



Dial-In Router UMTS Deltalogic24 configuration guide

© 2012 by

DELTALOGIC Automatisierungstechnik GmbH

Stuttgarter Str. 3

73525 Schwaebisch Gmuend

Germany

Phone sale: +49-(0)7171-916-120

Phone support: +49-(0)7171-916-112

Fax sale: +49-(0)7171-916-220

Fax support: +49-(0)7171-916-212

E-Mail sale: vertrieb@deltalogic.de

E-Mail support: support@deltalogic.de

Web site: www.deltalogic.de

All rights reserved. No part of this work is allowed to be copied, reproduced, conferred, processed and stored into electronic media or translated into any other language without a written permission of the author.

Note:

We have checked the content of this manual for conformity with the hardware and software described. Nevertheless, because deviations cannot be ruled out, we cannot accept any liability for complete conformity. The data in this manual have been checked regularly and any necessary corrections will be included in subsequent editions. We always welcome suggestions for improvement.

Last update: 2012-09-10. All technical changes reserved.

S7-200®, S7-1200®, S7-300®, S7-400®, HMI®, WinCC®, WinCC flexible®, ProTool®, STEP®, SINUMERIK® and SIMATIC® are registered trademarks of Siemens AG, ACCON® and DELTALOGIC® are registered trademarks of DELTALOGIC Automatisierungstechnik GmbH.

Setup your Deltalogic24 Account

First steps

Visit our website www.deltalogic24.de and create your user account or log in to your existing user account. In order to create a VPN network click "add new router" and enter the serial number of your router.

After adding the Dial-in Router UMTS to your user account, you will see a website with your network configuration (see *Screenshot 1*):

| Netzkonfiguration Deltalogic GmbH | | | | | | | |
|---|---|---|-----------------|--|-------------|-----------|---|
| Ihre IP: 79.245.81.214 | | | | | | | |
| <input type="button" value="Änderungen speichern"/> | | | | <input type="button" value="automatisch aktualisieren"/> | | | |
| Name/IP | Interner Name | Mail-Benachrichtigung | online | login | Traffic | Remote IP | |
| b2c0 10.111.12.34 | <input type="button" value="Router b2c0"/> Freigabe: <input checked="" type="checkbox"/> | <input type="button" value="Emailadresse eintragen"/> login: <input type="checkbox"/> disconnect: <input type="checkbox"/> | zuletzt online: | | OUT: IN: | | Log b2c0 ping b2c0 |
| b2c1 10.111.12.38 | <input type="button" value="Client b2c1"/> Freigabe: <input checked="" type="checkbox"/> | <input type="button" value="Emailadresse eintragen"/> login: <input type="checkbox"/> disconnect: <input type="checkbox"/> | zuletzt online: | | OUT: IN: | | Log b2c1 ping b2c1 |
| b2c2 10.111.12.42 | <input type="button" value="Client b2c2"/> Freigabe: <input checked="" type="checkbox"/> | <input type="button" value="Emailadresse eintragen"/> login: <input type="checkbox"/> disconnect: <input type="checkbox"/> | zuletzt online: | | OUT: IN: | | Log b2c2 ping b2c2 |
| b2c3 10.111.12.46 | <input type="button" value="Client b2c3"/> Freigabe: <input checked="" type="checkbox"/> | <input type="button" value="Emailadresse eintragen"/> login: <input type="checkbox"/> disconnect: <input type="checkbox"/> | zuletzt online: | | OUT: IN: | | Log b2c3 ping b2c3 |
| <input type="button" value="Änderungen speichern"/> | | | | | | | |

Screenshot 1 - Deltalogic24 network configuration sample

Introduction to Deltalogic24 web interface

The Deltalogic24 VPN network you have created has 4 user logins. The first user (b2c0) is the exclusive user for your router. The remaining users are clients (b2c1, b2c2, b2c3). They are used to connect your PC or laptop with this VPN network.

