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SIG

TLS or IPSec VPN server

User manual

Document reference : 9017409-01

The SIG router & VPN server is manufactured by

ETIC TELECOM
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PRESENTATION

INSTALLATION

CONFIGURATION

../..

... CONFIGURATION

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… CONFIGURATION

1 Technical data

General characteristics	
Dimensions	137 x 48 x 116 mm (h, l, p)
Electrical safety	EN 60950- UL 1950
EMC	ESD : EN61000-4-2 : Discharge 6 KV RF field : EN61000-4-3 : 10V/m < 2 GHz Fast transient : EN61000-4-4 Surge voltage : EN61000-4-5 : 4KV line / earth
RoHS	2002/95/CE (RoHS)
Supply voltage	110 to 230 VAC - 50/60Hz - 60 W
Operating T°	+5°C / + 40°C Humidity 5 - 95 %

Internet connection (Ethernet 4)	
Type	Bridge : PPPo Ethernet IP Router

Ethernet / IP router	
Ethernet	10/100 BT Port Ethernet 1 : LAN conection Port Ethernet 4 : WAN connection
IP router	Remote connections- static routes - RIP V2
Ip address translation	Source IP @ translation (NAT) Destination IP @ translation (DNAT) Port translation (Port forwarding)
DNS	
IP address assignment	LAN interface : Fixed IP @ or DHCP server
Throughput	30 MB/s

VPN and firewall	
VPN	• 128 VPN • IPSec - Client or server - PSK or X509 certificates • TLS/SSL - Client or server - X509 certificates • Encryption 3DES
Firewall	Stateful packet inspection
Logs	Event logs (date and time)

Remote access server (RAS)	
User list	25 users
Connection	VPN PPTP / L2TP-IPSec / TLS Open VPN Login & password Certificate X509
Alarms	3 inputs : emails

2 Overview

The SIG is designed to build safe and reliable remote control system through the internet or private extended networks.

The SIG comes with two 10/100 BT Ethernet interfaces :

The WAN interface (Interface Ethernet 4)
On that interface, the SIG behaves as a VPN server.

The LAN interface (Ethernet 1).

The SIG is at the same time

a VPN server able to manage up to 128 IPSec or TLS tunnels,

an IP router to route IP packets between its two interfaces.

a remote access server (RAS) to give a secure access to the LAN or to the remote sites for authenticated remote users.
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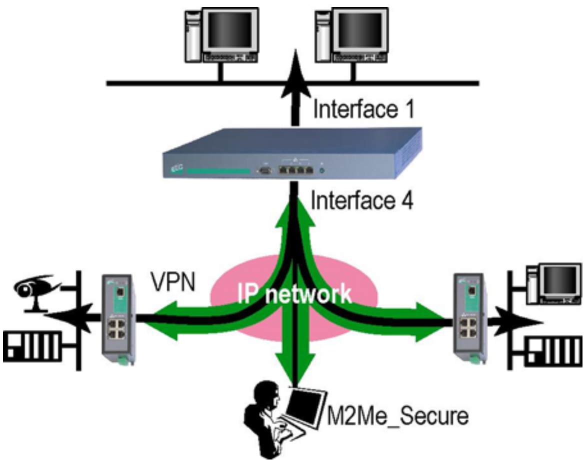
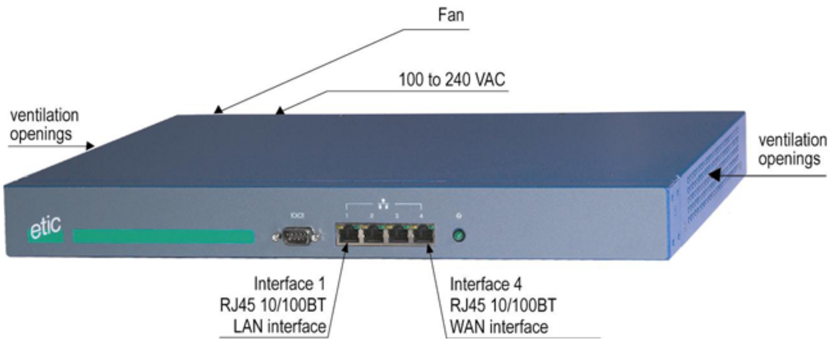


1 Product description

SIG router



Interface	Led	Function
Ethernet 1	DATA	Blinking quickly : Data activity
	LINK	Lit : Interface connected
Ethernet 4	DATA	Blinking quickly : Data activity
	LINK	Lit : Interface connected
	∿	Power led

Ethernet RJ45 connector Ethernet 10/100 BT		
Pin Nr	**Signal**	**Function**
1	Tx +	TX polarity +
2	Tx -	TX polarity -
3	Rx +	Reception polarity +
4	N.C	-
5	N.C	-
6	Rx -	Reception polarity -
7	N.C.	-
8	N.C.	-

2 Installation

The product includes a fan.

Mount the SIG router in a 19 inch rack or place it on a flat surface.

Leave 10 cm of clearance at the sides and in the rear to avoid overheating.

Attach the brackets.

Secure the SIG router to the rack with the rack-mounting screws.

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1 Configuring the SIG router

1.1 Overview

Administration server address
The administration html server is located at the LAN IP address of the router (The default address is192.168.0.128).

Html browser
We advise to use Internet Explorer version 8.

First set up
For the first configuration, we advise to connect the PC directly to the LAN interface (Ethernet 1) of the SIG router.

Set up modifications
Modifications can be carried out from the LAN, or remotely from the WAN through a VPN or setting a remote access connection (RAS connection).

Network IP address
Later in the text, we often speak of "network address".
We mean the lowest value of the addresses of the network.
For instance, if the netmask of a network is 255.255.255.0, the network address of that network is X.Y.Z.0.

Copy and paste
Parameters must be entered with the keyboard; they cannot be pasted.
However, it can be useful to paste a string when it is long and to avoid errors.
In that case, paste the string, delete the last character of the pasted string, and enter it again with the keyboard.

Saving and restoring the parameters file (see the maintenance chapter)
A parameters file can only be downloaded to a product having the same firmware version.
It is why, we advise to assign a name to a parameters file including the product name and the software version like for instance "myrouterfile_iplE1220_V241.bin".

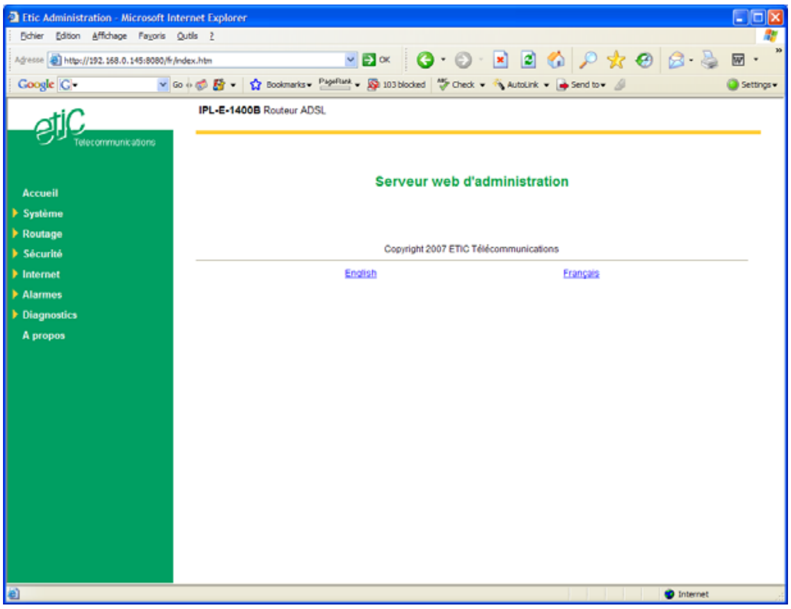
1.2 First configuration

Step 1 : Create or modify the PC's IP connection.
Assign to the PC an IP @ in accordance with the SIG IP address.
For the first configuration, assign or instance 192.168.0.127 to the PC.

Step 2 : Connect the PC directly to the LAN interface (Ethernet 1) of the SIG using any Ethernet cable (straight or cross wired).

Step 3 : Launch the navigator
Enter the LAN IP @ of the router 192.168.0.128.

The Home page of the administration server is displayed


Etic Administration - Microsoft Internet Explorer

Adresse http://192.168.0.145:8080/fr/index.htm

IPL-E-1400B Routeur ADSL

Serveur web d'administration

Copyright 2007 ETIC Télécommunications

English Français

1.3 Modifying the configuration

Modifications from the LAN (Interface 1)

Modifications can be carried out from the LAN at the IP address assigned to the html server.

- Launch the html browser and enter the IP address assigned to the router.

- Or, launch the ETICFINDER utility to detect the SIG address.

- Enter the login and password which may restricts the access to the html server.

Modifying the configuration from the WAN

The html administration server can be reached from the WAN either through a PPTP or TLS or L2TP/ IPSec remote user connection or through a VPN tunnel.

2 Rebooting the router after parameters changes

- After the parameters of any page have been entered, click the « Save » button at the bottom of the page.

- After some parameters changes, the SIG must restart.

When the configuration has been completely carried out, click the « Reboot » red button in the green bar, when displayed.

- Once the product has restarted, check the « Reboot » button has disappeared from the green bar.

To save the configuration file to a hard disk :

- Select the “maintenance” menu and then the “Save / restore” menu.
- Click the “Save current configuration to disk” button.

3 Recovering the IP address of the router

If you cannot access the SIG by any method, it is possible to recover the stored IP address by using the ETIC FINDER software provided by ETIC TELECOM.

4 Recovering the factory configuration

It may be necessary to restore the factory configuration of the router.

To restore the SIG factory configuration,

- Switch OFF the SIG router.
- Connect a key board to the USB port of the SIG router.
- Switch on the SIG router.
- Press ALT + CONTROL SUP at last 30 seconds after switching the router on.

Remark : The stored configuration will be lost; the factory IP address 192.168.0.128 will be restored.

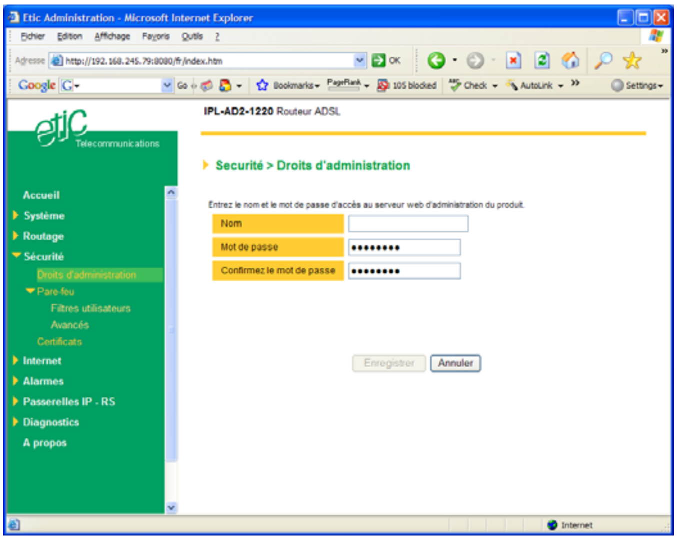
5 Restricting access to the administration server

The access to the administration server can be protected by a login and password.

To protect access to the administration server,

- Select the “Set up” menu, the “Security” menu and then the “Administration menu”.

Remark : For more simplicity, we advise to chose the login and the password of one of the remote users stored in the user list.



IPL-AD2-1220 Routeur ADSL

Securité > Droits d'administration

Entrez le nom et le mot de passe d'accès au serveur web d'administration du produit.

Nom	
Mot de passe	••••••••
Confirmez le mot de passe	••••••••

Enregistrer | Annuler

6 Assigning IP addresses to the LAN and the WAN interfaces

6.1 Principles of operations

The SIG features two Ethernet interfaces :

- **The LAN interface (Ethernet port 1) :**

On that interface, the following IP addresses must be entered :

The router IP address on the LAN interface *.

The IP addresses pool assigned to the remote users when they connect.

* The administration html server is located at that address.

- **The WAN interface :**

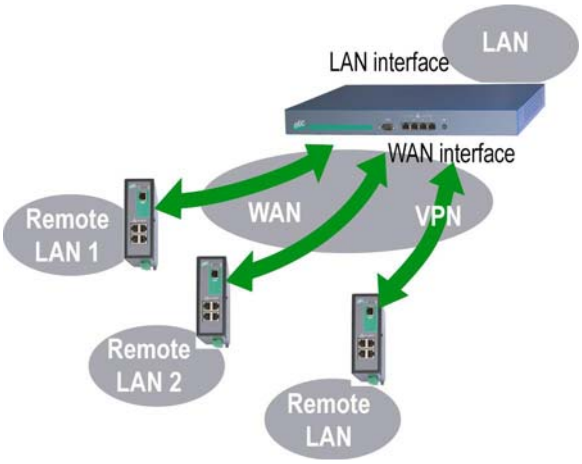
The WAN interface is the « Ethernet Nr 4 » interface.

The SIG behaves at the same time like a VPN server and like a remote access server on that interface.

- **IP addresses assignment rules :**

The SIG router will be able to route packets between the LAN and the WAN interface only if the IP address assigned to the network connected to the LAN interface is different from the one assigned to the WAN interface.

Moreover The LAN IP address must be different from any of the remote LAN IP address.



6.2 LAN interface parameters

6.2.1 IP addresses

- Click the « **Configuration**» menu and then « **LAN interface**» and then "**IP protocol**".

"IP address" parameter :
Enter the IP address assigned to the router over the LAN interface.
That IP address will have to be entered to display the administration server of the router.

"**Netmask" parameter :**
Enter the IP netmask assigned to the LAN

"Start of users IP address pool" & "end of users IP addresses pool" parameters :
That parameters define the pool of addresses which will be assigned automatically to remote user's PC when they will connect to the router.
Enter the start address and the end address.

