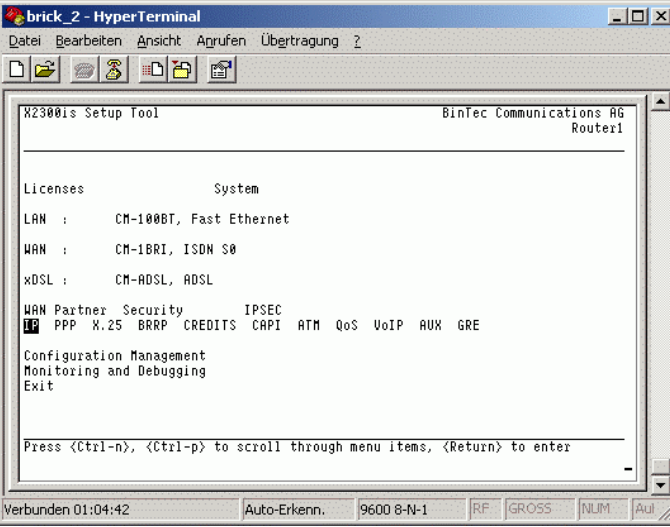
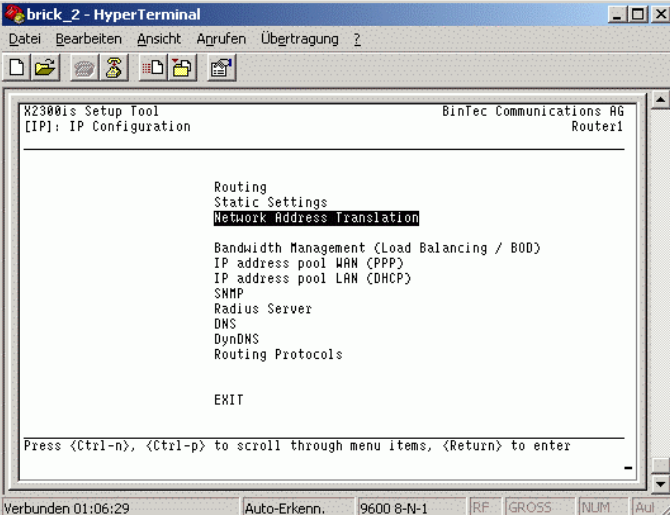
Consequently, none of the other devices within your LAN receive any further data.

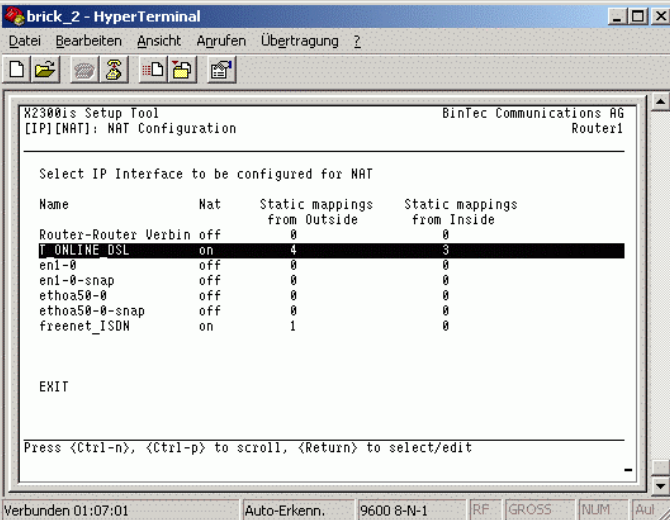
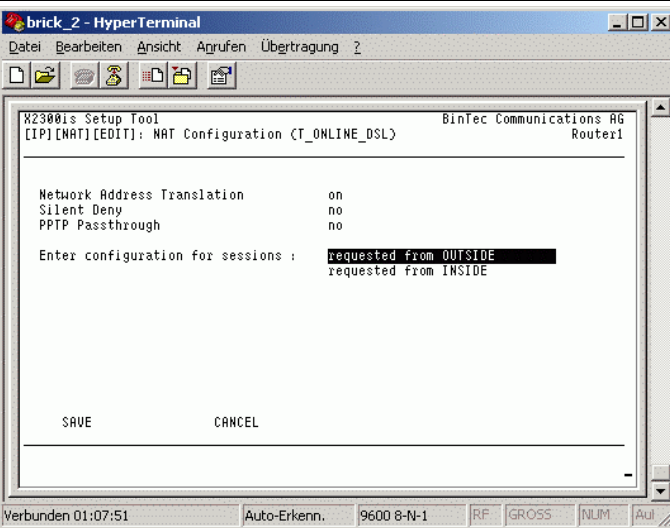
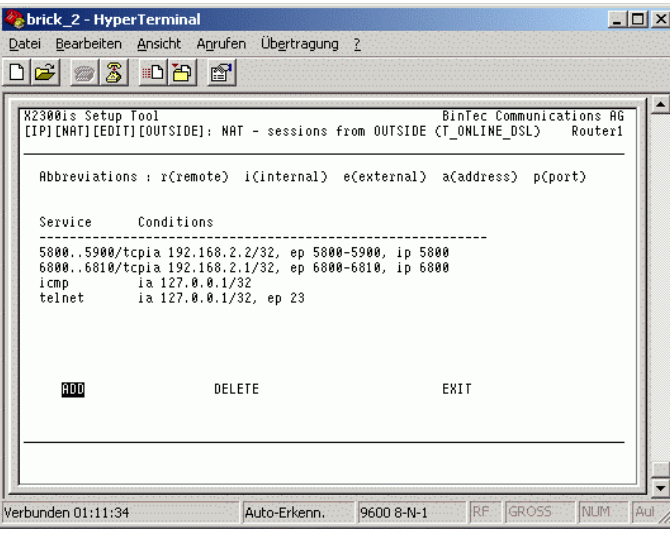
A standard assignment of ports to protocols or applications is performed by the IANA (Internet Assigned Numbers Authority). It provides a complete list under <http://www.iana.org/assignments/port-numbers>

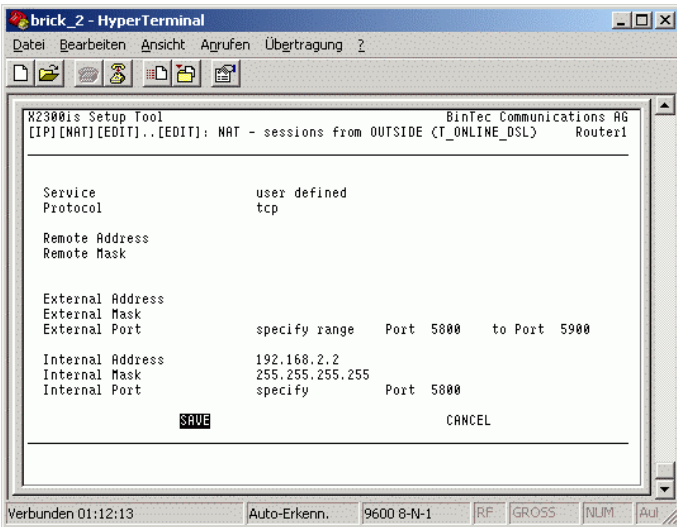
1.2 Configuring port forwarding on the router