You can see the password if you click on the corresponding username. Below the usernames there are IP addresses. With these IP address the corresponding user will be connected to the VPN.

Especially the IP address of the router-user (b2c0) is important for the communication. In this example it is 10.111.12.34 (take a look at *Screenshot 1*).

User-specific information



Administrator rights are necessary for the OpenVPN-Client installation on your computer. Starting OpenVPN-Client needs at least "Network Configuration Operators Group" or Administrator rights. Otherwise the routing rules in the PC will be missing and no communication is possible.

Configuration options of the Dial-In Router UMTS for Deltalogic24

With the Dial-In Router UMTS it is possible to establish a VPN connection to the Deltalogic24 server via mobile radio and/or via the office network.



It is furthermore possible to create a redundant VPN connection. With this configuration the office network is the primary connection path for financial reasons. If this connection fails, the router will switch over and create the VPN connection via mobile radio. Consecutively, you find some information about the 3 different configuration options:

1. VPN connection via mobile radio only

If the VPN connection is to be established via mobile radio only without any redundancy please follow this guide only.

2. VPN connection via the office network (LAN)

If the router is to be used in LAN operation only, please use the configuration guide "Dial-In Router LAN/DSL configuration guide for Deltalogic24". The configuration guide for establishing a connection via LAN is available under the following link:

www.deltalogic.de/downloads/EWR-LAN_Deltalogic24.zip

3. Redundant VPN connection via mobile radio or office network (LAN)

If a redundant connection is to be configured, please firstly follow the present configuration guide until the paragraph "Redundant connection via WAN". There you'll find further instructions.

Networks and abbreviations



The machine network (MN) is the network, in which the network devices, that are supposed to be accessible via the VPN later on, are connected to the 4-port switch. The Internet connection via APN of the chosen provider is called "PPP". The office network (ON) is used to establish a internet connection via LAN.

Choice of the SIM card

Catch up in advance on which data package is reasonable for your application. Contract SIM cards (post-paid) with data package offer a higher rate of security as indicating the APN and PIN suffices to establish a connection. There is no risk of a connection breakdown due to an exhausted card credit.

Establishing a connection via prepaid SIM cards is not possible in some cases. Especially SIM cards, that require a clearing or entering a key on a web site after log into the APN, are unsuitable. Furthermore, there is the risk that the credit on the card does not suffice to establish a connection.

Configuration of the Dial-In Router UMTS for Deltalogic24

First steps

- Insert the SIM card(s) into the Dial-In Router UMTS.
- Feed the router with voltage (24 VDC).
- Configure the network interface of the configuration PC as "Obtain IP address automatically" (DHCP) or allocate a static IP address in the network 192.168.1.x (deviating from 192.168.1.1).
- Connect the configuration PC with the router via Ethernet cable on LAN 1-4
- Open the web browser on the configuration PC and enter "192.168.1.1" in the address bar. Login data: User "insys", password "moros".

Configuration of the router's IP address within the machine network

Click on "Basic settings" > "IP address (LAN)" in the web interface. Here, the router's IP address within the machine network is entered, see *Screenshot 2*.

| IP address (LAN) | |
|------------------|--|
| IP address | <input type="text" value="192.168.111.1"/> |
| Netmask | <input type="text" value="255.255.255.0"/> |

Screenshot 2 – Configuration of the IP address within the machine network

If you confirm the changing with "OK" the router's web interface will be accessible via its new IP address. As soon as your configuration PC reobtained the router's IP address, enter the new IP address in your browser in order to be taken to the web interface.



The DHCP server, which is activated in the router on factory setting, automatically changes its IP address pool into the new machine network. If you are using a fixed network configuration on the configuration PC, change it according to the new machine network.

