

VPN Router



Document History

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Version	Revision	Publication	Notes
EN01	25/07/2013	26/07/2013	
EN02	30/09/2013	15/10/2013	 New tested Routers: → Net Module NB 1600 → Vigor 2920 same configuration but no ADSL/VDSL Modem included
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Information on this document:

Safe operation of the PCD controllers on the internet can only be guaranteed with additional external IT components offering integrated protection functions such as VPN, firewall, proxy servers, etc.

To that end, we have evaluated several VPN routers and tested them with our PCD controllers. This document lists the devices successfully tested and their suppliers. In this document the configuration and initial operation is

Tested devices:

- DreyTek Vigor 2850Vn
- DreyTek Vigor 2920Vn
- EuroGard Service Router V2 (WLan)
- EuroGard Service Router V2 (UMTS)
- Net Module NB 1600Net Module NB 1600-U



1 Technical information: Vigor 2850Vn, 2920, EuroGard Service Router V2 and Net Module NT 1600-U

The DrayTek Vigor 2850 is a business router for establishing VPN connections and managing small to medium-sized business/home networks. Its functionality and user interface are easy to use.

The EuroGard Service Router V2 is an industrial router for establishing secure connections on industrial installations. The configuration menu is available in several languages. The user guidance is simple to follow and establishing the VPN connection is easily achieved.

	DrayTek Vigor 2850Vn	DrayTek Vigor 2920VN	EuroGard Service Router V2 (WLan)	EuroGard Service Router V2 (UMTS)	Net Module NB 1600-U
Order data	2850Vn	2920Vn	ER 1201-WLAN	ER 1201-UMTS	NB 1600-U
Additional	http://www.drayte	http://www.drayte	http://www.euroga	http://www.euro	http://www.net
information	k.de/produkte/mo dem- router/vigor2850- serie.html	k.de/produkte/dua I-wan/vigor2920- serie.html	rd.de/en/	gard.de/en/	module.de/pro ducts/industrial - routers/mobile- router.html
Application/ Type	Business/Home	Business/Home	Industrial	Industrial	Industrial
Top-hat rail installation	No	No	Yes	Yes	Yes
Electrical supply	230 VAC	230 VAC	24 VDC	24 VDC	24 VDC
VPN Features					
Number of WAN interfaces	3: LAN/Modem/USB	3: LAN/Modem/USB	1: LAN	2: LAN/UMTS	2: LAN/UMTS
Integrated ADSL/VDSL modem	Yes	No	No	No	No
VPN PPTP	Yes	Yes	No	No	Yes
VPN L2TP/IPSec	Yes	Yes	No	No	No
openVPN	No	No	Yes	Yes	Yes
No. VPN clients	32 connections	32 connections	30 connections	30 connections	10 connections
Windows client	Yes (integrated in Windows)	Yes (integrated in Windows)	Yes (EurogardSRCon nect)	Yes (EurogardSRCo nnect)	Yes (openVPN)
IOS Client	Yes (IPSec/L2TP, integrated in IOS)	Yes (IPSec/L2TP, integrated in IOS)	No*	No*	Yes (openVPN)
Android Client	Yes (IPSec/L2TP, integrated in Android)	Yes (IPSec/L2TP, integrated in Android)	No*	No*	Yes (openVPN)
Extensions					
3G/4G modem	Yes, with USB stick	Yes, with USB stick	No	Yes, with integrated UMTS modem	Yes, with integrated 3G modem

* IOS or Android systems can now be connected to the router via WLAN. This requires two routers. One VPN server and one VPN client. Support for VPN on mobile devices is in preparation.



2 Use of an existing internet access point

2.1 Preparation

Setting up a connection in an existing Ethernet infrastructure: The internet connection to the Internet Service Provider (ISP) is enabled by an existing device (Router 1 in the figure below).



In the case shown above the internet connection to the ISP is established by Router 1. The existing Ethernet infrastructure should not or cannot be modified. Router 2, which contains the VPN server, is installed behind Router 1 in the existing LAN. In this case, Router 1 must be configured such that all relevant VPN ports are transmitted to the IP address of Router 2, or the DMZ is configured to the IP address of Router 2.

Depending on the configuration of the VPN connection [the VPN connection may be configured with Point-to-Point Tunneling Protocol (PPTP) or Layer 2 Tunneling Protocol (L2TP), which is usually used in combination with Internet Protocol Security (IPSec)], different ports from the public network are required at the WAN interface of the VPN server. A port represents a gateway for communicating with an application via TPC/IP, in this case with the VPN server.

	Protocol	Port
PPTP default	ТСР	1723
L2TP default	UDP	1701
IPSec default	UDP	500, 4500

In a normal configuration, most of the ports on the router managed by the ISP connection are blocked by the internal firewall. It is therefore **not** possible to operate a VPN server without making slight changes to the existing Ethernet structure.

As a rule, firewall means that all data packages trying to access the LAN via undefined ports will be blocked by Router 1 which manages the ISP connection. It is therefore not possible for the undefined port to establish communication with the devices behind the firewall.



In order to be able to establish a connection to the VPN server (device behind the firewall) of the ISP-managing Router 1, the ports relevant for the VPN connection in Router 1 must be defined in a firewall rule.

The configuration of Router 1 for forwarding ports depends on the manufacturer and software version of the device used. In general, there are 2 ways to forward these ports to the VPN server.

2.1.1 Explicit port forwarding (Forwarding)

The ports for establishing a VPN connection from the client to the server must be forwarded to the VPN server from the first router by means of a firewall rule.



Advantage of this configuration:

Very secure, since only the ports specified above are available on the VPN server.

Disadvantage of this configuration:

The VPN ports are defined with the ports described above by default. However, these definitions are not fixed and can be modified in the VPN server setup. If port forwarding is not completely identical with the configuration of the VPN server, a connection cannot be established.

The use of a DMZ offers additional options.

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2.1.2 Configuration of a DMZ

A DMZ allows all ports that are queried at the WAN interface and for which the first router cannot find a rule to be forwarded to a specific IP address.



Preparation of the existing router DMZ/NAT:

A DMZ must be established in order to keep the existing router that is connected with the ISP from distributing queries to unknown ports. This configuration may vary from router to router, but it is usually clearly described in the setup help section or in the router manual.

DMZ represents a "Demilitarized Zone". For devices that don't have their own security features, the zone is not protected and not more secure. In the DMZ, the properties of every device are comparable to those it would have if it were actually connected to the internet. This is because the router that is physically connected to the internet forwards all unrecognized data packages to or into the DMZ.



In most cases, the DMZ is configured with a designated IP address.

Caution:

Ports which have a rule that is recognized by the first router are not forwarded to the DMZ.

Disadvantage:

The VPN server requires its own protection system (firewall, etc...) Advantage:

Very easy to configure and manage.

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3 Vigor 2xx0 DrayTek

In the document the configuration of the Vigor router DreyTec 2850 and 2920 will describe. Both have the same configuration interface for configuring the basic settings and VPN. As opposed to Vigor 2850, the Vigor 2920 has no built-in ADSL / VDSL modem

3.1 Opening the setup menu

The PC must be connected to a LAN interface in order to set up the Vigor 2xx0. The router includes an active DHCP server with delivery. Configuring the Vigor 2xx0 with a factory configuration in an Ethernet infrastructure with an existing DHCP server should therefore be avoided.

Recommendation:

Disconnect your PC from all existing network connections. Connect your PC directly to the router.

By default, the IP address of the router is configured to "192.168.1.1". The router's DHCP server provides the connected PC with an address in the DHCP server's address space (usually "192.168.1.10" for the first device).

The router is configured in a browser.

In order to load the configuration interface in the browser, the router's IP address must be entered in the browser.

By default, the Vigor 2xx0 is delivered with the user name "admin" and password "admin". You can also find user names and passwords in the router manual.



🗅 Vigor Login Page 🛛 🗙 📃				23
← → C 🗋 178.83.186.183/web	login.htm		☆	≡
Username Password	admin •••••	Login		
Copyright@, DrayTek Corp. Al	l Rights Reserved.	Dray Tek	J	



3.2 Configuring the WAN port

WAN stands for "Wide Area Network". With a router, this is always the public interface in a public, unprotected area.

Vigor 2920



Vigor 2850



3.3 WAN operation behind a router/firewall

The Vigor 2xx0 allows 3 different WAN ports to be configured.

Note: The Vigor 2920 has no built-in ADSL / VDSL modem

Overview of possible connection types:

1) ADSL/VDSL modem \rightarrow (only Vigor 2850)

this configuration enables the router to be directly linked to an ISP's ADSL/VDSL connection using the integrated modem. The ISP's configuration parameters are needed for this type of connection.

2) Ethernet \rightarrow

this configuration allows the router to be operated behind an existing router. In doing so, the existing router provides the connection to the ISP.

USB →

this configuration allows the use of a connected modem (3G/4G) to establish a link to an ISP. The ISP's configuration parameters are needed for this type of connection.

