Thor Fiber 1550nm Erbium-Doped Fiber Amplifier

EDFA

User's Manual

F-EDFA Series

Products Descriptions

Product Descriptions The Thor Fiber 1550nm series EDFA, with its core components adopting the world's top brand pump laser and erbium-doped fiber, ensures the best optical performance through optimized optical design and production process. The electronic controlled modes of APC (Automatic Power Control), ACC (Automatic Current Control), and ATC (Automatic Temperature Control) circuits are adopted to guarantee high stability and reliability of the output power, while also ensuring excellent optical path indices.

Optional dual fiber inputs, in fact, are built-in with a complete optical switch system, which can serve as a backup for A and B optical paths. Should the main optical line fail or fall below the threshold value, the device will automatically switch to the standby optical line, ensuring the device's continuous operation. This product is primarily used in optical fiber ring networks or redundant backup networks, characterized by short switching times (< 8ms), low loss (< 0.8dBm), and manual forced switching capability.

The MPU (Microprocessor) with high stability and precision is utilized in the system. Its optimized thermal structure and heat dissipation design ensure the device's long life and high reliability. Thanks to the powerful network management function based on the TCP/IP protocol, network monitoring, and head-end management can be carried out for the status of multiple node equipment via the RJ45 network management interface, supporting multiple power supply redundancy configurations which enhance the device's practicability and reliability.

Features

1. Adopts the world's top brand pump laser and erbium-doped fiber.
2. Perfect APC, ACC, and ATC optical circuit design ensures low noise, high output, and high reliability of the device across the entire operating band (1530 ~ 1565nm).
3. Features automatic protection for low input or no input situations. When the input optical power is lower than the set value, the laser will automatically shut down to ensure laser safety protection.
4. Output is adjustable, with an adjustment range of 0~-4dBm.
5. Maximum output reaches 27dBm.
6. The optical switch's switching time is short, and the loss is small. It supports automatic switching and forced manual switching.
7. Fully automatic case temperature control and intelligent fans, which start operating when the case temperature reaches 35°C.
8. Built-in dual power supply, automatically switched, and supports hot plugging in/out.

9. The operating parameters of the whole machine are controlled by a microprocessor, and the LCD status display on the front panel offers functions such as laser status monitoring, parameter display, fault alarm, network management, etc. If the operating parameters of the laser deviate from the allowed range set by the software, the system will promptly alarm.

II. Installation

2.1 Preparation before Installation

Includes detailed instructions for preparation before installation, installation procedures, and operation guidance.

2.2 Installation

2.2.1 Please maintain a space of 1.75 inches (about 4.5 cm) between machines for ventilation and cooling of the device.

2.2.2 Ensure that the socket is functioning properly and is well-grounded, use a 110-220V power source with three cables, with the middle one connected to the ground. Incorrect grounding may damage the device or affect the quality of the signal.

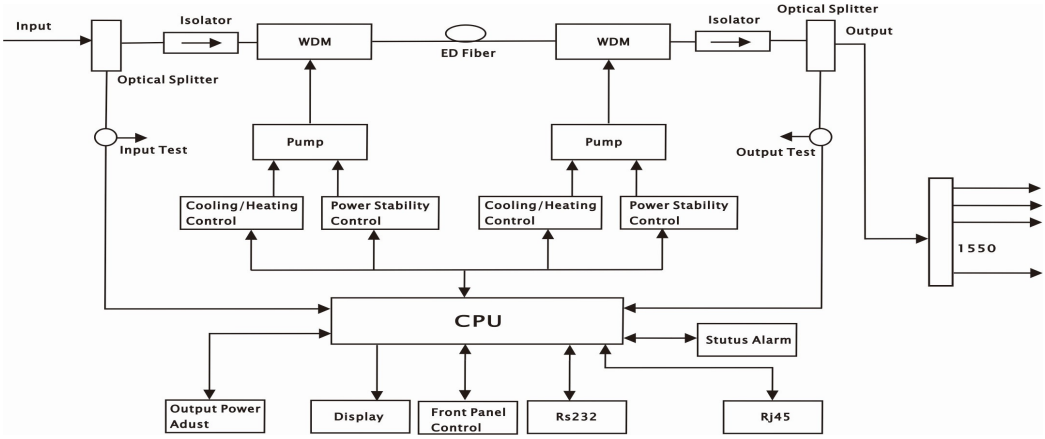
2.2.3 Make sure the power supply button on the rear panel is turned to OFF before connecting the power supply cable.

