HM64E High Power Multi Ports PON EDFA (3RU)

User's Manual

HM64E Series

Ⅰ. Products Descriptions

HM64E Series 1550nm high power fiber amplifier adopts two-stage amplification, the first stage adopts low-noise EDFA, the second stage adopts high-power EDFA, the total output optical power can reach 44dBm. It can replace several or dozens of EDFA, which can greatly reduce the cost of network building and maintenance and reduce the space of head-end. Each output port is built in with CWDM to multiplex CATV signal and OLT PON Data flow. The device will play an increasingly important role in the process of continuous extension and expansion of optical fiber network. It provides a high stability but low cost solution for the triple-play and large area coverage of FTTH.

Optional dual fiber inputs, in fact, built-in with a set of complete optical switch system , which can be used as the backup of A and B optical path. When the main optical line fails or lower than the threshold value, the device will automatically switch to the standby optical line to ensure the continuous operating of the device. The product is mainly used in optical fiber ring network or redundant backup network, It is featured in short switching time (< 8ms), low loss (< 0.8dbm) , and can be forced manually switched.

The core components adopts the top brand pump laser and double cladding active fiber. The optimized optical circuit design and manufacturing process ensure the best optical performance. The perfect electronic controlled APC (automatic power control), ACC (automatic current control) and ATC (automatic temperature control) are adopted to ensure high stability and reliability of output power, as well as excellent optical performance.

MPU (microprocessor) with high stability and precision is adopted in the system. The optimized thermal structure design , good ventilation and heat dissipation design ensure the long life and high reliability of the device. Based on the powerful network management function of TCP / IP protocol, network monitoring and head-end management can be carried out for the status of multiple node equipment through RJ45 network management interface, supporting multiple power supply redundancy configurations, which improved the practicability and reliability of the device.

Special Notes

In consideration of the request of inserting and plugging patch cord in the working state of the device, a maintenance function with a rapid drop of 6dB is added to protect the fiber core.

The output power is reduced by 6dB instead of turning off the power supply. It will not c ause a large area of out of service, but only a short-time signal decline.

The function is featured in :

A. After 6dBm reduced, the output power per port is ≤18dBm , the value makes it Available To pug in and out patch cord without hurting or burning the fiber core of patch cord.

B. It can return to original working status quickly after maintenance.

Features

1.1 It adopts the top brand pump laser and double cladding active fiber.

1.2 Each output port is built in with CWDM.

1.3 Compatible with any FTTx PON：EPON、GPON、10GPON.

1.4 Perfect APC, ACC and ATC optical circuit design ensures low noise, high output and high reliability of the device in the whole operating band (1545 ~ 1565nm).

1.5 It has the function of automatic protection of low input or no input. When the input optical power is lower than the set value, the laser will automatically shut down to protect the operating safety of the device.

1.6 Output adjustable, adjustment range : 0~-4dBm.

1.7 RF test in the front panel(optional).

1.8 The switching time of optical switch is short and the loss is small. It has the functions of automatic switching and forced manual switching.

1.9 Built- in dual power supply, automatically switched and hot plug supported.

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

1.11 Standard RJ45 interface is provided, supporting SNMP and WEB remote network management.

II. Installation

2.1 Preparation before installation

2.1.1 Please examine the machine to see if there is distinct

2.1.2 Please examine if the accessories is complete and the quality cards is here. If not, please contact sales or dealer

2.2 Installation

2.2.1 Please keep a space about 4.5cm between machines for ventilation.

2.2.2 Please make sure: the socket works very well and well grounded; The impedance ≤4Ω; 220V power with three cables，the middle one should connected to the ground。Incorrect grounding may hurt the device or influence the quality of signal.