PIN configuration

If the SIM card's PIN request is deactivated, you can skip this point. Otherwise, click on "UMTS" in the web interface. Here, the respective PIN corresponding to SIM card 1 or SIM card 2 is entered, see *Screenshot 3*.

| UMTS | | |
|------|----------------------|----------------------|
| | SIM card 1 | SIM card 2 |
| PIN | <input type="text"/> | <input type="text"/> |

Screenshot3 –PIN configuration

Dial out configuration

Click on "Dial out" in the web interface. This is to configure the router to establish an outgoing Internet connection. In *Screenshot 4* you can see an example for establishing a connection either via a T-Mobile (Target A) or via a Vodafone SIM card (Target B).

You can apply the settings as far as possible. User name, password and the "Access Point Name" is supplied by the provider of the SIM card. A list with standard APNs is opened by clicking on the question mark. If a daily connection establishment and termination is desired, this can be parameterized accordingly. Otherwise, "Establish connection immediately and hold permanently" should be selected.

Dial-Out

Activate Dial-Out ☒ Yes
☐ No

Dialing options for UMTS

| | Target A | Target B |
|--|---|--|
| Telephone number | *99***1# | *99***1# |
| User name | td1 | user |
| Password | td1 | pw |
| Authentication | <input type="radio"/> PAP <input type="radio"/> CHAP <input checked="" type="radio"/> PAP or CHAP | <input type="radio"/> PAP <input type="radio"/> CHAP <input checked="" type="radio"/> PAP or CHAP |
| Access Point Name | internet.t-mobile | web.vodafone.de ? |
| SIM card for target B | | <input checked="" type="radio"/> SIM card 1 <input type="radio"/> SIM card 2 |
| Idle time (in seconds) | 20 | |
| Maximum connect-time (in seconds) | 0 | |
| Priority | <input type="radio"/> Try the last successful target at first <input checked="" type="radio"/> Always try target A first | |
| <input checked="" type="checkbox"/> Request DNS server address | | |

☒ Connect immediately and hold connection

Interval for checking connection (in minutes) 60

Type to check the connection ☒ DNS request ptbtime1.ptb.de
☐ Ping to www.XYZ.xyz

☐ Connect automatically once a day at hh:mm 00:01

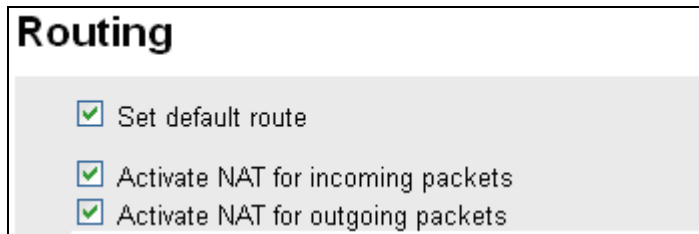
☐ Disconnect automatically once a day at hh:mm 00:00

Confirm all

Screenshot 4 – Dial out configuration

Routing

Click on "Dial-Out" -> "Routing". Check the boxes as you can see in *Screenshot 5*. Further settings are not necessary.



Routing

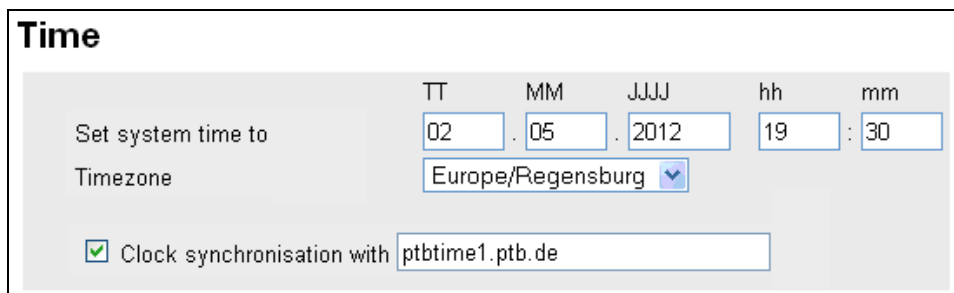
- ☒ Set default route
- ☒ Activate NAT for incoming packets
- ☒ Activate NAT for outgoing packets

Screenshot 5 – Routing configuration

Configuration of date and time

Click on "System" -> "Time" in the web interface.

