



XSLAN-1100

Switch SHDSL

USER GUIDE

The product XSLAN-1100 is designed and manufactured by

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DECLARATION OF CONFORMITY

The manufacturer, ETIC Telecom – 13 chemin du vieux chêne – 38240 Meylan – France, Hereby declares under sole responsibility that the listed devices conform to

- the Electromagnetic Compatibility (EMC) Directive 2014/30/UE,
- the Low Voltage Directive (LVD) 2014/35/UE,
- the Restriction of the use of certain Hazardous Substances (RoHS 2) Directive 2011/65/UE.

Type of device: SHDSL switch

Models: XSLAN-1100

The harmonized standards to which these devices comply are:

Standard	Title
EN 61000-6-2 2006	Immunity: EN61000-4-2 Electrostatic Discharge EN61000-4-3 RF Radiated Immunity EN61000-4-4 EFT/Burst Immunity EN61000-4-5 Surge Immunity EN61000-4-6 RF Conducted Immunity EN61000-4-8 Power Frequency Magnetic Field Immunity
EN 61000-6-4 2007 A1/2011	Emission: EN55022 Radiated and conducted emission
IEC/EN 62368	Safety and Health

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OVERVIEW

1 Purpose of this manual

The present user guide describes the features and the installation of the SHDSL switch XSLAN-1100.

In the rest of the document the term "XSLAN" is also used to designate the product.

2 Specifications

General characteristics	
Dimensions	120 x 37 x 88 mm (h,l,p)
Weight	0.44 kg
Casing	Metallic IP41 – IEC60529 DIN rail mounting
Temperature	Non-operating: -40°/ +85°C Operating: -20°/ +70°C
Humidity	5 à 95 % relative (non-condensing)
Power supply	Protected against reverse polarity Nominal : 12-24 VDC (min 10 VDC - max 30 VDC) 2 points Phoenix connector
Consumption	1.8 W
MTBF	730 000 h at 22 °C - MIL-HDBK-217F-N2 GB

SHDSL	
Modulation	ITU-T G.991.2, 802.3ah : 2BaseTL (EFM)
Data rate	192 kb/s to 15,2 Mb/s
Emission power	Annex A : 13.5 dBm (22 mW) Annex B : 14.5 dBm (28 mW)
Voltage of the emitted signal	6 to 8 V peak to peak on 135 Ohms
Signal spectrum	< 3 MHz at 15 Mb/s
Isolation	1500 V
Connection time	45 s typical
Plug & play	STU-C / STU-R auto-negotiation Automatic adaptation of the data rate
Latency	Frame transmission delay from one Ethernet port of an XSLAN+ to the Ethernet port of another XSLAN+ through an SHDSL link : 2 ms at 5.6 Mb/s

PRESENTATION

ETHERNET & IP	
Ethernet	10/100 Mb/s Half/Full duplex Auto MDI/MDIX
Switch	Store and forward - 1024 MAC addresses
Redondancy	RSTP - IEEE 802.1D / 802.1Q
VLAN	IEEE 802.1Q
IP address	IPV4 and IPV6
IP router	Multicast and broadcast filtering Static routes RIP V2 - OSPF
QOS	RFC 2474, 2475, 2597, 2598 « Differentiated services » Traffic prioritization and bandwidth reservation

Misc.	
SNMP	Supported MIBs: RFC1213-MIB (MIB-2) HDLSL2-SHDSL-LINE-MIB HOST-RESOURCES-MIB / IF-MIB IP-MIB BRIDGE-MIB RSTP-MIB SNMP traps
Date and time	NTP client and server
Configuration	Web serveurur
Log	Log with timestamp of the last 300 events Syslog
Management	Save and restore configurations Reset product to return to factory configuration