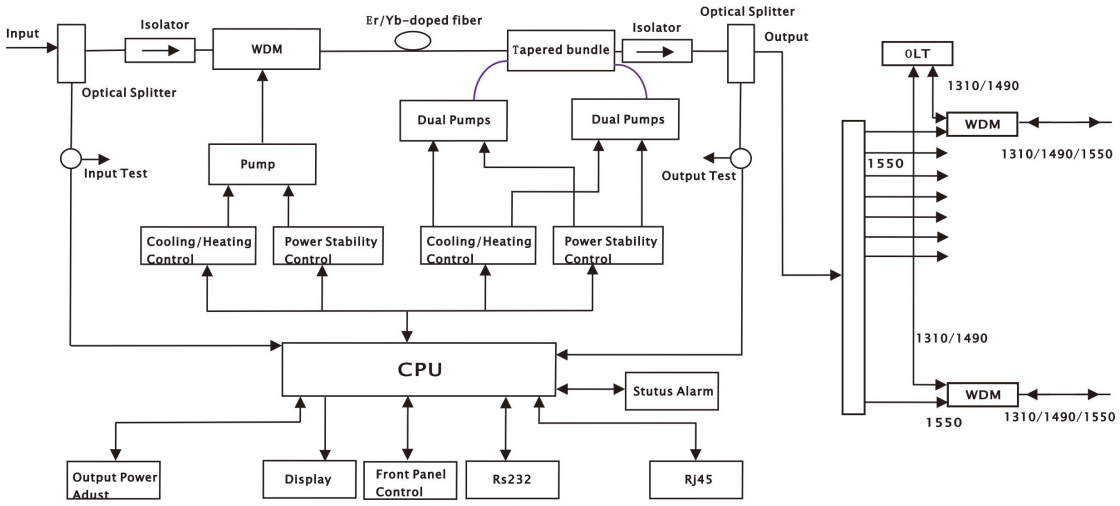
2.2.3 Please make sure the power supply button in the rear panel turn to OFF before the power supply cable connected.