If the time of day synchronization does not work via the NTP time server (Standard: "ptbtime1.ptb.de") indicated "Clock synchronisation with", please enter date and time manually, see *Screenshot 6*.



Time

Set system time to TT MM JJJJ hh mm
02 . 05 . 2012 19 : 30

Timezone Europe/Regensburg ▼

☒ Clock synchronisation with ptbtime1.ptb.de

Screenshot 6 – Configuration of date and time



If the time configuration is not correct, a VPN certificate's validity can possibly expire as it is not valid in the configured period!

OpenVPN client configuration

Download the CA certificate on www.deltalogic24.de and save it. Click on "LAN (ext)" -> "OpenVPN client" in the router's web interface. Scroll down to "Upload key or certificate". Click on "Browse..." and upload the CA certificate into the router. If the certificate has been uploaded correctly and confirmed by clicking on "OK" at the bottom of the page, the green check mark (✓) appears next to "CA certificate available".





Configure the other settings as shown in *Screenshot 7 and 8*. As soon as these settings are made, the check mark "Activate OpenVPN client" has to be ticked (✓).



User name/password: Access data for the router indicated in your Deltalogic24 account.



OpenVPN client


☒ Activate OpenVPN client

 OpenVPN client state
 Display log of last connection
 Display configurations file
 Create sample configuration file for remote terminal

IP address or domain name of remote site:
 Alternative remote site:
 Tunneling over port (local / remote):
 Protocol: ☒ UDP ☐ TCP
 Set default route (redirect-gateway): ☐
 Bind to local address and port: ☒
 Remote terminal is allowed to change its IP address (float): ☒
 Activate LZO compression: ☒
 Masquerade packets before tunnelling: ☒
 Cipher algorithm:
 Log level:
 Fragment packets (in bytes):
 Interval for renegotiation of data channel key (in seconds):
 Ping interval (in seconds):
 Ping restart interval (in seconds):
 Additional ICMP ping to:

Screenshot 7 - VPN configuration part 1

☒ Authentication based on certificate
☒ CA certificate available  
☒ No certificate available
☒ No private key available
 User name:
 Password:
 Check remote certificate type: ☐

☐ No authentication or authentication with preshared key
☒ No preshared key available
 Generate a new static key

IP address of VPN tunnel local:
 IP address of VPN tunnel remote:
 Netaddress of network behind the VPN tunnel:
 Netmask of network behind the VPN tunnel:

Screenshot 8 - VPN configuration part 2



The router's "Status VPN" LED flashes green as soon as the VPN connection has been established.

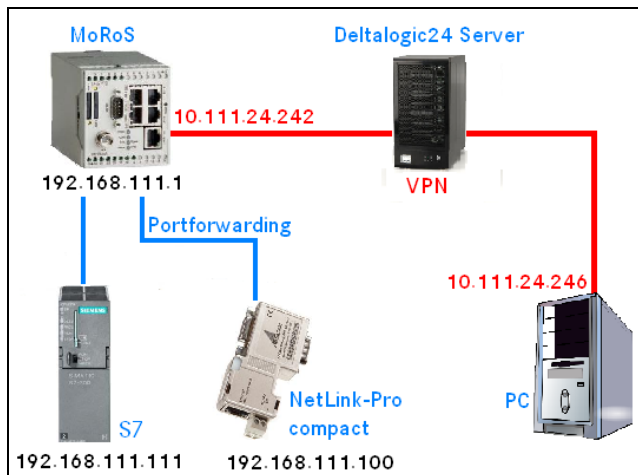
Port forwarding



Why is port forwarding necessary for a Deltalogic24 VPN connection?

Port forwarding/NAT is necessary when using a VPN connection via Deltalogic24 in order to reach the devices connected in the machine network. An example in *Screenshot 9*:

The communication of the Client-PC (10.111.24.246) within the VPN can only be established to the IP address of the router in the VPN (10.111.24.242). A direct connection to the end device in the machine network (e. g. 192.168.111.111) is not possible. The router forwards the incoming packets to the end devices following defined rules.