3 EMC & Environment compliances

EMC Immunity, EN61000-6-2			
Standard	Criteria	Port	Level pass
EN61000-4-2 ESD	B	Enclosure	+/-4kv contact +/-8kv air discharge
EN61000-4-3 Radiated	A	Enclosure	10V/M AM @ 1khz 80Mhz to 3Ghz
EN61000-4-4 Burst	B	SHDSL	+/- 2kv
		Power supply	+/- 2kv
		Ethernet	+/- 2kv
EN61000-4-5 Surge	B	SHDSL	+/- 5kv common mode (Normal and Telecom surge)
	B	Power supply	+/- 0,5kV common mode +/- 0,5kV differential mode
		Ethernet	+/- 4kv direct shield coupling
EN61000-4-6 RF conducted	A	SHDSL	10VAM 80% 1khz, 150khz to 80Mhz
		Power supply	
		Ethernet	
EN61000-4-8 Magnetic	A	Enclosure	30 A/M at 50hz/60hz
EN61000-4-18 Damped wave	A	Power supply	+/- 0,5kV differential
	B		+/- 1kV common mode
	A	Ethernet	+/- 1kV common mode
	B	SHDSL	+/- 1kV common mode

EMC Immunity, ITU -T-K21			
Test	Criteria	Port	K44 Test N°
Lightning voltage, special test protector	A	SHDSL	2.1.2a +/- 5kV transverse mode (Basic level)
			2.1.2b +/- 5kV port to earth (Basic level)

EMC Emissions, EN61000-6-4		
Emission test	Criteria	Limits
conducted Disturbance	Power supply	EN55032, Class A: 150khz to 30Mhz
	SHDSL	
	Ethernet	
Radiated emission	Enclosure	EN55032, Class A: 30Mhz to 1Ghz

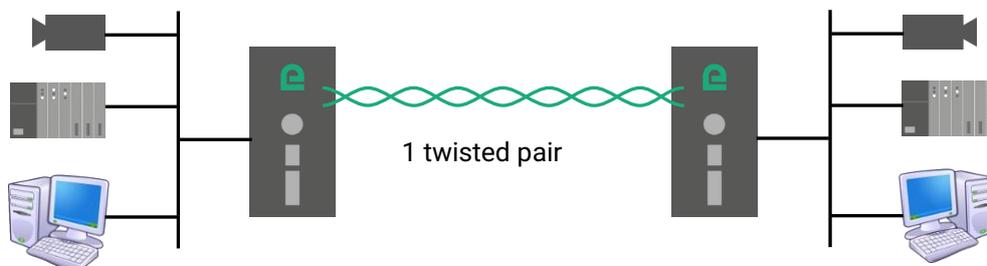
PRESENTATION

Climatic		
Standard	Test	Level
EN 60068-2-1 Cold	Ab	-40 °C - 16 hours – Non-operating
	Ad	-40 °C - 16 hours – Operating
EN 60068-2-2 Dry heat	Bb	+85 °C - 16 hours – Non-operating
	Bd	+70 °C - 16 hours – Operating
EN 60068-2-14 Change of temperature	Na	-25 °C à +70 °C – Non-operating 5 cycles of 2 hours
	Nb	-40 °C à +70 °C – Operating 3 °K/mn - 5 cycles de 2 hours
EN 60068-2-30 Damp heat	Db Variante 2	+25 °C à 55 °C – Operating 2 cycles

4 Product overview

The XSLAN-1100 is an industrial Ethernet switch that provides 1 SHDSL port to extend Ethernet transmission over several kilometers using any existing copper pair.

The data rate is up to 5,7 Mb/s on 3,7 Km and 15 Mb/s on 0,7 Km (see table in Annex 1).



The XSLAN-1100 is a « Plug & Play » product. It does not require any configuration. Just make the different connections. The SHDSL link is established in a few tens of seconds. Equipment located on either side of the line can communicate with each other as if they were connected locally.

The XSLAN-1100 is designed to operate in harsh environments, climatic and electromagnetic. In particular, it is equipped with lightning protection.

The XSLAN-1100 is eco-friendly. Despite its powerful advanced features, it consumes little energy. The level of the electromagnetic emission is very low.

The XSLAN-1100 can interwork with any switch in the XSLAN family. For example, it is possible to connect an XSLAN-1100 at one end of the line and an XSLAN+2220 at the other end.