This document outlines connection type 2. With this connection type, the router with the VPN server is positioned behind an existing router. In this case, the existing router manages the internet connection to the Internet Service Provider (ISP) and holds the system's public IP address.



3.4 Configuring the VPN server

The Vigor2xx0 supports the following remote access capabilities:

1) Tunneling protocols:

a. PPTP VPN service (Point-to-Point Tunneling Protocol)
 PPTP is used to establish a VPN by creating a tunnel for the point-to-point protocol. It provides sufficient scope for any type of authentication and encryption. The TCP port 1723 is usually used.

 b. IPSec VPN service (Internet Protocol Security)
 IPSec is a protocol suite that enables secured communication via potentially insecure IP networks, such as the internet.

c. L2TP VPN service (Layer 2 Tunneling Protocol)

Tunneling on the Layer 2 level of the OSI layer model (link layer). L2TP does not directly include encryption and is therefore most often used in combination with IPSec.



Remote Access Control Setup

L2TP is described in this document as it relates to establishing the VPN connection: Activate the service for IPSec and L2TP.

L2TP allows the routing of network NAT (Network Address Translation). In doing so, the VPN tunnel is created by IPSec.



2) IPSec settings Pre-Shared Key (PSK)

If a connection type with IPSec was selected, the PSK is required for configuring the connection options of the client.

VDSL2 Security Fire	wall		
Auto Logout 💌 🛛 🛛 🥵	VPN and Remote Access >> IPsec Gene	eral Setup	
Quick Start Wizard Service Activation Wizard Online Status VDSL	VPN IKE/IPsec General Setup Dial-in Set un for Remote Dial-in user IKE Authentication Method	s and Dynamic IP Client (LAN to LAN)	
WAN LAN NAT Firewall User Management Objects Setting CSM Bandwidth Management Applications VPN and Remote Access VPN and Remote Access VPN Genet Wizard VPN Server Wizard VPN Server Wizard VPN Server Wizard VPN Server Wizard Premote Access Control VPN Server Mizard Premote Dalain User IPsec General Setup IPsec General Setup IPsec Peer Identity Remote Dalain User LAN to LAN VPN TRUNK Management Connection Management USB Application System Maintenance Diagnostics External Devices	Pre-Shared Key Confirm Pre-Shared Key IPsec Security Method I Medium (AH) Data will be authentic, bu High (ESP) I DES I Data will be encrypted and	t will not be encrypted. 3DES ØAES d authentic. OK Cancel	

IPSec General Setup

Under no circumstances should the PSK be a word from the dictionary.

A password combining special characters, numbers and letters and totaling at least 12 characters is recommended.



3) Remote Dial-in Users

Up to 32 users can be defined here. All of these users can log on to the VPN server. The index of the relevant line must be clicked in order to establish a new user.

🕈 Möchten Sie, dass Ihr Passw	ort von Google	Chrome gesp	eichert wird?	Passwort sp	peichern	Für diese Wel	bsite niem als	5
Vigor2850 s VDSL2 Security Fire	Series wall	<						Dray
Auto Logout 🗨 IR6	VPN and F	Remote Access	>> Remote D)ial-in User				
Quick Start Wizard	Remote A	ccess User Acc	ounts:				Set t	o Factory Default
Inline Status	Index	User	Active	Status	Index	User	Active	Status
		Daniel	V	LAN1-DHCP	<u>17.</u>	???		
NAN	2.	Daniel 2	\checkmark	LAN1-DHCP	<u>18.</u>	???		
TAT	<u>3.</u>	???			<u>19.</u>	???		
irewall	<u>4.</u>	???			<u>20.</u>	???		
bjects Setting	<u>5.</u>	???			21.	???		
CSM	<u>6.</u>	???			22.	???		
Sandwidth Management	7.	???			23.	???		
/PN and Remote Access	8.	???			24.	???		
VPN Client Wizard	9.	???			25.	???		
Remote Access Control	10.	???			26.	???		
IPsec General Setup	11.	???			27.	???		
IPsec Peer Identity	12.	???			28.	???		
LAN to LAN	13.	???			29.	???		
VPN TRUNK Management	14.	222			30.	222		
Certificate Management	15.	222			31.	222		
ISB Application	16	222			32	222		
)iagnostics	10.				36.			
xternal Devices				OK	Can	cel		

³² Remote Dial-in Users



- 4) Remote Dial-in User Configuration
 - Set the currently selected user to active user: Set the timeout to "60" seconds.
 - 2) Dial-in options for the currently selected user: Preferred setting is L2TP with IPSec policy (Must).
 In this case, a protected IPSec tunnel to the server is established. Another L2TP tunnel is then set up in this tunnel, which allows the network to route between server and client.
 - 3) Activate Specify Remote Node.
 - 4) Definition of a user name and password for authentication.



- 5) The VPN server is now fully configured and ready for client connections.
- 6) When the client is connected, a link to the application can be made simply by entering the IP and .html file in the micro browser.



3.5 Android System 4.1.2 client

Open the menu \rightarrow Settings \rightarrow Additional settings:



The submenu includes the entry VPN (Virtual Private Networks), which is used to configure the client:





Add a VPN network connection:

- → Name = Can be freely defined
- → Server address = Public IP address or DNS name of the DSL router
- → L2TP key = Is not used for current router configuration
- → IPSec Pre-shared Key = Key that was provided in the router IPSec general setup
- → Save

Open the new VPN network connection:

	 	
User name Daniel Passwo Save account information	L2TP V2850 Connecting	L2TP Verbunden
Cancel Connect Danielle Daniel Danielle Daniel		
qwertyuiop		
asdfghjkl		
123 Sym		

→ User name and password that were provided for the remote dial-in user configuration.

Username		Daniel
Password(Max 19 char)		••••
🔲 Enable Mobil	e One-Tim	ne Passwords(mOTP)
PIN Code		
Secret		



3.6 iPhone/iPad client

The following steps are required to establish a L2TP/IPSec connection with an I-OS device:

1) Open "Settings". Under the menu item "General", select "VPN":

II. Swisscom 🗢	10:07	
Einstellungen All g	gemein	
		_
Info		>
Softwareaktual	isierung 1	>
Benutzung		>
Siri		>
		_
Mobiles Netz	Ein	>
VPN	Nicht verbunden	>
iTunes-WLAN-S	Sync	>
Spotlight-Such	e	>

2) Add a new VPN connection:





- Create a L2TP IPSec connection with a remote VPN server. Required settings or entries:
- → Description: Can be freely defined
- → Server: IP address or DNS of VPN server
- → Account: User profile with VPN access rights to the VPN server
- → Password: The password stored for this user profile
- → Shared Secret: The pre-shared key (PSK) that was provided for the VPN tunnel

📶 Swisscom 🔶	10:08					
Abbrechen Konfiguration Sichern						
L2TP	PPTP	IPSec				
Beschreibung Vigor						
Server	r 178.83.186.183					
Account	ount Daniel					
RSA-SecurID						
Kennwort						
Shared Sec	ret •••••	•••••				
Für alle Daten						
Ргоху						
Aus	Manuell	Autom.				

4) Select the tunnel used for VPN access and activate this tunnel. The status field displays that the tunnel was successfully established:

nıl. Swisscom 🗢 10:08 📼	💵 Swisscom 🗢 10:09 🛛 🕬
Allgemein VPN	Allgemein VPN
VPN	VPN
Konfiguration auswählen	Status Verbunden: 0:11 >
✓ Vigor Eigene	Konfiguration auswählen
VPN hinzufügen	✓ Vigor Eigene
	VPN hinzufügen >



3.7 Client Microsoft Windows XP

1) Open the network configuration:



2) Create a new

connection:

Setwork Connections	
<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools	Adva <u>n</u> ced <u>H</u> elp
🕞 Back 🔻 🕥 👻 🏂 🔎 Sear	ch 😥 Folders 🛄 🕶
Address 💊 Network Connections	
A	Name
Network Tasks 🛛 🕆	LAN or High-Speed Internet
Create a new connection	Lan 1
Set up a home or small office network	
Change Windows Firewall settings	
	•



3) The new connection wizard is loaded:



4) Connect to the network at my workplace (VPN):





5) Virtual Private Network connection (VPN):

ew Connection Wizard
Network Connection How do you want to connect to the network at your workplace?
Create the following connection:
© Dial-up connection
Connect using a modem and a regular phone line or an Integrated Services Digital Network (ISDN) phone line.
• Virtual Private Network connection Connect to the network using a virtual private network (VPN) connection over the Internet.
< <u>B</u> ack <u>N</u> ext > Cancel

6) Name of VPN:

New Connection Wizard	
Connection Name Specify a name for this connection to your workplace.	I)
Type a name for this connection in the following box. Company N <u>a</u> me	
Vigor 2850	
For example, you could type the name of your workplace or the name of a ser will connect to.	ver you
< <u>B</u> ack <u>N</u> ext >	Cancel



7) VPN server address:

New Connection Wizard	
VPN Server Selection What is the name or address of the VPN server?	D
Type the host name or Internet Protocol (IP) address of the computer to which you are connecting.	
Host name or IP address (for example, microsoft.com or 157.54.0.1):	
178.83.186.183	
< <u>B</u> ack <u>N</u> ext > Cancel	