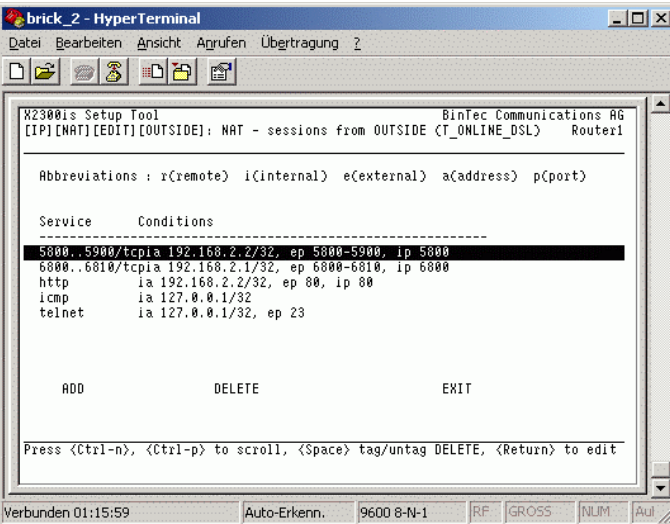
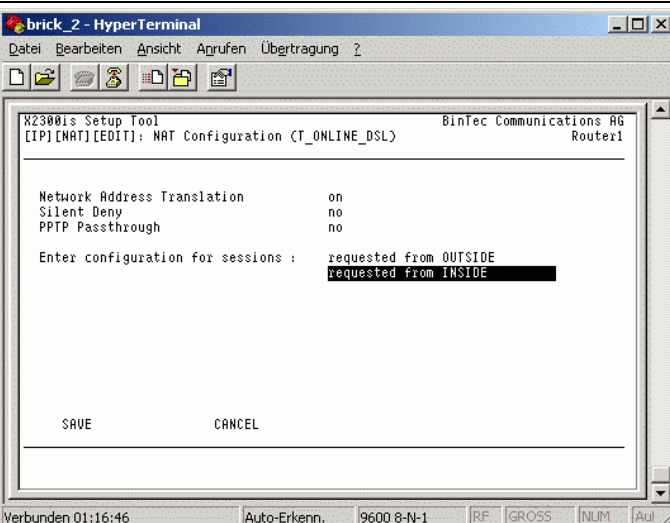
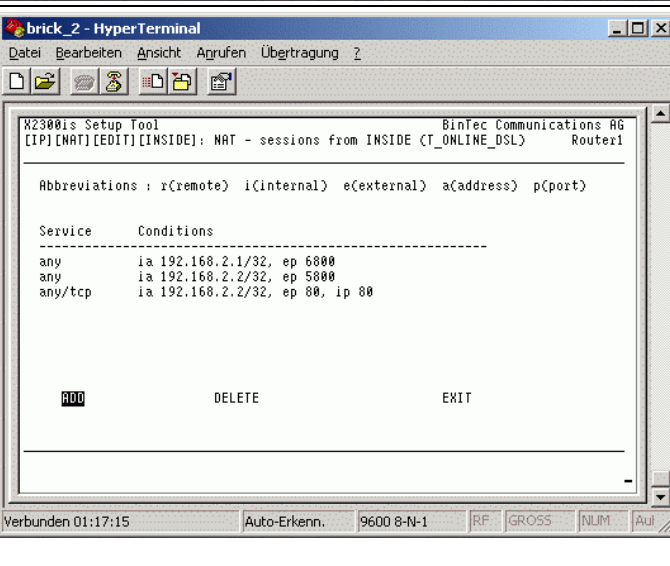
Table 1-1

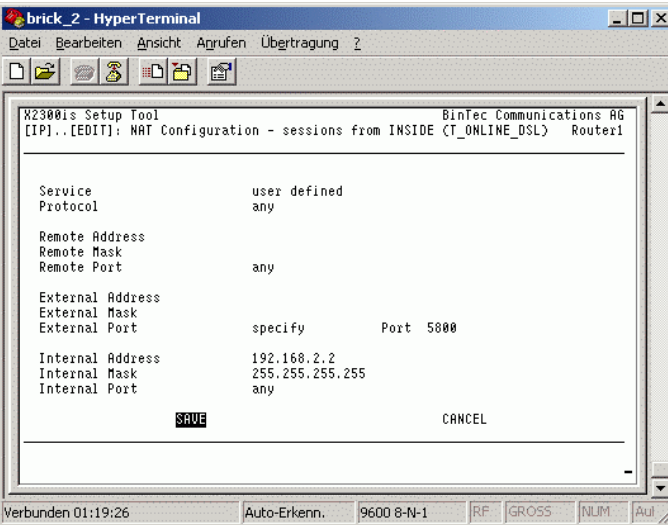
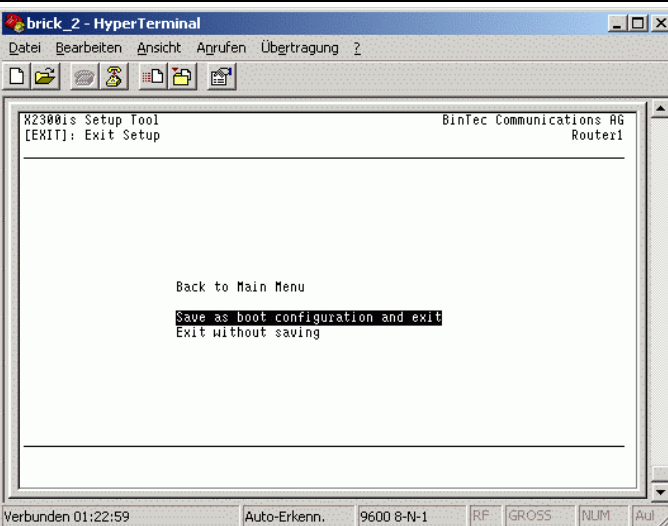
No.	Action	Note
1	<p>The BRICKware from BinTec that is already installed contains two default connections to your router. Depending on which COM port is used, now select a connection. The Windows HyperTerminal opens.</p> <p>Start > Programs > BRICKware > Device at COM1</p>	
2	<p>HyperTerminal Press ENTER to continue.</p>	
3	<p>After you press ENTER, a login prompt appears in which you enter the user data which is defined in your basic configuration. Use admin as the login, for example, followed by Enter and then the relevant password.</p>	

<p>4 Following login, enter setup. This takes you to the setup tool.</p>	
<p>5 Open the IP folder in order to access the Network Address Translation settings.</p>	
<p>6 Execute the Network Address Translation option by pressing ENTER in order to configure the settings.</p>	

<p>7 Select the Internet connection with which your router will be constantly online. If this should change, you will have to configure the settings for every other connection used. The T_ONLINE_DSL connection is selected in this example. The router is permanently online via this connection.</p>	 <pre> X2300is Setup Tool BinTec Communications AG [IP][NAT]: NAT Configuration Router1 Select IP Interface to be configured for NAT Name Nat Static mappings Static mappings Router-Router Verbin off 0 0 T_ONLINE_DSL on 1 1 enl-0 off 0 0 enl-0-snap off 0 0 ethoa50-0 off 0 0 ethoa50-0-snap off 0 0 freenet_ISDN on 1 0 EXIT Press <Ctrl-n>, <Ctrl-p> to scroll, <Return> to select/edit </pre>
<p>8 Network Address Translation was enabled previously, preventing the internal addresses from being contacted externally. Any functions which you wish to support via ports, despite this block, must now be defined individually in the Requested from OUTSIDE / INSIDE menu options. Open the dialed path.</p>	 <pre> X2300is Setup Tool BinTec Communications AG [IP][NAT][EDIT]: NAT Configuration (T_ONLINE_DSL) Router1 Network Address Translation on Silent Deny no PPTP Passthrough no Enter configuration for sessions : requested from OUTSIDE requested from INSIDE SAVE CANCEL </pre>
<p>9 You can now define a new route in the requested from OUTSIDE subfolder via ADD.</p>	 <pre> X2300is Setup Tool BinTec Communications AG [IP][NAT][EDIT][OUTSIDE]: NAT - sessions from OUTSIDE (T_ONLINE_DSL) Router1 Abbreviations : r(remote) i(internal) e(external) a(address) p(port) Service Conditions ----- 5800..5900/tcpia 192.168.2.2/32, ep 5800-5900, ip 5800 6800..6810/tcpia 192.168.2.1/32, ep 6800-6810, ip 6800 icmp ia 127.0.0.1/32 telnet ia 127.0.0.1/32, ep 23 ADD DELETE EXIT </pre>