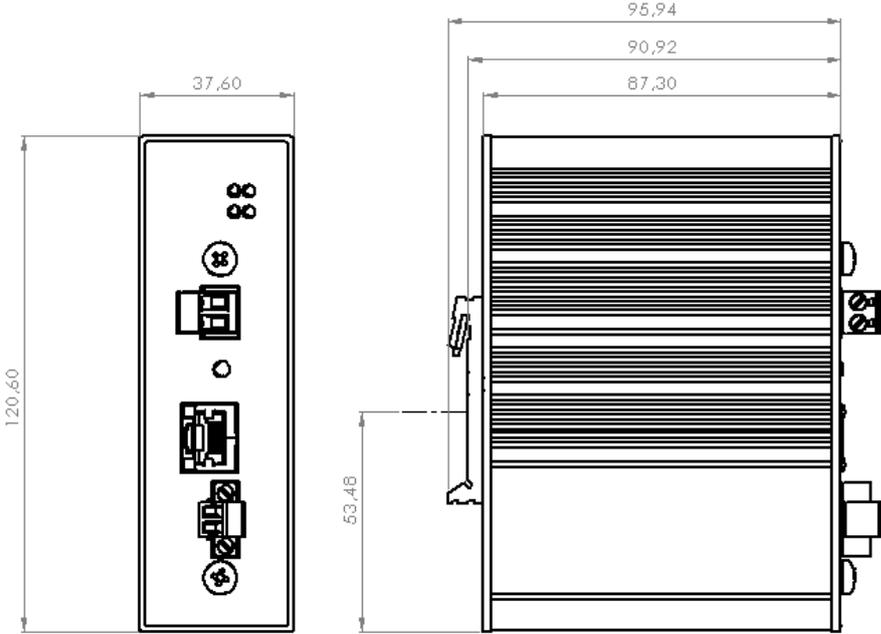
The XSLAN-1100 also offers advanced features. These functions are configured using a Web browser:

- **IP routing and filtering**
The XSLAN can remove the broadcast frames on the SHDSL link by routing the IP frames, and thus limiting the unwanted traffic on the SHDSL link.
- **VLAN**
The XSLAN+ features VLAN:
It is useful, for example, to separate the flows on the SHDSL link from those for the administration of the switch.
- **Quality of service DiffServ**
The XSLAN can manage different IP traffics with different priorities.
- **SNMP**
The XSLAN can be monitored by an SNMP manager and supports the main MIB of an Ethernet switch and the SHDSL MIB.

INSTALLATION

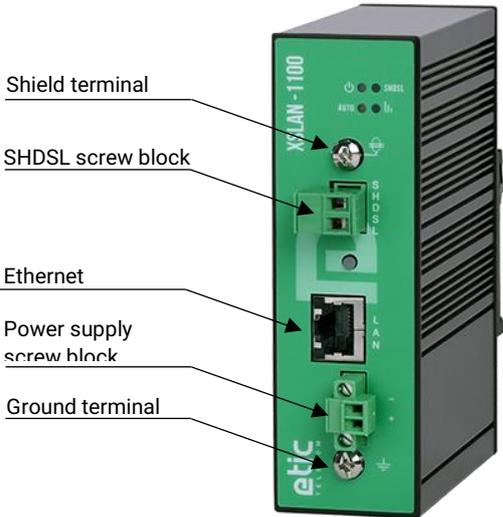
1 Description

1.1 Dimensions



All dimensions in millimeters.