8) Close wizard:

New Connection Wizard	
	Completing the New Connection Wizard You have successfully completed the steps needed to create the following connection: Vigor 2850 • Share with all users of this computer
	The connection will be saved in the Network Connections folder. Add a <u>s</u> hortcut to this connection to my desktop To create the connection and close this wizard, click Finish.
	< <u>B</u> ack Finish Cancel



9) Select properties in the connection dialog:

Connect Vigor	2850	? ×
<u>U</u> ser name: Password:		
C Anyone	iser name and password for the y who uses this computer	following users:
Connect	Cancel Properties	s <u>H</u> elp

10) Security Tab \rightarrow IPSec Settings \rightarrow Enter IPSec key:

Vigor 2850 Properties	×
General Options Security Networking Advanced	
Security options ① [Typical (recommended settings)] 义alidate my identity as follows:	
Require secured password Automatically use my Windows logon name and password (and domain if any)	
Require data encryption (disconnect if none)	
Advanced (custom settings) Using these settings requires a knowledge of security protocols. Settings	
I <u>P</u> Sec Settings	
Use pre-shared key for authentication Key.	
OK Cancel OK Cancel	



11) Enter user name and password of the VPN user:



12) Connection was made:

Connecti	ing Vigor 2850
2	Connecting to 178.83.186.183
	Cancel
Connecti	ing Yigor
2	Verifying username and password
	Cancel
Connecti	ng Vigor
2	Registering your computer on the network
	Cancel



- 13) The PC is now a member of the remote network. Access to devices is now possible with all applications that support Ethernet:
- → Browser → PG 5 0 start × 192.168.1.50/start.htm ← → C 7:53:09 S Monitoring 25/6/2013 Today 뎡 UserPasswordDialog_V01 [Device1] - Saia PG5® Project Man 0.00kWh File Edit View Project Device Online Tools Help 🗄 🗅 🚅 🕼 😭 🔛 🛗 📥 🚺 📴 🏣 Week 🖳 🔆 🔘 💭 🐌 0.00kWh **Project Tree** Project 'UserPasswordDialog_V01' : 2 Devices Properties Month T TCP/IP Settings Table 0.00kWh 🗄 🦲 Common Files 🔟 Library Manager E Device1 - PCD7.D457¥T5F - 168.152.35.23, S-Bus Stn 0 Year Properties 0.03kWh Coline Settings - SOCKET: TCP/IP, 192.168.1.50, Stn Auto C Device Configurator 8 Build Options 😟 🧰 Program Files 😟 🦲 Listing Files Documentation Files 🛨 🏧 Device2 - PCD3.M5540 - 192.168.1.2, S-Bus Stn 0



3.8 Microsoft Windows 7 client

Create a VPN connection in a Windows 7 system. Administrative rights are required to set up a VPN connection.

1) Open the Network and Sharing Center:

Currently connected to:	*7
Network 5 Internet access	
Dial-up and VPN	· ·
To Vigor	
Vigor 2850	8
	_
Open Network and Sharing C	enter

2) Create a new connection to a network:





3) Connect to the network at my workplace:



4) Use the internet connection:

Connect to a Workplace	
How do you want to connect?	
 Use my Internet connection (VPN) Connect using a virtual private network (VPN) connection through the Internet. Image: Image: Imag	
 Dial directly Connect directly to a phone number without going through the Internet. What is a VPN connection? 	
	Cancel



5) Define internet address and name of the connection:

G In Connect to a W	/orkplace	
Type the Interr	net address to connect to	
Your network adm	inistrator can give you this address.	
Internet address:	178.83.186.18	
Destination name:	Vigor 2850	
Use a smart	t card	
This option	allows anyone with access to this computer to use this connect	tion.
🔽 Don't conn	ect now; just set it up so I can connect later	
		Next Cancel
Entor upor nomo on	d meansurement of the V/DNL community	
Enter user name and	a password of the VPN server:	
Connect to a W	orkplace	
Connect to a W	orkplace	
Connect to a W Type your user User name:	orkplace	
Connect to a W Type your user User name: Password:	orkplace Trame and password Daniel Transe and password Daniel Transe and password Trans	
Connect to a W Type your user User name: Password:	orkplace	
Connect to a W Type your user User name: Password:	orkplace or name and password Daniel Show characters Remember this password	
Connect to a W Type your user User name: Password: Domain (optional):	orkplace or name and password Daniel Show characters Remember this password	
Connect to a W Type your user User name: Password: Domain (optional):	orkplace Iorkplace Daniel ••••••••••••••••••••••••••••••••••••	
Connect to a W Type your user User name: Password: Domain (optional):	/orkplace /orkplace Daniel Show characters Remember this password	
Connect to a W Type your user User name: Password: Domain (optional):	/orkplace /orkplace Daniel Show characters Remember this password	
Connect to a W Type your user User name: Password: Domain (optional):	Jorkplace Daniel Show characters Remember this password	



7) Close wizard:

Connect to a Workplace	
The connection is ready to use	
I	
➔ Connect now	
	Close

8) Open the Network and Sharing Center \rightarrow Change adapter settings

🕞 🕘 🛛 😫 🕨 Control Panel 🕨	All Control Panel Items Network and Sharing Ce	enter 👻 🍫 S	earch Control Panel	Q
Control Panel Home	View your basic network information	n and set up connec	ctions	e
Change adapter settings	🔍 —— 🛽		- 🔘	See full map
Change advanced sharing settings	WIN-22VGHKOTHAH Netw (This computer)	vork 5	Internet	
	View your active networks		Conr	nect or disconnect
	Network 5 Work network	Access type: Connections:	Internet Local Area Con Local Area Con	nection nection 3
	Change your networking settings			
	Set up a new connection or network			
	Set up a wireless, broadband, dial-up,	ad hoc, or VPN connecti	on; or set up a route	er or access point.
	*** Connect to a network			
	Connect or reconnect to a wireless, wi	ired, dial-up, or VPN netw	vork connection.	
Canadan	Choose homegroup and sharing optic	ons		
HomeGroup	Access files and printers located on ot	ther network computers,	or change sharing s	ettings.
Internet Options	Troubleshoot problems			
Windows Firewall	Diagnose and repair network problem	is, or get troubleshooting	information.	



9) Open properties of the VPN connection:



10) Enter L2TP/IPSec connection settings and set the IPSec Pre-Shared Key (PSK):

Vigor 2850 Properties	Advanced Properties
General Options Security Networking Sharing	LZTP
Type of VPN:	Use preshared key for authentication
Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)	Key: *************
Data encryption:	O Use certificate for authentication
Require encryption (disconnect if server declines)	$\ensuremath{\overline{\ensuremath{\mathbb{V}}}}$ Verify the Name and Usage attributes of the server's certificate
Authentication	
O Use Extensible Authentication Protocol (EAP)	
· · · · · · · · · · · · · · · · · · ·	
Properties	
Allow these protocols	OK Cancel
Unencrypted password (PAP)	
Challenge Handshake Authentication Protocol (CHAP)	
Microsoft CHAP Version 2 (MS-CHAP v2)	
Automatically use my Windows logon name and password (and domain if any)	
pacentera (and contain, if driy)	
OK Cancel	



11) Open the VPN connection and establish the connection.

🐓 Connect Vig	jor 2850
User name:	Daniel
Password:	[To change the saved password, click here]
Domain:	
Save this u Me only Anyone	ser name and password for the following users: who uses this computer
Connect	Cancel Properties Help



12) The connection was made, IP addresses from the router's DHCP server were assigned

🔋 Status von Vigor 2850 📃 💌	Status von Vigor 2850
Allgemein Details	Allgemein Details
Verbindung IPv4-Konnektivität: Internet IPv6-Konnektivität: Kein Netzwerkzugriff Medienstatus: Verbindung hergestellt Dauer: 00:00:57 Details Aktivität Gesendet — Empfangen	EigenschaftWertGerätenameWAN Miniport (L2TP)GerätetypvpnAuthentifizierungMS CHAP V2Komprimierung(keine)PPP-MultilinkframingInaktivClient-IPv4-Adresse192.168.1.11Server-IPv4-Adresse192.168.1.1NAP-StatusNicht NAP-fähigVerwendeter NetzwerLAN-VerbindungUrsprüngliche Adresse168.152.35.150Zieladresse178.83.186.183
Bytes: 1.768 543 Komprimierung: 0 % 0 % Fehler: 0 0 Eigenschaften Trennen Diagnose Schließen	Schließen

- 13) The PC is now a member of the remote network. Access to devices is now possible with all applications that support Ethernet.
- ➔ Browser
- → PG 5



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3.9 Windows troubleshooting:

In the event that the connection was not successful, please check the following points and repeat the process starting at number 15. Activate the IPSec Policy Agent and the IKE and AuthIP IPSec keying modules.