<p>10</p>	<p>In our example we define the route from external port 5800 to internal port 5800 of IP address 192.168.2.2. We have approved a whole range in the case of the external port via the setting specify range because, under normal circumstances, the smart server in WinCC flexible 2004 is contacted via the smart viewer via port 5900. The specify setting means that a single port is forwarded. No range can be defined in the case of the internal port; the starting point suffices.</p> <p>Caution: The danger with large ranges is that ports are affected which are already occupied by standard protocols.</p>	
<p>11</p>	<p>Save your entry and exit the dialog with SAVE.</p>	
<p>12</p>	<p>The table now contains the entry that you have just created. You can now create other routes for all the requisite ports.</p> <p>Caution: The HTML page on each panel can only ever be contacted via port 80. Therefore, depending on the external port, you must contact the internal IP address and port 80.</p> <p>Example: External port 81 --> internal port 80 and IP 192.168.2.1 External port 82 --> internal port 80 and IP 192.168.2.2</p> <p>The return route will be configured later on in the menu option requested from INSIDE.</p>	

<p>13</p>	<p>View: Newly created entry</p>	 <pre> X2300is Setup Tool BinTec Communications AG [IP][NAT][EDIT][OUTSIDE]: NAT - sessions from OUTSIDE (T_ONLINE_DSL) Router1 Abbreviations : r(remote) i(internal) e(external) a(address) p(port) ----- Service Conditions ----- 5800 5900/tcp ia 192.168.2.2/32, ep 5800-5900, ip 5800 6800 6810/tcp ia 192.168.2.1/32, ep 6800-6810, ip 6800 http ia 192.168.2.2/32, ep 80, ip 80 icmp ia 127.0.0.1/32 telnet ia 127.0.0.1/32, ep 23 ADD DELETE EXIT Press <Ctrl-n>, <Ctrl-p> to scroll, <Space> tag/untag DELETE, <Return> to edit </pre>
<p>14</p>	<p>In order to configure the return route, open the menu option requested from INSIDE.</p>	 <pre> X2300is Setup Tool BinTec Communications AG [IP][NAT][EDIT]: NAT Configuration (T_ONLINE_DSL) Router1 Network Address Translation on Silent Deny no PPTP Passthrough no Enter configuration for sessions : requested from OUTSIDE requested from INSIDE SAVE CANCEL </pre>
<p>15</p>	<p>Add a new return route via ADD.</p>	 <pre> X2300is Setup Tool BinTec Communications AG [IP][NAT][EDIT][INSIDE]: NAT - sessions from INSIDE (T_ONLINE_DSL) Router1 Abbreviations : r(remote) i(internal) e(external) a(address) p(port) ----- Service Conditions ----- any ia 192.168.2.1/32, ep 6800 any ia 192.168.2.2/32, ep 5800 any/tcp ia 192.168.2.2/32, ep 80, ip 80 ADD DELETE EXIT </pre>

<p>16</p>	<p>Click SAVE to close the dialog</p>	 <p>W2300is Setup Tool BinTec Communications AG [IP]...[EDIT]: NAT Configuration - sessions from INSIDE (T_ONLINE_DSL) Router1</p> <p>Service user defined Protocol any</p> <p>Remote Address Remote Mask Remote Port any</p> <p>External Address External Mask External Port specify Port 5800</p> <p>Internal Address 192.168.2.2 Internal Mask 255.255.255.255 Internal Port any</p> <p>SAVE CANCEL</p> <p>Verbunden 01:19:26 Auto-Erkenn. 9600 8-N-1 RF GROSS NUM Au</p>
<p>17</p>	<p>Close the setup tool with Save as boot configuration and exit.</p>	 <p>W2300is Setup Tool BinTec Communications AG [EXIT]: Exit Setup Router1</p> <p>Back to Main Menu Save as boot configuration and exit Exit without saving</p> <p>Verbunden 01:22:59 Auto-Erkenn. 9600 8-N-1 RF GROSS NUM Au</p>

1.3 Changing a panel's port setting

When using several panels in a local network, port settings for accessing the Sm@rtServer must be adapted on an HMI system in the context of Sm@rtService.

The following conflict arises:

Example for illustration (see also section 1.1.2):

We have used the following configuration for the incoming and outgoing route for your router.

Panel 1

external port 80 <--> internal port 80
external port 5800 <--> internal port 5800
external port 5900 <--> internal port 5900

Panel 2

external port 81 <--> internal port 80
external port 5801 <--> internal port 5800
external port 5901 <--> internal port 5900

Call up the router name together with port 81 in the Internet Explorer; the website for panel 2 appears.

(For example, <http://router1.dyndns.org:81>)

You can go to the HTML page "RemoteControl.html" via the Remote Control menu option. The link for calling the Sm@rtClient is embedded there. Sm@rtClient facilitates the remote control of the panel. The default link configuration is for panel access to take place via port 5800 (default).

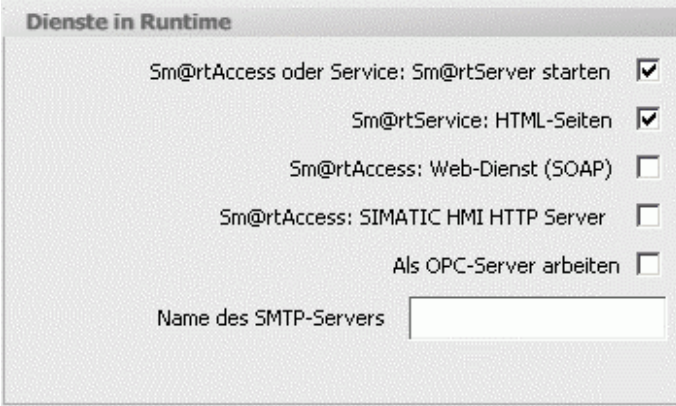
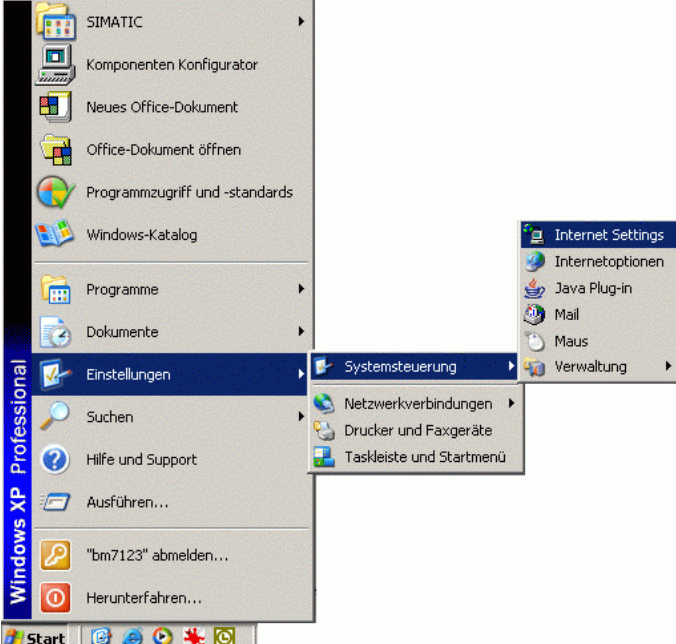
Thus, when the "Start Sm@rtClient" link is selected, the Internet Explorer attempts to contact the router address together with port 5800. (for example, <http://Router1.dyndns.org:5800>).