Screenshot 9 – Drafted installation



Port forwarding configuration for the Dial-In Router LAN/DSL

Open the router's web interface and click on "LAN (ext)" -> "Portforwarding".

In *Screenshot 10* you can see how to enter a rule. This rule reveals the following: Incoming packets on port 102 TCP are forwarded to the IP address 192.168.111.111 (S7 PLC, see *Screenshot 9*) on port 102.

| | | | | |
|--|------|-----|-----------------|---------|
| <input checked="" type="checkbox"/> Activate port forwarding for LAN (ext) interface | | | | |
| Create new rule | | | | |
| Protocol | Port | bis | to IP address | to port |
| TCP | 102 | | 192.168.111.111 | 102 |

Screenshot10 – Port forwarding with the Dial-In Router

Redundant connection via mobile radio/LAN



If no redundant connection is created, please skip this page.

Configuration of the redundant connection

In order to configure a redundant connection establishment, click on "LAN (ext) -> "Redundant WAN".

Please check the box "Activate redundant WAN". Afterwards, please set up the time interval of the connection testing as well as the time in minutes after that it is to switch back to the LAN connection, see *Screenshot 11*.

Redundant WAN

☒ Activate redundant WAN

Interval for checking connection (in minutes)

Type to check the connection ☒ DNS request
☐ Ping to

Switch back to LAN (ext) after interval (in minutes)

Confirm all

Screenshot 11 – Redundant WAN

Use the configuration guide "Dial-In Router LAN/DSL" to configure the connection via the office network: www.deltalogic.de/downloads/EWR-LAN_Deltalogic24.zip

Please note that the OpenVPN client and port forwarding must be configured under "LAN (ext)" and "Dial out".



The following contents "OpenVPN client configuration on the PC" and "Access via ACCON-S7-Net drivers" are identical in both configuration guides.

OpenVPN-Client configuration on the PC



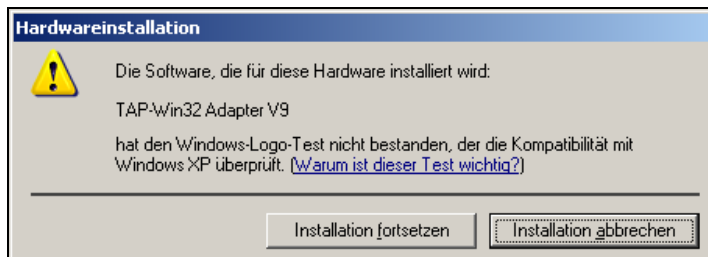
If this instruction is not on hand digitally, you will find links and samples on www.deltalogic24.de -> "OpenVPN" at the bottom of the website.

Download and installation of OpenVPN-Client

Download the OpenVPN-Client and install the software:

www.openvpn.net/index.php/download/community-downloads.html

The notification during the installation of the "TAP-Win32 Adapter" is to be confirmed by clicking "Continue Anyway", see *Screenshot 12*.



Screenshot 12 – Hardware installation TAP-Win32 Adapter v9

Saving the certificate file

Save the certificate file as "deltalogic24.de.crt" in the configuration directory (standard: "C:\Program files\OpenVPN\config"): www.deltalogic24.de/deltalogic24.de.crt





Note: The Internet Explorer saves the file ending with ".cer". In order to ensure the correct functionality the file ending has to be renamed into ".crt".

Creating the configuration file

Create a text file ending with ".ovpn" (e. g. "deltalogic24.ovpn") in the configuration directory, copy and paste the following lines and save the file:

```
remote deltalogic24.de
client
dev tun
proto udp
comp-lzo
auth-user-pass
ca deltalogic24.de.crt
```

Connection establishment

Start the "OpenVPN GUI" by choosing it in the Start Menu or on the desktop with administrator or network operator rights (otherwise the routing won't work). Right-click on system tray icon of the OpenVPN-Client  and select "Connect". Enter your login data of a client access (this you find in your Deltalogic24 network summary). As soon as the symbol turns green  the connection has been established.