1) Open Control Panel:





2) Open Management:



3) Open Services window:





4) Start Services

(IPsec Policy Agent and IKE and AuthIP IPSec keying modules)

a. IPsec Policy Agent





b. IKE and AuthIP IPSec keying modules:

General Log On	Recovery Dependencies
Service name:	IKEEXT
Display name:	IKE and AuthIP IPsec Keying Modules
Description:	The IKEEXT service hosts the Internet Key Exchange (IKE) and Authenticated Internet Protocol
Path to executab C:\Windows\sys	ole: tem32∖svchost.exe -k netsvcs
Startup type:	Automatic
Startup type: Help me configur	Automatic re service startup options. Started
Startup type: Help me configur Service status: Start	Automatic re service startup options. Started Stop Pause Resume
Startup type: Help me configur Service status: Start You can specify from here.	Automatic re service startup options. Started Stop Pause Resume the start parameters that apply when you start the service
Startup type: Help me configur Service status: Start You can specify from here. Start parameters	Automatic re service startup options. Started Stop Pause Resume the start parameters that apply when you start the service



4 EuroGard Service Router 2

The router should always be configured starting with the settings for the local network (LAN) and ending with those for the VPN server. The reason for this is that parameters of the local configuration and system time are used when generating the server certificate in the router.



Wide Area Network (WAN) \rightarrow Connection to router with public IP address Local Area Network (LAN) \rightarrow Connection to local network



4.1 Opening the setup menu

The PC must be connected to the router's LAN interface in order to set up the Eurogard Service Router V2. The router includes an active DHCP server with delivery. Configuring the Eurogard Service Router V2 with a factory configuration in an Ethernet infrastructure with an existing DHCP server should therefore be avoided.

Recommendation: Disconnect your PC from all existing network connections. Connect your PC to the router directly.

By default, the factory-set IP address of the router is configured to "192.168.155.1". The router's DHCP server provides the connected PC with an address in the DHCP server's address space.

The router is configured in a browser.

To load the configuration interface in the browser, the router's IP address must be entered in the browser.

The Eurogard Service Router V2 is delivered with the factory-set user name "eurogard" and password "eurogard". You can also find user names and passwords in the router manual.





4.2 Configuring the LAN port (Local Area Network)

Open the router configuration and set the basic settings for the local network: Use the addresses in the address space of your existing applications or define a new address space for a new system. At a minimum, the host name, domain name and location should be changed. This is because these entries are later used in generating the server certificate. The domain name is later entered in this certificate as the connection name to the VPN server.

	Router Configuration $ ightarrow $				
Info	Posic Cottings	euro S	ServiceRouter		Logout:Daniel Host name: werk2 System Time: 24.07.2013 17:04 Uptime: 12 days
«Router Configuration»	Basic Settings/LAN	(gard V	2		Load: 0.22, 0.28, 0.41 Softwareversion: 4.3.1 Language: English V
Devices	Web Access/WAN		Router Configuration \rightarrow Basic Settings/LAN		
Messaging	Time	Info «Router Configuration»	Basic Settings/LAN		
Status-Logs	dDNS	Devices	System settings		
Backup Maintenance	Certificates	Messaging	Host name	werk2	
	OpenVPN	Status-Logs	Domain name	pcd-demo.com	
		Backup Maintenance	IP address in plant network	192.168.155.1	
	Accounts		Netmask	255.255.255.0	
	WLAN		Router is DHCP server for plant network	enabled V	
	Logs		DHCP pool start DHCP pool end	192.168.155. 100 192.168.155. 120	
	Firewall		DHCP-range VPN start	192.168.155. 130	
	Routing		OpenVPN mode	on	Help
			HTTPS port of webinterface (default:443)	443	



4.3 Configuring the WAN port (Wide Area Network)

The Eurogard Service Router V2 allows 4 different WAN ports to be configured.



1) Ethernet \rightarrow

This configuration allows the router to be operated behind an existing router. In doing so, the existing router provides the connection to the ISP.

- DSL/PPPoE → (an external ADSL/VDSL modem is required) this configuration enables the router to be directly connected to an ADSL/VDSL modem. The ISP's configuration parameters are needed for this type of connection.
- 3) UMTS \rightarrow

This configuration allows use of the integrated UMTS modem to establish a connection to an ISP. The ISP's configuration parameters are needed for this type of connection.

Please note: In this configuration (UMTS), the router can only be operated as a VPN client.

4.3.1 WAN over Ethernet

If you are using an internet connection that already exists.

DHCP: The IP address of the device is acquired from the DHCP server at the WAN interface. Statically: The IP address is permanently defined.

Info «Router Configuration» Devices	Basic Settings/LAN Web Access/WAN	euro S Gard V	erviceRouter 2		Logout:Daniel Host name: werk2 System Time: 24.07.2013 17:06 Uptime: 12 days Load: 0.20, 0.26, 0.39 Softwareversion: 4.3.1 Language: [English]
Messaging Status-Logs Backup Maintenance	Time dDNS Certificates OpenVPN Accounts WLAN Logs Firewall Routing	Info «Router Configuration» Devices Messaging Status-Logs Backup Maintenance	Router Configuration → Web Access/WAN WAN configuration WAN configuration WAN media Configuration MTU (leave empty for automatic setting)	Ethernet DHCP/dynamic	Help



4.3.2 WAN over UMTS

If the router is equipped with an integrated UMTS modem, the UMTS modem can be used as a WAN interface.

Please note that a connection via UMTS supports only VPN client functionalities. In doing so, the router cannot be used as a VPN server.

The parameters required to dial in are provided by your ISP.

e u r o S g a r d V	erviceRouter 2 Router Configuration \rightarrow Web Access/WAN		Logout:Daniel Host name: werk2 System Time: 24.07.2013 17:06 Uptime: 12 days Load: 0.20, 0.26, 0.39 Softwareversion: 4.3.1 Language: English V
Info «Router Configuration» Devices	WAN configuration WAN configuration		
Messaging Status-Logs	WAN media APN	UMTS V	
Backup Maintenance	PIN Username	any	
	Password data counter	off v	
	Enable log-file	disabled 🗸	
	sa	ve	Help



4.4 Time configuration

Before the certificate is generated, the time of the router must be checked and, if necessary, the time server activated or the time manually set.

Info «Router Configuration» Devices	Basic Settings/LAN Web Access/WAN	e v r o S gard V	erviceRouter 2		Logout:Daniel Host name: werk2 System Time: 24.07.2013 17:34 Uptime: 12 days Load: 0.70, 0.62, 0.58 Softwareversion: 4.3.1 Language: English ↓
Messaging Status-Logs Backup Maintenance	dDNS Certificates OpenVPN Accounts WLAN Logs Firewall Routing	Info «Router Configuration» Devices Messaging Status-Logs Backup Maintenance	Router Configuration → Time Time Current time: 17:34:20 Wed 24 Jul 2013 CEST Time configuration Time source Time zone Serve address Action 0.pool.ntp.org Kele 1.pool.ntp.org Kele 2.pool.ntp.org Kele 3.pool.ntp.org Kele 3.pool	NTP v Europe/Berlin v	Нер

4.5 Generate server certificate

To generate the server certificate, the information provided in the steps above are also used as additional parameters, which you need to add on the page "Certificate". It is therefore important that the above steps are completed before generating the certificate.

	Router Configuration \rightarrow				
Info «Router Configuration»	Basic Settings/LAN	euro S Gard V	erviceRouter 2		Logout:Daniel Host name: werk2 System Time: 24.07.2013 17:35 Uptime: 12 days Load: 0.80, 0.66, 0.59 Softwareversion: 4, 3, 1
Devices	Web Access/WAN		-		Language: English V
Messaging	Time		Router Configuration \rightarrow Certificates		
Status-Logs	dDNS	Info	Certificates		
Backup Maintenance	Certificates	«Router Configuration»	Certificate content		
	OpenVPN	Devices			
	Accounts	Messaging	Country domain name	CH	
	WLAN	Status-Logs	State	FR	
	Loos	Backup Maintenance	Locality	Murten	
	Firewall		Organization	Saia Burgess Controls AG	
	Routing		Section	ТРМ	
			Info email	daniel.schossmaier@saia-	
			Validity in days	9125	
			Include WAN IP	disabled 🗸	
			Include LAN IP	enabled ~	
			New certificates	generate	



4.6 Activating the openVPN server

4.6.1 VPN mode server

The server must be activated in order to activate the VPN functionality. In addition, the IP address range within which the VPN client will receive an IP address from the VPN client should be defined.



Please note:

An IP address should not be statically configured in the range of the VPN client IP addresses.

