



Application User Guide

AUG 0xx / Rev. 1.0

Connect 2 sites together using VPN by Mobile network

This document explains how to connect 2 remote eWON devices securely over the Internet using a mobile connection (through a VPN connection).





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1. Requirements

Hardware requirements

In order to follow this guide you will need:

- 2 eWONs with a FLX 3202 extension card

Software requirements

eWON configuration software:

The eWON is configured through its web server. All you need is a standard Web Browser software like Internet Explorer, Chrome or Firefox.

Additionally we recommend to download the eBuddy utility from our website:
<http://support.ewon.biz>.

This utility allows to list all the eWONs on your network and to change the default IP address of an eWON to match your LAN IP address range. With eBuddy you can also easily upgrade the firmware of your eWON (if required).

Other programming software:

N/A

Network requirements (see with your Mobile ISP)

VPN being a point-to-point communication, one of the two eWON needs to have a static IP to ease the communication between units.

Some Mobile ISP can provide a static public IP, but it is more often a static IP in a private network. In this case the VPN can only be joined by another unit with an IP from this private network.

If your Mobile ISP cannot provide this kind of service but the received IP is public, you can use a Dynamic DNS Solution (Dyndns, No-IP or similar DNS Service).

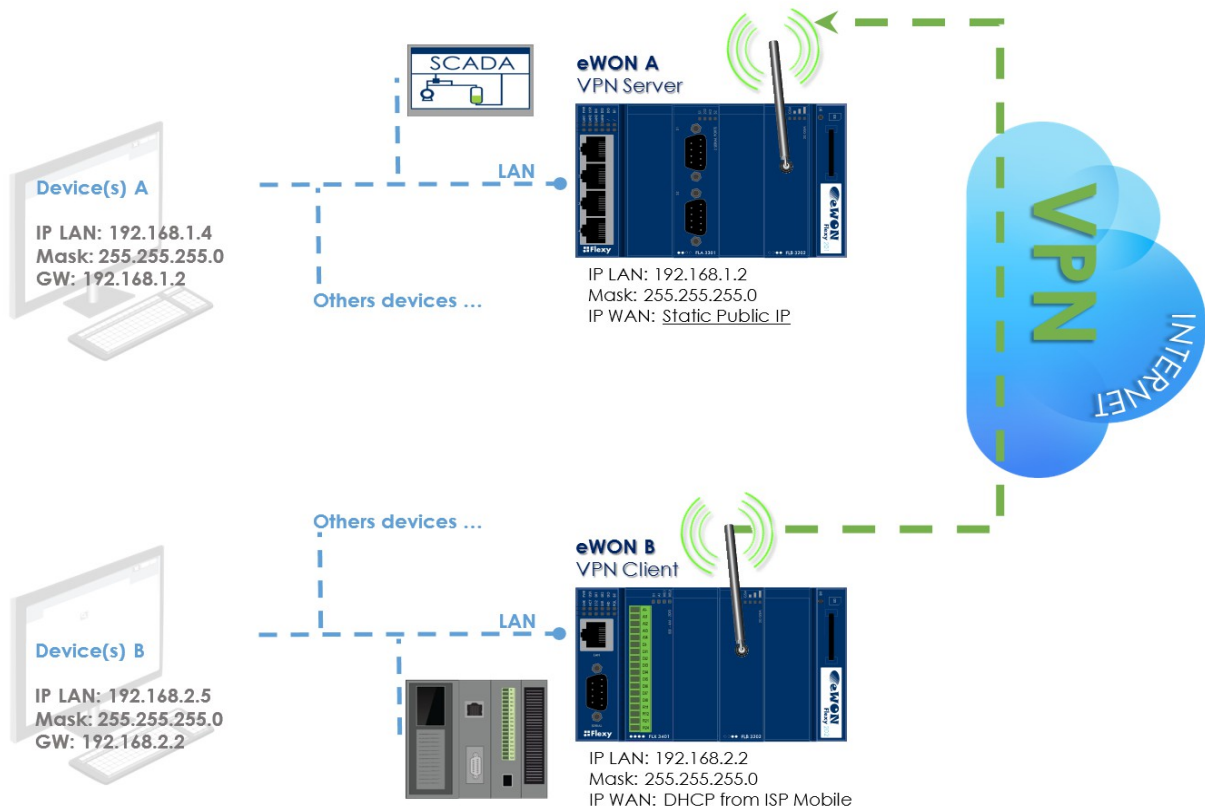
Be aware that a Dynamic DNS solution will generate some unexpected disconnection.

eWON Firmware Version

To be able to follow this guide your eWON needs a firmware version 5.0 or higher. A simple way to perform an eWON firmware upgrade is to use eBuddy, the eWON companion tool.

2. Introduction

In this document, we will see how to connect 2 remote sites together using VPN over the Internet. We will use 2 eWONs FLEXY and establish a VPN connection over the Internet using FLX3202 extension card and a Mobile Network.



Here are the steps to make 2 networks communicate (eWON A – eWON B) through a VPN connection:

- Configure the Internet connection on both eWONs
- Configure the eWON A for VPN incoming (as VPN Server)
- Configure the eWON B for VPN outgoing (as VPN Client)
- Set the eWON A LAN address as default gateway for your devices on site A
- Set the eWON B LAN address as default gateway for your devices on site B

- Note -


Make sure that the IP addresses on site A are in a different range than the addresses on site B, otherwise, the routing will be impossible.

3. Configure the eWON VPN Server

In our example, eWON A is the VPN Server.