6.2.2 DHCP server configuration

Over the LAN interface, the SIG router can behave like a DHCP server.
If you select that option, we advise to assign a fixed IP address to the SIG router itself over the LAN interface.

To configure the DHCP server function,

- select the « **Set up**» menu and then « **LAN interface**» and then « **DHCP server** ».
-

“IP address pool start” & “IP addresses pool end” parameters :
That parameters define the range of IP addresses which can be assigned by the SIG to the DHCP client devices.

-

“Primary DNS IP address” & “secondary DNS IP address” parameters :
Enter the IP addresses of the domain name servers.; the DHCP server will communicate that addresses to the DHCP client devices.

6.3 WAN interface parameters

The « Ethernet 4 » RJ45 connector is the WAN interface.

The SIG can be connected to a company network or to any Internet router through that interface.

- Select the « **Internet**» menu and then « **WAN interface**» and then "**Connection**".

"Obtain an IP address automatically" parameter :
Set that option if a DHCP server is in charge of attributing an the IP address of the WAN interface of the router.
Otherwise, enter WAN interface IP address, netmask and default gateway IP address parameters.

"IP address" & "netmask" parameters :
Enter the IP address and netmask assigned to the WAN interface of the router.

"Default gateway" parameter :
Enter the IP address of the default gateway.

"Obtain DNS IP addresses automatically" parameter : Select that option if the Domain name server IP addresses are provided automatically through the WAN interface.
Otherwise, enter the DNS servers IP addresses.

"Primary DNS IP address" & "secondary DNS IP address" parameters :
Enter the IP addresses of the domain name servers.

"Activate network address translation" parameter :
If that option is selected, the source IP address of any packet coming from a device connected to the LAN interface and routed to the WAN interface, is replaced by the SIG router WAN IP address.

7 Creating VPN connections between routers

7.1 Principles

A VPN tunnel is a safe link set between two end-points routers over an IP network : Both routers authenticate, data are encrypted and each device of a LAN can exchange data with each device of the other one.
To get more explanations about how VPNs work, refer to appendix 1.

128 VPNs can be set on the WAN interface of the SIG router.

Two types of VPN can be set : TLS VPNs and IPSec VPNs.

IPSec has the advantage to be a standard solution.

TLS is easier to employ because the transport layer is TCP or UDP; it is why, it can be easily used when the VPN must pass through several or even numerous company routers.

Once a type of VPN (TLS or IPSec) has been selected, all the VPN set with the SIG router will be of the same type.

Two steps are necessary to configure the SIG to create VPN connections between routers :

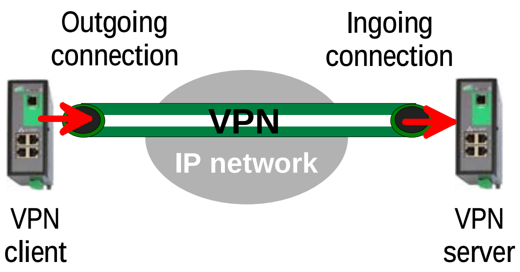
1st step : Select the VPN type and set up the VPN parameters

Once a type of VPN has be selected, it applies to all the connections with remote routers.

2nd step : Create VPN connections

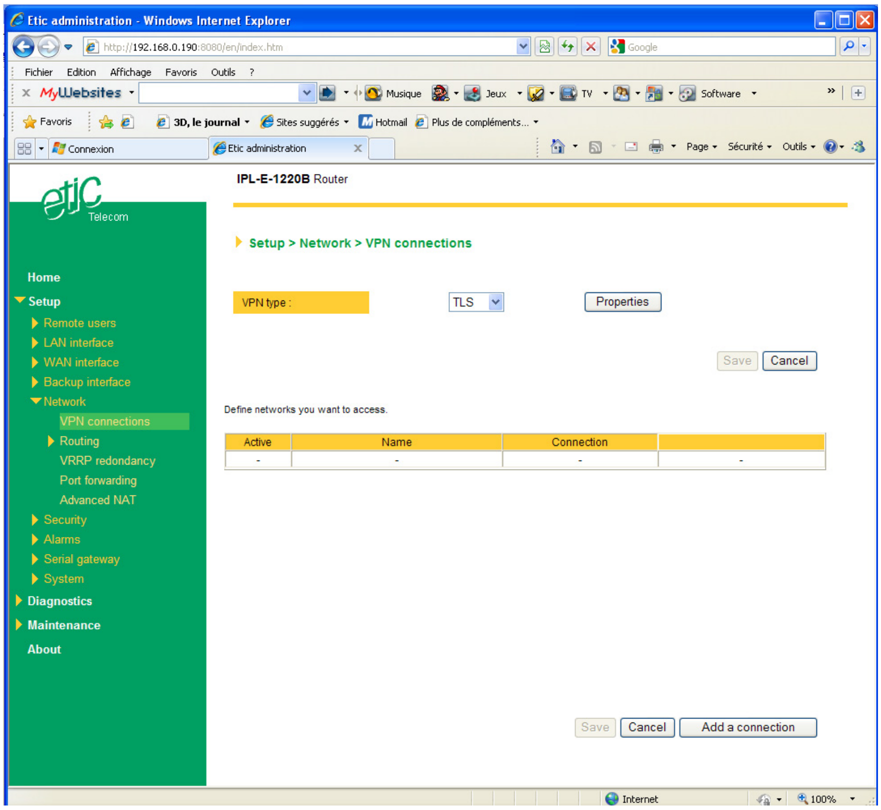
A connection can be an incoming connection or an outgoing connection.

If a connection is an incoming connection, the local router is named "VPN server" and the remote router is a "VPN client".



To create VPN connections between routers,

- select the « **Set up**» menu and then « **Network**» and then “**VPN connections**”.



IPL-E-1220B Router

Setup > Network > VPN connections

VPN type : TLS

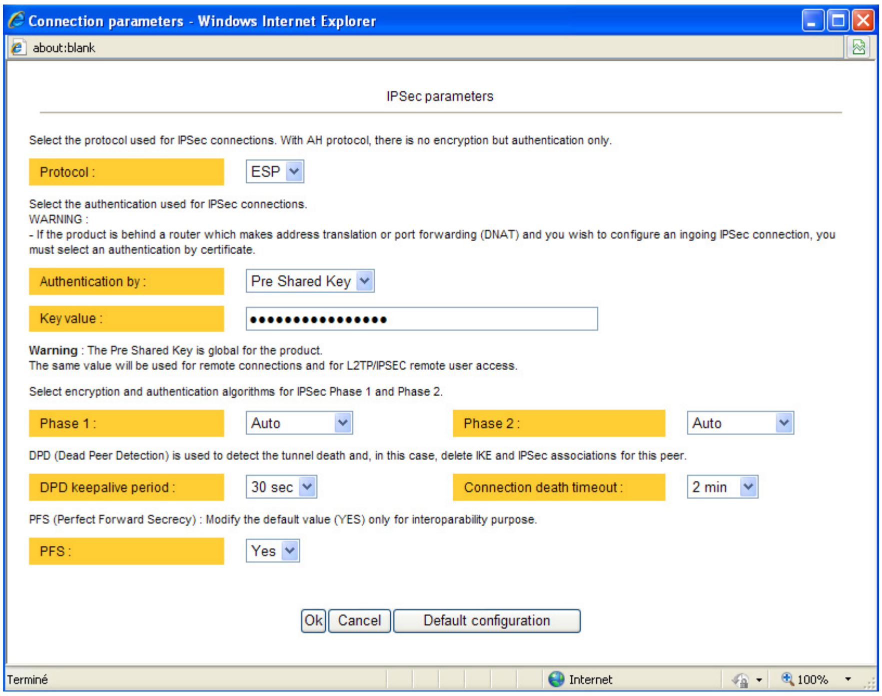
Define networks you want to access.

Active	Name	Connection	
-	-	-	-

7.2 IPSec VPN connections

7.2.1 Configuring the IPSec protocol

- Select the "**Set up"** menu, the "**network**" menu and then '**VPN connections**".
- Select the "**Ipsec**" type of VPN,
- Click **"Properties**" .



IPSec parameters

Select the protocol used for IPSec connections. With AH protocol, there is no encryption but authentication only.

Protocol : ESP

Select the authentication used for IPSec connections.
WARNING :
- If the product is behind a router which makes address translation or port forwarding (DNAT) and you wish to configure an ingoing IPSec connection, you must select an authentication by certificate.

Authentication by : Pre Shared Key

Key value : ●●●●●●●●●●●●●●●●

Warning : The Pre Shared Key is global for the product.
The same value will be used for remote connections and for L2TP/IPSEC remote user access.

Select encryption and authentication algorithms for IPSec Phase 1 and Phase 2.

Phase 1 : Auto Phase 2 : Auto

DPD (Dead Peer Detection) is used to detect the tunnel death and, in this case, delete IKE and IPSec associations for this peer.

DPD keepalive period : 30 sec Connection death timeout : 2 min

PFS (Perfect Forward Secrecy) : Modify the default value (YES) only for interoparability purpose.

PFS : Yes

" Protocol " parameter :
AH ((RFC2402) provides integrity, authentication, replay resistance and non-repudiation but not encryption.
select AH, if no encryption is required or if NAT traversal is required.

ESP provides the same services plus encryption.
If ESP is selected, an encryption and an authentication protocols must be selected.

“Authentication & encryption key” parameters :

Authentication an encryption can be carried-out with a pre-shared key or a certificate.

“Pre-shared key” value :
The pre-shared key value applies to all the connections.
The maximum length of the key is 40 characters.

The same preshared key value will be used for remote users L2TP / IPSec connections.

“**Certificate” value**
The SIG router is delivered with a certificate stored into the product in our factory.
To add a certificate, refer to the “Security” menu.

“Encryption and hash algorithm phase 1” & “Encryption and hash algorithm phase 2” parameters :

That parameters allow to define the encryption and hash algorithms in use during the phase 1 of the exchanges between the end-points (VPN set-up) and during the phase 2 (data exchange).

The default value is Auto; in that case both end-points will negotiate a common algorithm.

“DPD request period” parameters :

A DPD request (also called Keepalive message) is a message sent periodically by each end-point to the other one to make sure that the VPN must be left active.

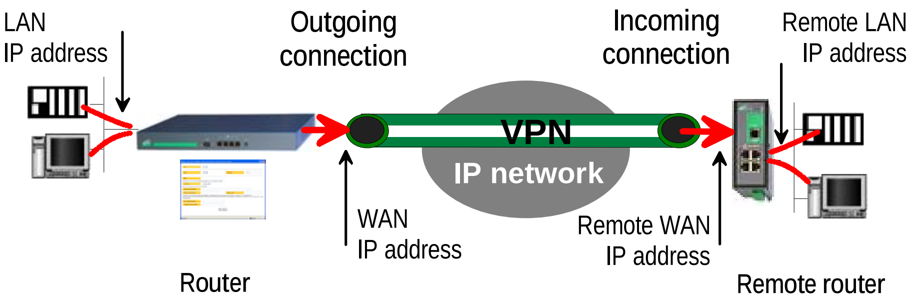
This parameters sets the maximum amount of time (in seconds) between two of these requests.

“Connection death time-out” parameters :

This parameter defines the maximum amount of time (in seconds) a VPN connection will stay established if no traffic or no DPD request message are received from the remote router.

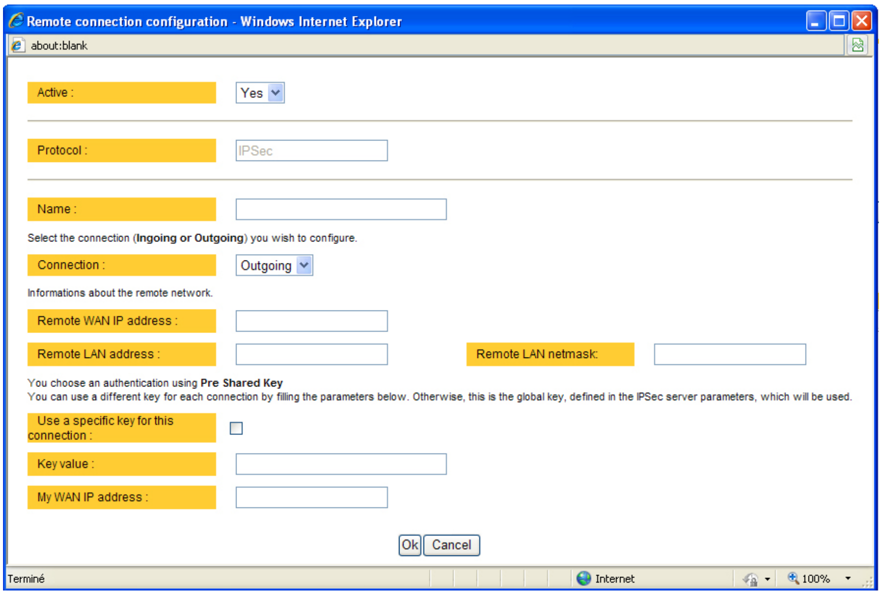
ATTENTION : Once the parameters of the IPSEC connection have been selected, click the OK button and then the Save button.

7.2.2 Setting up an outgoing IPSec connection



To set up an outgoing VPN connection,

- Come back to the “**VPN connections**” screen,
- Click the “add a connection” button.



Active :	Yes
Protocol :	IPSec
Name :	

Select the connection (**Ingoing or Outgoing**) you wish to configure.

Connection :	Outgoing

Informations about the remote network.

Remote WAN IP address :			
Remote LAN address :		Remote LAN netmask:	

You choose an authentication using **Pre Shared Key**
You can use a different key for each connection by filling the parameters below. Otherwise, this is the global key, defined in the IPSec server parameters, which will be used.