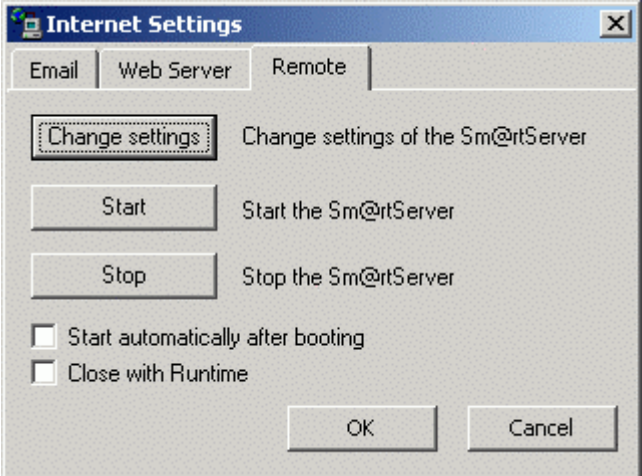
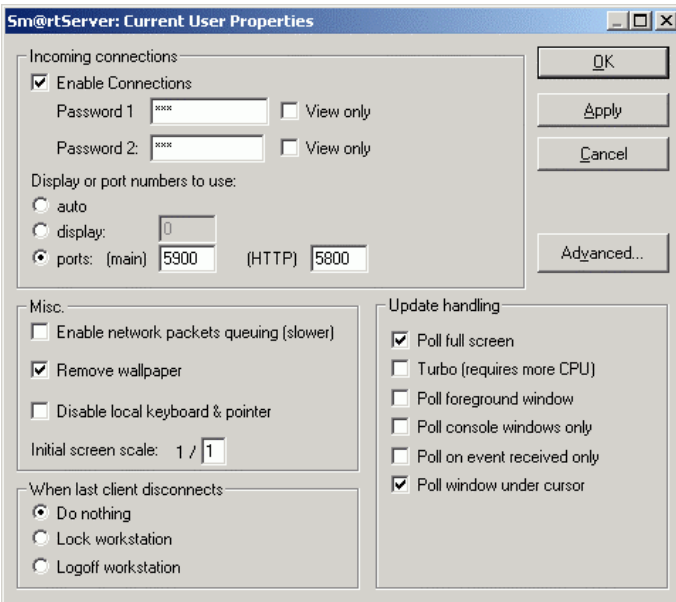
In our example, panel 1 is contacted instead of panel 2 on the basis of the router configuration shown.

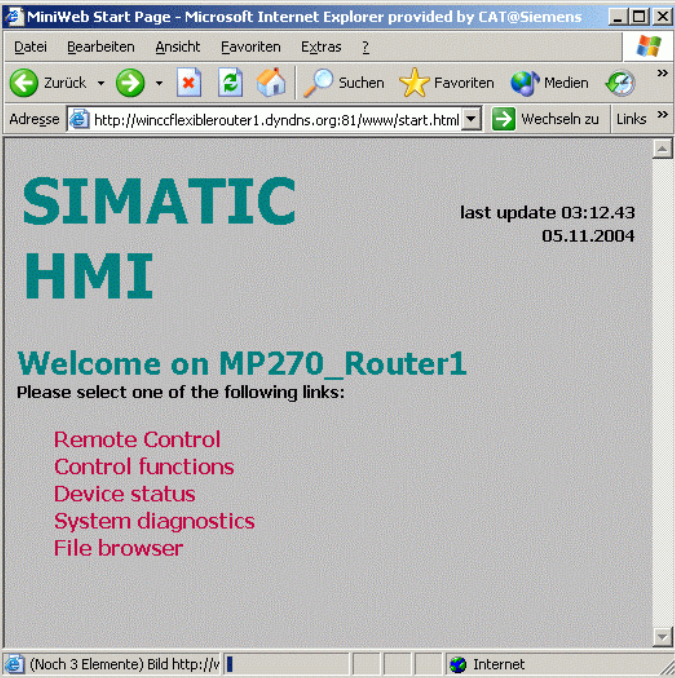
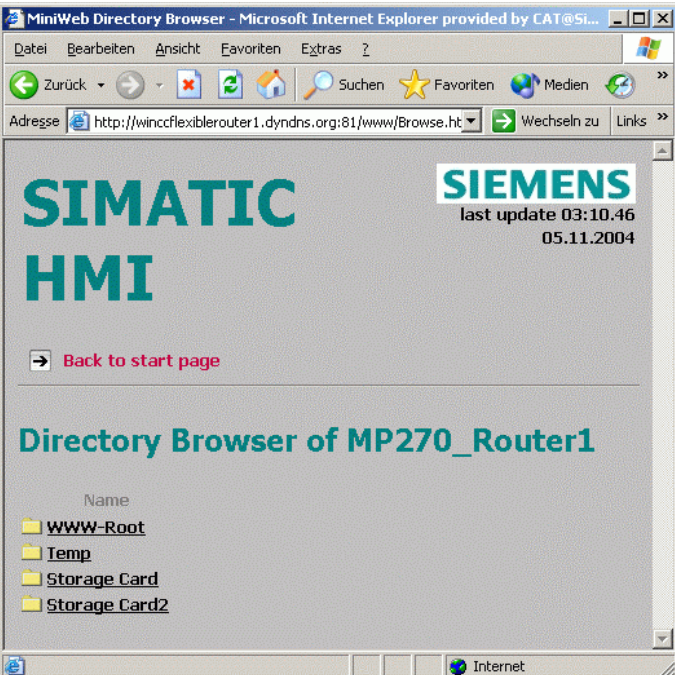
Consequently, when using several panels, the standard HTML page "RemoteControl.html" has to be adapted in order to start the Sm@rtClient. This measure allows you to distinguish between the different destination devices.

The description below shows you how to change the ports on the standard HTML page "RemoteControl.html".