LAN and Modem Interface Configuration

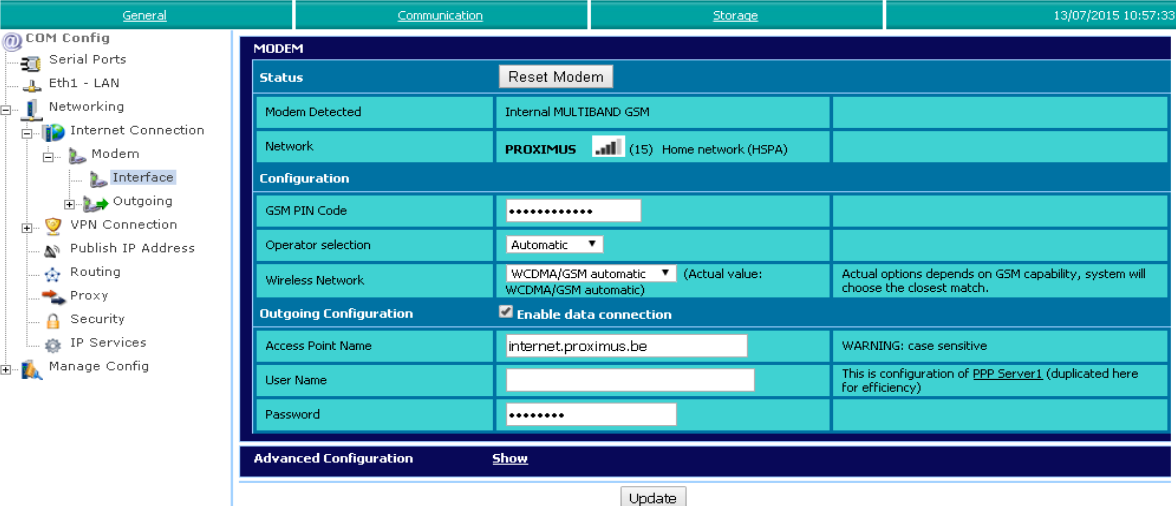
Set the eWON LAN IP Address:



Set the eWON Modem interface:

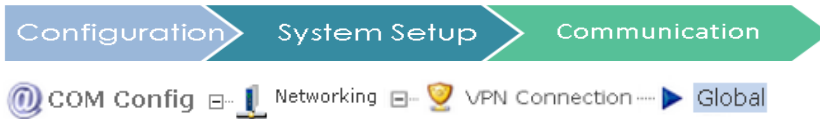


Network configuration is automatically provided during the PPP negotiation with your ISP.



VPN Configuration

Global VPN configuration



By default *Port In* is set on 0

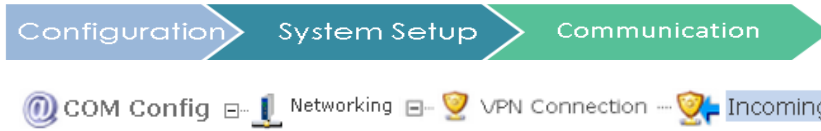
Which means that the eWON is listening to port 1194 for the incoming VPN connection.

General	Communication	Storage	13/07/2015 11:07:35																								
<p>@ COM Config</p> <ul style="list-style-type: none"> Serial Ports Eth1 - LAN Networking <ul style="list-style-type: none"> Internet Connection <ul style="list-style-type: none"> Modem Interface Outgoing VPN Connection <ul style="list-style-type: none"> Global Incoming Outgoing Publish IP Address Routing Proxy Security IP Services Manage Config 																											
<p>VPN Connection configuration</p> <p>Advanced options</p> <table border="1"> <tr> <td>Diagnosis level</td> <td>Low</td> <td>Diagnosis goes to 'Real time log'</td> </tr> <tr> <td>Port In</td> <td>0</td> <td></td> </tr> <tr> <td>Port Out</td> <td>1194</td> <td></td> </tr> <tr> <td>'keep alive' interval</td> <td>120 seconds</td> <td>0 = disable Keep alive.</td> </tr> </table> <p>Internet connection proxy In case internet access requires a proxy: No proxy</p> <p>Really Advanced options Please do not change, unless you know exactly what you are doing!</p> <table border="1"> <tr> <td>VPN Driver Mode</td> <td>TUN</td> <td>Reboot required when changed.</td> </tr> <tr> <td>VPN Protocol</td> <td>UDP</td> <td></td> </tr> </table> <p>Talk2M PRO options (Clear all for Talk2M FREE)</p> <table border="1"> <tr> <td>Talk 2M PRO Account name</td> <td></td> <td></td> </tr> <tr> <td>Talk2M Access Server Address</td> <td>talk2m_free_eu</td> <td></td> </tr> </table> <p style="text-align: center;">Update</p>				Diagnosis level	Low	Diagnosis goes to 'Real time log'	Port In	0		Port Out	1194		'keep alive' interval	120 seconds	0 = disable Keep alive.	VPN Driver Mode	TUN	Reboot required when changed.	VPN Protocol	UDP		Talk 2M PRO Account name			Talk2M Access Server Address	talk2m_free_eu	
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Talk 2M PRO Account name																											
Talk2M Access Server Address	talk2m_free_eu																										

- Note -

Adapt the UDP port used for the Incoming VPN connection if needed.