Use a specific key for this connection :	☐
Key value :	
My WAN IP address :	

Ok Cancel

Give a name to the connection and select **the “Outgoing” option.**

'Remote WAN IP address' parameter :
Enter the IP network address and netmask assigned to the remote router over its WAN interface..

"Remote LAN address & Remote LAN netmask" parameters :
Enter the IP network address and netmask assigned to the remote LAN.

- **Preshared key**

If the preshared key used by the connection is the general PSK entered in the "VPN" menu, no additional parameter has to be entered.

If a particular PSK must be used, complete the configuration of the connection as explained below.

"Unique PSK for this node" parameter :
Select that option if a particular PSK key has to be used for this connection.

"PSK value" parameter :
Enter the value of the PSK.

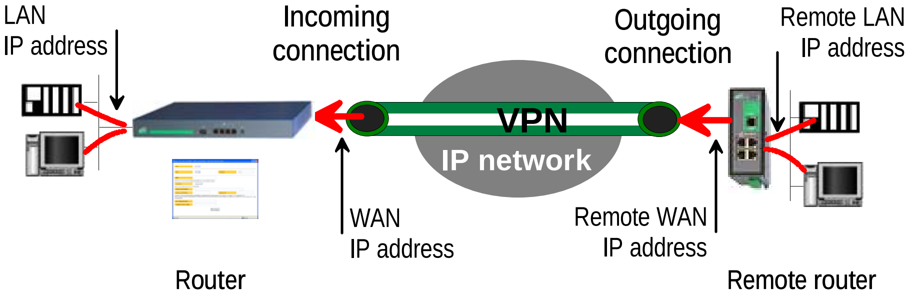
"My WAN address" parameter :
Enter the IP address of the router on the WAN interface.

- **Certificate**

"My subjectAlt name" & "Remote subjectAlt name" parameters :
Paste the field "SubjectAltName" of the active certificate of the router you are configuring and the one the remote router.

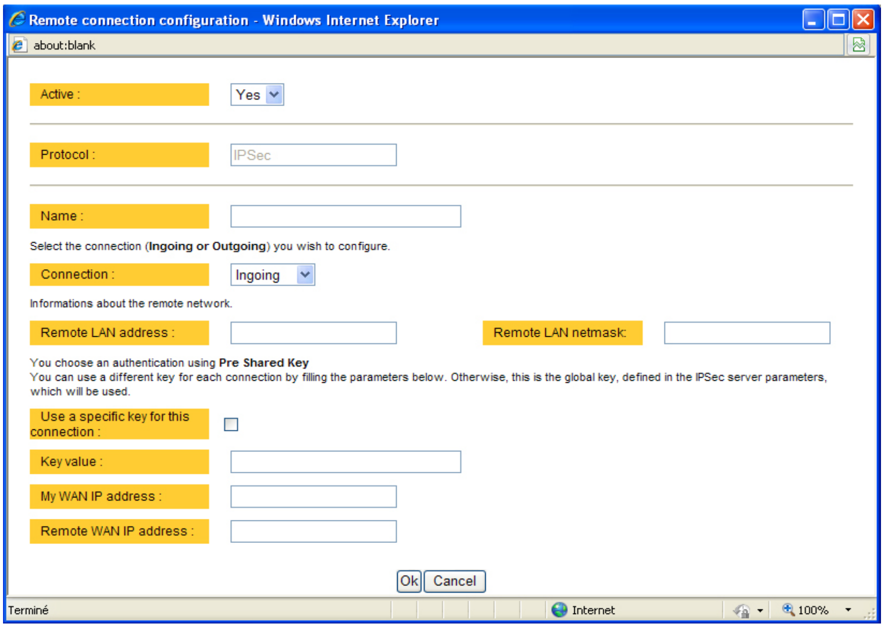
Attention : For ETIC certificates, this field is the Email field

7.2.3 Configuring an ingoing IPSec connection



To set an ingoing VPN connection,

- Come back to the “**VPN connections**” screen,
- Click the “add a connection” button.



Active : Yes

Protocol : IPSec

Name :

Select the connection (**Ingoing or Outgoing**) you wish to configure.

Connection : Ingoing

Informations about the remote network.

Remote LAN address : Remote LAN netmask:

You choose an authentication using **Pre Shared Key**
You can use a different key for each connection by filling the parameters below. Otherwise, this is the global key, defined in the IPSec server parameters, which will be used.

Use a specific key for this connection : □

Key value :

My WAN IP address :

Remote WAN IP address :

Give a name to the connection and select **the "ingoing" connection direction option**.

"Remote WAN IP address" parameter :
Enter the IP network address and netmask assigned to the remote router over its WAN interface.

"Remote LAN address" & "Remote LAN netmask" parameters :
Enter the IP network address and netmask assigned to the remote LAN.

- **Preshared key**

If the key used by the connection is the general PSK entered in the VPN menu, no additional parameter has to be entered.

If a particular PSK must be used, carry out the configuration of the connection as explained below.

"Use a specific key for this connection" parameter :
If that option is not selected, the preshared key entered in the VPN configuration screen will be used by the router.
If that option is selected, enter the specific key.

"My WAN address & Remote WAN address" parameters :
Enter the WAN IP address of the router and the WAN IP address of the remote router.

Attention : For ETIC certificates, this field is the Email field

- **Certificate**

"My subjectAlt name" & "Remote subjectAlt name" parameters :
Paste the field "SubjectAltName" of the active certificate of the router you are configuring and the one the remote router.

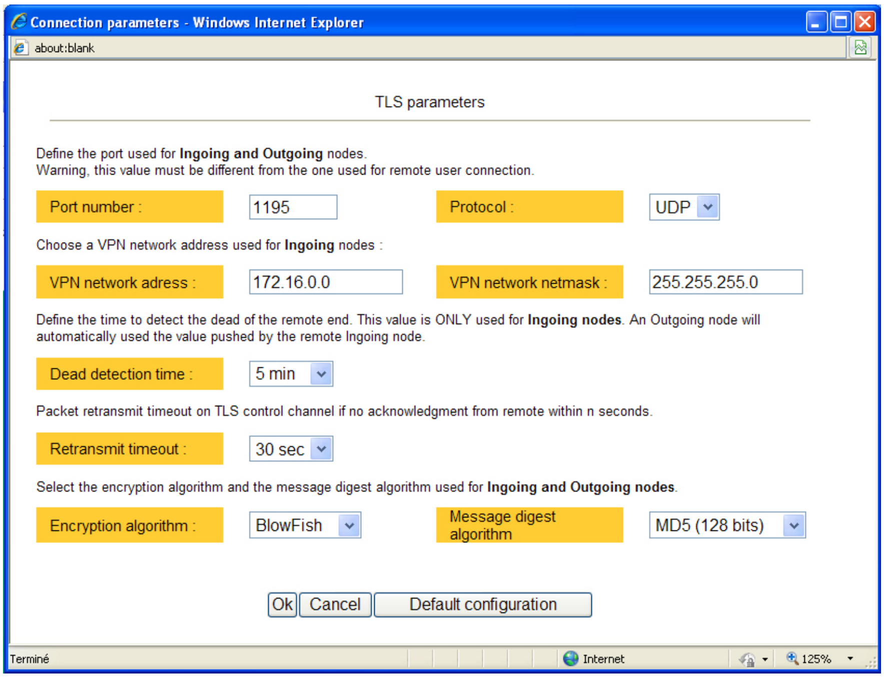
Attention : For ETIC certificates, this field is the Email field.

7.3 TLS VPN connections

7.3.1 Configuring the TLS-SSL protocol

- Select the “**Set up**” menu, the “**network**” menu and then the ‘VPN connections” menu.

- Select the “**TLS**” VPN type and click “Properties” .



TLS parameters

Define the port used for **Ingoing and Outgoing** nodes.
Warning, this value must be different from the one used for remote user connection.

Port number :	1195	Protocol :	UDP

Choose a VPN network address used for **Ingoing** nodes :

VPN network adress :	172.16.0.0	VPN network netmask :	255.255.255.0

Define the time to detect the dead of the remote end. This value is ONLY used for **Ingoing nodes**. An Outgoing node will automatically used the value pushed by the remote Ingoing node.

Dead detection time : 5 min

Packet retransmit timeout on TLS control channel if no acknowledgment from remote within n seconds.

Retransmit timeout : 30 sec

Select the encryption algorithm and the message digest algorithm used for **Ingoing and Outgoing nodes**.

Encryption algorithm :	BlowFish	Message digest algorithm	MD5 (128 bits)

“Port number” & “protocol” parameters :
Select the port Nr and the type of level 3 protocol used to transport the TLS VPN; UDP will be preferred.

Attention :
The port number value must be different from the one used by remote users.

“VPN network address” & “VPN network netmask” parameters :

The TLS VPN server router assigns automatically an IP address to the VPN client router.

That VPN IP address must not be confused with the WAN interface IP address.

Attention :

The VPN IP network address field must be different from the WAN network IP address .

The number of VPN addresses cannot be greater than 255; the netmask cannot exceed 255.255.255.0.

“Connection death time-out” parameter :

This parameter defines the maximum amount of time (in seconds) a VPN connection will stay established before being cleared if no response to the VPN control message has been received from the remote router.

“Packet retransmit time-out” parameter:

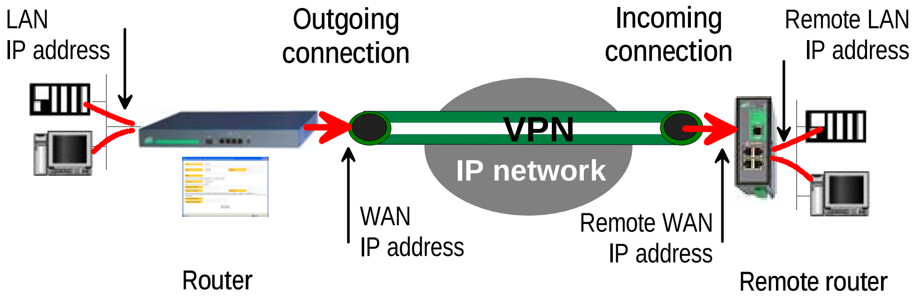
A control message (also called Keepalive message) is sent periodically by the VPN server router to make sure that the VPN must be left active.

This parameters sets the amount of time (in seconds) the server will wait for the response before repeating it.

“Encryption algorithm” & “Authentication algorithm” parameter :

That parameters allow to define the encryption and hash algorithms in use.

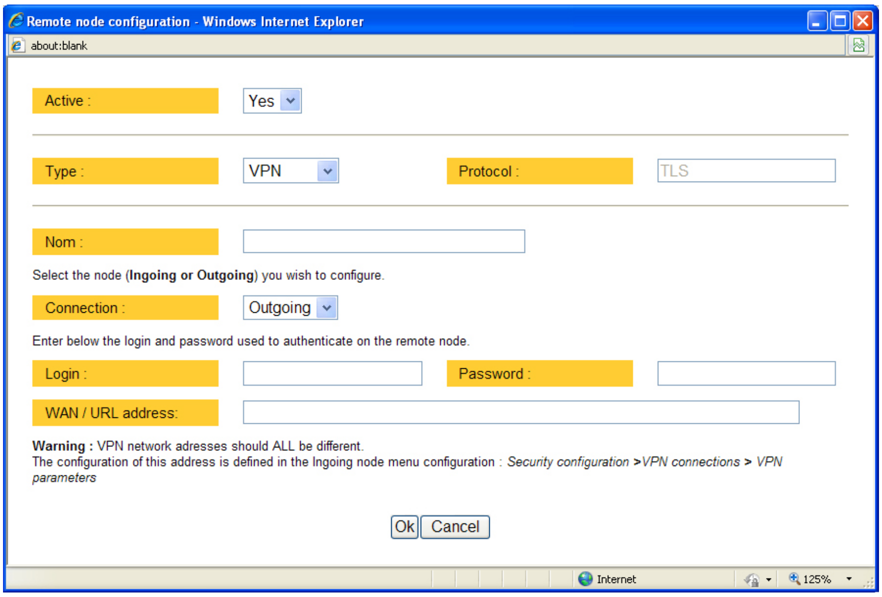
7.3.2 Configuring an outgoing TLS connection



- Select the "**Set up**" menu, the "**network**" menu and then the '**VPN connections**" menu.

- Click the "add a connection" button.

- Give a name to the connection and select **the "Outgoing" connection direction** option.



Active : Yes

Type : VPN   Protocol : TLS

Nom :

Select the node (**Ingoing or Outgoing**) you wish to configure.

Connection : Outgoing

Enter below the login and password used to authenticate on the remote node.

Login :   Password :

WAN / URL address:

Warning : VPN network adresses should ALL be different.
The configuration of this address is defined in the Ingoing node menu configuration : *Security configuration* >*VPN connections* > *VPN parameters*

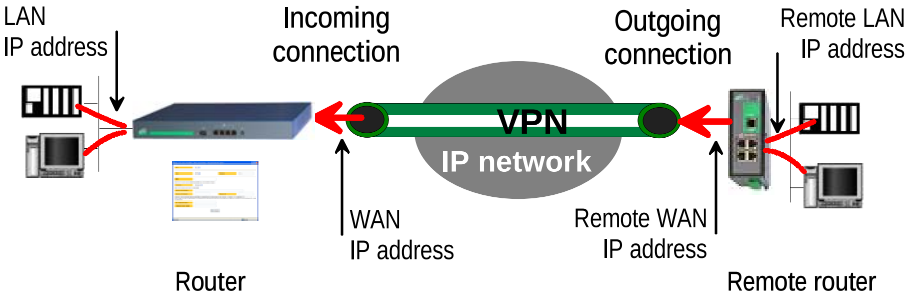
Ok Cancel

“Login & Password” parameter:
Enter the login and password, the router will have to use to authenticate.