		Router Configuration \rightarrow		orvicePouter		Host name: werk2
	Info			erviceRouter		System Time: 24.07.2013 17:36 Uptime: 12 days
	«Router Configuration»	Basic Settings/LAN	State v	2		Softwareversion: 4.3.1 Language: English V
	Devices	Web Access/WAN	Info	Router Configuration \rightarrow OpenVPN		
	Messaging	Time	«Router Configuration»	OpenVPN		
	Status-Logs	dDNS	Devices	Basic OpenVPN-settings		
	Backup Maintenance	Certificates	Messaging	VPN-Mode First IP-address of DHCP-range for VPN-	Server V	
		OpenVPN	Status-Logs Backup Maintenance	clients Last IP-address of DHCP-range for VPN-	192.168.155. 140	
		Accounts		VPN transport protocol	UDP V	
		WLAN		Port	1194	
		Logs		Enable client to client connections	on 🗸	
		Firewall		Limit paket size to	1400 Byte 🗸	
		Routing		Enable log-file	on 🗸	
1				Log-verbosity	5 🗸	
				Maximum log size	10MiB 🗸	
				Time interval for keep-alive pakets in seconds	60	
				Restart VPN-connection after loss of how many keep-alive pakets (min. 2)	4	
				Cryptoalgorithm	Standard v2-Router	
				Translate network (usualy not needed)		Help
					save	

In most cases, the default values do not need to be changed.



4.6.2 Create accesses

Create a new access. Every client requires access and the certificate associated with it. In doing so, the "group" (see figure below) represents what rights that access has. The group "user" has no rights to change the router configuration. However, it can connect as a VPN client or via the SSL proxy server. "Admin", on the other hand, can authorize access to modify the router configuration.

- → New access (entry of user name, group and password)
- → New certificate \rightarrow Create client certificate.
- → Download of certificate required for access.

Info	Router Configuration →	euro S	ervice	Route	er					Lo Host System Time: 24.0 Upt Load: 0.4	opout:Danie name: werk 17.2013 17:40 time: 12 day 60, 0.63, 0.6
«Router Configuration»	Basic Settings/LAN	C	2							Softwarev Language:	English V
Devices	Web Access/WAN	Info	Router Configuration	-+ Accounts							
Messaging	Time	«Router Configuration»	Accounts								
Charles Land	dDNS	Devices	Show 10	entries					Sear	rch:	
Status-Logs		Messaging	Account- Name	Plant network	Certificate	Online status			Action		
Backup Maintenance	Certificates	Status-Logs	Admin	admin	valid until Jun 27 08:57:29 2038 GMT	offline	download	Change password	X Delete account	= ^u new user certifica	ate
	OnenVDN	Backup Maintenance	Daniel	admin	valid until Jun 27 08:57:22 2038 GMT	offline	download	+ [©] Change password	X Delete account	+ ^e new user certifica	ate
	Openven		Client2	user	valid until Jun 29 08:25:48 2038 GMT	offline	download	- Change password	X Delete account	1 th new user certifica	ate
	Accounts		Support	user	valid until 3un 27 15:32:37 2038 GMT	offline	download	P Change password	X Delete account	1 ⁰ new user certifica	ate
•	WIAN		Support2	user	valid until Jul 2 13:25:30 2038 GMT	offline	download	+ Change password	X Delete account	²⁰ new user certifica	ate
	in cont		Test3	user	valid until Jul 2 15:09:07 2038 GMT	offline	download	P Change password	X Delete account	+ ^e new user certifica	ate
	Logs		Werk2	user	valid until Jun 27 12:09:55 2038 GMT	offline	download	, Change password	X Delete account	¹⁰ new user certifica	ate
	Firewall		Showing 1 t	to 7 of 7 entrie	s 				20 2 		<u>1111</u>
	Routing			ccount name	Reals		Password	6	Retype pass	word	
			User		user 🗸					+ 5	save

Show 10 🗸	entries			Search:
Name	Plant Anetwork	Certificate 💧	Online status	Action
Admin	admin	valid until Jun 27 08:57:29 2038 GMT	offline	download 🏸 Change password 🗱 Delete account
Daniel	admin	valid until Jun 27 08:57:22 2038 GMT	offline	download 🎤 Change password 🗱 Delete account
Client2	user	valid until Jun 29 08:25:48 2038 GMT	offline	🖬 download 🎤 Change password 🗱 Delete account 🖳 new user certificate
Support	user	valid until Jun 27 15:32:37 2038 GMT	offline	🖬 download 🎤 Change password 🕱 Delete account 🔅 new user certificate
Support2	user	valid until Jul 2 13:25:30 2038 GMT	offline	🖬 download 🎤 Change password 🗶 Delete account 🔅 new user certificate
Test3	user	valid until Jul 2 15:09:07 2038 GMT	offline	adownload 🎤 Change password 🕱 Delete account 🔅 new user certificate
Werk2	user	valid until Jun 27 12:09:55 2038 GMT	offline	🖬 download 🎤 Change password 🗱 Delete account
User	user	does not exist	offline	download Change password X Delete account
Showing 1 to	0 8 of 8 entries			× ►
User	user	valid until Jul 18 15:48:55 2038 GMT	offline	download Change password Chelete account
User	user	valid until Jul 18 15:48:55 2038 GMT	offline	download
				▼

Please note:

When creating a new server certificate, all client certificates must be also be regenerated.



5 EuroGard Service Router 2 VPN Client

The EuroGard Service Router can also be used as a VPN client:



1) A EuroGard router is likewise employed as the VPN server. Configuring OpenVPN access as a client:

	Router Configuration —				
Info	Pasis Cattings	euro S	erviceRouter		Logout:Daniel Host name: werk2 System Time: 24.07.2013 17:54
«Router Configuration»	Basic Settings/LAN		2		Uptime: 12 days Load: 0.74, 0.73, 0.68
Devices	Web Access/WAN		۷		Softwareversion: 4.3.1 Language: English V
Messaging	Time	F	Router Configuration \rightarrow OpenVPN		
Status-Logs	dDNS	Info «Router Configuration»	OpenVPN		
Backup Maintenance	Certificates	Devices	Basic OpenVPN-settings		
	OpenVPN	Messaging	VPN-Mode	off	
	Accounts	Status-Logs		Client	
	WLAN	Backup Maintenance		save	
	Logs				
	Firewall				
	Routing				

2) Load the certificate generated by the server when creating the accesses. This certificate contains all keys and information for establishing the connection to the VPN server.



OpenVPN			
Basic OpenVPN-settings			
VPN-Mode	Client	Choose File to Upload	×
Enable log-file	on 🗸	Organize ▼ New folder	م 0
Log-verbosity	5 🗸	★ Favorites	
Maximum log size	10MiB 🗸	Desktop Downloads	
Use HTTP-proxy		₩ Kecent Places User@werk2.pcd-	
	Duration of Des	Documents	
Status 🔍 Account 🍨 Server 🛇	certificate Protocol O	Music	
Showing 0 to 0 of 0 entries	No data available in t	Videos	
		Computer *	
upload new configuration file	Browse	File name: User@werk2.pcd-demo.com.vpn 💌 All Files (*.*)	•
	save	Open 🔽 Can	cel

3) The VPN server is entered in the table. Activate access in the list.

Status 🕴	Account *	Server 🌖	Duration of certificate	Protocol (Destination port	Packet size limit	Cryptoalgorithm	Action
		werk2.pcd-	Jul 18			1.400	Standard v2-	🗶 Delete account
enabled	User	demo.com	15:48:55 udp 1194 1400 2038 GMT		1400	Router	Se account	
Showing	Showing 1 to 1 of 1 entries							

4) When the VPN tunnel has been successfully created, the current status is displayed under Status Logs → Network (CONNECTED)

_	Info -> System	VDN-Status		
«Info»		VFN Status		
Router Configuration	System	Parameter		
		VPN-Modus:		client
Devices	System name	Port:		1194
Messaging	Location	Server:		werk2.pcd-demo.com
Status-Logs	<u>network</u>	Protokoll:		udp
Backup Maintenance	Logs	Paketgrößenlimit:		1400
	Firewall	Kryptoalgorithmus:		Kompatibilitätsmodus für v1-Router
		übertragene Daten:		
	dDNS	durch VPN-Tunnel empfangen:	: 898 Byte	
	Diagnosis	durch VPN-Tunnel gesendet: Rohdaten empfangen: Rohdaten engangen:	660 Byte 7 KiByte	
	Routing	Kondaten gesendet: Letzte 3 Statusmeldungen: Thu Jun 13 07:50:09 2013	GET_CONFIG	
		Thu Jun 13 07:50:11 2013 Thu Jun 13 07:50:11 2013	ASSIGN_IP CONNECTED	

Verbunden mit: 92.104.90.64 Zugewiesene VPN-IP: 192.168.155.131



5.1 EurogardSRConnect client software

The client software is needed to establish an openVPN connection with the server of the Eurogard router. Administrative rights are required for installing the openVPN client.

The EuroGardSRConnect software is available on the EuroGard homepage http://www.eurogard.de

Software tool EuroGardSRConnect

- 14) Add a new router: 🔒 Eurogaro SRConnect - Version: 2.0.0.6 - [Startfenster] - II X Datenbanken nach XML exportieren . Detail Löschen Neuer Router Verbinde Settings Verbindungslog anzeigen OpenVPN_Port SSL_Port Kommentar ISO_Tsap_Port Zeitprotokol Bezeichn Admin_Option 1194 443 Werk2 Filter: Bezeichnung filtern <u>F</u>ilter entfernen 🚽 wartend
- 15) Load the user certificate generated by the router in the application. This certificate contains all key and information.