1.2 Connectors



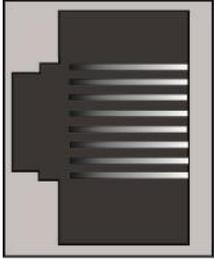
INSTALLATION

Ground terminal	
Symbol	Description
	M4 screw terminal

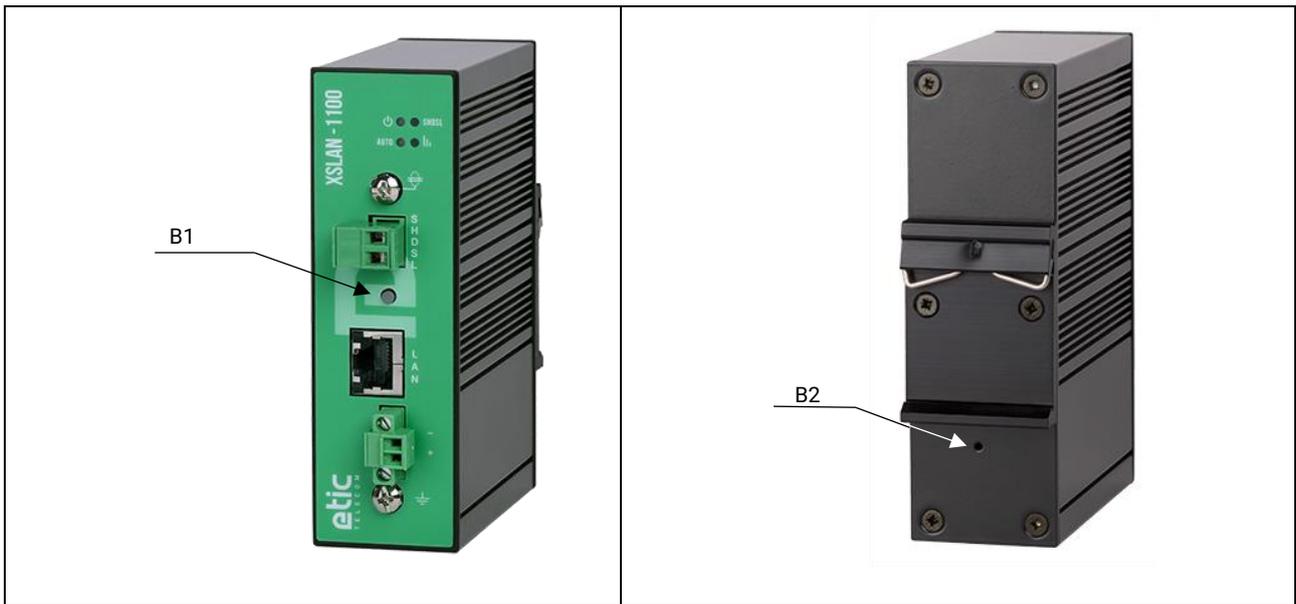
Shield terminal	
Symbol	Description
	M4 screw terminal – Shield connection of the transmission cable

2 positions screw terminal: Supply voltage Protected against reverse polarity		
Position	Signal	Function
1	Power 1 +	12 - 24 VDC
2	Power 1 -	0V

2 positions screw terminal: SHDSL		
Position	Signal	Function
1	Line	SHDSL line conductor
2	Line	SHDSL line conductor

Ethernet RJ45 connector			
Position	Signal	Function	RJ45
1	Tx +	Emission polarity +	
2	Tx -	Emission polarity -	
3	Rx +	Reception polarity +	
4	N.C	-	
5	N.C	-	
6	Rx -	Reception polarity -	
7	N.C.	-	
8	N.C.	-	

1.3 Push-buttons



Front panel push-button: B1		
Pressing the PB	LED AUTO	Function
3 seconds	Steady green	Automatic connection mode No IP address and no access to the Web pages

Rear panel push-button: B2		
Pressing the PB	LED 	Function
During operation	Flashing red	Temporary return to the factory configuration. (IP address 192.168.0.128) The current configuration is not lost.
During power-up	Flashing red	Return to the factory configuration. The current configuration is deleted except if it has been saved into a file.

INSTALLATION

1.4 LED indicators

LED indicators			
Function	LED	Description	
Opération		Off Steady green Slow blinking green Steady red Fast blinking red	Power off The unit is ready The unit is busy Startup (30s) – Otherwise hardware or software failure Firmware download in progress
SHDSL Connection	SHDSL	Off Blinking On Flashing	Port disable Connection in progress Connection established Traffic on the link
SHDSL Data rate		Off 1 flash 2 flashes 3 flashes	No connection $64 \text{ kb/s} \leq \text{Data rate} < 512 \text{ kb/s}$ $512 \text{ kb/s} \leq \text{Data rate} < 2048 \text{ kb/s}$ $2048 \text{ kb/s} \leq \text{Data rate}$
Mode	AUTO	Off On	Advanced configuration and diag. mode (Web pages) Auto mode (no web page)

2 Safety instructions

The product shall be installed in a fire electrical resistant cabinet by a qualified operator.