Incoming VPN configuration



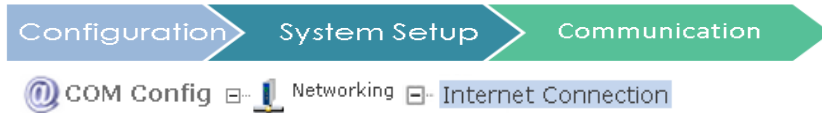
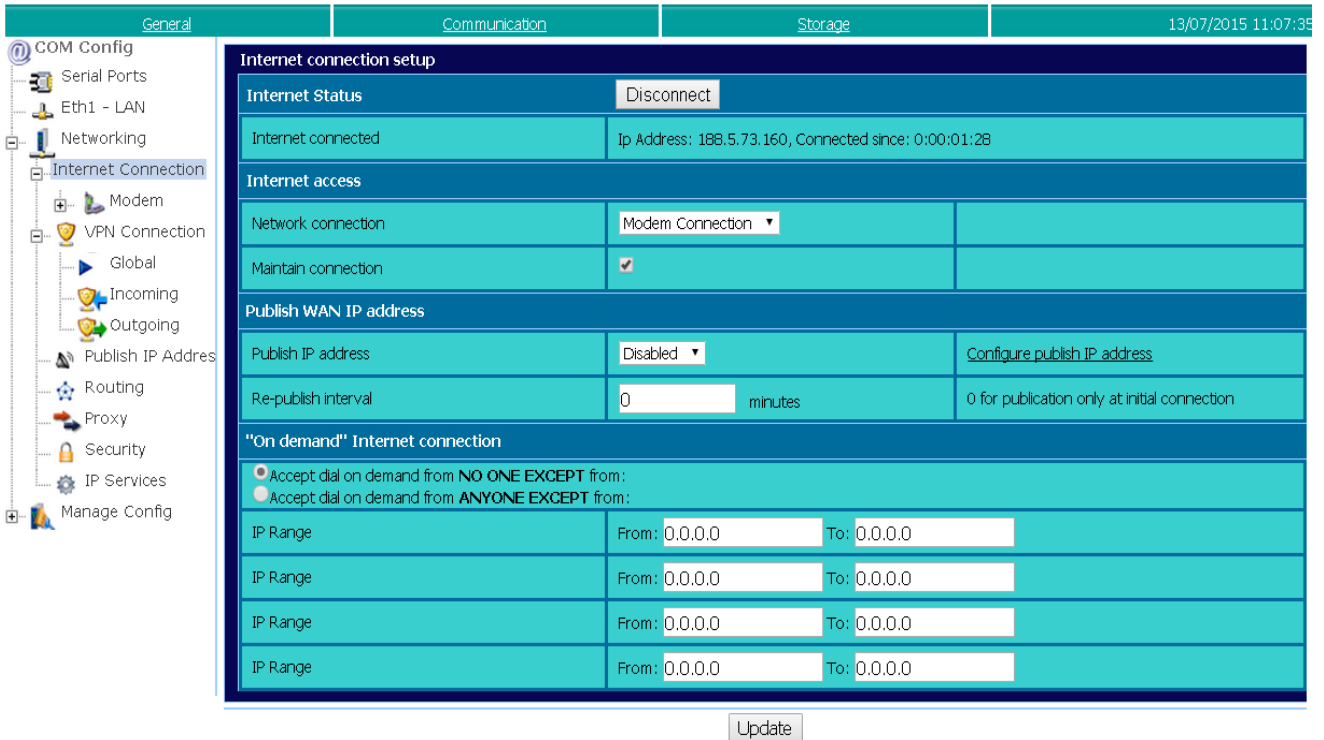
- Check «listen for incoming VPN connection».
- Enter a Passphrase (and remember the Passphrase !!)
- Assign the VPN IP address: leave it on automatic.

General	Communication	Storage	13/07/2015 11:07:35															
<p>@ COM Config</p> <ul style="list-style-type: none"> Serial Ports Eth1 - LAN Networking <ul style="list-style-type: none"> Internet Connection <ul style="list-style-type: none"> Modem Interface Outgoing VPN Connection <ul style="list-style-type: none"> Global Incoming Outgoing 																		
<p>Accept incoming VPN connection configuration</p> <p>VPN activation rule</p> <p>The VPN activation rule is normally defined in Networking Config (duplicated here for simplicity)</p> <table border="1"> <tr> <td>Listen for incoming VPN connection</td> <td><input checked="" type="checkbox"/></td> <td>During Internet connections</td> </tr> </table> <p>Incoming VPN connection parameters</p> <table border="1"> <tr> <td>Passphrase</td> <td colspan="2"><input type="password" value="....."/></td> </tr> <tr> <td>VPN Ip addresses config</td> <td>Automatic</td> <td></td> </tr> <tr> <td>Local VPN IP address</td> <td>10.254.0.2</td> <td></td> </tr> <tr> <td>Remote VPN IP address</td> <td>10.254.0.1</td> <td></td> </tr> </table> <p style="text-align: center;"><input type="button" value="Update"/></p>				Listen for incoming VPN connection	<input checked="" type="checkbox"/>	During Internet connections	Passphrase	<input type="password" value="....."/>		VPN Ip addresses config	Automatic		Local VPN IP address	10.254.0.2		Remote VPN IP address	10.254.0.1	
Listen for incoming VPN connection	<input checked="" type="checkbox"/>	During Internet connections																
Passphrase	<input type="password" value="....."/>																	
VPN Ip addresses config	Automatic																	
Local VPN IP address	10.254.0.2																	
Remote VPN IP address	10.254.0.1																	

- Note -

Set it manually only in case of address conflict.

Internet Connection Configuration

General Communication Storage 13/07/2015 11:07:35

@ COM Config

- Serial Ports
- Eth1 - LAN
- Networking
 - Internet Connection
 - Modem
 - VPN Connection
 - Global
 - Incoming
 - Outgoing
 - Publish IP Address
 - Routing
 - Proxy
 - Security
 - IP Services
 - Manage Config

Internet connection setup

Internet Status: Disconnect

Internet connected: Ip Address: 188.5.73.160, Connected since: 0:00:01:28

Internet access

Network connection: Modem Connection

Maintain connection:

Publish WAN IP address

Publish IP address: Disabled [Configure publish IP address](#)

Re-publish interval: 0 minutes (0 for publication only at initial connection)

"On demand" Internet connection

Accept dial on demand from **NO ONE EXCEPT** from:

Accept dial on demand from **ANYONE EXCEPT** from:

IP Range	From: 0.0.0.0	To: 0.0.0.0
IP Range	From: 0.0.0.0	To: 0.0.0.0
IP Range	From: 0.0.0.0	To: 0.0.0.0
IP Range	From: 0.0.0.0	To: 0.0.0.0

Update

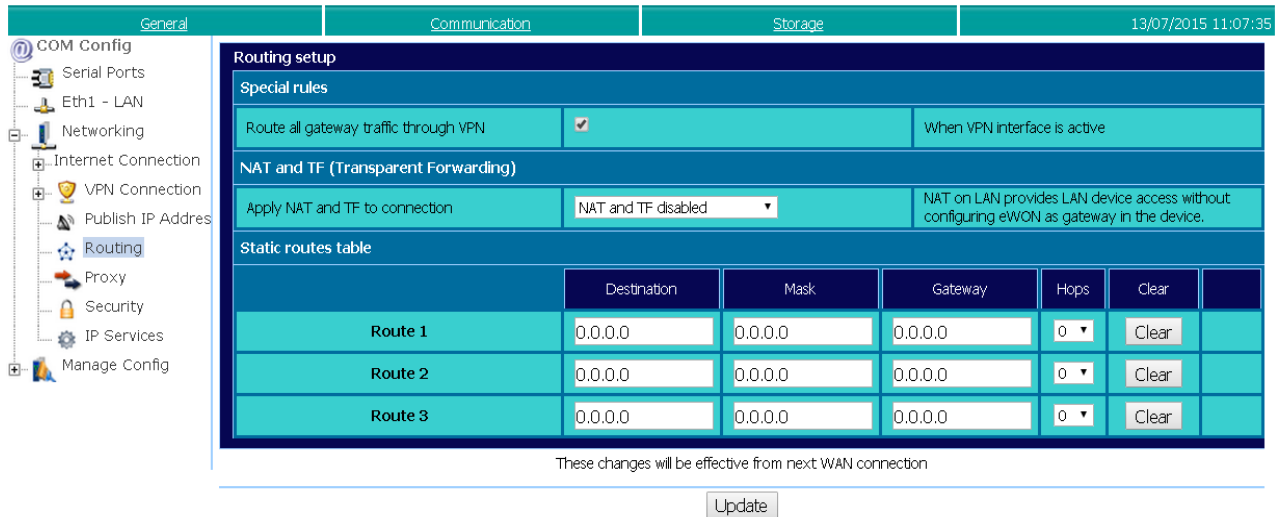
- Select «Modem connection» for the Network connection.
- Check «Maintain connection».
- Disable the Publish WAN IP address.