16) Save the user certificate. After saving, you will see the connection parameters in the lower window. In most cases, the parameters do not need to be modified.

EurogardSPConnect - Version 2006 - I	configuration detail	
G EurogandishConnect - Version, 2.0.0.0 -	coniguration detail)	
user management		
euro gard	reachable participants Show connection Log	Connect Save Delete Back
	Name	Werk 2
	OpenVPN tar file	C:\Usera'vegis\Desktop\VP1\User@werk2.pcd-demo.com.vpn.tar Load
		activate time protocol Show Time protocol
	commentary	
	Information about the con	use administrator rights for this connection mectivity of the Router (will not in used to connect to the ServiceRouter)
	OpenVPN Port 1194	SSL Port 443 SSH Port 22
	content of the OpenVPN Config file config save reload config	rembe vetic2 pod demo.com 2 client proto udo pod 1194 nobind opher AES-128-CBC ns-cettype server dev tapio exploit-exit-notify fragment 1400 pull ca werk2 pod demo.com.ct cet User@werk2.pod demo.com.ct
waiting		

17) Connect to the VPN server

EurogardSRConnect - V	/ersion: 2.0.0.6 - [configuration detail]	- • ×					
user management							
<u>EU</u> And	reachable participants Disconnect Save Delete Back						
	Connection log OpenVPN						
	Thu Jul 25 07:17:33 2013 OpenVPN 2.3.1 I686-w64-mingw32 [SSL (OpenSSL)] [L20] [PKC511] [eurephia] [IPv6] built on Mar 28 2013 Thu Jul 25 07:17:33 2013 NOTE: OpenVPN 2.1 requires '-script-security 2' or higher to call user-defined scripts or executables						
	NM and the second						
	Lea milita: podelano.com.cnt Cent User@werk2.pcd-demo.com.cnt						
connecting							
Anwenderhinweis	Anwenderhinweis						
Sie sind zu	m ServiceRouter verbunden und können nun zur Programmiersoftware wechseln.						

→ Browser



- 18) The PC is now a member of the remote network. Access to devices is now possible with all applications that support Ethernet.
- → PG 5 - 0 start × C 192.168.1.50/start.htm 7:53:09 S Monitoring 25/6/2013 Today G UserPasswordDialog_V01 [Device1] - Saia PG5[®] Project Man 0.00kWh File Edit View Project Device Online Tools Help 🗄 🗅 🚅 🕼 😭 🔛 🛗 📥 🚺 🖬 🧯 Week 🖳 🔆 🔘 🖉 🐌 🔊 0.00kWh **Project Tree** Project 'UserPasswordDialog_V01' : 2 Devices Properties Month R TCP/IP Settings Table 0.00kWh 🗄 🦲 Common Files 💵 Library Manager 🖻 🚺 Device1 - PCD7.D457¥T5F - 168.152.35.23, S-Bus Stn 0 Year Properties 0.03kWh Coline Settings - SOCKET: TCP/IP, 192.168.1.50, Stn Auto C Device Configurator 8 Build Options 😟 🧰 Program Files 主 📄 Listing Files Documentation Files 20 Device2 - PCD3.M5540 - 192.168.1.2, S-Bus Stn 0 ÷.



5.2 IOS and Android systems

If two routers are used in the client/server operation, it is possible for IOS and Android systems to be wirelessly connected to the network of the EuroGard Service Router 2. To do this, the router to which the systems are to be connected must be equipped with a W-LAN option.

The EuroGard Client Router can be connected to the server by either a cable or UMTS connection.





6 Net Module VPN Router NB 1600 and 1600-U

Configuring of NB 1600 or NB 1600-U as openVPN-server in Modus TUN.



Wide Area Network (WAN) \rightarrow Connection to router with public IP-address Local Area Network (LAN) \rightarrow Connection to local network



6.1 Specifications

	Net Module NB 1600	Net Module NB 1600-U
Order data	NB 1600	NB 1600-U
Additional	http://www.netmodule.de/prod	http://www.netmodule.de/products/indu
information	ucts/industrial-routers/wireline-	strial-routers/mobile-router.html
	router.html	
Application/	Industrial	Industrial
Туре		
Top-hat rail	Yes	Yes
installation		
Electrical supply	24 V DC (-15% +20%)	24 V DC (-15% +20%)
VPN Features		
Number of WAN	1; LAN	2; LAN, UMTS
interfaces		
Integrated	No	No
ADSL/VDSL		
modem		
VPN PPTP	Yes	Yes
VPN	No	No
L2TP/IPSec		
openVPN	Yes	Yes
No. VPN Clients	10	10
Windows Client	Yes openVPN	Yes openVPN
IOS Client	Yes openVPN	Yes openVPN
Android Client	Yes openVPN	Yes openVPN
Extensions		
3G / 4G Modem	No	3G (UMTS 7.2 Mbps)



6.2 Opening the setup menu

In order to set up the Net Module router, the PC must be connected with a LAN-interface of the router. The router is delivered with an activated DHCP-server. Therefore, it should be avoided to configure the Net Module router with its factory configuration in an Ethernet infrastructure with an existing DHCP-server.

Recommendation:

Disconnect your PC from all existing network connections. Connect your PC directly to the router.

By default, the IP address of the router is configured to "192.168.1.1". The router's DHCPserver provides the connected PC with an address in the DHCP-server's address range (usually "192.168.1.10" for the first device).

The router is configured in a browser.

In order to load the configuration interface in the browser, the router's IP address must be entered in the browser.

When connected for the first time, the router opens a configuration wizard where the user has to set the user name as well as password.

net SS		I
Щ	NB1600 Login Please provide username and password to log in:	
ANAG	Username: Password:	
E E E	Login	
W 000		
NB16		



6.3 Configuration of WAN and LAN ports (Wide Area Network)

Configuring the LAN1 interface as a WAN interface. The IP-address of the WAN interface is provided by the previously-placed router or can be assigned statically in the region outside of the previous DHCP-server.

net	1						
Module 🗸	HOME INTER	FACES ROUTING	FIREWALL V	PN SERVIO	CES SYSTEM	LOGOUT	
		AND					
WAN Link Management		ANZ					
Settings Supervision	IP Settings LAN1						
Ethernet	Mode:						
Port Settings Link Cettings							
IP Settings	WAN Mode:		^o client				
USB		(5) 🔿 static	IP				
Serial Port			E				
DivitaLIVO			_				
Digital I/O							

The LAN2 interface is used for the automation network and should receive an IP-address in the IP range of this network. In the following example, the automation network is located in the IP-address range 192.168.155.0/24.

LAN1 LAN2]	
IP Settings LAN2		
Mode:		
Static Configuration		
IP address:	3 192.168.155.12	
Subnet mask:	255.255.255.0	
IP address:		
Subnet mask:		





As soon as the DHCP-client is activated for the WAN interface, the IP-address received from the DHCP-server can be checked in the HOME menu.



Connection Details LAN1

Description	Value
Administrative state	enabled
Operational state	up
Link is up since	2013-09-30 07:09:30
IP address	192.168.0.19
Gateway	192.168.0.1
Transfer rate down / up	7.37 KByte/s / 1.79 KByte/s
Data downloaded / uploaded since 2013-04-12 04:53:33	878.13 MB / 6.17 MB Reset

6.4 Time configuration

The time configuration of the router must be checked before creating the certificates. You can set the time manually or activate the time synchronization.

 \rightarrow For the time synchronization is an internet connection necessary.

	<u> </u>		
	Module	HOME INTERFACES	ROUTING FIREWALL VPN SERVICES SYSTEM LOGOUT
\mathcal{C}_2	System Settings Time & Region	3 System Time Current system time:	2013-09-30 08:16:27 Set time
N	System Information Restart	Time Synchronisation	
MA	Authentication	NTP server:	0.pool.ntp.org
8	User Accounts Remote Authentication	NTP server 2 (optional):	1.pool.ntp.org
\geq	Software Update	Time zone	
8	Manual Software Update Automatic Software Update	Time zone:	UTC+01:00 Amsterdam, Berlin, Bern, Rome, Stockholm 💌
316	Configuration	Daylight saving changes:	
NE	Automatic File Configuration	Apply Sync	



6.5 Create server certificates

The server certificates are required in order to create an openVPN user. The information stored in the router, such as host name and e-mail addresses etc., are used for the certificate.

Module S	HOME INT	TERFACES ROU	JTING	FIREWALL	VPN	SERVICES	SYSTEM	LOGO
System	Root CA H	TTPS SSH	Ope	nVPN1				
Settings Time & Region	Root CA							
System Information	Root CA certificate):	missing					
	Root CA key:		missing					
Authentication User Accounts Remote Authentication Software Update Manual Software Update Automatic Software Update	3 Initialize	Processing The device is proce Step 1: Initializing of Step 2: Generating Step 3: Generating	essing a ke ertificate d random bi Diffie-Hell	ey/certificate req atabase ts mann paramete	juest, ple er file	ease stand by		
Configuration Manual File Configuration		Root CA			1			
Automatic File Configuration Eactory Configuration		Root CA certificate:		View				
Troubleshooting Network Debugging System Debugging		Root CA key:		View				

After creating the server certificate a certificate for the openVPN tunnel must be created.