Troubleshooting



If the user and password request does not appear, check whether the files are in the right directory as well as whether its content is correct. If there are errors when connecting, please send the content of the respective log file (right-click on the system tray icon -> "View Log") including a description of errors via e-mail to support@deltalogic.de.

Using the ACCON-S7-Net drivers



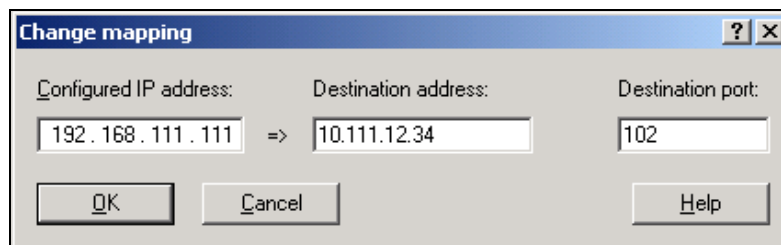
The ACCON-S7-Net drivers include ACCON-TeleService-IE and the communication drivers for ACCON-NetLink-PRO (compact) and other devices. ACCON-S7-Net can be downloaded on "www.deltalogic.de" under "Downloads" -> "S7 adapter" or you will find the setup on any DELTALOGIC CD.

Establishing an online connection with ACCON-TeleService IE

As the PLC is not accessible via the IP address 192.168.111.111 but via 10.111.24.242, opening the Step7 project and switching to "Online" (cf. *Screenshot 10*) does not work. The PG/PC-interface ACCON-TeleService IE resolves this problem.

After opening the PG/PC-interface and selecting ACCON-TeleService-IE, open the properties. At first, by selecting "New", a station is created. In a station you can find the routing information for a project or a machine. Therefore, a reasonable name is to be chosen, e. g. "Project XYZ" so that a map can be generated.

Within the station, "direct map" has to be marked and by clicking on "New...", a new rule respectively map will be entered, see *Screenshot 13*.

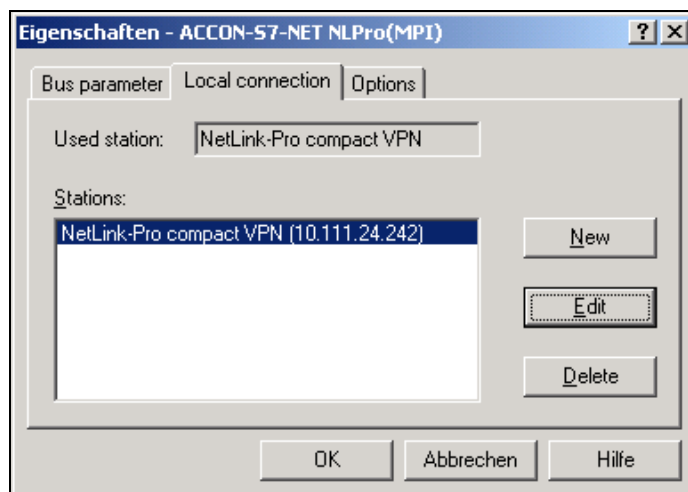


Screenshot 13 – Mapping ACCON-TeleService IE

The map above shows that the PLC with the IP address 192.168.111.111 is accessible via the router's IP address in the VPN 10.111.24.242 via port 102. With this property, an opened project with projected IP address 192.168.111.111 can switch to "Online".

Establishing an online connection with the ACCON-NetLink-PRO compact

Configure the PG/PC interface "ACCON-S7-Net NLPro (MPI/PROFIBUS/PPI)" with the following settings: The VPN-IP address of the ACCON-NetLink-PRO compact has to be configured as IP address "10.111.24.242" and the corresponding station has to be selected, see *Screenshot 14*.



Screenshot 14 – Interface properties of "ACCON-S7-Net NLPro"