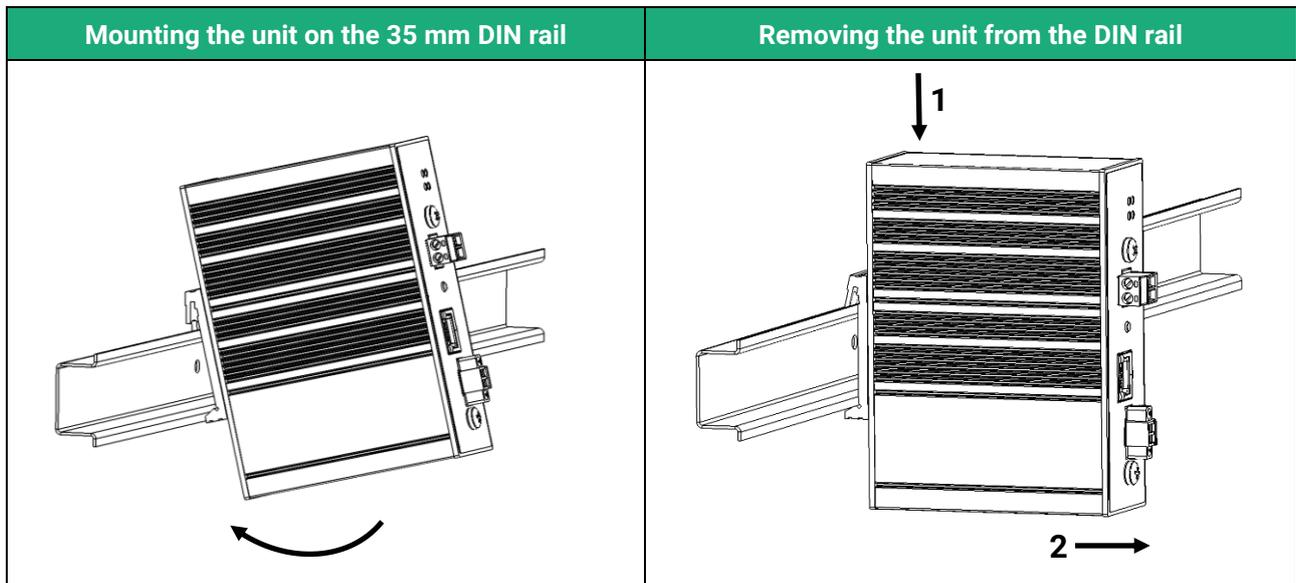
The product must be connected only to equipment that complies with the IEC60950-1 or IEC62368-1 standards and that meets the following classifications:

- IEC60950-1 : Limited power circuits and SELV type – §2.2 and 2.5
- IEC62368-1 : ES1 & PS2



To avoid any risk of burns, it is strongly recommended to wear gloves to handle the product in operation when the ambient temperature exceeds 30 °C.

3 DIN rail mounting



4 cooling

The product is designed to be mounted on a 35mm DIN rail.

To avoid obstructing the airflow around the unit, the spacing must be at least 25 mm above and below, and 10 mm left and right.

5 Alimentation

The supply voltage must be regulated and strictly between 10 and 30 Volt DC (nominal: 12 – 24 VDC).

At power up the inrush current can reach 20 A for 100 μ s.

In operation, the consumption can reach 2W during short moments (peak).

6 Earthing

The enclosure of the XSLAN-1100 is metallic ; For safety and EMC reasons, the ground terminal must be connected to the protective earth of the installation.

7 Preparing and checking the line

7.1 Type of cable

Twisted pair cable

The XSLAN+ SHDSL switch is designed to be connected to one or several telephone grade twisted pairs. The conductor diameter must be included between 0.4 mm and 1 mm.

A cable may be composed of several twisted pairs.

Each pair can usually be used for a different SHDSL transmission if necessary. However, care must be taken to ensure that crosstalk between pairs is not excessive.

Cable made of quads

It often happens that the twisted pairs of the same cable are wound in groups of two pairs; a group of two pairs rolled into each other is called a quad.

This type of cable is suitable. However, we will try to use only one pair per quad to avoid crosstalk (see below).