2.2.4 Ensure the fiber interface is clean before connecting the fiber.

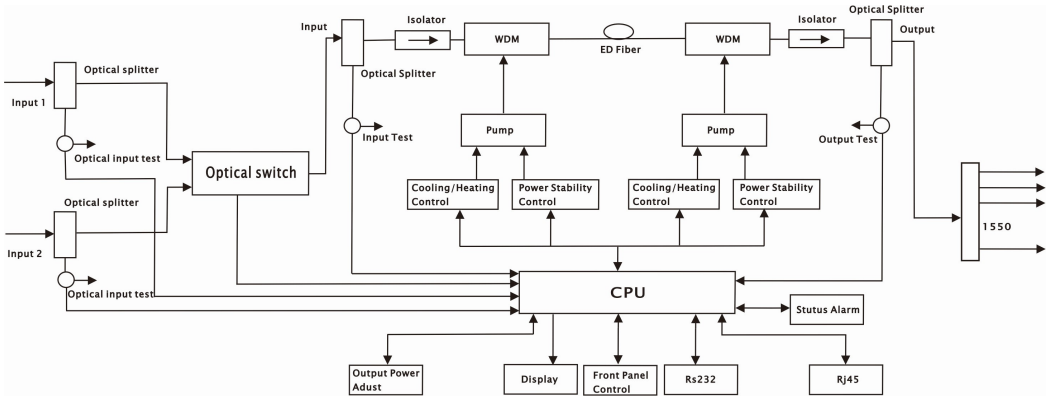
III. Operation

3.1 Diagram

Single Input



Dual Inputs

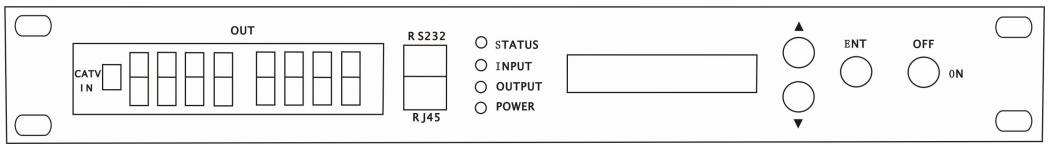


3. 2 Main Technical Parameters

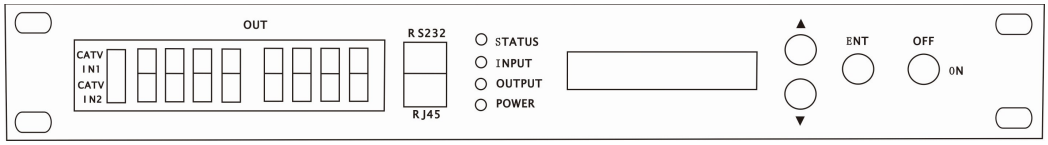
Category	Items	Unit	Index			Remarks
			Min.	Typ.	Max.	
Optical Parameters	Operating Wavelength	nm	1530		1565	
	Optical Input Range	dBm	-10		+10	
	Output Power	dBm	13		27	1dBm interval
	Output Adjustment Range	dBm	-4		0	Adjustable, each step 0.1dB
	Output Power Stability	dBm			0.2	
	No. of Output Ports		1		4	Specified by User
	Noise Figure	dB			5	Pin：0dBm
	Switching Time of Optical Switch	ms			8.0	Optional
	Insertion Loss of Optical Switch	dB			0.8	Optional
	PDL	dB			0.3	
	PDG	dB			0.3	
	PMD	ps			0.3	
	Remnant Pump Power	dBm			-30	
	Optical Return Loss	dB	50			
	Fiber Connector		SC/APC			
General Parameters	Network Management Interface		SNMP,WEB supported			
	Power Supply	V	90		265	AC
			-72		-36	DC
	Power Consumption	W			25	24dBm,dual power supply

	Operating Temp	℃	-5		+65	Fully automatic case temp control
	Storage Temp	℃	-40		+85	
	Operating Relative Humidity	%	5		95	
	Dimension	mm	360×483×44			D、W、H
	Weight	Kg	5.0			

3.3 Front Panel Instructions



Single Input

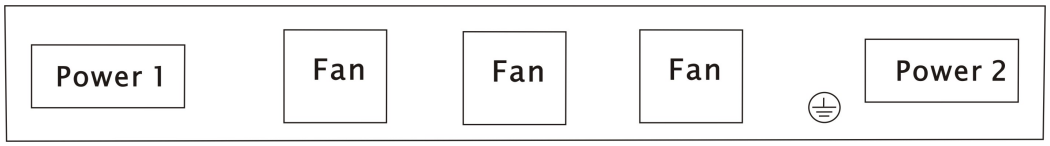


Dual Inputs

S/N	Identification	Name	Remarks
1	LCD	LCD Display	To display the parameters of the device
2	STATUS	Device Status	LED Green, Device working
			LED Red，Device alarming or faulty
3	INPUT	Fiber Input	LED Green, Input within requested range
			LED Red，no input or out of the requested range or only single input connected in dual inputs model
4	OUTPUT	Fiber Output	LED Green，Fiber output is within normal range

			LED Red，Fiber output is out of normal range	
5	POWER	Power Supply	LED Green，Dual power supply working	
			LED Yellow，Single power supply working	
6	CATV IN	CATV input	1550nm fiber input	Single input
7	CATV IN1	CATV input 1	1550nm fiber input 1	Dual Inputs
8	CATV IN2	CATV input 2	1550nm fiber input 2	Dual Inputs
9	OUT	Fiber Output	Fiber Output	
10	▲▼	Buttons	Start menu page turning and set the device	
11	ENT	Enter	Confirmation after menu page turning and device setting	
12	OFF/ON	Key	ON pump laser on ， OFF pump laser off	
13	RS232	RS232 Port	Local programming	
14	RJ45	RJ45 Port	Remote SNMP and WEB supported	