2.2.4 Please keep the interface of the fiber clean before connecting the fiber.

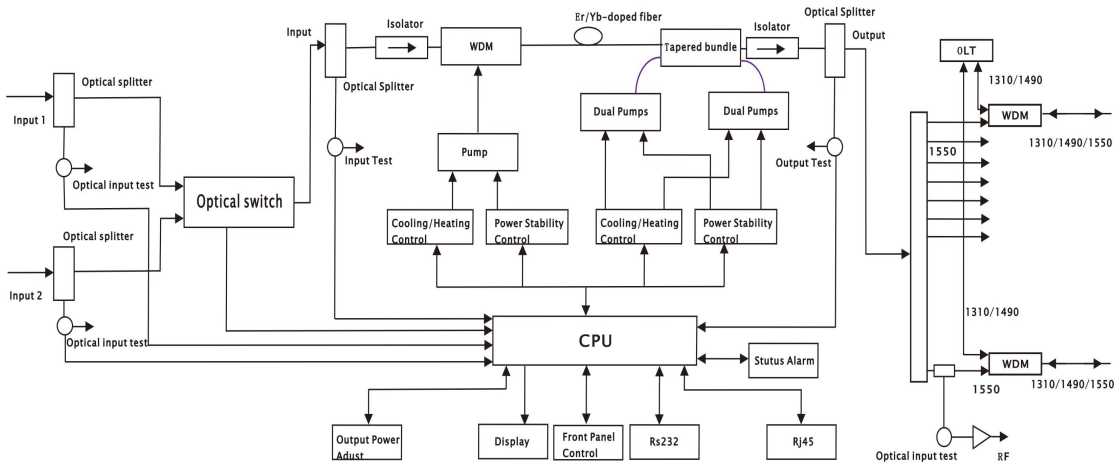
III. Operation

3.1 Diagram

Single Input Model



Dual Inputs Model

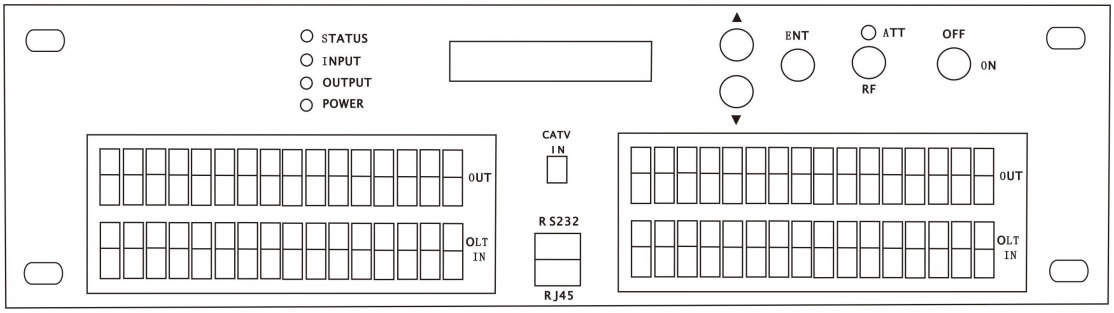


3. 2 Main Technical Parameters

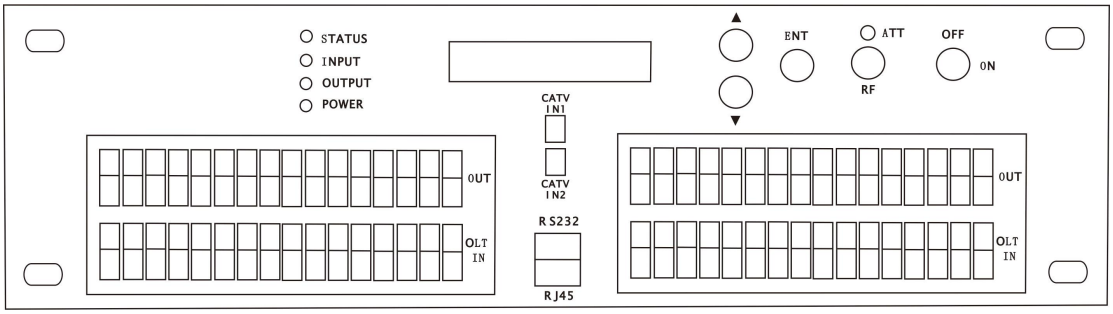
Category	Items	Unit	Index			Remarks
			Min.	Typ.	Max.	
Optical Index	CATV Operating Wavelength	nm	1545		1565	
	OLT PON Pass Wavelength	nm	1310/1490			CWDM
	Optical Input Range	dBm	-8		+10	
	Output Power	dBm			44	1dBm interval
	Output adjustment Range	dB	-4		0	Adjustable, each step 0.1dB
	Output ATT	dB		-6		Output ATT at one time And recover
	Output Ports Uniformity	dB			0.7	
	Output Power Stability	dB			0.3	
	No. of OLT PON Ports				64	SC/APC
					128	LC/APC
	No. of COM Ports				64	SC/APC
					128	LC/APC
	CATV Pass Loss	dB			0.8	
	OLT Pass Loss	dB			0.8	
	IsHM64Etion between CATV and OLT	dB	40			
	Switching Time of Optical Switch	ms				
	Insertion Loss of Optical Switch	dB			0.8	Optional
	Noise Figure	dB			6.0	Pin：0dBm
	PDL	dB			0.3	
	PDG	dB			0.4	
	PMD	ps			0.3	
	Remnant Pump Power	dBm			-30	
	Optical Return Loss	dB	45			
	Fiber Connector		SC/APC			FC/APC、LC/APC
General Index	RF Test	dBμV	78		82	Optional
	Network Management Interface		SNMP,WEB supported			
	Power Supply	V	90		265	AC

			-72		-36	DC
	Power Consumption	W			150	Dual PS,1+1 standby,43dBm
	Operating Temp	℃	-5		+65	
	Storage Temp	℃	-40		+85	
	Operating Relative Humidity	%	5		95	
	Dimension	mm	370×483×132			D、W、H
	Weight	Kg	8.2			

3.3 Front Panel Instructions



Single Input

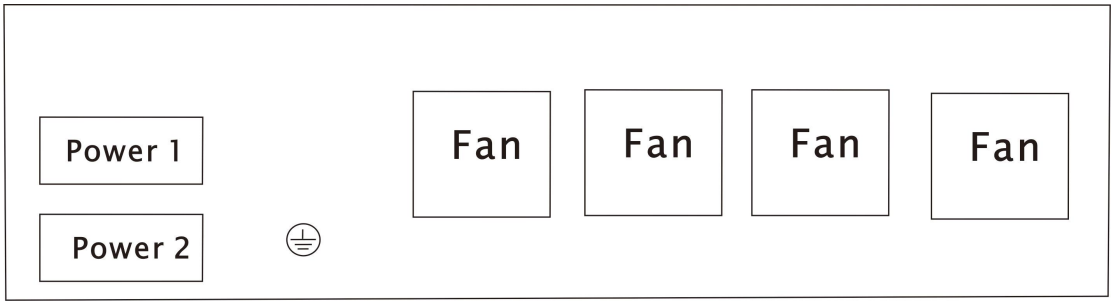


Dual Inputs

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	OLT IN	OLT Input	OLT Input	CWDM
10	OUT	Fiber Output	Fiber Output	
11	▲ ▼	Buttons	Start menu page turning and set the device	
12	ENT	Enter	Confirmation after menu page turning and device setting	
13	OFF/ON	Key	ON pump laser on ， OFF pump laser off	
14	RF TEST	RF test point	Output level 78～82dBμV	Optional
15	RS232	RS232 Port	Local programming	
16	RJ45	RJ45 Port	Remote SNMP and WEB supported	