	4.0				0	
	Module SS	HOME INTERFACE		FIREWALL VPN	SERVICES SYSTI	EM LOGOUT 🞚
NAGER	System Settings Time & Region System Information Restart	Root CA HTTPS OpenVPN1 Tunnel1 is running in server	SSH Open mode with certificates	VPN1		
EB MA	Authentication Authentication User Accounts Remote Authentication	- a C	generate keys/certifi upload pre-generate	cates ad keys/certificates		
W 00	Software Update Manual Software Update Automatic Software Update	Private key: CA root certificate:	missing			
NB16	Configuration Manual File Configuration Automatic File Configuration Factory Configuration	4 Create Processing The device is proce Step 1: Generating Step 2: Creating ce	essing a key/certificate request, key for openvpn-tunnel0 rtification request for	please stand by.		
	Troubleshooting Network Debugging System Debugging Tech Support	- /CN=NB1600/email Step 3: Signing cer Step 4: Conving CA Step 5: Verlifying op Server certifi	IAddress=router@support.netr tificate for opervpn-tunnel0 with root certificate/key envpn-tunnel0 certificate again cate:	nodule.com/0=NetModule/0 h config from /tmp/openvpn-ti ist root CA View	U=NetModule/C=CH/ST=Switzerland InnelD-ca.conf	L:
(2	Keys & Certificates	Private key:		View		
		CA root certit	īcate:	View		



6.6 Enabling the openVPN server

A D			0				
Module	HOME INTERFA	CES ROUTING	FIREWALL VPM	SERVICES	SYSTEM	LOGOUT	1
OpenVPN Administration Tunnel Configuration Client Management	OpenVPN Administrative	ion status 3 c enal C disa	bled				
IPsec Administration Tunnel Configuration	Apply Restart	V					
PPTP Administration Tunnel Configuration	OpenVPN Tunnel Stat	us					
	Tunnel 1:	Server	s running				
	Tunnel 2:	disable	u 				
	Tunnel 3:	disable	u 				
	Tunnet 4:	disable	u				

In order to sign in a client, the tunnel must be configured. The Net Module router allows you to configure a VPN-server tunnel or 4-client tunnels.

Enable the tunnel as a server.

If mobile devices with an Android or I-OS system must log in to the openVPN server, the TUN mode (routing) must be activated.

OpenVPN	Tunnel 1 Tunnel 1	2 Tunnel 3 Tunnel 4
Administration	OpenVPN Tunnel 1 Cor	riguration
Client Management	Operation mode:	O disabled
IPsec Administration Tunnel Configuration	·	4 client [©] standard c server [©] expert
РРТР	Server port:	1194
Administration Tunnel Configuration	Туре:	
	Network mode:	6 routed O bridged
	Cipher:	BF-CBC
	Use compression:	
	Use keepalive:	
	Redirect gateway:	
	Protocol:	udp 💌
	Authentication:	certificate-based



6.7 Creating a client access

A client is created by activating the checkbox. It is recommended to give the client a name.

	Cliente	Networking Deutee	Deumlood	
OpenVPN Administration Tunnel Configuration	Client Managem	net Koules	Download	
Client Management	Enabled	Client	Connection info	
IPsec	3 🔽	Daniel		
Tunnel Configuration		Client2		
PPTP Administration		Client3		
Tunnel Configuration		Client4		
		Client5		
		Client6		
		Client7		
		Client8		
		Client9		
		015-040		

You don't need to change the tunnel address as well as client network address with the current tunnel settings.

Module	HOME IN	TERFACES	ROUTING	1 FIREWALL V	PN SERVICES	SYSTEM	LOGOU
OpenVPN Administration	Client Network) Networking	Routes	Download			
Client Management	This menu can be You may also spe	e used to config cify a network, v	ure a fixed tunni vhose packets :	el endpoint addres: should get routed t	s for each client. owards the client.		
Administration Tunnel Configuration	Select client:		Daniel	-			
Administration Tunnel Configuration	Tunnel address:		⊙ dynar ⊖ fixed	nic			
	Client network:		💿 none	O specify			



In order to know the networks behind the VPN tunnel, the routs must be defined. You have to enter the net-address of the automation network here.

Module 🗸	HOME INTERFACES	ROUTING FIR	EWALL VPN SERVICE	S SYSTEM	LOGOU
OpenVPN Administration Tunnel Configuration	Clients Networking Client Routes This list of polyage will be	Routes	Download	I ha rautad haaldt	o the conve
IPsec Administration Tunnel Configuration	Network N 192.168.155.0	letmask 255.255.255.0	n, so marmarring parkers wi	i ne logieg park i	o ne serve
PPTP Administration Tunnel Configuration	4 192.168.0.0	255.255.255.0			
	Enable routing between clients:	v			

The configuration files for the client can be downloaded from the router. Make sure that the server address is correctly written and accessible.

Module SS	HOME INTERFACES ROUTING FIREWALL VPN SERVICES SYSTEM LOGO
	$\sim -$
OpenVPN Administration	Clients Networking Routes Download
Tunnel Configuration Client Management	Download OpenVPN Client
IPsec Administration	Windows Linux
PPTP	Download Expert Mode Files 4
Administration Tunnel Configuration	Server address/hostname: [178.83.186.183



7 Windows openVPN client for Net Module router

7.1 Installation

Install the application openVPN 2.2.2 (http://www.netmodule.com/download/openvpnclient/windows). You need administration rights for the installation.

7.2 Unpacking the configuration package

Unpack the configuration package downloaded from the router and copy the content in the config folder, which you will find in the installation path of the openVPN client "C:\Program Files\OpenVPN\config".



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🕞 Back 🗸 💮 🖌 🏂 Search 🌮 Folders 🛛 🔝 ד							
Address 🛅 C:\Documents and Settin	ngs\vmware\Desktop\Daniel			💌 🄁 Go			
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	Daniel.crt	4 KB	Security Certificate	30.09.2013 09:52			
	Daniel.key	1 KB	Registration Entries	30.09.2013 09:52			
items to the Web		1 KB	OpenVPN Config File	30.09.2013 09:52			
🖂 E-mail the selected	Daniel.p12	4 KB	Personal Informatio	30.09.2013 09:52			
items	Thiuz4.pem	1 КВ	Privacy Enhanced Mail	30.09.2013 09:52			
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7.3 Establishing a connection

Starting the openVPN client. The openVPN client is displayed with a small icon in the status bar of the operating system. Connect to the openVPN server.

SIMATIC Image: Constraint of the second se	forcepaulty fortepaulty fortepaul	OpenVPN GUI		
Programs Documents	×		Verbinden	
Settings			Status	
Help and Support Run			Log Information	
Log Off vmware	-		Passwort ändern	
Turn Off Computer	. C:\Documents and Settin	🔁 C:\Documents and Se	Einstellungen Beenden	10:02



🥦 OpenYPN Verbindung (Daniel)	
Aktueller Status: Verbunden	
Mon Sep 30 1003 38 2013 OperVPN 2.3.1 698-w64-mingw32 (SSL (0penSSL)] [LZ0] [PKCS11] [eurephia] [IPv6] built on Mar 28 2013 Mon Sep 30 1003 38 2013 MANAGEMENT: TCP Socket latering on [AF_INET] 72.0.0.1:25340 Mon Sep 30 1003 38 2013 MANAGEMENT: Client connected from [AF_INET] 27.0.0.1:25340 Mon Sep 30 1003 38 2013 MANAGEMENT: Client connected from [AF_INET] 27.0.0.1:25340 Mon Sep 30 1003 38 2013 MANAGEMENT: Client connected from [AF_INET] 27.0.0.1:25340 Mon Sep 30 1003 38 2013 MANAGEMENT: Client connected from [AF_INET] 27.0.0.1:25340 Mon Sep 30 1003 38 2013 MANAGEMENT: Client connected from [AF_INET] 27.0.0.1:25340 Mon Sep 30 1003 38 2013 MANAGEMENT: CMD had or Mon Sep 30 1003 38 2013 MANAGEMENT: CMD had or Mon Sep 30 1003 38 2013 MANAGEMENT: CMD had or Mon Sep 30 1003 38 2013 MANAGEMENT: CMD had release' Mon Sep 30 1003 38 2013 WANAGEMENT: CMD had release' Mon Sep 30 1003 38 2013 WANAGEMENT: CMD had release' Mon Sep 30 1003 38 2013 WANAGEMENT: CMD had release' Mon Sep 30 1003 38 2013 WANAGEMENT: STATE: 1380528219.VMT. Mon Sep 30 1003 38 2013 UDPV4 link local (undef] Mon Sep 30 1003 38 2013 UDPV4 link local (undef] Mon Sep 30 1003 38 2013 UDPV4 link local (undef] Mon Sep 30 1003 38 2013 WANAGEMENT: STATE: 1380528219.VMT. Mon Sep 30 1003 38 2013 WANAGEMENT: STATE: 1380528219.VMT. Mon Sep 30 1003 38 2013 WANAGEMENT: STATE: 1380528219.VMT. Mon Sep 30 1003 42 2013 VCFIFY OK: depti=1, C=CH, ST=Switzerland, L=Switzerland, D=NetModule, U-U=NetModule, U-	
Mon Sep 30 1033 44 2013 OPTIONS IMPORT: route orbins modified Mon Sep 30 1003 44 2013 do Joorfia, Ik-Joyde-O, Iker Mon Sep 30 1003 44 2013 do Joorfia, Ik-Joyde-O, Iker Mon Sep 30 1003 44 2013 AMAAGEMENT: STATE: Mon Sep 30 1003 44 2013 Lacetestil ARP Flush on ro Mon Sep 30 1003 44 2013 Successful ARP Flush on ro Mon Sep 30 1003 44 2013 CVWINDUWS System 22/v Mon Sep 30 1003 44 2013 CVWINDUWS System 22/v Mon Sep 30 1003 44 2013 Initialization Sequence Com Mon Sep 30 1003 44 2013 Initialization Sequence Com Mon Sep 30 1003 44 2013 Initialization Sequence Com Mon Sep 30 1003 44 2013 Initialization Sequence Com	03
Trennen Neu Verbinden Minim	ieren