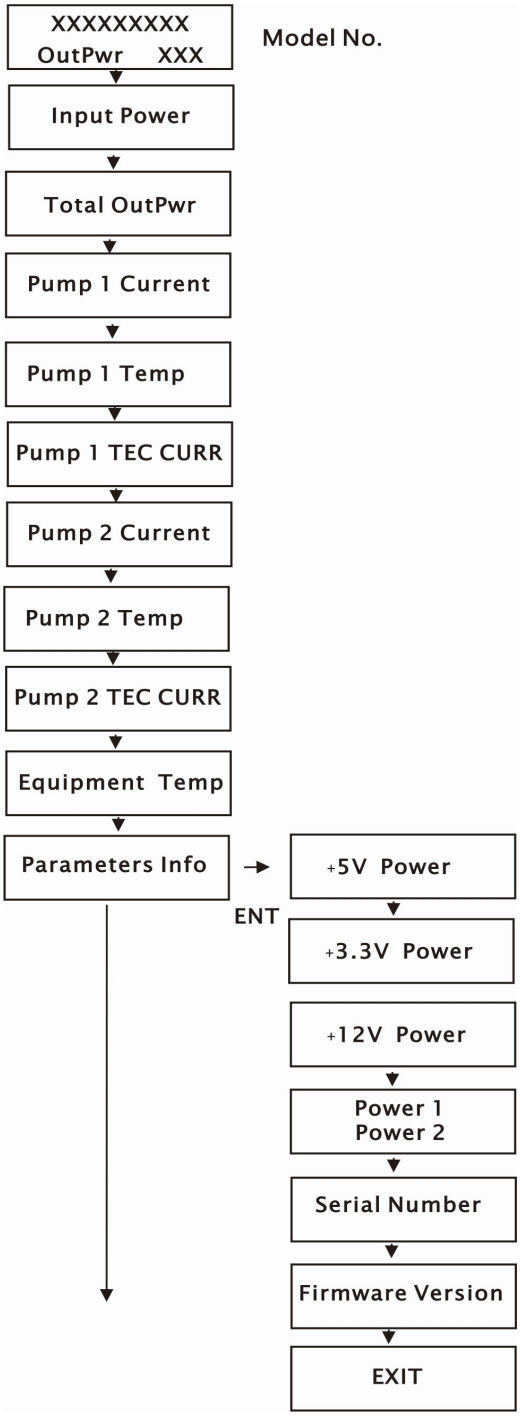
3.4 Rear panel Instructions

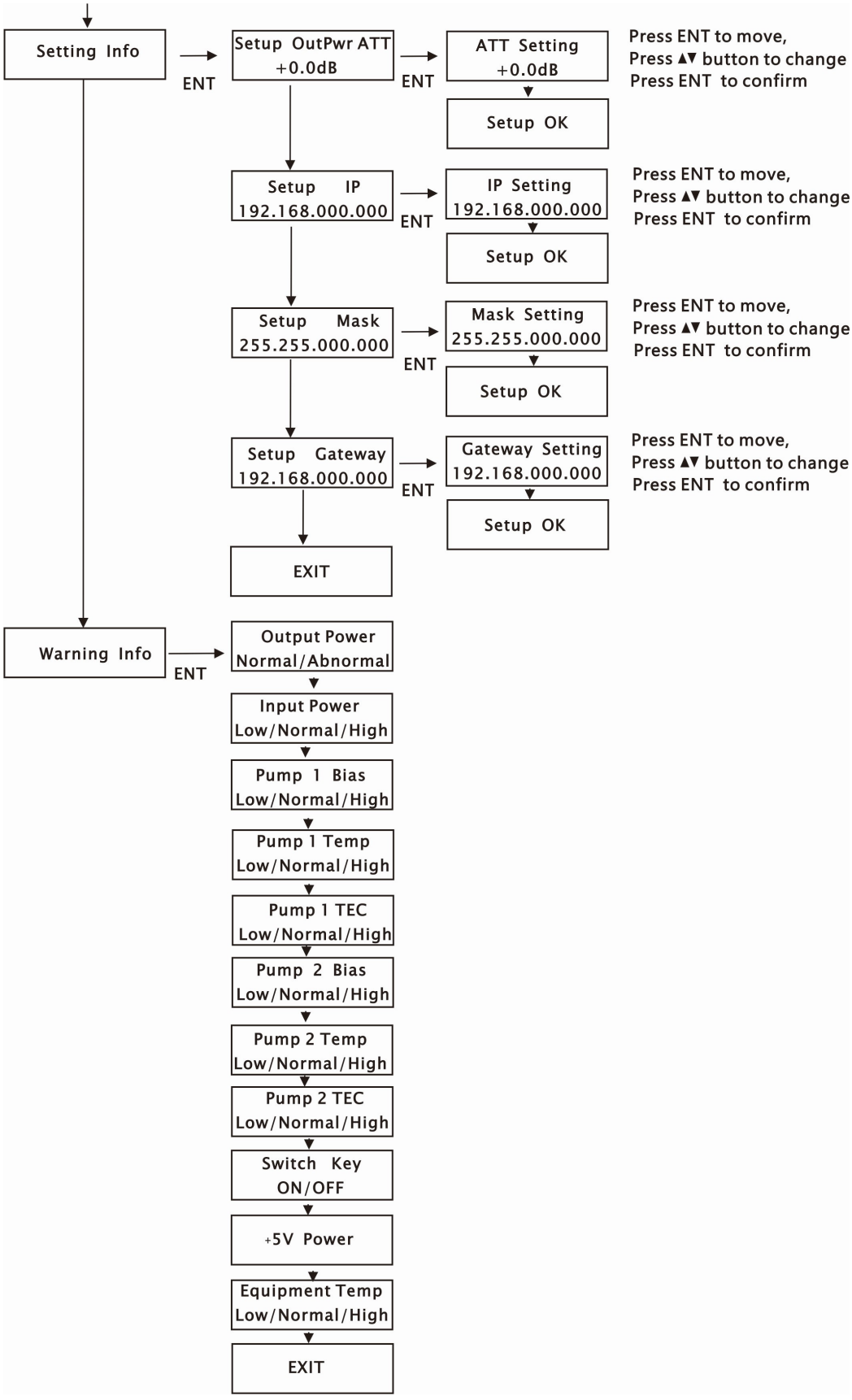


S/N	Identification	Items	Remarks
1	Fan	Fan	For the cooling of the device
2	⏚	Grounding Port	For Grounding
3	Power1	Power Socket1	Hot plug in/out supported
4	Power2	Power Socket 2	Hot plug in/out supported

3.5 Front Panel Operation

Press the ▼ to display the following menus in turn, and press the ▲ to reverse the cycle


XXXXXXXXX
OutPwr XXX
Model No.
Input Power
Total OutPwr
Pump 1 Current
Pump 1 Temp
Pump 1 TEC CURR
Pump 2 Current
Pump 2 Temp
Pump 2 TEC CURR
Equipment Temp
Parameters Info
ENT
+5V Power
+3.3V Power
+12V Power
Power 1
Power 2
Serial Number
Firmware Version
EXIT


Setting Info
ENT
Setup OutPwr ATT
+0.0dB
ENT
ATT Setting
+0.0dB
Setup OK
Press ENT to move,
Press ▲▼ button to change
Press ENT to confirm
Setup IP
192.168.000.000
ENT
IP Setting
192.168.000.000
Setup OK
Press ENT to move,
Press ▲▼ button to change
Press ENT to confirm
Setup Mask
255.255.000.000
ENT
Mask Setting
255.255.000.000
Setup OK
Press ENT to move,
Press ▲▼ button to change
Press ENT to confirm
Setup Gateway
192.168.000.000
ENT
Gateway Setting
192.168.000.000
Setup OK
Press ENT to move,
Press ▲▼ button to change
Press ENT to confirm
EXIT
Warning Info
ENT
Output Power
Normal/Abnormal
Input Power
Low/Normal/High
Pump 1 Bias
Low/Normal/High
Pump 1 Temp
Low/Normal/High
Pump 1 TEC
Low/Normal/High
Pump 2 Bias
Low/Normal/High
Pump 2 Temp
Low/Normal/High
Pump 2 TEC
Low/Normal/High
Switch Key
ON/OFF
+5V Power
Equipment Temp
Low/Normal/High
EXIT

IV. Products Series

Total Output Power		No. of Output Port	Output Power per Port
dBm	mW		
13	20	1	13.0
14	25	1	14.0
15	32	1	15.0
16	40	1	16.0
17	50	1	17.0
18	63	1	18.0
19	80	1	19.0
20	100	1	20.0
21	125	1	21.0
		2	17.5
22	160	1	22.0
		2	18.5
23	200	1	23.0
		2	19.5
24	250	1	24.0
		2	20.5
25	320	1	25.0
		2	21.5
		4	18.0
26	400	1	26.0
		2	22.5
		4	19.0
27	500	1	27.0
		2	23.5
		4	20.0

V. Notes

5.1 A static-sensitive pump laser is used in the EDFA; please note that electrostatic protection should be employed during the storage of the EDFA, and it should not be stored with corrosive materials. The storage temperature should be between -40°C and +85°C.