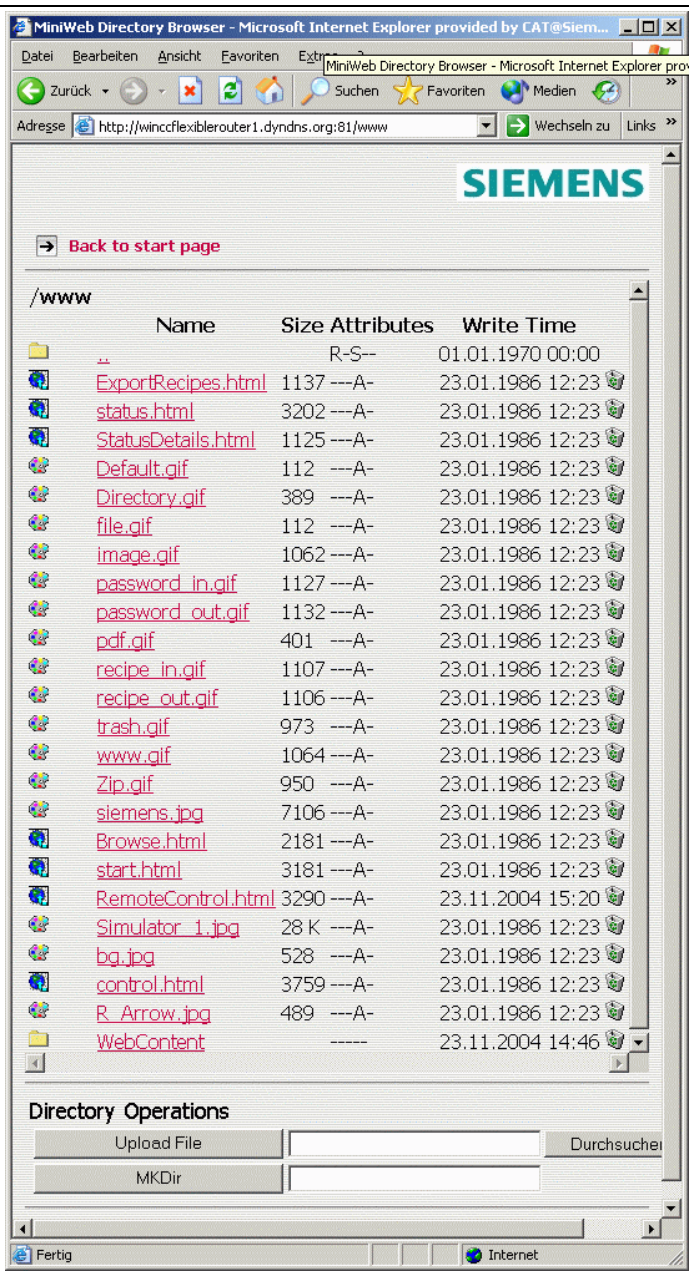
Table 1-2

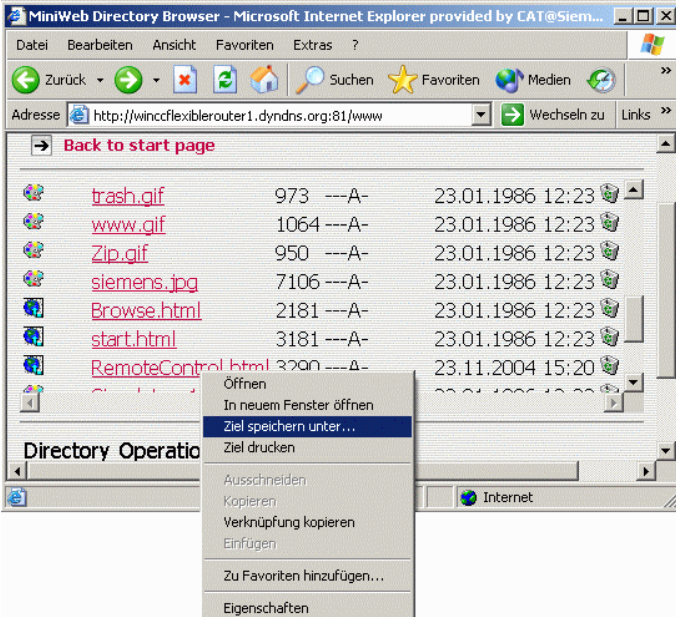
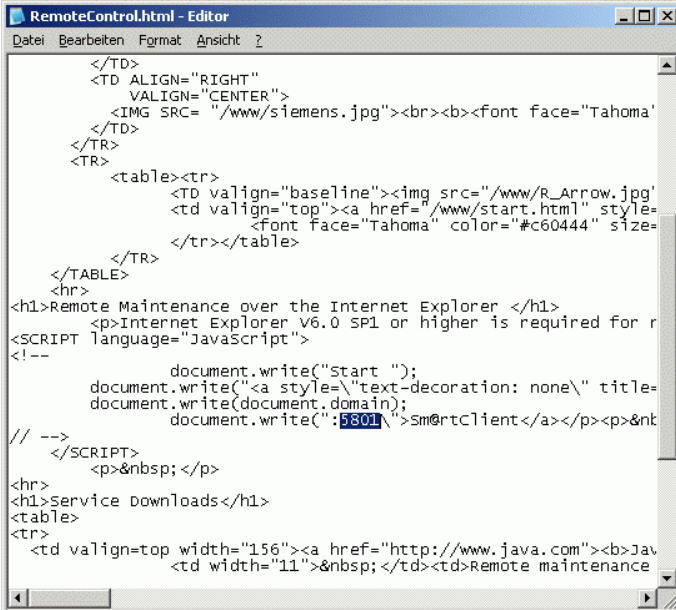
No.	Action	Note
1	<p>Prerequisite for the following steps:</p> <p>N.B. The following settings are only possible on a panel if the relevant configuration has been transferred to the panel beforehand with the aid of WinCC flexible Engineering using the Sm@rtService: HTML pages utility (see basic settings).</p>	
2	<p>Check the port settings of the Sm@rtServer on the port settings.</p> <p>Start > Settings > Control Panel > Internet Settings.</p>	

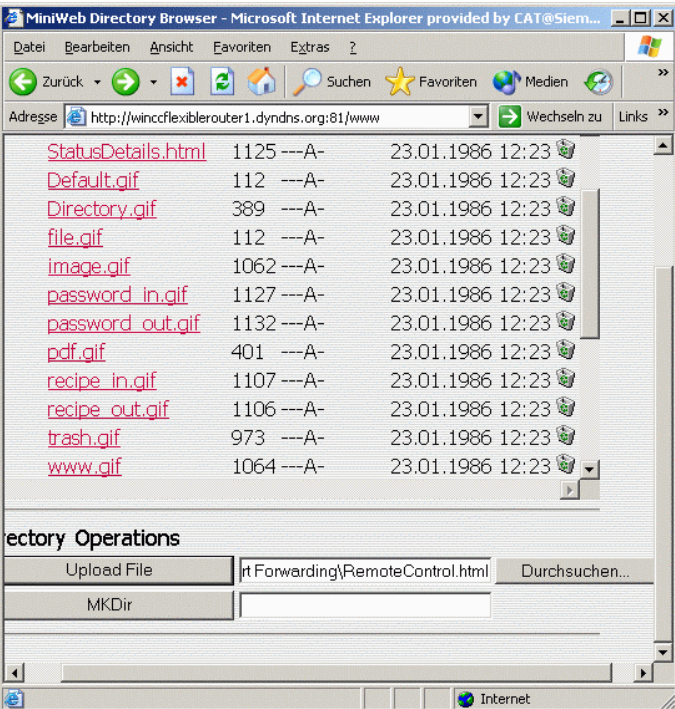
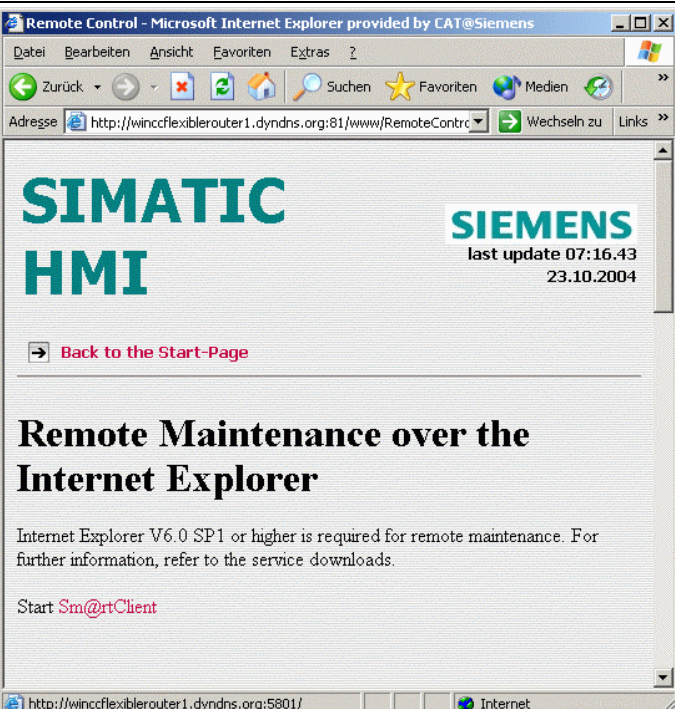
<p>3 Open the Sm@rtServer properties on the Remote tab by clicking the Change settings button.</p> <p>Note: In the panels you will find this setting in the Control Panel under the "Internet Settings" icon.</p>	
<p>4 You can now check the ports under ports:.</p> <p>The dialog shown on the right shows the defaults that have been used in our example.</p> <p>(main) is the port for direct access with the Smart Viewer.</p> <p>(HTTP) is the port for access via the Internet VNC Client.</p>	