Routing Configuration

eWON Routing Configuration



- Enable «Route all gateway traffic through VPN».
- Select «NAT and TF disabled».



General Communication Storage 13/07/2015 11:07:35

COM Config
Serial Ports
Eth1 - LAN
Networking
Internet Connection
VPN Connection
Publish IP Address
Routing
Proxy
Security
IP Services
Manage Config

Routing setup

Special rules

Route all gateway traffic through VPN	<input checked="" type="checkbox"/>	When VPN interface is active
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NAT and TF (Transparent Forwarding)

Apply NAT and TF to connection	NAT and TF disabled	NAT on LAN provides LAN device access without configuring eWON as gateway in the device.
--------------------------------	---------------------	--

Static routes table

	Destination	Mask	Gateway	Hops	Clear
Route 1	0.0.0.0	0.0.0.0	0.0.0.0	0	Clear
Route 2	0.0.0.0	0.0.0.0	0.0.0.0	0	Clear
Route 3	0.0.0.0	0.0.0.0	0.0.0.0	0	Clear

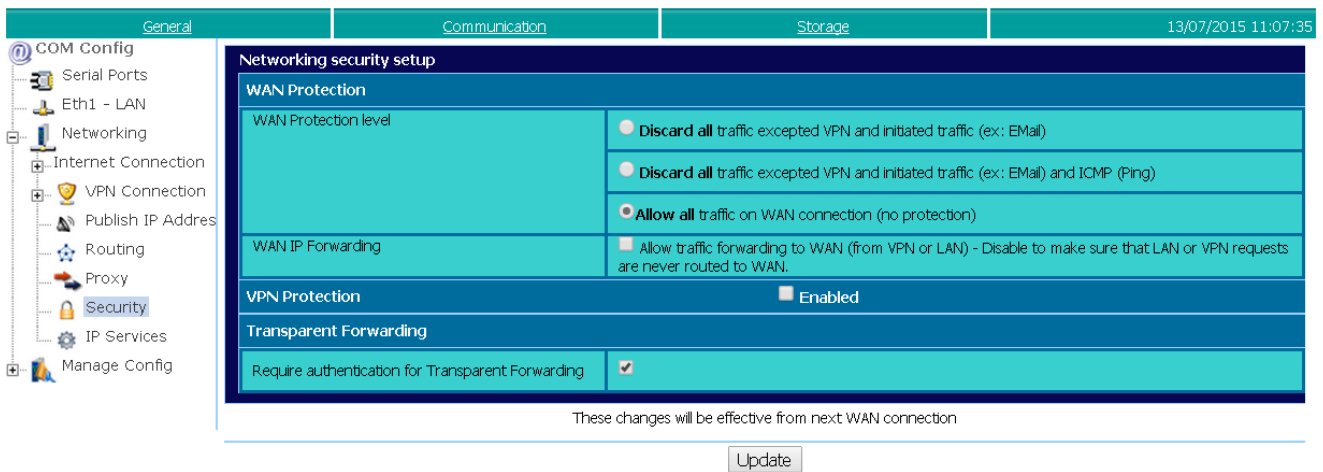
These changes will be effective from next WAN connection

Update

Security Configuration



In WAN Protection level: select «Allow all...»



General Communication Storage 13/07/2015 11:07:35

@ COM Config

- Serial Ports
- Eth1 - LAN
- Networking
- Internet Connection
- VPN Connection
- Publish IP Address
- Routing
- Proxy
- Security
- IP Services
- Manage Config

Networking security setup

WAN Protection

WAN Protection level

- Discard all traffic excepted VPN and initiated traffic (ex: EMail)
- Discard all traffic excepted VPN and initiated traffic (ex: EMail) and ICMP (Ping)
- Allow all traffic on WAN connection (no protection)

WAN IP Forwarding

Allow traffic forwarding to WAN (from VPN or LAN) - Disable to make sure that LAN or VPN requests are never routed to WAN.

VPN Protection Enabled

Transparent Forwarding

Require authentication for Transparent Forwarding

These changes will be effective from next WAN connection

Update

- Note -

You can adjust it later to «Discard all traffic excepted VPN and initiated traffic», if required.

Reboot your eWON

To be sure that the eWON unit takes the VPN connection configuration into account, It is advised to reboot it.

4. Configure the eWON VPN Client

In our example, eWON B is the VPN Client.

LAN and Modem Interface Configuration

Set the eWON LAN IP Address:

Configuration > System Setup > Communication

COM Config > Eth1 - LAN

General	Communication	Storage	13/07/2015 11:07:35
Ethernet LAN Connection			
Address Setup		Static Mac Address: 00:03:27:01:91:bd	
IP address	192.168.2.2		
Subnet mask	255.255.255.0		
Default gateway	0.0.0.0		
DNS Setup			
Primary DNS IP address	0.0.0.0	Leave blank (or 0.0.0.0) if no DNS	
Secondary DNS IP address	0.0.0.0		
Update			

Set the eWON Modem interface:

Configuration > System Setup > Communication

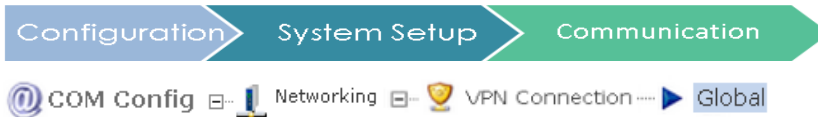
COM Config > Networking > Internet Connection > Modem > Interface

Network configuration is automatically provided during the PPP negotiation with your ISP.