Remote WAN IP address / URL parameter :
Enter the IP address of the remote router or its DNS name.

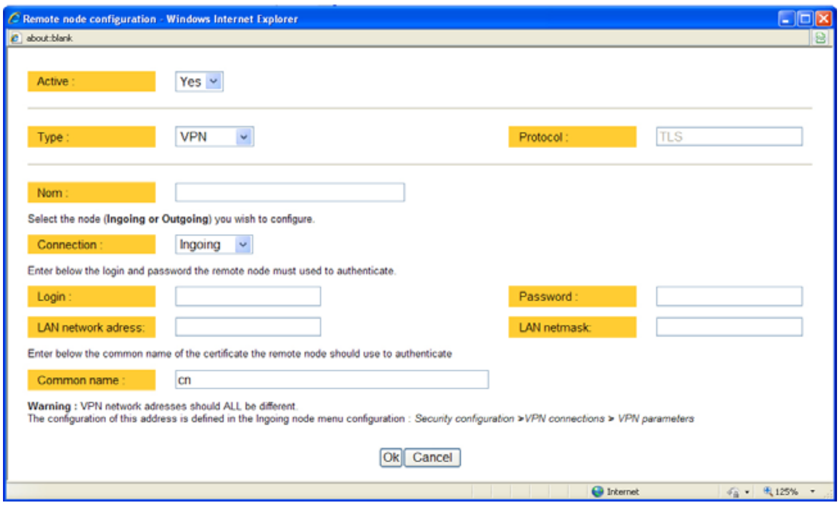
“Remote WAN IP address” ” parameters :
Enter the IP network address and netmask assigned to the remote router over its WAN interface.

7.3.3 Configuring an ingoing TLS connection



- Select the “**Set up**” menu, the “**network**” menu and then the ‘**VPN connections**” menu.

- Click the “add a connection” button.



Active :	Yes		
Type :	VPN	Protocol :	TLS
Nom :			

Select the node (**Ingoing or Outgoing**) you wish to configure.

Connection :	Ingoing

Enter below the login and password the remote node must used to authenticate.

Login :		Password :	
LAN network adress:		LAN netmask:	

Enter below the common name of the certificate the remote node should use to authenticate

Common name :	cn

Warning : VPN network adresses should ALL be different.
The configuration of this address is defined in the Ingoing node menu configuration : *Security configuration >VPN connections > VPN parameters*

Give a name to the connection and select **the “ingoing” connection direction** option.
“Remote router Login” & “Remote router password” ” parameters :
Enter the login and password of the remote router
The remote router has to use that login and password to authenticate.

“Remote LAN address” & “Remote LAN netmask” ” parameters :
Enter the IP network address and netmask assigned to the remote LAN.

“Common name” parameters :
Enter the remote router certificate common name.

Attention : For ETIC certificates, this field is the Email field.

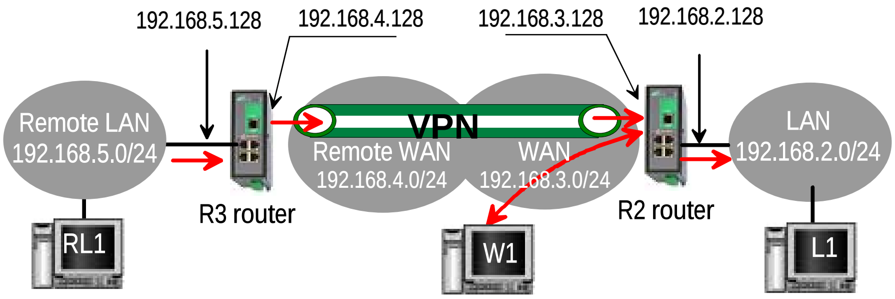
8 Routing functions

8.1 Basic routing function

Once an iP address has been assigned to the R2 router on the LAN interface and another one on the WAN interface (see drawing hereafter), the SIG R2 router is ready to route frames …

… between devices connected to the remote LAN network like RL1, and devices connected to the LAN network like L1 through a VPN;

… between devices connected to the WAN network like W1, and devices connected to the LAN network like L1

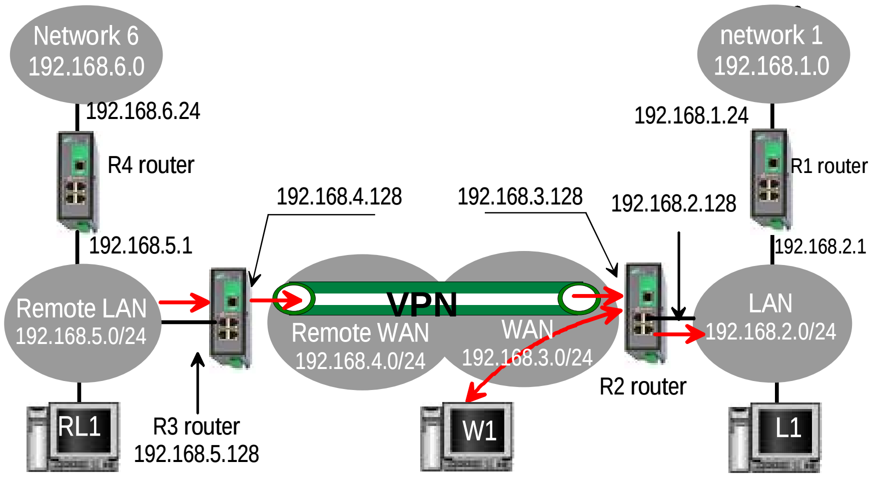


Remark 1 : Firewall rules must be set to authorize WAN to LAN transfer.

Remark 2 : A default gateway address must be entered in each device of the different networks.

8.2 Static routes

However, the router R2 is not able to route frames between a device like L1 belonging to the LAN network and a device connected to “network 6” (see the drawing hereafter).



In that case, it is necessary to enter the route to that hidden “network 6”; that route is called a static route.

A static route consists in a table which describes a destination network (IP address and netmask) and the IP address of the neighbour router through which an IP packet to that destination must pass.

Router 2 static routes :

Active	Route name	Destination	Netmask	Gateway
Yes	Network 6	192.168.6.0	255.255.255.0	192.168.5.1
Yes	Network 1	192.168.1.0	255.255.255.0	192.168.2.1
Yes	Network Remote WAN	192.168.4.0	255.255.255.0	192.168.5.128

Remark :
It is not necessary to enter in the router R2 the static route to the WAN network nor to the remote LAN network, that routes have been automatically created by the router respectively when the WAN IP address has been entered and when the VPN has been configured.

To set a static route,

- Select the "**Configuration**" menu, the "**network**" menu the "**Routing**" menu and then "**Static routes**".
- click the "Add a route" button.

"Destination IP address" & "netmask" parameters :
Enter the destination network IP address and netmask.

"Gateway IP address" parameters :
Enter the Ip address of the gateway through which the IP packets intended for that network must pass.

8.3 RIP protocol

RIP (**Routing Information Protocol**) is a routing protocol which enables each router belonging to a network to acquire the routes to any subnet.

The principle is as follows :

Routing table
Each router holds a routing table.
Each entry of the table consists in the destination subnet address and the adjacent router address leading to that subnet.

Routing table broadcasting :
Each router broadcasts its table**.**

Routing table update :
Each router updates its own table using the tables received from the other ones.

To enable RIP,

- select the « **Set up**» menu, the “Routing” menu and then the “RIP” menu».
- Select the ‘Enable RIP on LAN interface” and the “Enable RIP on WAN interface” options.

9 Address and port translation

The SIG provides the capability to replace the original source IP address and the destination port and IP address in particular situations.

9.1 Port forwarding

The port forwarding function consists in transferring to a particular device connected to the LAN interface a particular data flow addressed to the SIG router on its WAN interface.

That function applies only to the frames addressed to the WAN IP address of the router.

The transfer criteria is the port number; the port number is used as an additional address field.

When a frame is addressed to the SIG router with a particular registered port, it is transferred to a particular device connected to the LAN interface.

Example :

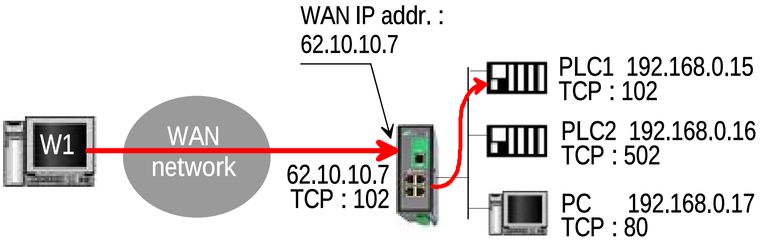
Let us suppose the PC named “W1” of the WAN network has to send frames to the device PLC1 of the LAN network

Suppose moreover that the addresses of the LAN network cannot be used on the WAN network for any reason.

The solution can be to use the Port forwarding function :

When W1 needs to transmit frames to PLC1, it addresses the frames to the SIG router on a chosen and agreed port.

The router checks the frame, replaces the destination address by the Ip address of the device on the LAN interface, and eventually changes the port number.



The port forwarding rule will be

Internet / WAN	LAN translation	
Service	Device	Service
102	192.168.0.15	102
502	192.168.0.16	502
80	192.168.0.17	80

To set the Port forwarding function,

- select the “network” menu and then the “Port forwarding” menu.
- Click “Add a DNAT” rule.

9.2 Advanced network address and port translation

9.2.1 Principle

That function consists in replacing the source port and IP address or the destination port and IP address of particular frames received by the router on its interfaces according to configured rules.

It applies to all the frames received by the router on any of its two interfaces except to the IP packets contained in a remote user PPTP or TLS connection.

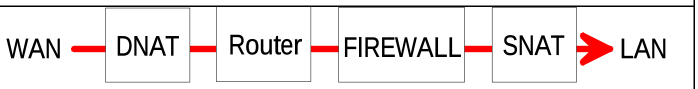
It applies as well to frames the destination address of which is the SIG router itself or to frames the destination IP address is a device belonging to the LAN subnet, or to the WAN subnet or to another network.

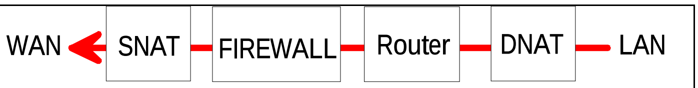
One brings out

the DNAT function which consists in replacing the destination port and IP address.

the SNAT function which consists in replacing the source IP address.

Because the DNAT and SNAT functions modify the IP addresses of the IP packets processed by the SIG router, and because the firewall filters that frames, it is very important to understand in which order that different functions are carried out.

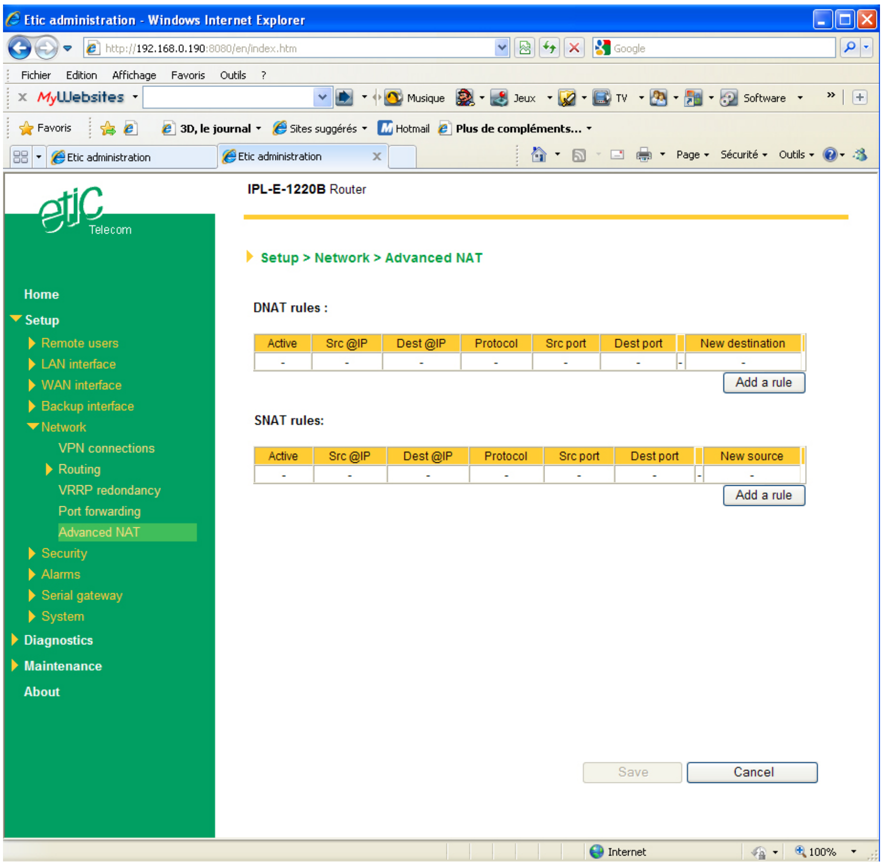
Direction	
WAN to LAN	 WAN DNAT Router FIREWALL SNAT LAN

LAN to WAN	 WAN SNAT FIREWALL Router DNAT LAN

9.2.2 Configuration

To set the advanced address translation functions,

- select the “**Set up**” menu, “**Network**” , and then the “**Advanced NAT**” menu.