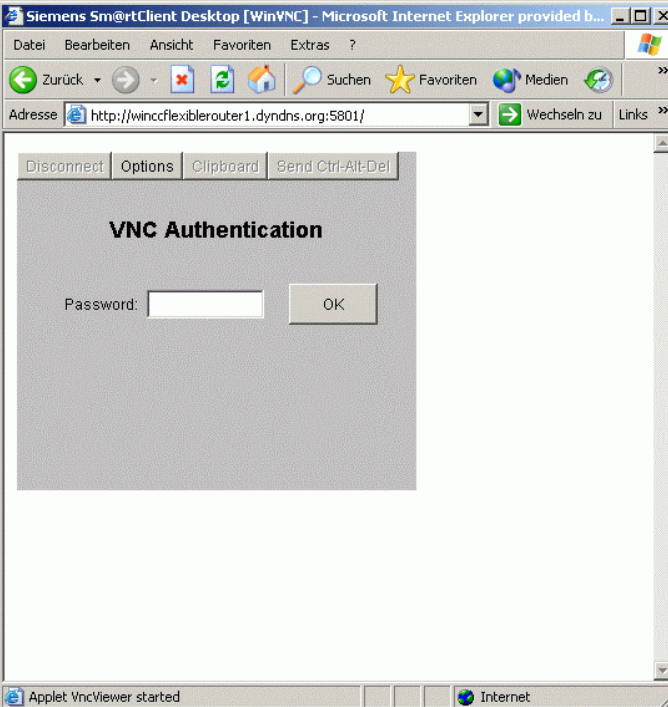
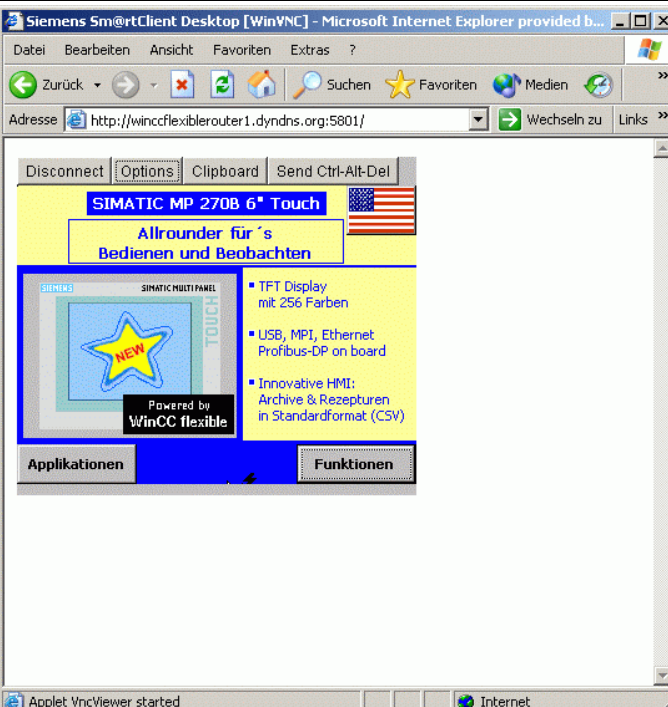
<p>5</p>	<p>Now start the panel homepage via the Internet.</p>	
<p>6</p>	<p>The File Browser link takes you directly to the panel directory. Please select the WWW-Root directory and login with your user name and password.</p>	

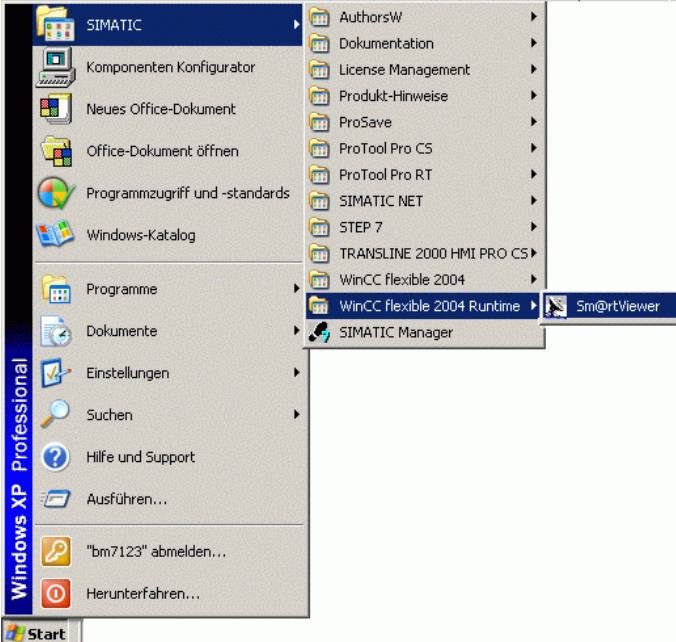
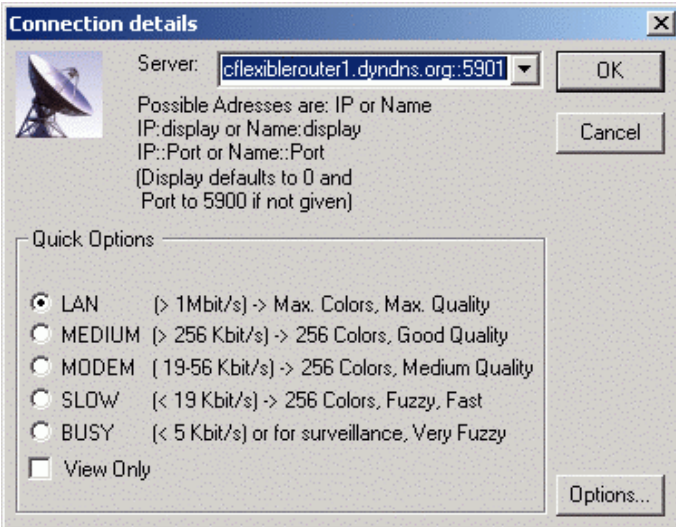
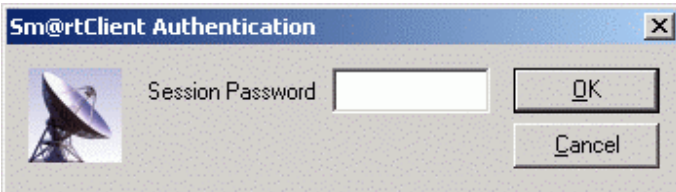
- 7 This takes you to the directory on the panel's internal flash.