5.2 Since the output power of the EDFA is high, do not turn on the power supply before the EDFA is connected to the system or before the output ports are equipped with protective sleeves. Do not plug in or unplug the patch cord while the device is operating; otherwise, it may damage the output interface, resulting in decreased output power.

5.3 Please do not attempt to look into the optical connectors when power is applied, as it may result in eye damage.

5.4 Do not block the cooling holes of the device and ensure it is well-ventilated.

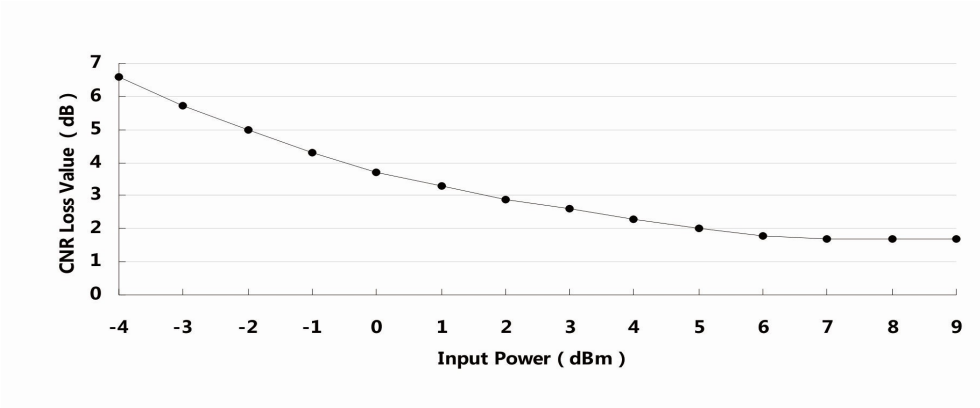
5.5 If necessary, use anhydrous industrial alcohol instead of medical alcohol to clean the fiber connector after the power supply of the device is turned off.

5.6 For high-power EDFA, it is easy to damage the fiber output interface and decrease the output power, so the recommended maximum value on each port is lower than 19dBm.

5.7 Please do not test the EDFA repeatedly; otherwise, the fiber connector interface may be damaged and the output power decreased.

5.8 The change in input optical power significantly influences CNR. Higher input power results in a higher CNR, while lower input power results in a worse CNR, as illustrated in the figure below:

CNR loss value/Input Power



VI. Solution to some ordinary problems

S/N	Fault Phenomenon	Faulty Reason	Solution	Remarks

1	Power Yellow	Single power supply working	Connect another power supply	
2	STATUS Red LASER IN Red LASER OUT Red	No input or input too low	Adjust the value of input power	
3	STATUS Red INPUT Green LASER OUT Red LCD Display “KEY OFF”	The key turned to OFF	Turn the key to ON	
4	Output power LCD displays normal value, but low value by power meter	Fiber interface hurt caused by wrong operation such as plug in/out patch cord when the power supply is on, it will cause the output lower than LCD display	Replace the fiber connector	The advised optical power per port ≤19dBm
		Output interface of EDFA or patch cord is dirty.	Clean the output interface with industrial anhydrous alcohol or dust-free paper	
		Power meter error	Change power meter	Top brand power meter is advised
		The wavelength deviation of input optical signal is far from 1550nm	Adjust the wavelength of optical transmitter	
5	LCD display shows output is about 0 ~ 4dB lower than specified value	Checking if the ATT attenuation in “Setting Info" is enabled	Turn off “ATT” function	
6	The optical power of the output end of the optical amplifier is normal, but the index of the user end is deteriorated	Optical power to fiber is high	Decrease the power to fiber under 19dBm	

VII. Warranty Terms

THOR FIBER F-EDFA-16 series EDFA is covered by a ONE-YEAR LIMITED WARRANTY, which begins on the initial date of your purchase. We provide lifetime technical support to our customers. If the warranty has expired, repair service will only charge for parts (if required). In the event that a unit must be returned for service, please note the following before returning the unit:

7.1 The warranty sticker on the housing of the unit must be in good condition.

7.2 A clear and readable document describing the model number, serial number, and issues should be provided.

7.3 Please pack the unit in its original container. If the original container is no longer available, please pack the unit with at least 3 inches of shock-absorbing material.

7.4 Returned unit(s) must be shipped prepaid and insured. COD and freight collect are not acceptable. NOTE: We do not assume responsibility for damage caused by improper packing of returned units.

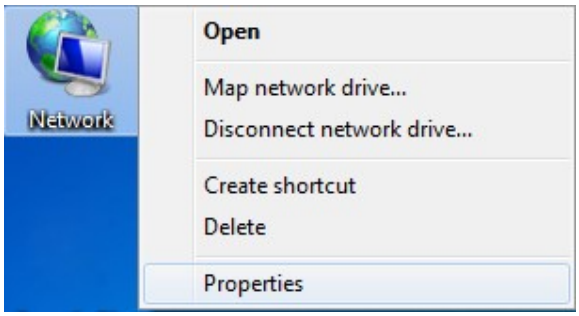
The following situations are not covered by the warranty:

1. The unit fails to perform due to operator errors.
2. The warranty sticker is altered, damaged, or removed.
3. Damage caused by force
4. The unit has been altered or repaired without authorization.
5. Other issues caused by operator errors.