IPL-E-1220B Router

Setup > Network > Advanced NAT

DNAT rules :

Active	Src @IP	Dest @IP	Protocol	Src port	Dest port		New destination
-	-	-	-	-	-	-	-

Add a rule

SNAT rules:

Active	Src @IP	Dest @IP	Protocol	Src port	Dest port		New source
-	-	-	-	-	-	-	-

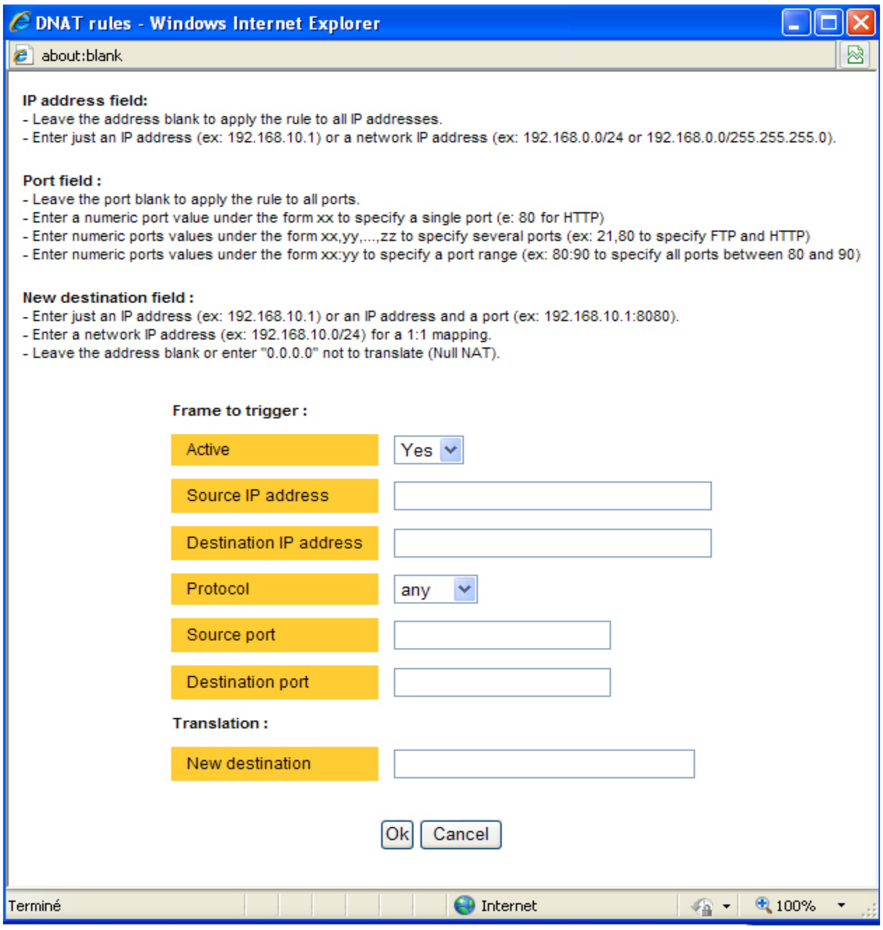
Add a rule

Save Cancel

To create a new DNAT rule

- Click "Add a DNAT" rule.
- Select "Yes" to enable the rule.
- Enter the replacement criterion :
  Source IP address & Destination IP address.
  Protocol (TCP, UDP, …)
  Source port & Destination port

- Enter the new destination port number and IP address.



IP address field:
- Leave the address blank to apply the rule to all IP addresses.
- Enter just an IP address (ex: 192.168.10.1) or a network IP address (ex: 192.168.0.0/24 or 192.168.0.0/255.255.255.0).

Port field :
- Leave the port blank to apply the rule to all ports.
- Enter a numeric port value under the form xx to specify a single port (e: 80 for HTTP)
- Enter numeric ports values under the form xx,yy,...,zz to specify several ports (ex: 21,80 to specify FTP and HTTP)
- Enter numeric ports values under the form xx:yy to specify a port range (ex: 80:90 to specify all ports between 80 and 90)

New destination field :
- Enter just an IP address (ex: 192.168.10.1) or an IP address and a port (ex: 192.168.10.1:8080).
- Enter a network IP address (ex: 192.168.10.0/24) for a 1:1 mapping.
- Leave the address blank or enter "0.0.0.0" not to translate (Null NAT).

Frame to trigger :

Active	Yes
Source IP address	
Destination IP address	
Protocol	any
Source port	
Destination port	

Translation :

New destination	

To replace the source IP address & destination port

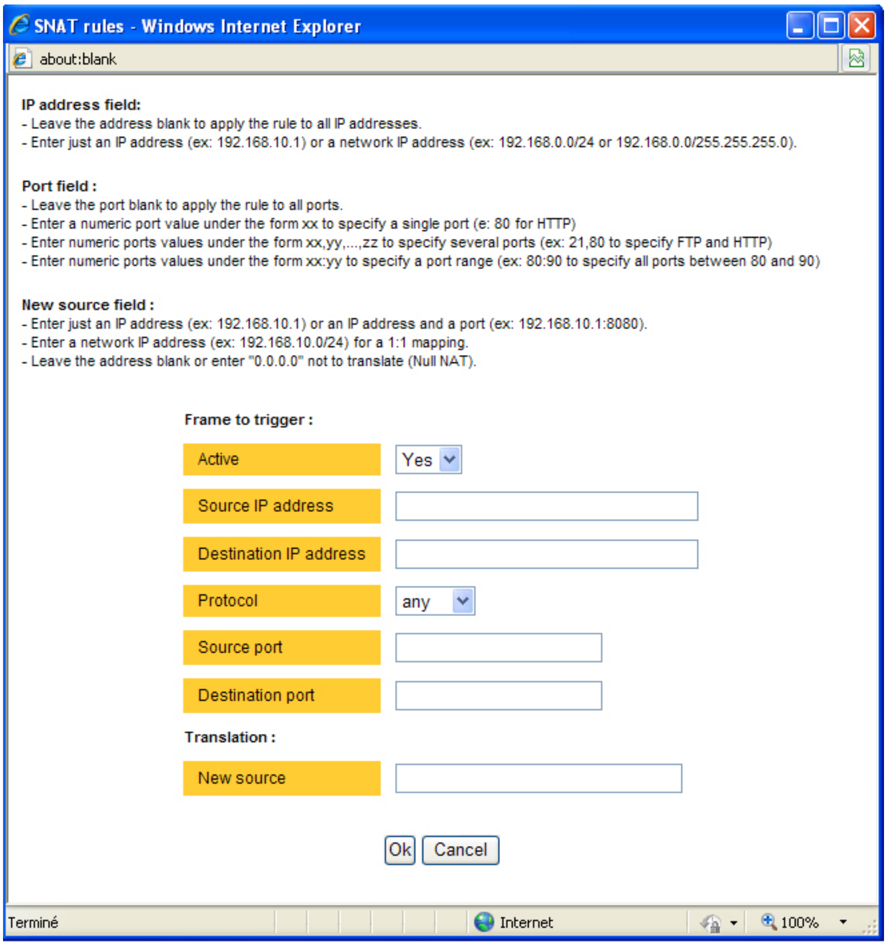
- Click "Add a SNAT" rule.

- Select "Yes" to enable the rule.

- Enter the replacement criterions :

Source & Destination IP address.
Protocol (TCP, UDP, …)
Source & Destination port

- Enter the new source IP address.



IP address field:
- Leave the address blank to apply the rule to all IP addresses.
- Enter just an IP address (ex: 192.168.10.1) or a network IP address (ex: 192.168.0.0/24 or 192.168.0.0/255.255.255.0).

Port field :
- Leave the port blank to apply the rule to all ports.
- Enter a numeric port value under the form xx to specify a single port (e: 80 for HTTP)
- Enter numeric ports values under the form xx,yy,...,zz to specify several ports (ex: 21,80 to specify FTP and HTTP)
- Enter numeric ports values under the form xx:yy to specify a port range (ex: 80:90 to specify all ports between 80 and 90)

New source field :
- Enter just an IP address (ex: 192.168.10.1) or an IP address and a port (ex: 192.168.10.1:8080).
- Enter a network IP address (ex: 192.168.10.0/24) for a 1:1 mapping.
- Leave the address blank or enter "0.0.0.0" not to translate (Null NAT).

Frame to trigger :

Active	Yes
Source IP address	
Destination IP address	
Protocol	any
Source port	
Destination port	

Translation :

New source	

10 VRRP redundancy

10.1 Principle

VRRP is a protocol designed to increase the availability of the default gateway of a subnet.

Thanks to VRRP, a group of two or more routers can service the hosts of one subnet instead of only one usually; only one router of that group actually routes frames; if it fails another one of the group takes its place.

The routers belonging to a VRRP group must be connected to the same Ethernet segment.

VRRP works as follows :

An usual IP address is assigned to each router of the group.

An additional and common IP address, called the virtual IP address is assigned to all the routers of the group. This virtual address is the address which must be stored as the default gateway address in all the host devices belonging to the subnet.

A priority index is assigned to each router of the group. Using that index, the routers of the group can elect a master router; the master router is the one which has the greatest priority code. The other routers are the backup routers.

The master router is the only one to answer to the ARP requests and route actually frames. It uses the virtual IP address and the virtual MAC address If that option has been selected.

In case of failure of the master router, another master router is elected. It replaces the router in failure. It will use the same virtual IP address and the virtual MAC address as the previous master router.

The SIG router manages that protocol as well on the LAN and on the WAN interface.

10.2 Configuring VRRP on the LAN interface

To enable and configure VRRP,

- select the “**Set up**” menu, the “**network**” menu and then the “**VRRP” menu**.

«Enable VRRP on the LAN interface» parameters :

Tick that checkbox to enable VRRP on the LAN interface.

«VRRP Id (1-255)» parameter:

Assign an identity code to the routers group between 1 and 255.

The same identity code must be assigned to all the routers of the group.

«Virtual IP address» parameter :

Enter the IP address the elected master router will use to answer to ARP requests.

«Priority (1-255)» parameter :

Assign a priority index to the router

The router which has the greatest index will become the master router.

«Use a virtual MAC address» parameter :

A virtual MAC address can be associated to the virtual IP address.

If that option is selected, the elected master router will answer to ARP requests by using that virtual MAC address.

That MAC address is 00-00-5E-00-01-XX, where XX is the VRRP Id of the group coded in hexadecimal.

10.3 Configuring VRRP on the WAN interface

To enable and configure VRRP,

- select the “**Set up**” menu, the “**network**” menu and then the “**VRRP” menu**.

«Enable VRRP on the WAN interface» parameter :

Tick that checkbox to enable VRRP on the LAN interface.

«VRRP Id (1-255)» parameter :

Assign an identity code to the routers group between 1 and 255.

The same identity code must be assigned to all the routers of the group.

«Virtual IP address» parameter :

Enter the IP address the elected master router will use to answer to ARP requests.

«Priority (1-255)» parameter :

Assign a priority index to the router

The router which has the greatest index will become the master router.

«Use a virtual MAC address» parameter :

A virtual MAC address can be associated to the virtual IP address.

If that option is selected, the elected master router will answer to ARP requests by using that virtual MAC address.

That MAC address is 00-00-5E-00-01-XX, where XX is the VRRP Id of the group coded in hexadecimal.

11 Remote users connections service

The SIG provides a full remote user connection function called RAS :

- The remote user authenticates using the login, password and eventually a certificate; the router accepts the connection only if the remote user belongs to the user list.
- Individual access rights are automatically allocated to the remote user.
- An IP address belonging to the LAN network is automatically assigned to the remote PC.
- Data are encrypted (TLS and L2TP / IPSec only).
- The connection is logged.
- Moreover, the SIG is compatible with the M2Me_Connect service when setting a direct connection is not possible.

To set up the remote user connection service, the following steps must be carried out :

- Step 1 :

Configure a PPTP or TLS or L2TP connection

- Step 2 :

Complete the user list

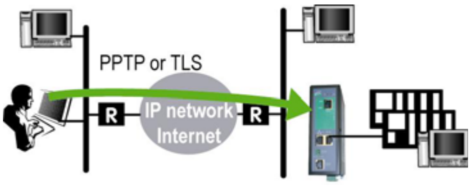
- Step 3 ::

Define the firewall rules to limit the rights of the remote users

12 Remote users connections

12.1 Principles

A remote user connection is a tunnel set between a remote PC and a router providing the RAS function (Remote Access Service), like the SIG.



A remote user connection provides security and simplicity advantages :

- The remote user is identified with a login in and password or eventually a certificate.

- The data is encrypted (TLS or L2TP).

- An IP address belonging to the local network is automatically assigned to the remote user's PC.

The SIG manages PPTP and TLS or L2TP remote connections.

Only one type can be selected. It will apply to all the remote users connections.

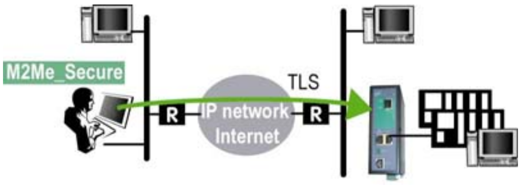
A PPTP is the simplest type of remote user connection; data is not encrypted.
The remote user can be identified only with a login and password.

A TLS connection provides encryption; moreover; the remote user can be identified with a log in and password and with a certificate if necessary.

12.2 Configuring a TLS connection

The M2Me_Secure software provided by ETIC TELECOM is a Windows TLS client software.
Installed on a PC running Windows XP or Seven, M2Me_Secure makes TLS connections from a remote PC to the SIG easy; moreover it includes a connection book in such a way one just need a click to connect to a remote site.