The routs stored in the VPN-server will be activated.

Attention: The logged Windows user needs to have the rights to create routing information bases.

🙉 C:\WINDOWS\system32\cmd.exe - ping 192.168.155.12 -t	
Microsoft Windows XP [Version 5.1.2600] (C) Copyright 1985-2001 Microsoft Corp.	
C:\Documents and Settings\vmware>ping 192.168.155.12 -t	
Pinging 192.168.155.12 with 32 bytes of data:	
Reply from 192.168.155.12: bytes=32 time=807ms TTL=64 Reply from 192.168.155.12: bytes=32 time=346ms TTL=64 Reply from 192.168.155.12: bytes=32 time=414ms TTL=64	

8 Android openVPN client for Net Module Router

Download the application OpenVPN Connect or OpenVPN for Android via the Android Play Store.

Connect the device, on which the configuration file downloaded from the router is stored, with your PC.

Attention: The openVPN-server must be configured in TUN mode for Android client systems.

Copy the configuration files on the device in the register "config".

Example: "Computer\GT-I9100\Phone\config"



Start the application OpenVPN for Android and open the configuration file downloaded from the PC.

ψ 80% 🕱	<u>†</u> 🖻 👘	h. 🕄 🖇	2 13:49	🜵 📥 80% 🛧	<u> </u>	13:50	🜵 🛋 80% 🖈 İ 🖻 👘 🖇 🛜 📶 💈 13:50					
Apps	s	Widgets	👤	🤗 Open\	/PN for Android		🔗 Import configuration file					
0	(3)	\bigcirc		Profiles	Settings F	AQ	File Explorer					
droid VNC server	VNC_server	Screenshot UX Trial	Quadris				Location: /storage/sdcard0 WhatsApp					
TERM	\mathbf{O}	۲					🖿 bluetooth					
TETRIS®	Swisscom Apps	WebOfCam	Dolphin Browser	No VPN profiles defined.			No VPN profiles defined.					
- (Use the \bigoplus icon to add a new VPN Use the 🚞 icon to import an existing (.ovpn or .conf) profile from your sdcard.		Use the (f) icon to add a new VPN						
Cisco VPN	strongSwan	OpenVPN for	NCP VPN			🛋 com.webofcam						
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•	\mathbf{S}	MR	~	Be sure to also	check out the FAQ. There	e is a	🛋 documents					
FortiClient	WhatsApp	SBC Micro Browser Lite	Net Ping	quick start guide.			🛋 external_sd					
\bigcirc	SBC						🖿 log					
OpenVPN Connect	SBC Micro Browser						🖿 media					
-oonned	• •	• •		Ð			Select					

The profile is now imported into the openVPN client for Android and is available.

Saving screenshot	Saving screenshot		Saving screenshot			
R Import configuration file	😭 Convert Config File		A OpenVPN for Android			
File Explorer	Importing config file from source file:/storage/sdcard0/config/		Profiles	Settings	FAQ	
Location: /storage/sdcard0/config	Daniel.ovpn					
i /	Your configuration had a few configuration options that are not mapped to UI configurations. These options were added as custom configuration options. The custom configuration is displayed below:		Daniel		<u>+</u>	
in/						
Daniel.conf						
Daniel.crt						
Daniel.key	resolv-retry infinite					
Daniel.ovpn						
Daniel.p12	Done reading config file.					
ca.crt						
dh1024. Copied to clipboard	Copied to clipboard					
Select	×	Ľ	\oplus			

8.1 Establish a connection

Connect with the openVPN-server.

The operating system Android will ask you concerning the network configuration if you trust the application. In order to establish a connection you have to approve the dialog box.

As soon as the establishment of the connection was successful, the key icon is displayed in the status bar of Android.







9 I-OS openVPN client for Net Module Router

Install the application openVPN, which is available in the Apple App Store.

Install the application iTunes on your PC and connect the iPad with your PC.

Attention: The openVPN-server must be configured in TUN mode for I-OS client systems.

Open the iPad or I-OS device in iTunes

-0			:=	Q- Mediathek
Titel Alb	en Interpreten	Genres Wiedergabelis	ten Radio Match	iPad 🔺 iTunes Store
				•
1	Titel Alb	Titel Alben Interpreten	Titel Alben Interpreten Genres Wiedergabelis	Tittel Alben Interpreten Genres Wiedergabelisten Radio Match

Download the files, which were unpacked by the router, for the openVPN tunnle configuration via the tab "Apps" \rightarrow OpenVPN in the application

Über	sicht Info Apps Musik Filme TV Fotos	Auf diesem iPad
Аррз		2 Apps
Nach Art sortieren 🛊	Q.	France Contacte Tunes
C:\Program Files\OpenVPN\config\Daniel	Ertingengen	Mail App Store
C Back • C • A Search Products		2
Address C:\Program Files\OpenVPN\config\Daniel	YouTube Ka	itten Fotos Videos
File and Folder Tasks Image: Child Content of the	Zettungskies Zettungskies Einste Wählen Sie Appszum Inste Home-Bildschirm. Ord	a a a a a a a a a a a a a a
Mit fölgenden Apps können Sie Dokume	ente zwischen dem IPad und diesem Computer überti	ragen.
Apps	Dokumente von "OpenVP	N":
	Daniel.conf	Heute 14:27 8 KB
	Daniel.p12	Heute 14:27 8 KB
	I-PAD.com	20.08.2013 14:14 8 KB 20.08.2013 14:14 8 KB
		(Uizzufizza) (Cishan unter
		Finzurugen



Open the App OpenVPN. The downloaded openVPN-server configuration is detected automatically and can be approved by clicking on add button.

out	OpenVPN	Н
New profiles	s are available	
🕕 1 ne	w OpenVPN profile is available for import.	(2)
178.8 Autolog	3.186.183/Daniel jin profile	
၇ OpenV	'PN Connect	
Profile	178.83.186.183-2/IPAD@SR2.178.83.186.183.tun.vpn Autologin profile	>
Status	Disconnected	>
Connectio		
More from C	OpenVPN Technologies	
pr	vivatetunnel.com Your Secure and Private Path to the Internet	>
(penVPN Access Server VPN Solution for your Business	>

9.1 Establishing of a connection

Connect with the OpenVPN-server by moving the roll bar.

	14.44	
ut	OpenVPN	
OpenVPN Conne	ot	
Profile C2 17	8.83.186.183/Daniel ologin profile	
Status 🧖 Co	nnecting	>
Connection		
Connection Details		
Duration 0:00:01	Last packet received < 1 second ago	
Bytes In 48	Bytes Out 106 -	



f you see the status	, connected", then the VPN-tunnel	is established.
wisscom 🙃 🕅	14:45	🖞 lädt nicht 🔳

pout		C	OpenVPN	Help	
၇ OpenV	PN Connect			_	
Profile	178.83.186.183/I Autologin profile	Daniel			The second secon
Status	Connected		:	>	VIII VIII EVENTY Reput man and the second
Connectio	on 💶				b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch system b) a vid a branch
Connection	Details				 a set of the set of
Duration	0:00:08 Last p	acket receive	ed 1 second ago		
Bytes In	3.88 KB	Bytes Out	3.84 КВ –		
VPN IPv6		VPN IPv4	10.8.0.6		
User		Client IP			
Server	178.83.186.183	Server IP	178.83.186.183		
Port	1194	Protocol	UDPv4		
More from O	penVPN Technologies				
pr	ivatetunnel.com Your S	Secure and Pr	rivate Path to the Internet	>	
(?) or	penVPN Access Server	VPN Solution	n for your Business	>	