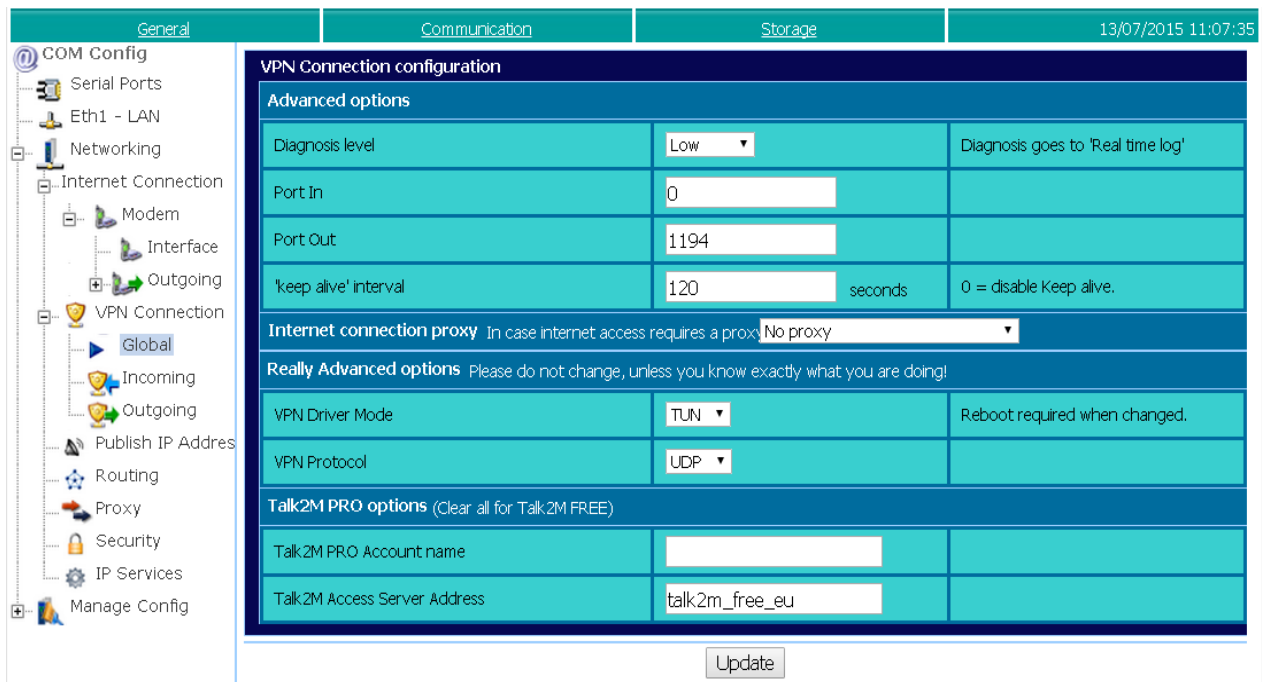
General	Communication	Storage	13/07/2015 10:57:33
MODEM			
Status		Reset Modem	
Modem Detected	Internal MULTIBAND GSM		
Network	PROXIMUS (15) Home network (HSPA)		
Configuration			
GSM PIN Code	*****		
Operator selection	Automatic		
Wireless Network	WCDMA/GSM automatic (Actual value: WCDMA/GSM automatic)		Actual options depends on GSM capability, system will choose the closest match.
Outgoing Configuration			
<input checked="" type="checkbox"/> Enable data connection			
Access Point Name	internet.proximus.be	WARNING: case sensitive	
User Name		This is configuration of PPP Server1 (duplicated here for efficiency)	
Password	*****		
Advanced Configuration Show			
Update			

VPN Configuration

Global VPN configuration



By default, 1194 port is used on the other eWON for the incoming VPN connection.

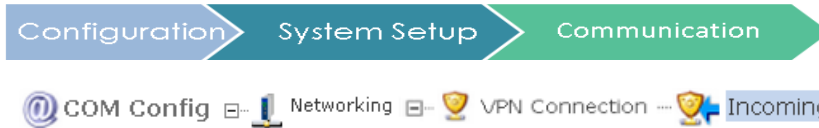


General		Communication	Storage
13/07/2015 11:07:35			
COM Config			
Serial Ports			
Eth1 - LAN			
Networking			
Internet Connection			
Modem			
Interface			
Outgoing			
VPN Connection			
Global			
Incoming			
Outgoing			
Publish IP Address			
Routing			
Proxy			
Security			
IP Services			
Manage Config			
VPN Connection configuration			
Advanced options			
Diagnosis level	Low	Diagnosis goes to 'Real time log'	
Port In	0		
Port Out	1194		
'keep alive' interval	120 seconds	0 = disable Keep alive.	
Internet connection proxy In case internet access requires a proxy: No proxy			
Really Advanced options Please do not change, unless you know exactly what you are doing!			
VPN Driver Mode	TUN	Reboot required when changed.	
VPN Protocol	UDP		
Talk2M PRO options (Clear all for Talk2M FREE)			
Talk2M PRO Account name			
Talk2M Access Server Address	talk2m_free_eu		
Update			