Shielded cable

It is better to use a shielded cable.

The shield must be connected to the earth at one of its ends.

The shield decreases the influence of the electromagnetic ambient noise on the SHDSL signal.

Moreover, the shield protects the XSLAN against lightning.

Electrical power cable

Two power conductors can be used instead of a twisted pair to set an SHDSL connection.

However, because the two wires are not twisted, the ambient electrical noise may disturb the transmission.

Compared to the transmission over a twisted pair, the maximum distance between two SHDSL switches is decreased.

7.2 Crosstalk interference

If the cable is made of several pairs, a signal transmitted in one pair may disturb the signal transmitted in another one, and, in some cases, may decrease the effective data rate of the SHDSL connection.

The closer the pairs, the greater the crosstalk. Thus the risk of crosstalk is higher between two pairs of the same quad.

This is why, if the cable is made up of quads, it is advisable to avoid using the two pairs of the same quad.

7.3 Shield earthing

A shielded cable provides better noise immunity and surges protection during thunderstorms.

The best protection is provided when the shield is earthed at each end of the line.

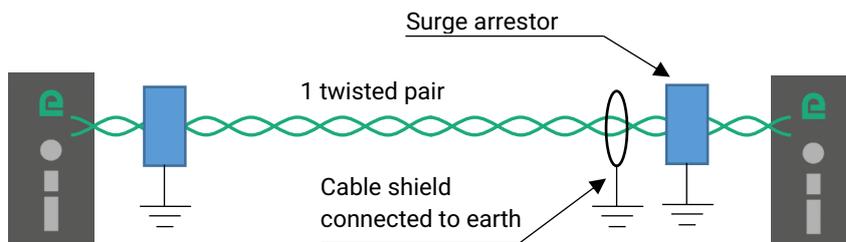
However, there may be a large potential difference between the connection points to the earth, especially when the line is long.

Therefore, to avoid a large current flowing in the shield, it is recommended to connect the shield to the earth at only one end of the cable.

7.4 Protecting the SHDSL switch from lightning

The XSLAN is coupled to the line by a transformer which provides isolation between the circuit board and the line. Moreover, the XSLAN+ is equipped with internal protections against overvoltage.

However, if the line is vulnerable to thunderstorms, for example if it is an air line, or if it is several kilometers long, or if the installation is in a very exposed area, it is recommended to protect each XSLAN with a surge protector, as described below.



8 Connecting the XSLAN to the line

The SHDSL signal is not polarized; the two wires of the twisted pair can be interchanged. Check that the shield, if any, is properly earthed.

When the XSLAN is directly connected to the line without the use of an external surge protector, the shield of the cable will be connected to the shield terminal which provides electrical continuity with the ground terminal.

COMMISSIONING

La procédure de mise en service ci-dessous décrit le mode « Plug & play », sans avoir besoin de configurer les XSLAN-1100. On se référera au chapitre suivant si l'on souhaite utiliser des fonctions avancées.

The commissioning procedure below describes the "Plug & play" mode, without the need to configure the XSLAN-1100s. Refer to the next chapter to use advanced functions.

- Power on the 2 XSLAN-1100.
- Make sure the AUTO indicator is lit on both XSLAN-1100s. If not, press the push button on the front panel (B1) until the AUTO indicator lights up (approx. 3s)
- The connection is established in about 45 s.
- The SHDSL LED indicates the progress of the connection as described in the following table:

State of the connection	SHDSL LED
The other XSLAN was not detected (for example when the line is not connected)	Blinking 0,1 s ON / 2 s OFF
Data rate negotiation	Blinking 0,3 s ON / 0,3 s OFF
Connected	Steady on
Traffic on the link	Flashing

- Once the line is connected, the LED  indicates the data rate for that connection.
- Check the correct operation by transmitting a periodic PING from the PC to another device through the SHDSL link.

PREPARING THE ADVANCED SETUP

1 Connecting a PC for configuration

1.1 Overview

The XSLAN-1100 is designed to be used without any configuration. However, it may be necessary to access the switch administration, either to use a particular function such as, for example, VLANs, QoS or SNMP administration or to perform advanced diagnostics.