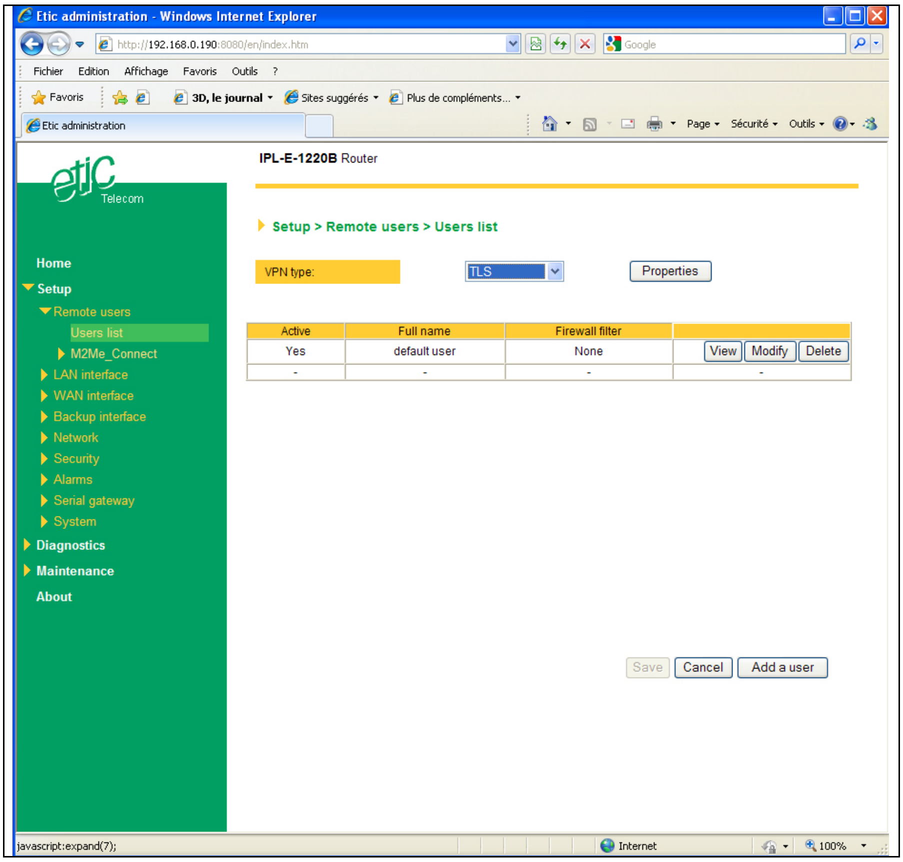
We describe hereafter how to configure the router and the M2Me_Secure software to set a TLS VPN between both.



Step 1 : Router configuration

To configure a remote user TLS connection,

- select the “**Set up**” menu, the “**Remote users**” menu and then the “**User list” menu**.



IPL-E-1220B Router

Setup > Remote users > Users list

VPN type: TLS

Active	Full name	Firewall filter	
Yes	default user	None	View Modify Delete
-	-	-	-

- Select the VPN type “ TLS”.

- Click the “Properties” button and set the parameters.

”Port number” & “Protocol” :
Select the port Nr and the type of level 3 protocol used to transport the TLS VPN; UDP will be preferred.

Attention :
The selected port number assigned to the remote users connections must be different from the one used for VPN connections between routers if such VPN connections have been configured.

“Remote Users authentication” parameters :

Authentication an encryption can be carried-out with a pre-shared key or a certificate.

If the “Login/password” is selected, the remote user is authenticated with a login and a password.

If the “Login/password and Certificate” value is selected, the remote PC is authenticated with the certificate and the user with a login and password. In that case, the PC certificate must be stored in the user list.

«Encryption algorithm» & «Message digest algorithm» parameters :

Leave the default values.

Step 2 : Configure the M2Me_Secure software

For detailed information, refer to the M2Me_Secure manual.

- Click « Menu » and then « New site ». The Site configuration window is displayed.

- Select the « General » tab and enter a site name.

- Select the « Connection » tab; select the option “That site can be reached through the Internet.

- In the field « Host name or IP address », select the router IP address or DynDNS name or DNS name.

- Select the « Advanced tab » ; select the level 3 protocol (UDP or TCP), the port number and the encryption algorithm.

These parameters must have the same values must in the PC and in the router.

12.3 Configuring a PPTP connection

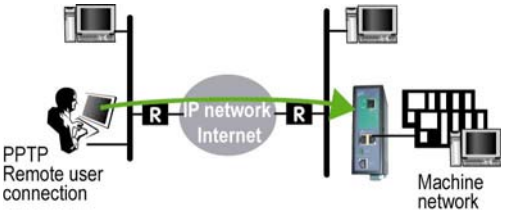
We describe hereafter how to configure the router and the PC to set a PPTP remote user connection between them.

Step 1 : Router configuration

- select the “**Set up**” menu, the “**Remote users**” menu and then the “**User list” menu**.

- Select the VPN type “ PPTP”.

Remark : The “properties” button allows to modify the authentication protocol; leave the default configuration if the PPTP client is a PC running Windows.



Step 2 : Set a PPTP connection on the PC side.

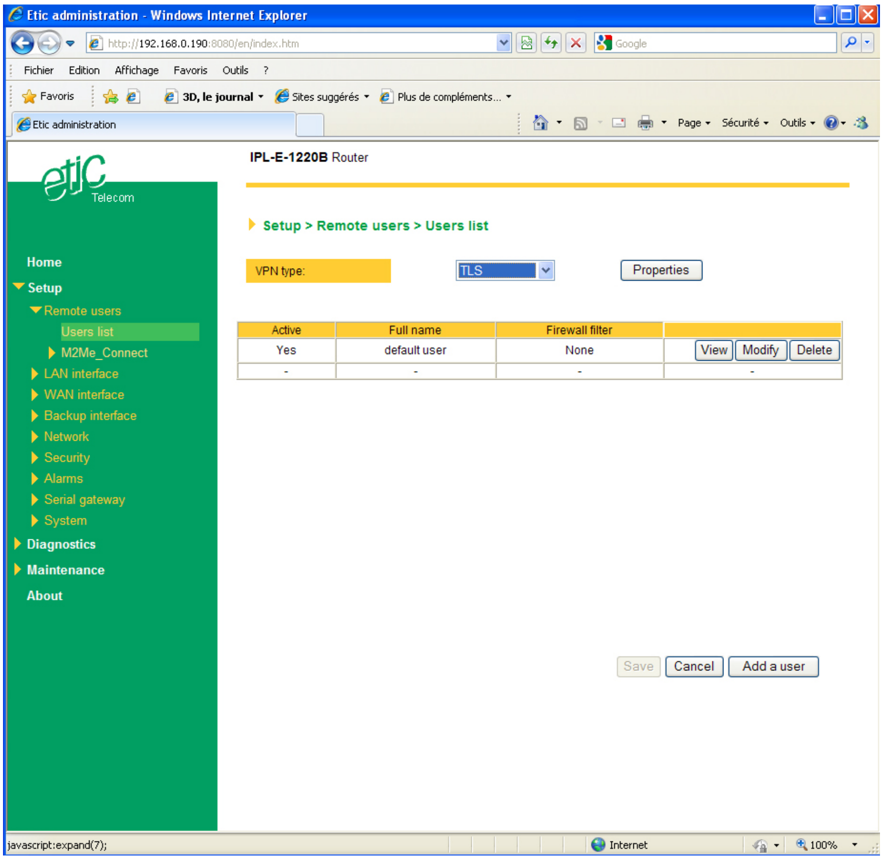
13 Users list

The user list registers 25 authorised remote users forms.

Each user form stores the identity of the user (Login and password), his email address to send alarm emails and the filter assigned to him.

To display the user list,

- select the “**Set up**” menu, the “**Remote users**” menu and then the “**User list”** menu.



IPL-E-1220B Router

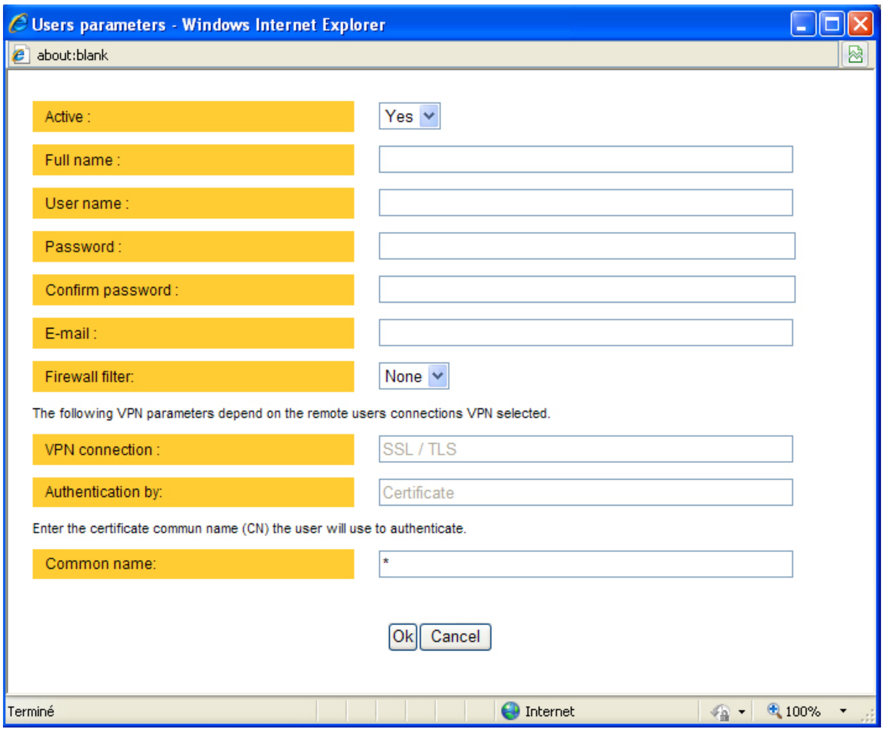
Setup > Remote users > Users list

VPN type: TLS

Active	Full name	Firewall filter	
Yes	default user	None	View Modify Delete
-	-	-	-

Attention :
Coming from factory, a default user is registered; his login is **admin** and the password is also **admin**. After the test phase, we advise to modify these login and password.

To add a user form



Active :	Yes
Full name :	
User name :	
Password :	
Confirm password :	
E-mail :	
Firewall filter:	None

The following VPN parameters depend on the remote users connections VPN selected.

VPN connection :	SSL / TLS
Authentication by:	Certificate

Enter the certificate commun name (CN) the user will use to authenticate.

Common name:	*

- Click the “add a user ” button

“ Active (value Yes or NO)” :
Select “No” if you want to prevent the user to access the network.
Select “yes” to authorize the user to access the network.

Full name :
It is the name displayed in the user list.

Login & password
The login and the password will have to be entered by each user at the beginning of the remote connection.

E-mail :
The SIG will send an email to that address in two situations :
Alarm email : the SIG sends an alarm email to the defined user If the input 1 is closed or opened (if that option has been set).

Internet connection email : Once connected to the Internet, the SIG will send to the demanding user an email containing the dynamic IP @ assigned to the SIG by the provider. (See OPERATION chapter).

Firewall filter :
Select a filter in the list.
A filter defines a domain of the local network.
Thus, once assigned to a user, a filter limits his or her access rights.

14 Firewall

14.1 Overview

The firewall filters IP packets between the WAN and the LAN interface of the SIG router. It is divided in 3 particular filters :

- **The remote users filters**

The function of the remote users filters is to limit the IP domain an authenticated remote user can reach when he connects to the SIG router through the Internet.

The remote users filters filter the destination IP address and port number of the IP packets included inside a PPTP or TLS or L2TP remote user connection.

Thus the IP addresses checked by the remote users filters are LAN IP addresses.

25 remote users filters can be created and assigned individually to each of the users declared in the user list.

The source IP address of the packets is not checked by the remote users filters because the filters apply to the remote users connections according the login and password of the remote user checked when the remote user connection is set.

- **The main filter**

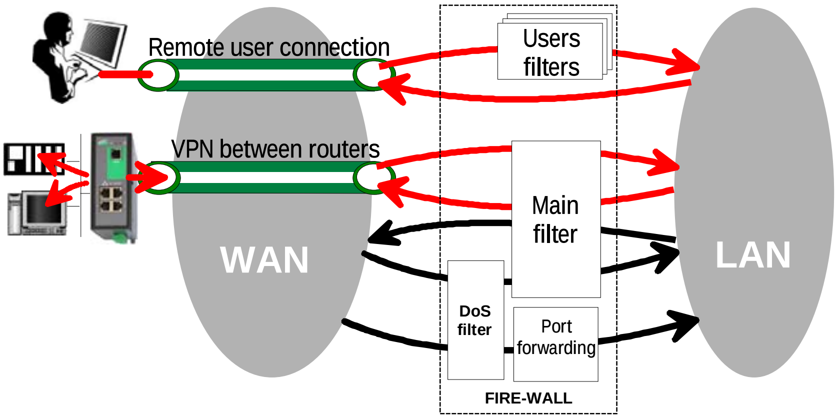
It filters IP packets whether carried inside one of the VPNs or outside a VPN.
The main filter checks source and destination IP addresses and the source and destination ports.

The main filter does not check the IP packets included in a remote user connection. That packets are checked by the remote users filter.

The main filter does not check the IP packets defined in the “Port forwarding” table. That packed are directly forwarded to the defined device (see Port forwarding).

- **The deny of service filter** is made to usual attacks coming from the Internet. That filter cannot be configured.

The firewall of the SIG firewall can thus be represented by the drawing hereafter :



14.2 Main filter

The main filter applies to all the IP packets except to the ones included in remote users connections.

To recognize a TLS remote user connection, the router detects the port number.

14.2.1 Main filter Overview

- **Main filter structure**

For a better organisation, the main filter is divided in two tables; both having the same structure.

The “VPN” filter : It filter the packets transmitted inside the VPNs.
The “WAN” filter : It filters the packets transmitted outside the VPNs

Each of that two filters is made of

a filter policy
and
a filter table each line of which is a filter rule

- **Main filter default policy**

The default policy is the decision which will be applied if a packet does not match any of the rules of the filter.

The WAN to LAN and the LAN to WAN traffic are regarded separately because the decision can be opposite for a packet coming from the WAN or coming from the LAN :

WAN to LAN : The default policy can be “Accept” or “drop”.

LAN to WAN : The default policy can also be “Accept” or “drop”.