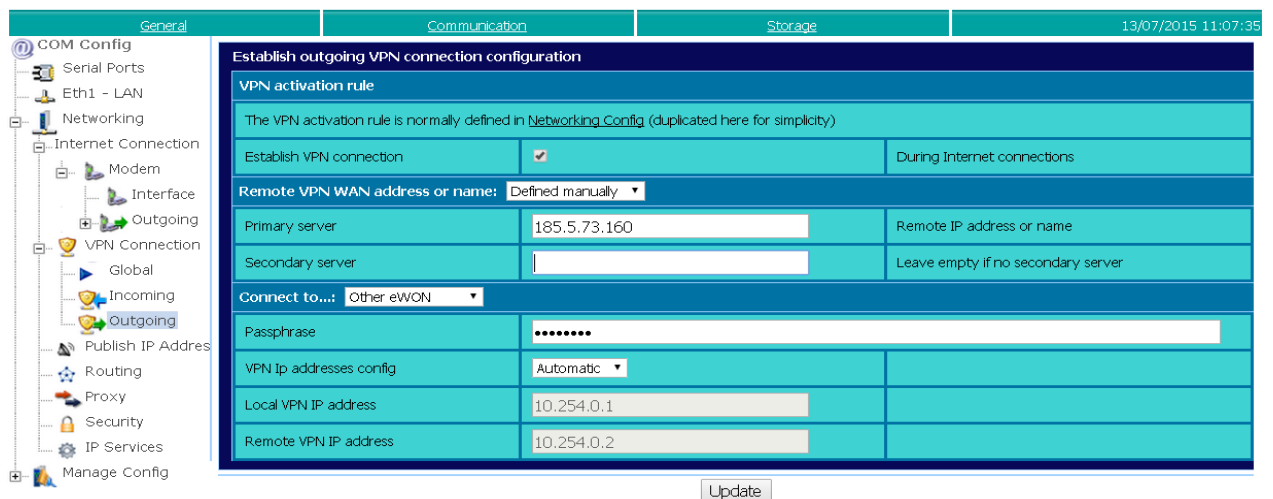
- Note -

Adapt the UDP port used for the Incoming VPN connection, if needed.

Outgoing VPN configuration



- Enable «Establish VPN connection».
- For the «Primary server» enter the public IP address of the eWON A.
- Select «Other eWON» for the «Connect to...»
- Enter the Passphrase you configured for eWON A.
- Assign the VPN IP address: leave it on automatic.

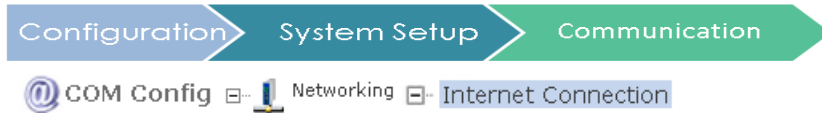
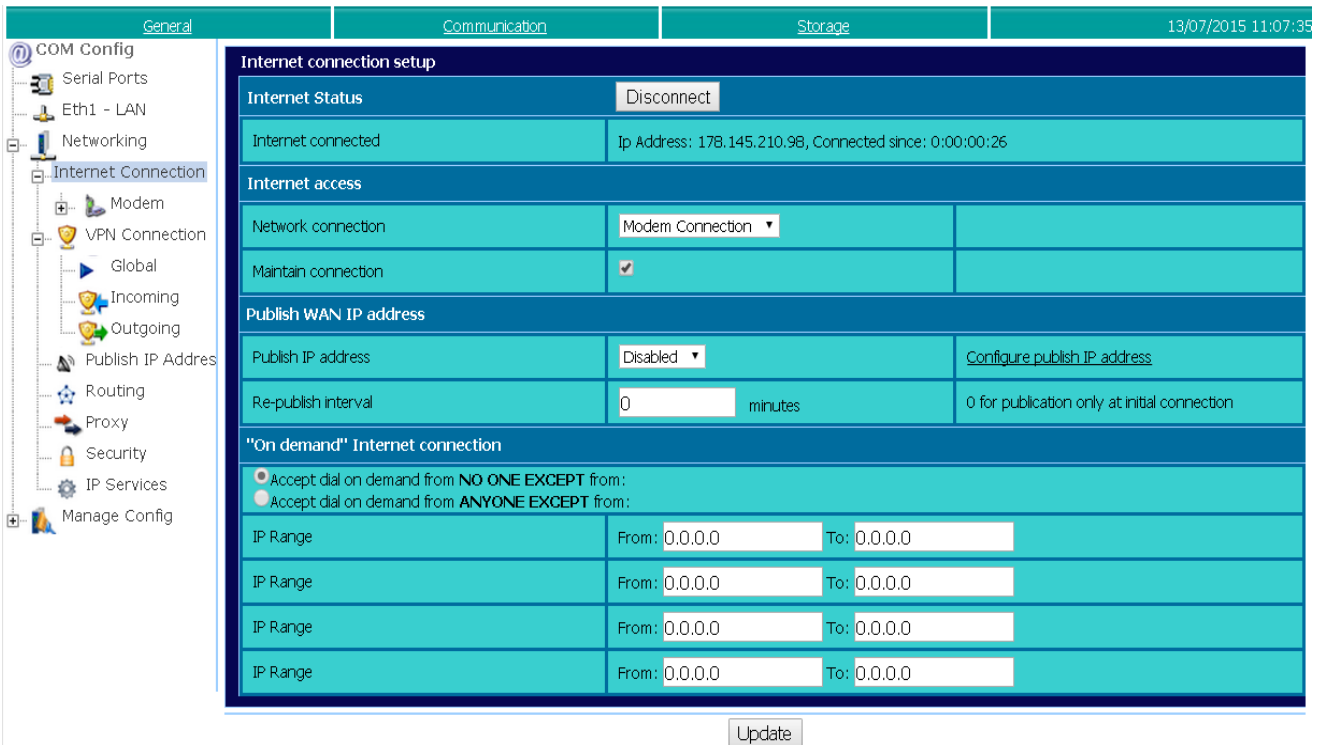


Establish outgoing VPN connection configuration		
VPN activation rule		
The VPN activation rule is normally defined in <i>Networking Config</i> (duplicated here for simplicity)		
Establish VPN connection	<input checked="" type="checkbox"/>	During Internet connections
Remote VPN WAN address or name: Defined manually		
Primary server	185.5.73.160	Remote IP address or name
Secondary server		Leave empty if no secondary server
Connect to...: Other eWON		
Passphrase	
VPN Ip addresses config	Automatic	
Local VPN IP address	10.254.0.1	
Remote VPN IP address	10.254.0.2	
<input type="button" value="Update"/>		

- Note -

Set the IP address manually only in case of address conflict.