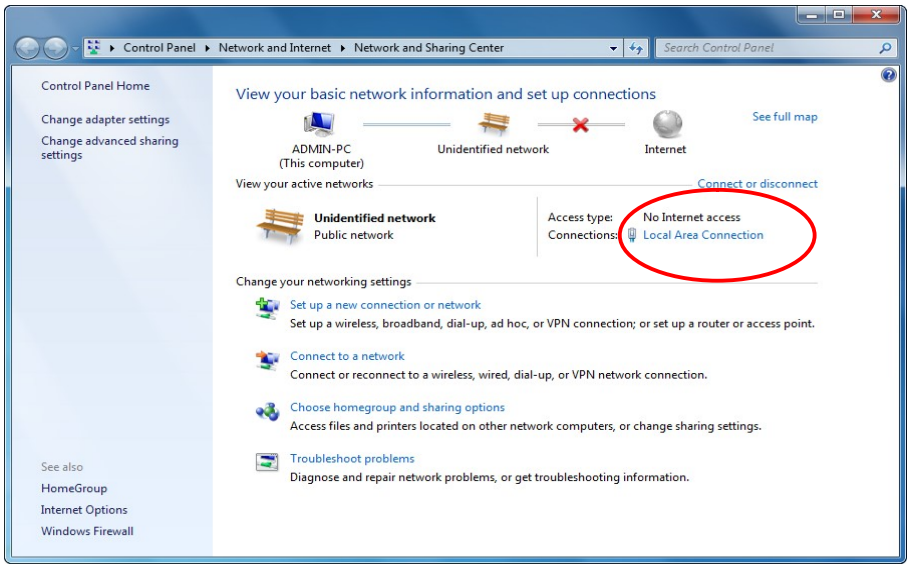
VIII. Web Server

Web Server management interface, users can directly check the basic operating and web parameters by Web. It's common to see the Microsoft's IE, Google's Chrome, Mozilla Foundation's Firefox, Norway Opera Software ASA Company's Opera, etc. in the computer. Web Server is the great support to these mainstream browsers. The following figures are explained by Opera .

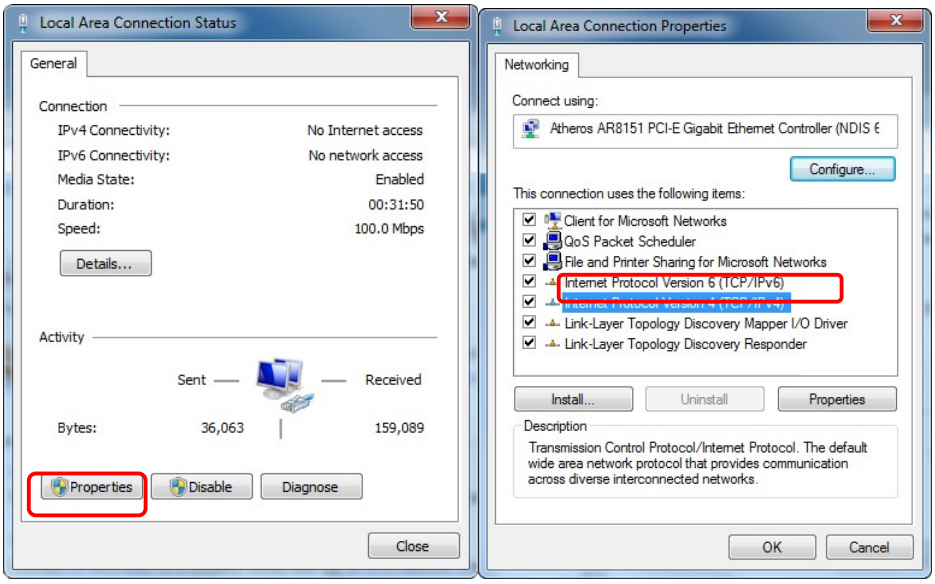
8.1First, find the IP address in the LCD menu of the device that the default IP address is 192.168.0.22. Set the IP address of the network card of the computer to the same network segment as the device. Find the "network" icon on the Windows desktop, select the icon, click the right button of mouse, and select "properties" in the pop-up menu



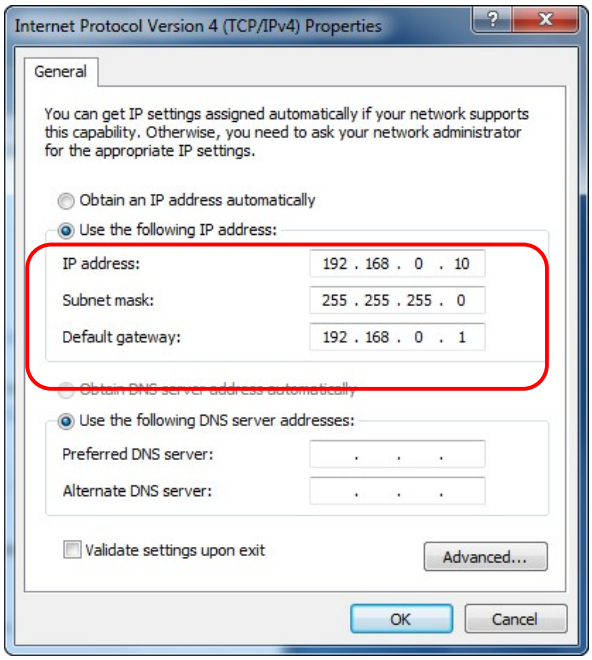
click to "local connection"in the pop up interface