In this case, the XSLAN-1100 is configured and managed by a PC with a web browser. No additional software is required.

Online help:

For most pages of the administration server an help page is available by clicking [?](#) located at the top right of the page.

Administration server address:

When the product is delivered, the IP address of the administration web server is 192.168.0.128.

First setup:

For the first configuration, we advise to connect the PC directly to the LAN interface of the RAS. Subsequent changes can be made remotely.

Restoring the factory IP address:

The factory IP address 192.168.0.128 can be restored (see the User guide of the product).

Restricted access to the administration server:

If you do not have access to the administration server, it is probably that access has been restricted for security reasons or for other reasons.

Network IP address:

Later in the text, we often speak of “network IP 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 IP address of that network is terminated by a zero (X.Y.Z.0.).

Characters allowed

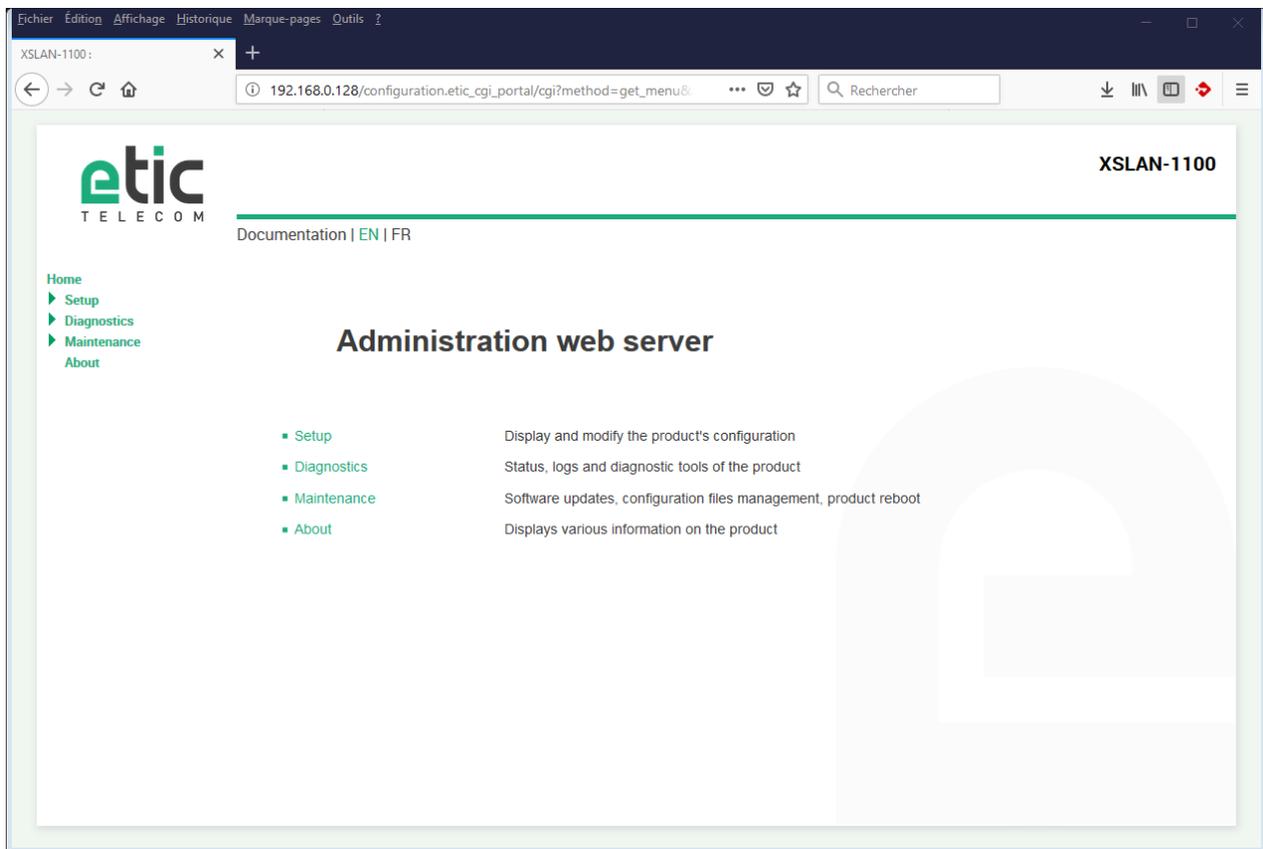
Accented characters are not supported.