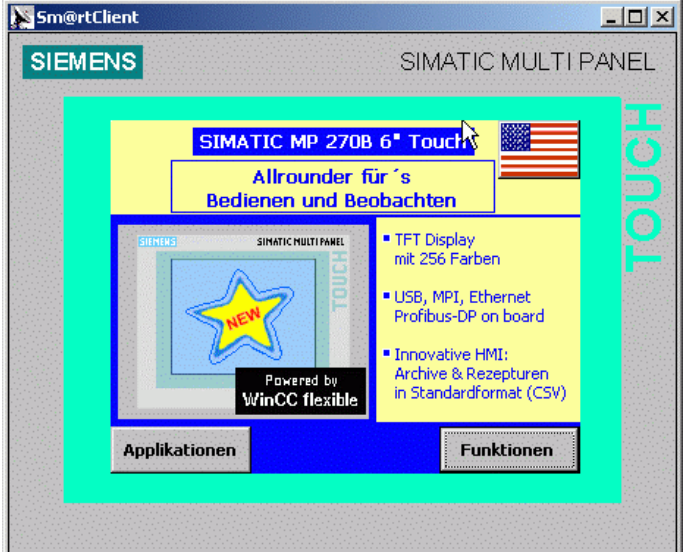


<p>8</p>	<p>Hier finden Sie die Datei RemoteControl.html. Laden Sie diese Datei auf Ihren PC (rechte Maustaste > Ziel speichern unter...)</p> <p>Achtung: Der PC versucht die Datei als HTM abzuspeichern, Sie benötigen aber die Dateieindung HTML.</p>	 <p>The screenshot shows a web browser window titled 'MiniWeb Directory Browser - Microsoft Internet Explorer provided by CAT@Siem...'. The address bar shows 'http://wincflexiblerouter1.dyndns.org:81/www'. The main content area displays a directory listing with columns for file names, sizes, permissions, and dates. The file 'RemoteControl.html' is highlighted, and a right-click context menu is open over it. The menu options include 'Öffnen', 'In neuem Fenster öffnen', 'Ziel speichern unter...', 'Ziel drucken', 'Ausschneiden', 'Kopieren', 'Verknüpfung kopieren', 'Einfügen', 'Zu Favoriten hinzufügen...', and 'Eigenschaften'. The 'Ziel speichern unter...' option is selected.</p>
<p>9</p>	<p>Here you will find the RemoteControl.html file. Load this file onto your PC (right-click > Save Target As...)</p> <p>Caution: The PC attempts to save the file as HTM. However, you require the extension HTML.</p>	 <p>The screenshot shows a text editor window titled 'RemoteControl.html - Editor'. The editor displays the source code of the HTML file. The code includes HTML tags for a table and a script block. The script block contains JavaScript code that writes 'Start' and the domain name to the document. The code is as follows:</p> <pre> </TD> <TD ALIGN="RIGHT" VALIGN="CENTER">
<font face="Tahoma' </TD> </TR> <TR> <table><tr> <td valign="baseline"><img src="/www/R_Arrow.jpg' <td valign="top"><a href="/www/start.html" style= <font face="Tahoma" color="#c60444" size= </tr></table> </TABLE> <hr> <h1>Remote Maintenance over the Internet Explorer </h1> <p>Internet Explorer V6.0 SP1 or higher is required for r <SCRIPT language="JavaScript"> <!-- document.write("Start "); document.write("<a style='text-decoration: none' title= document.write(document.domain); document.write('Sm@rtClient</p><p>&nt // --> </SCRIPT> <p>&nbsp;</p> <hr> <h1>Service Downloads</h1> <table> <tr> <td valign=top width="156">jav <td width="11">&nbsp;</td><td>Remote maintenance </pre>

<p>10</p>	<p>Delete the original file from the panel by clicking the recycle bin to the right of the filename. Then click Browse... to select the changed file on your computer and move it back to the panel.</p>	
<p>11</p>	<p>You can now click the Remote Control link on the homepage and execute the Start Sm@rtClient function in the next screen.</p>	

<p>12</p>	<p>The VNC client opens. You can identify the changed port in the address bar. Enter the password. You can then operate the required panel.</p>	
<p>13</p>	<p>Overview of the called panel.</p>	

<p>14</p>	<p>This also works with the Sm@rtViewer. Start it via Start > SIMATIC > WinCC flexible 2004 Runtime > Sm@rtViewer</p>	
<p>15</p>	<p>Specify your router IP address::Port or router name::Port and click OK.</p>	
<p>16</p>	<p>Enter the password and click OK to confirm. The Sm@rtClient starts. You can now operate the panel.</p>	

17	Overview of the called panel.	 A screenshot of a Siemens SIMATIC MP 270B 6" Touch panel interface. The window title is 'SmartClient'. The main content area features a yellow background with a blue border. At the top, it says 'SIEMENS' on the left and 'SIMATIC MULTI PANEL' on the right. Below this, there's a blue banner with 'SIMATIC MP 270B 6" Touch' and an American flag. Underneath is a yellow box with the text 'Allrounder für 's Bedienen und Beobachten'. A central graphic shows a smaller version of the panel with a yellow star and the word 'NEW'. To the right of this graphic is a list of features: 'TFT Display mit 256 Farben', 'USB, MPI, Ethernet Profibus-DP on board', and 'Innovative HMI: Archive & Rezepturen in Standardformat (CSV)'. Below the list is a black box with 'Powered by WinCC flexible'. At the bottom, there are two buttons: 'Applikationen' and 'Funktionen'. The word 'TOUCH' is written vertically on the right side of the panel.
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2 Glossary

Table 2-1

No.	Abbreviation	Description
1	ADSL	<p>Stands for Asymmetric Digital Subscriber Line.</p> <p>ADSL supports the use of the infrastructure in the existing phone network for broadband utilities. Additional data for Internet utilities is transmitted on the copper two-core conductors of the analog and digital telephone lines (POTS or ISDN) in the case of ADSL. For this purpose, the spectrum of frequency used by ADSL is divided into several sections. This enables the telephony and data signals to be transported side-by-side between the subscriber's line and the local exchange. There is a splitter on either side to separate and combine the signals.</p> <p>In ADSL, the maximum transmission rate that can be achieved is asymmetric in both directions, upstream and downstream. ADSL supports upstream transmission of up to 1.5 MBit/s and downstream of up to 8 MBit/s. However, as the transmission rate which can be achieved drops significantly the further apart the local exchange and subscriber are, these values cannot be achieved in practice for the majority of lines.</p> <p>The asymmetric DSL variants, in which there is a speed of up to 256 kBit/s available for upstream and up to 3 MBit/s available for downstream, are particularly suitable for private users and small businesses who do not wish to make large volumes of frequently requested Internet content available on their PC for other users.</p>
2	BBAE	<p>Stands for Broadband Access Equipment.</p> <p>The BBAE represents a subscriber's terminal connection to a line that is used for broadband. It separates the provider network from the subscriber line cable and conditions the signals for transmission via the connection element.</p> <p>In the case of ADSL connections, the BBAE generally also features the splitter that separates the broadband and narrow band signals from one another and combines them again.</p>
3	CAPI	<p>Stands for Common Application Programming Interface.</p> <p>A standardized software interface for communication between software and hardware.</p> <p>CAPI is the name of a program which is supplied with an ISDN card and which is used to activate it. Other programs that wish to transmit data via the card only have to pass this data on to the CAPI driver.</p>
4	DSL	<p>Stands for Digital Subscriber Line.</p> <p>DSL technology enables data transmission to be accelerated substantially via conventional phone lines, making it especially</p>