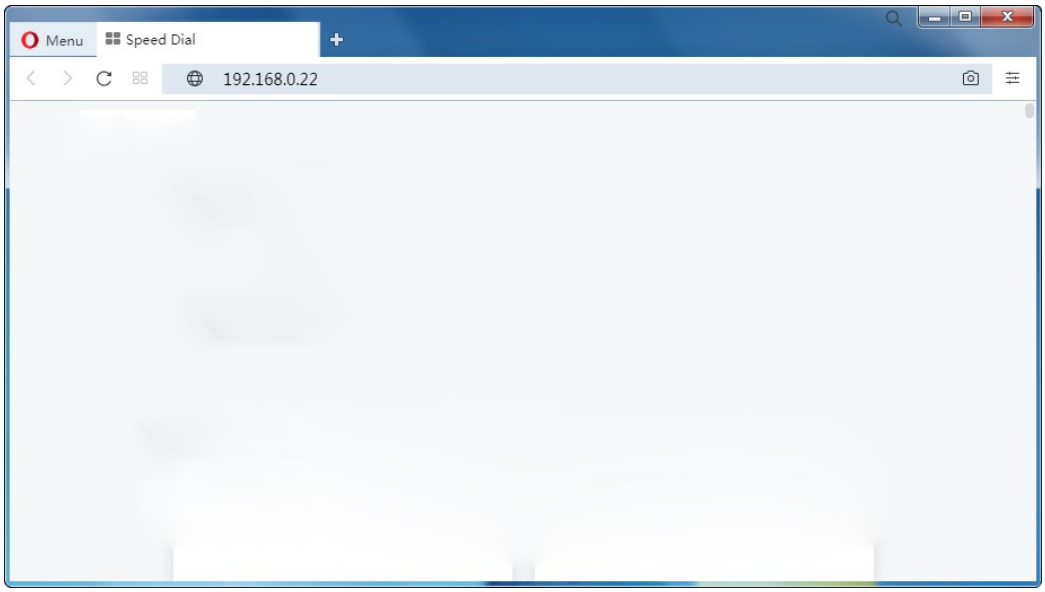
select “Properties” in the pop up “Local Connection Status” and double click “Internet Protocol Version 4 (TCP/IPv4)”



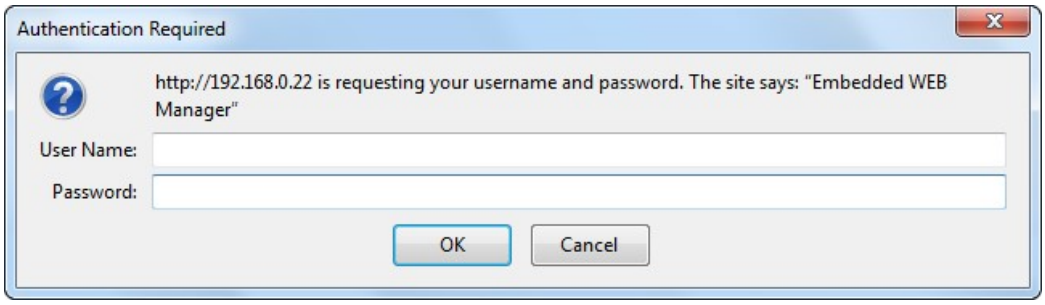
set the IP address that makes the IP address the same segment as the device to enable a computer to access a device



8.2 Open the Web, enter the IP address of the device in the browser address bar, such as 192.168.0.22

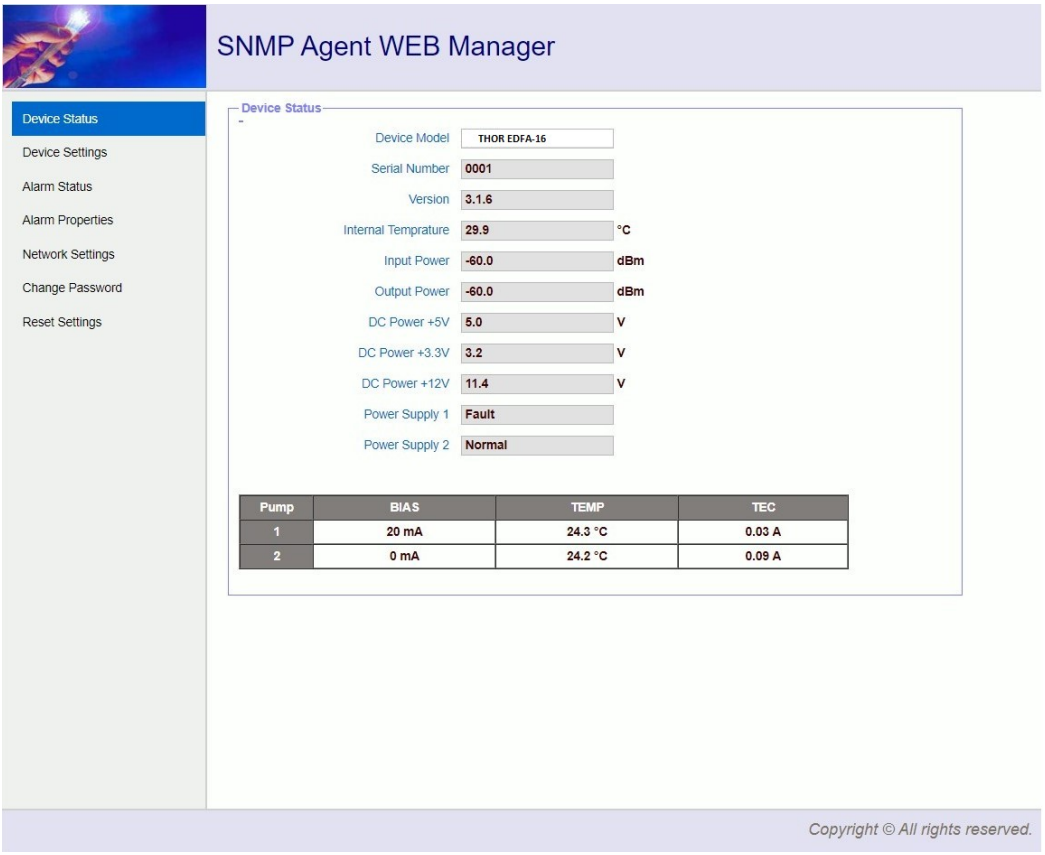


the browser will pop up a login box



Enter in the pop up login user box : **"admin"** (Note: all lowercase letters), password: "**123456**" , then press the Enter key