PREPARING THE ADVANCED SETUP

1.2 First configuration

- Make sure the AUTO indicator is off. If not, press the push button on the front panel (B1) until the AUTO indicator goes off (about 3s).
- **Create or modify the PC TCP/IP connection**
- Assign to the PC an IP address different but consistent with the factory IP address of the XSLAN. For the first configuration, assign for instance 192.168.0.1 to the PC.
- **Connect the PC to the XSLAN**
- Connect the PC directly to the XSLAN with any Ethernet cable (straight or cross-wired);
- **Launch the web browser**
- Launch the web browser and then enter the IP address of the XSLAN: 192.168.0.128

The Home page of the administration server is displayed.



Note : Access to the administration server is not protected when configuring the XSLAN for the first time.

1.3 Changing the configuration later

Thereafter, the XSLAN administration server is accessible from the Ethernet interface or remotely through the SHDSL line at the IP address assigned to the product.

- Open the html browser and enter the IP address of the administration server of the XSLAN.
- Enter, if any, the user name and password that protect the access to the administration server.

2 Temporary return to the factory settings

If the IP address of the XSLAN could not be founded, or if it is impossible to access the administration server, for example, following a bad VLAN configuration, it is possible to restore the factory settings without losing the current configuration.

- Press the push-button located on the back (B2), for example with a small screwdriver
- Keep the push-button pressed for about 3 seconds;
- The LED  blinks red rapidly
- The administration server becomes accessible at the factory IP address (192.168.0.128), in HTTP without a password. The factory configuration is temporarily running. However, the current configuration is not lost and it is the one that is still displayed in the pages of the Administration Server.
- After reading the IP address or changing some parameters, press again the push button (B2) or reboot the product.
- The product can be reached at the registered IP address.

Note :

If the IP address of the XSLAN is unknown, the software tool **EticFinder** can be used.

This software detects all ETIC branded products on a local network. After starting the software, click on the "Search" button, and when the product list is displayed, double-click on the product address to access the html server.

3 Restoring the factory settings

It is possible to restore the factory configuration permanently using the push button on the rear panel, or by using the administration server. In this case, the current configuration will be lost unless it has been saved to a file.

To restore the factory settings using the push button,

- Power off the XSLAN,
- Press the push-button (B2), for example with a small screwdriver,
- Power on the XSLAN, while keeping the push-button pressed at least 10 s.

The LED  turns red ; the XSLAN boots and the factory configuration is restored.

Note : The factory configuration can also be restored via the menu **Maintenance > Configurations management** of the administration server.

PREPARING THE ADVANCED SETUP

4 Protecting the access to the administration server

- In the menu, choose **Setup > Security > Administration rights**
- Enter a user name and password to protect the administration server.
- Tick the **Password protect the web site access** checkbox

If the username and password to access the administration server are lost, you have to [temporarily return to the factory settings](#); access to the administration server is then free.

5 Configuration steps

To configure the product, we advise to proceed as follows:

- Set up the LAN interface
- Set up the SHDSL connections
- Set up VLAN
- Set up SNMP
- Set up QoS
- Set up the routing functions

For detail about the configuration and the diagnostics, refer to the XSLAN-1100 / XLAN+ / XSMIL Setup Guide:
Reference : "DOC_DEV_XS_Setup guide_x"

ANNEX 1 : SHDSL data rate versus distance

The table below shows the data rate which is possible to get on a SHDSL link depending on the wire diameter and the distance.

These values are indicative in noise free environment.

Data rate	192Kb/s	1,2Mb/s	2,3Mb/s	5,7 Mb/s	6.7 Mb/s	10 Mb/s	12 Mb/s	15 Mb/s
Distance (Ø 0.9 mm) *	13 km	8 km	6 km	3.7 km	2.5 km	1.5 km	1 km	0.7 km
Distance (Ø 0.4 mm) *	7 km	4 km	3 km	2 km	1.3 km	0.9 km	0.6 km	0.4 km



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