Internet Connection Configuration

The screenshot shows the 'Internet connection setup' page in the eWON web interface. The left sidebar contains a tree view with 'COM Config' expanded to 'Networking' and then 'Internet Connection'. The main content area is titled 'Internet connection setup' and includes the following sections:

- Internet Status:** A 'Disconnect' button and a status bar showing 'Internet connected' with IP Address: 178.145.210.98, Connected since: 0:00:00:26.
- Internet access:** 'Network connection' set to 'Modern Connection' (dropdown), and 'Maintain connection' checked.
- Publish WAN IP address:** 'Publish IP address' set to 'Disabled' (dropdown) with a link to 'Configure publish IP address'. 'Re-publish interval' is set to '0' minutes, with a note '0 for publication only at initial connection'.
- 'On demand' Internet connection:** Two radio buttons: 'Accept dial on demand from NO ONE EXCEPT from:' (selected) and 'Accept dial on demand from ANYONE EXCEPT from:'. Below are four rows for 'IP Range', each with 'From:' and 'To:' fields, both containing '0.0.0.0'.

An 'Update' button is located at the bottom right of the configuration area.

- Select «Modem connection» for the Network connection.
- Check «Maintain connection».
- Disable the Publish WAN IP address.

Select «Ethernet Wan connection» for the Network connection.

Check «Maintain connection».

Disable the Publish WAN IP address.

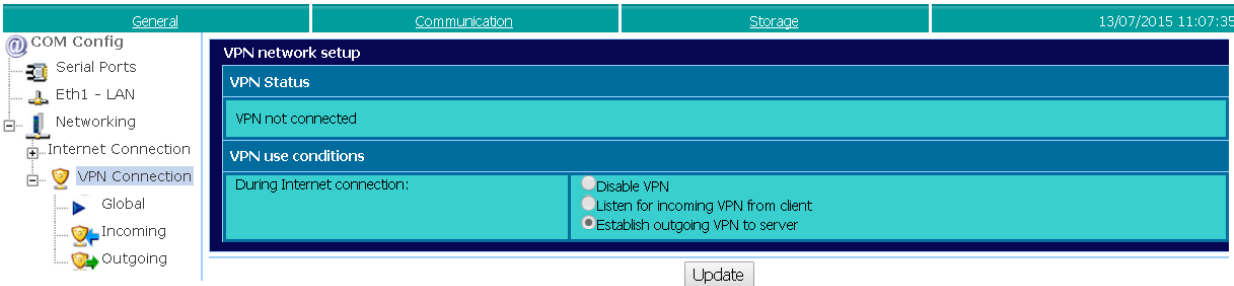
Routing Configuration

Routing VPN Configuration



@ COM Config [Networking] [VPN Connection]

Make sure that the VPN network setup is on : «Establish outgoing VPN to server».

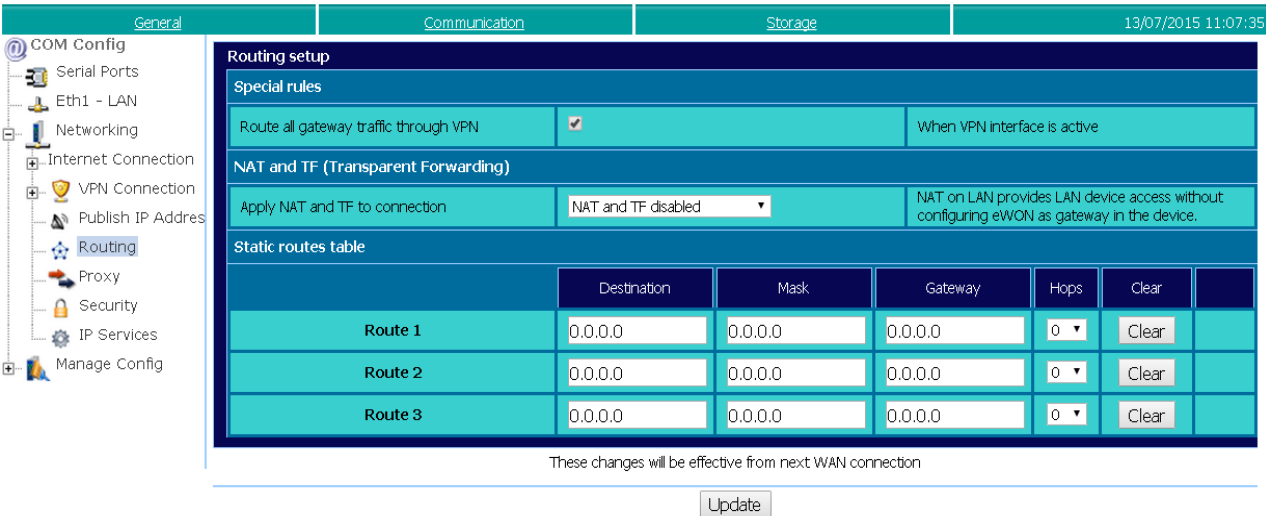


eWON Routing Configuration



@ COM Config [Networking] [Routing]

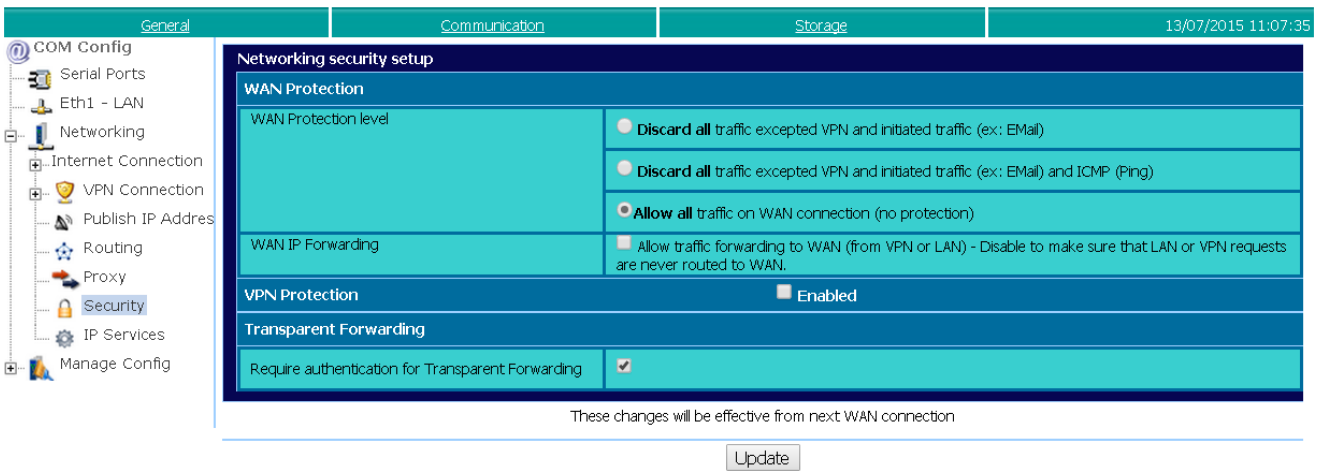
- Enable «Route all gateway traffic through VPN».
- Select «NAT and TF disabled».