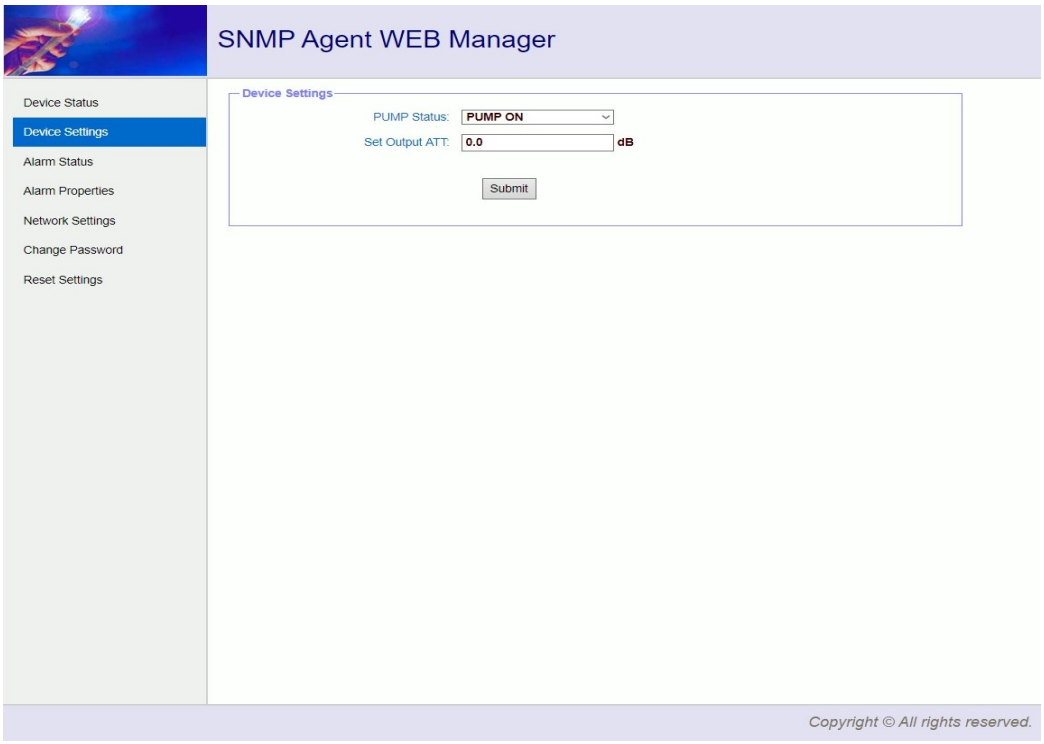
8.3 The browser opens the device status by default