For instance, if the default policy assigned the WAN to LAN traffic is “drop”, it means that an IP packet which does not match any of the rules of the main filter will be rejected.

- **Main filter table**

The main filter is a table, each line being a rule.

Each rule of the filter is composed a several fields which defines a particular data flow and another field which is called the action field.

The fields which define the data flow are :
Direction (« WAN to LAN » or « LAN to WAN »),
Protocol (TCP, UDP…),
IP@ & port number, source & destination.

The Action field can take two values
Accept : To authorize the data flow to be forwarded to the router interface.
Drop : To drop the packet which matches the rule.

- **How does the main filters works**

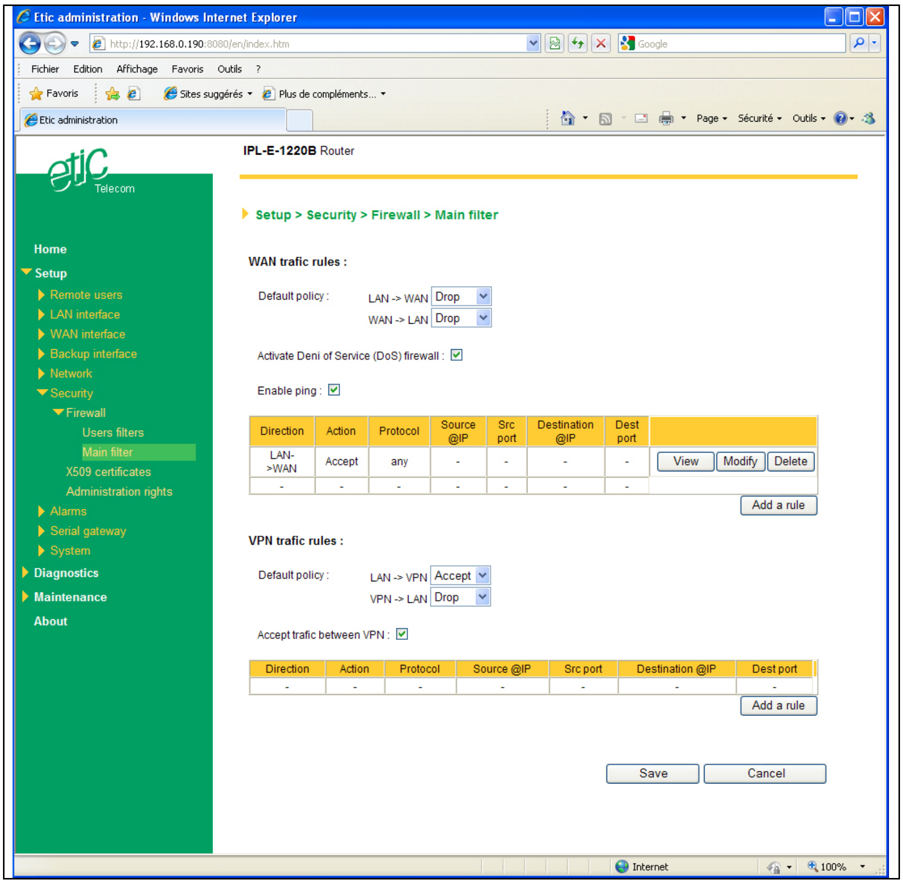
When the firewall receives a packet, it checks if it matches the first rule..
If it does, the decision is applied to the packet according to the "Action" field.

If it does not, the firewall checks if it matches the second rule; and so on.

If the packet does not match any of the rules of the table, the default policy is applied to the packet (drop or reject).

14.2.2 Configuring the main filter

Select the "**Security**" menu and then "**Firewall**" and "**Main filter**".



IPL-E-1220B Router

Setup > Security > Firewall > Main filter

WAN trafic rules :

Default policy : LAN -> WAN Drop; WAN -> LAN Drop

Activate Deni of Service (DoS) firewall : ☑

Enable ping : ☑

Direction	Action	Protocol	Source @IP	Src port	Destination @IP	Dest port	
LAN->WAN	Accept	any	-	-	-	-	View Modify Delete
-	-	-	-	-	-	-	

Add a rule

VPN trafic rules :

Default policy : LAN -> VPN Accept; VPN -> LAN Drop

Accept trafic between VPN : ☑

Direction	Action	Protocol	Source @IP	Src port	Destination @IP	Dest port
-	-	-	-	-	-	-

Add a rule

Save Cancel

The "Main filter" page is divided in two parts :

WAN traffic rules :
The first part, entitled "WAN" traffic rules, is made to define how the IP packets **not carried in a VPN,** have to be filtered.

VPN traffic rules :
The second part, entitled "VPN traffic rules" allows to define how the IP packets **carried inside the VPNs** have to be filtered.

Configure successively the WAN traffic rules using the same method.

Step 1 : Select the default policy

"LAN to WAN" parameter :
That parameter sets what the filter will decide if an IP packet coming from the LAN does not match any f the rules of the filter :
If the value "Accept" is selected, the IP packet will be transmitted to the VPN.
If the value "Drop" is selected, the IP packet will be rejected.

"WAN to LAN" parameter :
That parameter sets what the filter will decide if an IP packet coming from the WAN does not match any f the rules of the filter :
If the value "Accept" is selected, the IP packet will be transmitted to the LAN.
If the value "Drop" is selected, the IP packet will be rejected.

The cautious default policy is to choose the value "Drop"; at the opposite, if the value "Accept" is selected, a frame which does not match any of the rules of the filter is transmitted.

Step 2 : Add a rule to the filter

Click the "add a rule" button.

"Direction" parameter :
Select the direction of the data flow to which the rule applies.

"Action" parameter :
Select the value "Accept" if the IP packet has to be transmitted in the selected direction.
Select the value "Drop" if the IP packet has to be rejected.

"Protocol" parameter :
Select the level 3 protocol concerned.

"Source IP address" & "Source port" parameters :
Enter the value of the source IP address and the source port number.
It is possible to enter a range of source IP addresses and not a single IP address by selecting a netmask value from 1 to 32; It is the number of binary 1 of the netmask; for instance, the value 24 means 255.255.255.0; the value 16 means 255.255.0.0.

”Destination IP address” & “destination port” parameters :
Enter the value of the destination IP address and the destination port number. Select the netmask value.

14.3 Remote users filters

A remote user filter applies to the IP packets received inside a remote user connection.

25 remote user filters can be configured and assigned individually to each of the users declared in the user list.

A remote user filter is a table of destination port numbers and IP addresses belonging to the LAN network.

Once a remote user is connected to the SIG router, the router applies the filter assigned to him (see the remote user form).

According to his identity (Login and password, he will thus only access to the IP domain defined by the filter.

Example :

Filter name : Access to the device PLC1 (html and modbus)		
Filter policy : All is forbidden except what we specify		
Rules list		
Action	Device	Service
Allow	PLC1 192.168.0.12	80
Allow	PLC1 192.168.0.12	Modbus 502

A filter must be assigned at least to one user to become enabled.

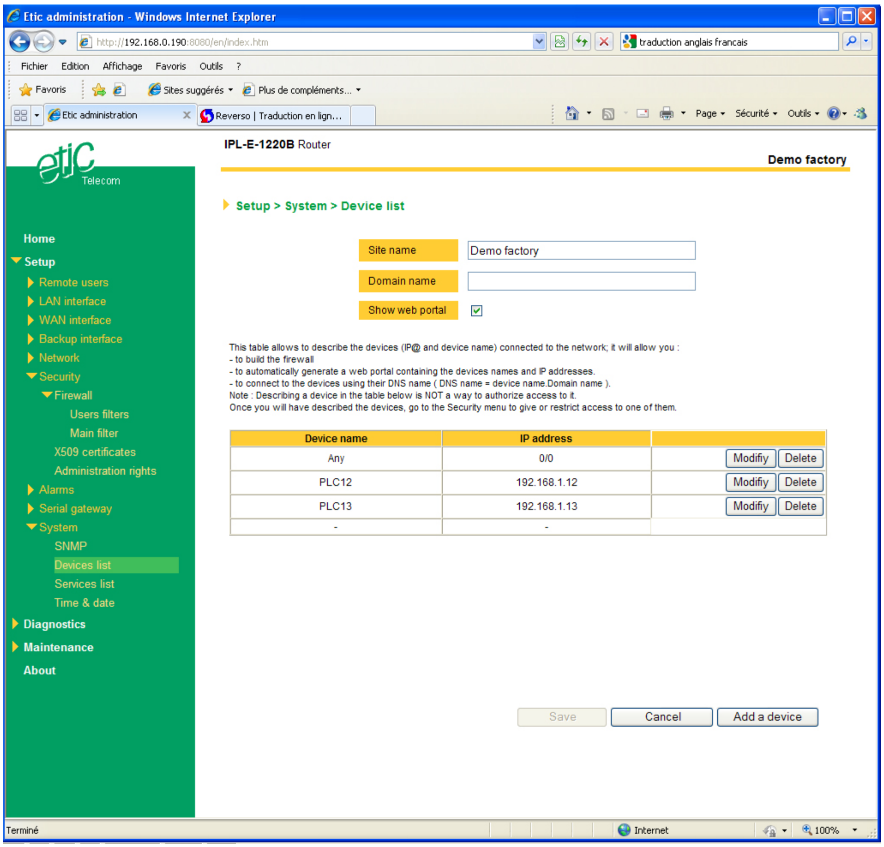
Step 1 : Complete, if necessary, the list of services

Remark : *The main services (html, ftp, modbus) are available from factory; for that reason, most of the time, that step can be skipped.*

- Select the menu “system” and then “service list” The list of TCP ports is displayed.
- Click « add a service ».
- Enter the label of that the new service, assign a protocol (udp, tcp, icmp) and a port number.
- Save. The list is updated.

Step 2 : Enter the list of devices of the LAN network

- Select the «System» menu, then «Devices list».
  The list of the devices of the LAN network is displayed.



IPL-E-1220B Router

Demo factory

Setup > System > Device list

Site name	Demo factory
Domain name	
Show web portal	☑

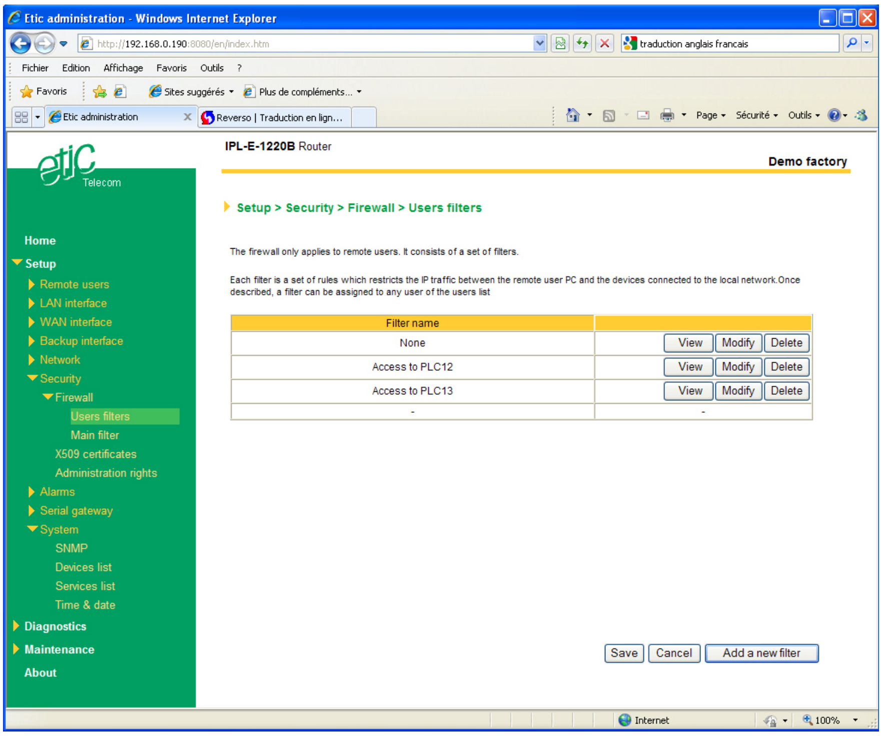
This table allows to describe the devices (IP@ and device name) connected to the network; it will allow you :
- to build the firewall
- to automatically generate a web portal containing the devices names and IP addresses.
- to connect to the devices using their DNS name (DNS name = device name.Domain name).
Note : Describing a device in the table below is NOT a way to authorize access to it.
Once you will have described the devices, go to the Security menu to give or restrict access to one of them.

Device name	IP address	
Any	0/0	Modifiy Delete
PLC12	192.168.1.12	Modifiy Delete
PLC13	192.168.1.13	Modifiy Delete
-	-	

- Click « add a device ».
- Assign a label and an IP address to the device and click OK.

Step 3 : Build a remote user filter

- Select the « security» menu, then « firewall» and then «Filter list» The users filters list is displayed.