		<p>suitable for high-speed Internet use. ISDN services or analog telephony continue to run undisturbed on the same line. The high transmission rates are achieved by enlarging the frequency range used. For example, ADSL supports transmission rates of up to 8 MBit/s. Lines with capacities of 768 kBit/s are very common.</p> <p>The name DSL represents a whole family of technologies that are combined under the collective term xDSL. In Germany, lines for private customers are mainly offered with asymmetric DSL (ADSL) and single pair DSL (SDSL) technologies. ADSL, which is much more common, transmits the Internet data in the existing telephone network above telephony frequencies between 138 and 1,104 kHz. For example, ADSL is also the basis for the T-DSL product offered by Deutsche Telekom AG.</p> <p>e auch die Basis für das T-DSL-Angebot der Deutschen Telekom AG.</p>
5	DynDNS	<p>The term DynDNS stands for dynamic DNS and is meant to indicate that you as the customer can enter the IP address belonging to a name in the DNS server yourself.</p> <p>The partner's IP address is contacted, and the connection is established. However, since fixed IP addresses are expensive, most users connect to service providers and are assigned a dynamic IP address.</p> <p>This changes every time you connect (hence the term dynamic), making it impossible to locate a partner with a dynamic IP address. DynDNS servers on the Internet offer assistance in this respect. They enable partners to be located despite their dynamic IP address. If the partner is known, i.e. if its IP address is known, there is nothing to prevent communication. In the interests of security, communication with the partner can be encrypted with the aid of IPsec, for example, in a second step.</p>
6	IPsec (Internet Protocol Security)	<p>IPsec is a protocol that can be used to establish a secure IP connection.</p> <p>A distinction is made between two modes:</p> <ol style="list-style-type: none"> 1. Tunnel mode The entire IP package is encrypted in this mode. Tunnel mode is primarily used to transmit data between two company locations or between a private PC and a company network (to enable staff to work from home, for example) via the Internet secure from monitoring (VPN). 2. Transport mode Here only the data part is encrypted. This is used to transmit critical data, e.g. in passwords.
7	ISDN	<p>Stands for Integrated Services Digital Network.</p> <p>The striking feature of ISDN phone lines is that there are at least two basic access channels (B-channels) available for use simultaneously.</p>

		<p>This means that a subscriber is contactable by phone whenever it is online or sending a fax. It also supports two parallel phone calls from one line. In addition, higher transmission rates are possible than with an analog line. Each B-channel can transmit 64 kBit/s, i.e. the two together support 128 kBit/s.</p> <p>ISDN digital transmission and switching technology supports diverse forms of communication on the phone line such as telephony, faxing or Internet connections.</p> <p>ISDN continues to use the cabling from the previous analog telephone network in order to connect the customers to the exchange. However, ISDN technology uses this with much greater efficiency and flexibility. Connections can be established more quickly, speech quality is much improved, and not only is data transmission is quicker, it is also extremely reliable thanks to error correction.</p>
8	NTBA	<p>Stands for Network Termination Basic Rate Access.</p> <p>The NTBA forms the network termination to the public ISDN network. It converts the signal from the network provider from its two-wire line (UK0 bus) to a four-wire line (S0 bus).</p> <p>The exchange supplies current to the NTBA via the ISDN supply voltage – the NTBA, in turn, supplies the S0 bus. In normal operating mode, power is also fed to the NTBA via a power supply unit. In this mode it can supply up to four terminals which are connected to the S0 bus and which do not possess a power supply of their own.</p> <p>If the NTBA is operated without an additional power supply unit or if the power supply fails, the NTBA uses the network provider's ISDN supply voltage in order to operate on standby.</p>
9	Port Forwarding	<p>Port forwarding is a technology which supports the mapping of ports to IP addresses in NAT networks (Network Address Translation), i.e. if router ports have to be forwarded permanently to a specific IP address. This mapping technology is a function offered by many of the current DSL routers. For this purpose, the advanced settings for the router generally include a table in which a port that has to be mapped is permanently allocated to a specific local IP address.</p>
10	Routers	<p>Routers are first and foremost hardware devices or software programs that can be used to connect one or more computers or whole networks to other networks.</p> <p>The router acts as the control center in order to forward connection requests to the required network or the service.</p> <p>In addition to their basic functionality, hardware routers and, in particular, the current ISDN or DSL routers possess DHCP services or servers which can be used to manage address allocation and control centrally. Depending on the settings, IP addresses can be supplied in this way to whole networks which is beneficial to inexperienced users, in particular.</p>
11	Splitters	Splitters

		<p>In ADSL lines, the splitter divides the incoming signal from the provider network into the broadband ADSL signal and the narrow band ISDN signal or analog telephone signal. For transmission in the opposite direction, the two parts of the signal are combined to facilitate simultaneous transmission via the subscriber line.</p> <p>The splitter is frequently contained directly in the broadband access equipment (BBAE).</p>
12	TCP	<p>TCP, which stands for Transmission Control Protocol, is an important component of the TCP/IP protocol. It is based on connections and requests receipt of confirmation for every package sent.</p>
13	TCP/IP	<p>TCP/IP stands for Transmission Control Protocol/Internet Protocol. This generally refers to the whole family of protocols. It was developed to facilitate connection between computers in different networks.</p> <p>Nowadays TCP/IP is used in many LANs (Local Area Networks) and is the basis for the world wide web.</p>
14	T-DSL	<p>Deutsche Telekom has been offering DSL lines under the name T-DSL since the late 90s. T-DSL is the most commonly used variant of DSL, which also makes it the most common type of broadband Internet access in Germany.</p> <p>Deutsche Telekom is not the only organization that offers T-DSL access to the Internet via its subsidiary T-Online, this is also available from a relatively large number of resellers. However, they all use Deutsche Telekom infrastructure to establish the physical link to the customer. The remaining providers primarily use their own versions of ADSL or else SDSL, although this works symmetrically and supports data rates of up to 2.3 MBit/s.</p>
15	VPN (Virtual Privat Network)	<p>Company employees can use a Virtual Private Network (VPN) to connect to the company network (Intranet) from home or from locations outside the company via the Internet. A number of company sites can also be linked this way.</p> <p>The advantage of this is that there is no need for modem links or leased channels, simply a connection to the Internet. The employee connects to the Internet first of all. An encrypted channel (tunnel) is then established between the VPN client and VPN server. Following authentication via user name and password or public key/certificate, an encrypted IPsec tunnel is set up via which data can be transmitted without risk of being monitored.</p>
16	WAN	<p>The term WAN (Wide Area Network) refers to networks which transmit data over a larger distance than a LAN (Local Area Network).</p>

3 Warranty and Support

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