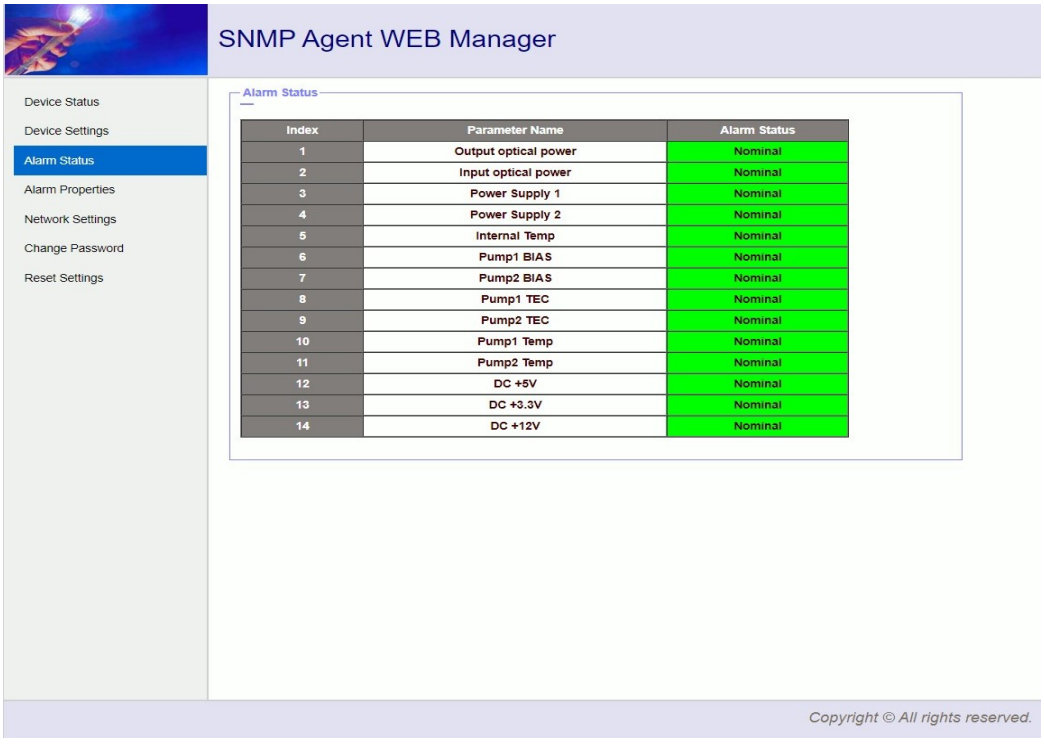
Real-time parameter

8.4 The left side of page is a navigation menu, click to enter the corresponding menu page

Page Navigation Bar

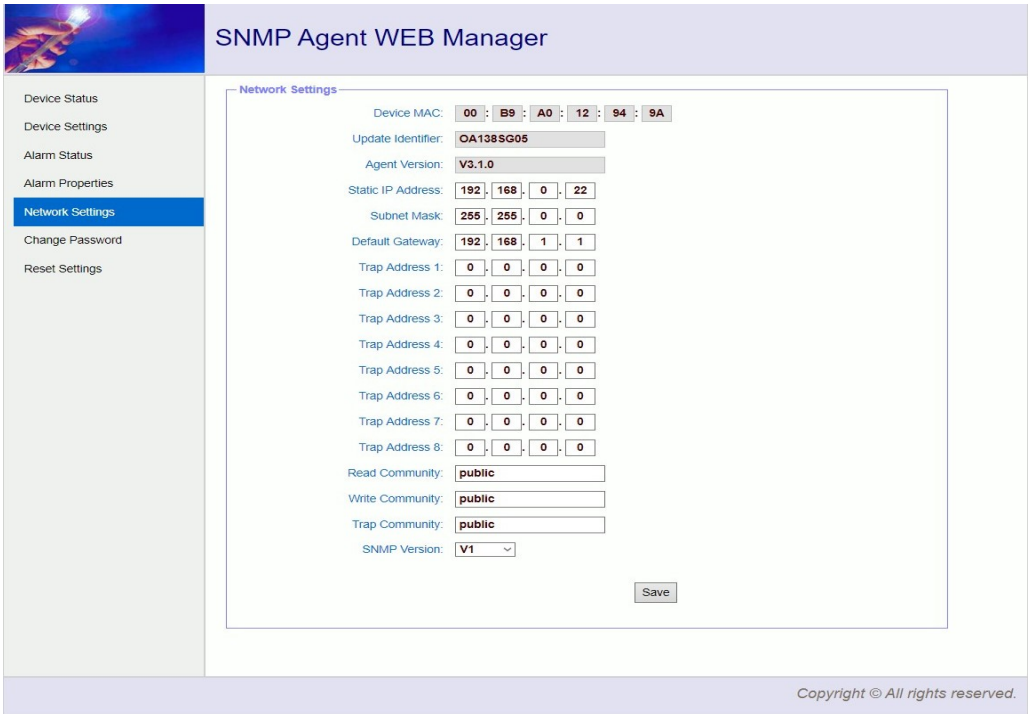


Device Settings

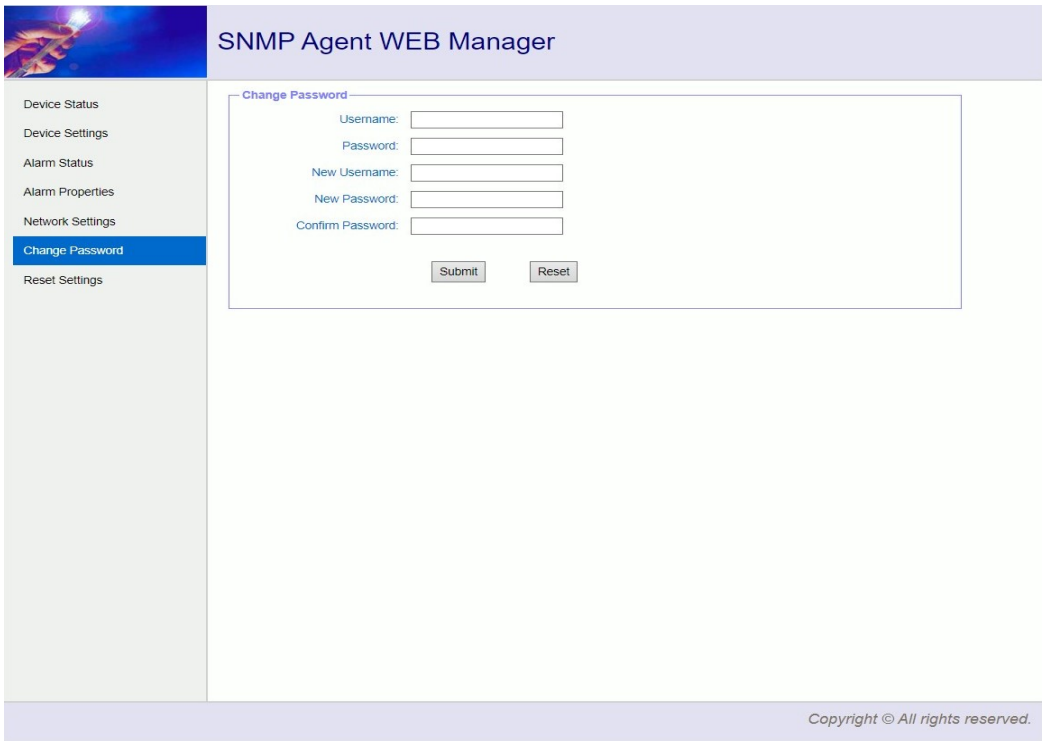


Alarm Status

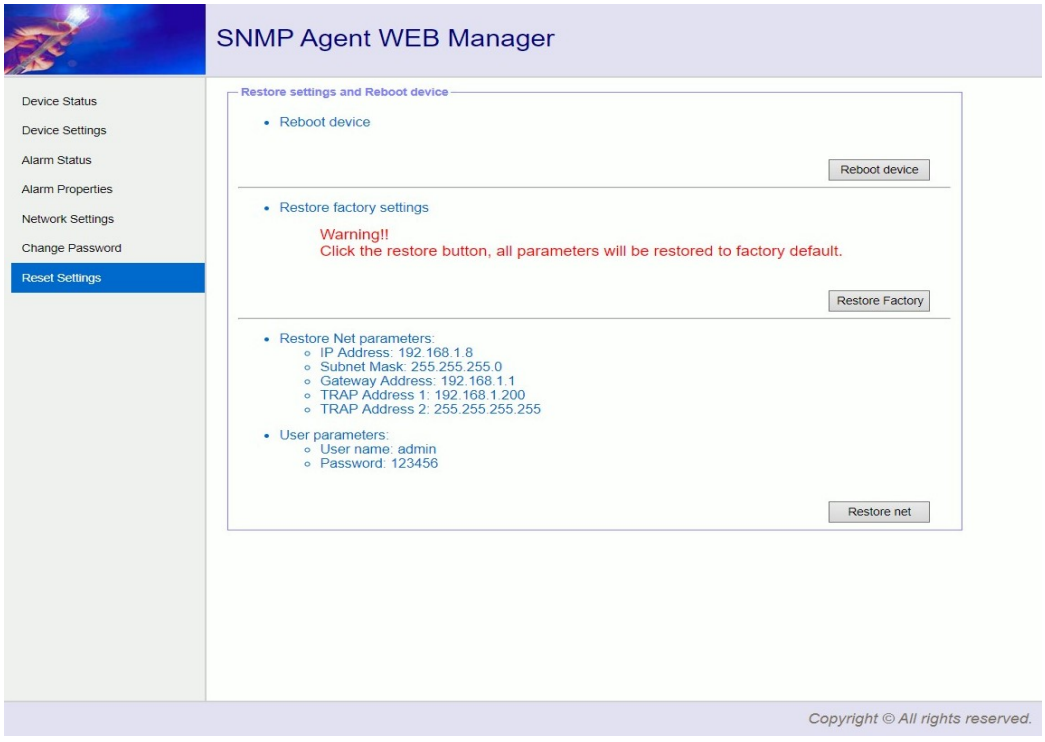
Alarm Properties



Network Settings



Change Username and Password



Restore Settings