IPL-E-1220B Router

Demo factory

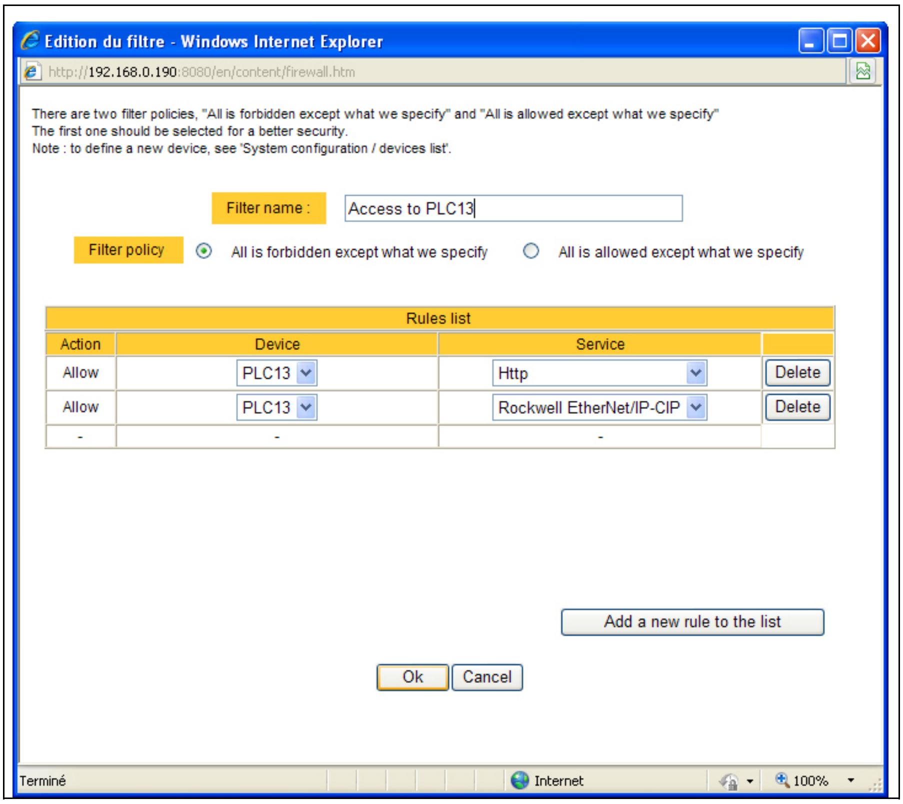
Setup > Security > Firewall > Users filters

The firewall only applies to remote users. It consists of a set of filters.

Each filter is a set of rules which restricts the IP traffic between the remote user PC and the devices connected to the local network.Once described, a filter can be assigned to any user of the users list

Filter name	
None	View Modify Delete
Access to PLC12	View Modify Delete
Access to PLC13	View Modify Delete
-	-

- Click « add a new filter ».


Edition du filtre - Windows Internet Explorer
http://192.168.0.190:8080/en/content/firewall.htm
Terminé
Internet
100%

There are two filter policies, "All is forbidden except what we specify" and "All is allowed except what we specify"
The first one should be selected for a better security.
Note : to define a new device, see 'System configuration / devices list'.

Filter name : Access to PLC13

Filter policy ● All is forbidden except what we specify ○ All is allowed except what we specify

Rules list			
Action	Device	Service	
Allow	PLC13	Http	Delete
Allow	PLC13	Rockwell EtherNet/IP-CIP	Delete
-	-	-	

Add a new rule to the list

Ok Cancel

- Assign a name to the new filter.
- Choose the policy ; « All is forbidden except what we specify » is the advised policy.
- Click « add a new rule to the list ».
- Select a device among the ones which have been stored and a service (also called port).
- Add other rules if necessary.
- Click OK when the filter is complete ; the updated filter list is displayed.

Step 4 : Assign a filter to each user

- Select the « Remote user» and then « User list ».
- Select a user to which you want to assign a filter ; and click modify ; the user window is displayed.

Assign a filter to the user ; click OK and save.

15 Advanced functions

15.1 Adding a certificate

Coming from the factory, the SIG router includes a certificate delivered by ETIC TELECOOMUNICATIONS acting as a certification authority.

That certificate can be used to set a VPN between two routers.

Two SIG routers can set a VPN with one another using certificates only if the certificates have been provided by the same authority.

Additional X509 certificates, provided by ETIC Telecommunications or not, can be downloaded into the router.

To import a new certificate, the file extension can be PKCS#12 with a password or PEM.

Even if more than one certificate have been downloaded into the SIG router, one certificate can be used for all the connections.

15.2 SNMP

The SIG router is able to send snmp traps when alarms occur.

Activation :
If that option is selected, the router will send an SNMP trap if an alarm is detected.

SNMP network management IP address :
Enter the IP address of the management platform

SysName & **SysLocation :**
That fields allow to identify the source device.
Example :
Sysname : etic
Syslocation : France

Product start-up :
If that option is selected, the router will send an SNMP trap each time it will connect to the Internet

15.3 Configuring the web portal

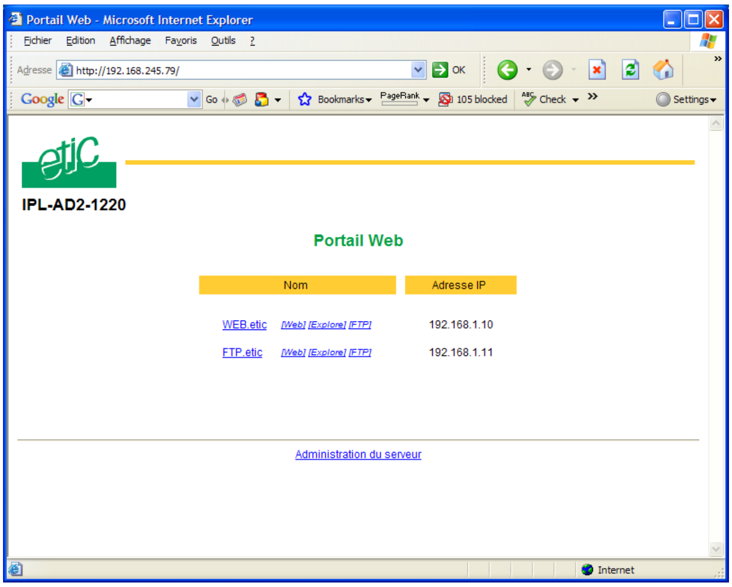
The web portal in an html page; it displays a list of devices connected to the LAN. Each line of the list is made of the device name, its IP address and three links :

The html link : To go directly to the web server of the associated machine.

The « explore » link : To explore the HD of the associated machine, if it is a Windows machine.

The « ftp » link : To explore the files of the associated device.

If the we portal option has been selected (see below), the web portal page is displayed when the remote user launches the navigator and enters the Ip address assigned to the SIG router. In that case, the administration server, usually can be displayed at the same address but at the port number 8080 instead of 80 when the web portal page option is not selected.


Portail Web - Microsoft Internet Explorer
Fichier Edition Affichage Favoris Outils ?
Adresse http://192.168.245.79/
OK
Google G
Go
Bookmarks
PageRank
105 blocked
Check
Settings
Internet

IPL-AD2-1220

Portail Web

Nom		Adresse IP
WEB.etic	[Web] [Explore] [FTP]	192.168.1.10
FTP.etic	[Web] [Explore] [FTP]	192.168.1.11

Administration du serveur

15.4 Configuring the DNS server

For domain names resolution, the SIG can behave like a domain name server or a domain name relay.

DNS server :
A domain name server is a networking device which is able to associate a label (etictelecom.com for instance) with an IP address.

That function allows a client device to send a request to a network equipment referring to a domain name as if it was the actual IP address of the destination device.

The SIG router is able to resolve any domain name composed with the name of one of the devices entered in the devices list followed the site name which is entered at the top of the devices list.

DNS relay :

The SIG router behaves also like a DNS relay; any DNS request it receives from the LAN, which cannot be resolved because the device is not registered in the devices list, will be transferred to the internet to be resolved.

That function can be carried out only if the SIG IP address is pointed out as the main DNS server of the devices of the LAN.

That function is efficient in particular when a device connected to the LAN has to send emails through the Internet.

1 Diagnostic

The html server provides extended diagnostic functions.

Select the Diagnostic menu and then the appropriate sub-menu.

- **Log sub-menu:**

The log displays the last 300 dated events :

ADSL, VPN and users connections and disconnections,
power on,
Serial gateway events.

- **Network status sub-menu and then status sub-menu :**

That screen displays the current status of the LAN interfaces and of the Internet connection :

LAN interfaces :

That part of the page shows the data of the LAN interface :

MAC address,
Ethernet mode (10 /100, half or full),
IP address.

WAN interface :

That part of the page shows the data of the Internet interface :

MAC address,
Ethernet mode (10 /100, half or full),
IP address,
DNS servers addresses
Default gateway

- **VPN sub-menu :**

That menu displays the table of the VPN (remote user connections and remote routers connections) which are established.

- **Ping :**

That screen enables to send a ping frame to an IP address.

2 Saving the parameters to a file

Once a product has been configured, the parameters can be stored and restored when necessary.

To save the parameters,

- Select the “System” menu and then “Save restore”,
- Click the ”Save” button
- Select the location to store the file and give a name to the file.

The file suffix is “.bin”.

To restore the parameters,

- Select the “System” menu and then “Save restore”,
- Click the “browse” button and select the parameters file,
- Click the “Load” button and confirm to restart the product.

Attention : A parameters file can only be restored towards a product having the same firmware version.

3 Updating the firmware

Step 1 : Before starting, you need,

a PC with a Web browser and an Ethernet cable;
the FTP server software which can be downloaded from the « firmware page » of the ETIC « download area » web server.

Step 2 : Download the release of the firmware from our download area to your PC

Step 3 : Prepare the PC
Check the Ip address of the PC is compatible with the one of the router.

Connect the router to the PC.

Launch the TFTP server (tftp32.exe) software and select the new release (L026xxx/img) by using the "Browser" button.

Click on "Show dir" to check the files of the directory : rfsmini.tgz, rootfs.bin, u-boot.bin and uImage.

Step 4 : Update the firmware
Launch the web browser

Enter the IP address of the ETIC product ; the home page of the ETIC configuration server is displayed.

Select the "System" menu and then " firmware Update". In the field "IP address of the TFTP server", enter the IP address of your PC.

Note : The IP address of the PC is written in the field "Server Interface" in the TFTP server windows.

Click "Save" and then "Update".

The first file should begin to be downloaded from the PC to the router.

During the operation, the led blinks

When the download is finished, the product automatically reboots.

To be sure the new release has been installed, go to "About" in the administration web page of the IP product.

Step 5 : Restore the default configuration

- Select the “Maintenance” menu and then the “Save / restore” menu.
- Click the “Restore default configuration” button.

1/ Set up menu

Remote users	To assign an ID and PWD to each authorized user and set their rights To set the M2Me service
LAN interface	To enter the IP @ of the router on the LAN interface. To enter the IP @ assigned to the remote users To set up the Ethernet interfaces To set up the DHCP server on the LAN interface
WAN interface	To enter the IP @ of the router over the WAN interface.
Network	To configures the VPNs To enter static routes and enable the RIP protocol To set up the VRRP redundancy protocol To set up port forwarding To set up advanced Ip addr. translation functions
Security	To set the firewall rules (User filter and main filter) To add a certificate To restrict access to the administration server
Alarm	To set up alarm SNMP traps To set up alarm emails
System	To set up SNMP parameters To enter the devices list To update the service list To update time and date

2/ Diagnostic menu

Log	To display the events (VPN connections, user connections..)
Network status	Interfaces status : @ MAC, @IP, ADSL, VPN VPN status Routing tables
Tools	To send Pings from the router
Advanced	To store the internal report to a disk for diagnostic purposes

3/ Maintenance menu

Firmware update	To update the firmware
Save / restore	To save or restore a configuration file .To restore the factory configuration
Reboot	To restart he router

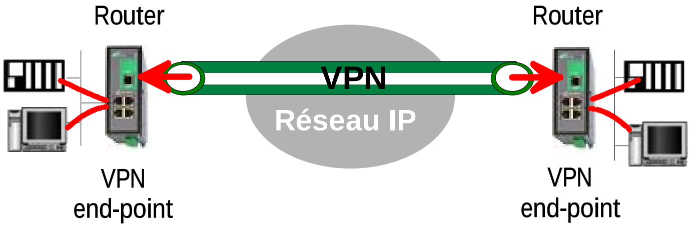
4/ About menu

To display the certificate “product key”
To display the firmware version

1 Overview

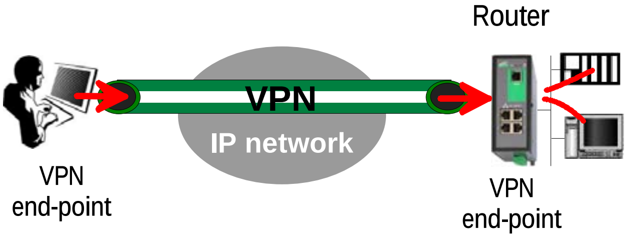
VPN is the acronym for « virtual private network » ; it is a mechanism which allows to connect safely 2 networks together, or 1 remote PC and one network, through a network eventually not intrinsically safe.

VPN between two networks



Once a VPN has been set between the two routers , any device of the first network can communicate with any device of the second one as if the two routers were directly connected with an Ethernet cable.

VPN between a remote PC and a network



2 Functions

A VPN provides the functions described hereafter :

Authentication
The VPN ensures that the party with which the communication is set is actually **the one it claims to be.**

Data integrity
The VPN mechanism ensures that information being transmitted over the public Internet is not altered in any way during transit

Confidentiality
A VPN protects the privacy of information being exchanged between communicating parties.

3 Operation

Authentication phase
The first operation the end-points carry out is authentication.

2 levels of authentication can be performed using a VPN :

> **Device level authentication**
> A code is stored in each end-point (i.e. router or PC); it can be a Key or a certificate delivered by a certification authority.
> During the initial phase, the two end-point exchange their codes; each party checks that the other party code is valid.
>
> **User level authentication**
> The SIG router holds a user list; once a VPN has been set with the remote user PC, the remote user identification code and password is checked.

Encrypted tunnel transmission phase
Once the end-points have exchanged and checked each other identity code, they set the VPN tunnel.
It is an IP packets exchange; the source and destination IP addresses are the end-points.
That tunnel encapsulates the encrypted IP data flow transmitted between any of the devices connected to each end-point.

VPN clearing

Periodically, each router (or at least the VPN server router) sends to the other one a control message to check the VPN must remain established.

If no response is received from the other party, the VPN is cleared.

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