Security Configuration



In WAN Protection level: select «Allow all...»



General Communication Storage 13/07/2015 11:07:35

COM Config

- Serial Ports
- Eth1 - LAN
- Networking
- Internet Connection
- VPN Connection
- Publish IP Address
- Routing
- Proxy
- Security
- IP Services
- Manage Config

Networking security setup

WAN Protection

WAN Protection level

- Discard all traffic excepted VPN and initiated traffic (ex: EMail)
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- Allow all traffic on WAN connection (no protection)

WAN IP Forwarding

Allow traffic forwarding to WAN (from VPN or LAN) - Disable to make sure that LAN or VPN requests are never routed to WAN.

VPN Protection Enabled

Transparent Forwarding

Require authentication for Transparent Forwarding

These changes will be effective from next WAN connection

Update

- Note -

You can adjust it later to «Discard all traffic excepted VPN and initiated traffic», if required.

Reboot your eWON

To be sure that the eWON unit takes the VPN connection configuration into account, It is advised to reboot it.

5. Public IP address

To make the VPN connection work, you need to specify in the eWON VPN Client (eWON B) the public IP address of the eWON VPN Server. You then need a static public IP address for the eWON A (ask your Mobile ISP).

The public IP address of the eWON VPN Client does not need to be static and does not have to be known.

Often the ISP does not provide a public address but a private IP address belonging to a private APN. This type of APN usually allows members of the same APN to connect with each other using the same configuration as explained above.

If you do not have a static IP address, you can configure your eWON A for dynamic DNS (Dyndns, No-Ip or similar DNS Service) and use the associated URL in the eWON VPN Client.

- Note -

Be aware that a Dynamic DNS solution can generate some unexpected disconnection. In such case, the eWON (VPN Client) will take several minutes before retrying to the DNS lookup and get the new server IP.

6. Configuration of the devices behind the eWONs

All the devices connected to the LAN of eWON A must have the LAN IP address of eWON A as Gateway.

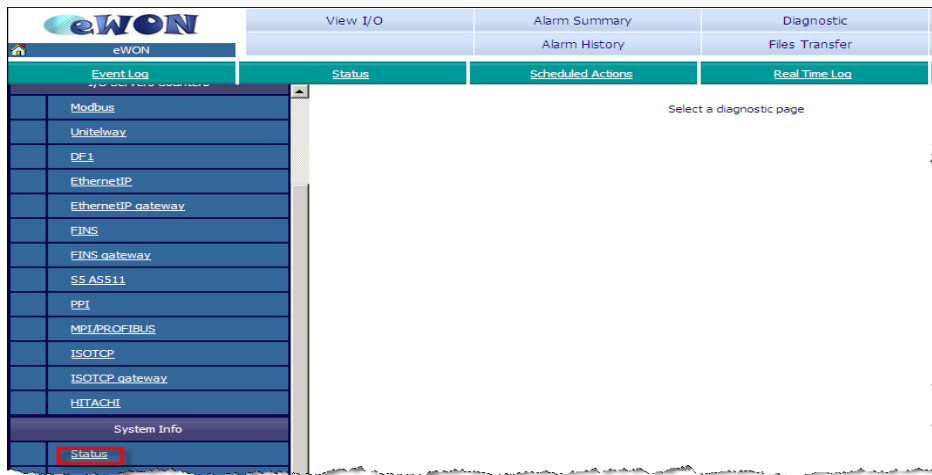
All the devices connected to the LAN of eWON B must have the LAN IP address of eWON B as Gateway, as shown our introduction ([page 4](#)).

7. Connection Establishment

Once the VPN connection has been configured, the connection will be automatically established when the eWON is powered on.

To verify that the VPN connection is established, follow this path:

Diagnostic → Status → Status



Click on **«Status»** to open the following page:

In our example the VPN allocated IP address is 10.254.0.2 for eWON A.

Status				
Description	Value	Unit	Stat	?
PPP allocated IP address	0.0.0.0			
Current IP transparent forward address	0.0.0.0			
VPN allocated IP address	10.254.0.2			
PPP accumulated incoming traffic	0	Bytes		
PPP accumulated outgoing traffic	0	Bytes		
ADSL Line status				
ADSL WAN status				
ADSL Local IP	0.0.0.0			
ADSL Remote IP	0.0.0.0			
ADSL Primary DNS	0.0.0.0			
ADSL Secondary DNS	0.0.0.0			

The eWON B received the VPN IP address 10.254.0.1

Status				
Description	Value	Unit	Stat	?
PPP allocated IP address	0.0.0.0			
Current IP transparent forward address	0.0.0.0			
VPN allocated IP address	10.254.0.1			
PPP accumulated incoming traffic	0	Bytes		
PPP accumulated outgoing traffic	0	Bytes		

8. Troubleshooting

If a VPN connection has been established, but the devices behind the eWONs do not communicate:

- Check that devices on site A are not on the same LAN IP address range as the LAN IP address range of devices on site B.
- Make sure that each eWON is the default gateway of the devices linked to it.

If the VPN connection cannot be established:

- Verify that the eWON Server WAN IP address range is different from the eWON Client WAN IP address range.

If the VPN connection is interrupted:

- Check if the «Maintain Connection» is activated in each eWON (in the **Internet Connection** configuration page).



Revision

Revision History

Revision Level	Date	Description
1.0	13/07/2015	First Release

#i	Microsoft, Internet Explorer, Windows and Windows XP are either registered trademarks or trademarks of Microsoft Corporation
#ii	Firefox is a trademark of the Mozilla Foundation
#iii	Chrome is a trademark of Google Inc.

Document build number: 15

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Revision Information

eWON sa, Member of ACT'L Group