3.4 Rear panel Instructions

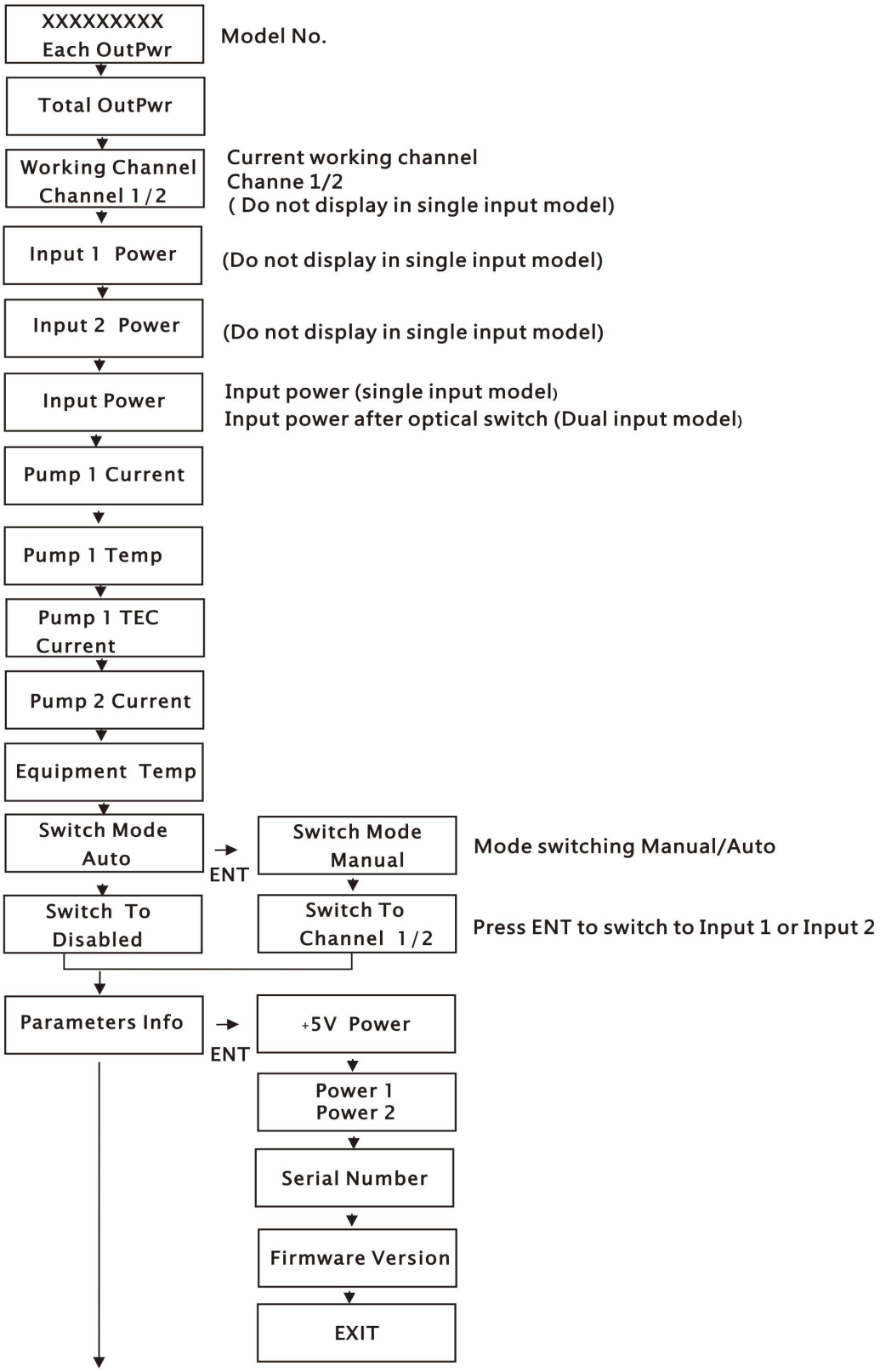


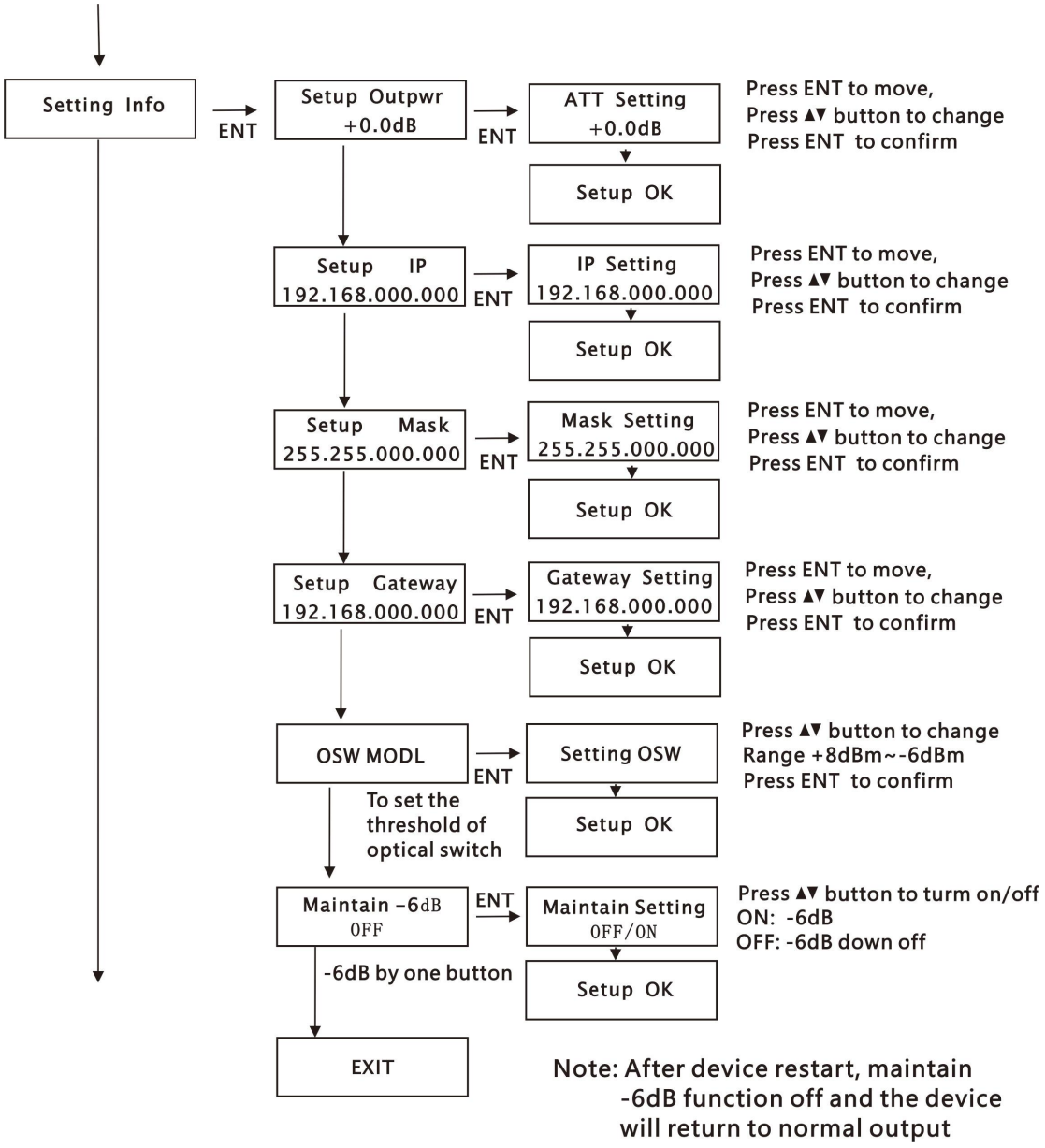
S/N	Identification	Items	Remarks
1	Fan	Fan	For the cooling of the device
2	⏚	Grounding Port	For Grounding

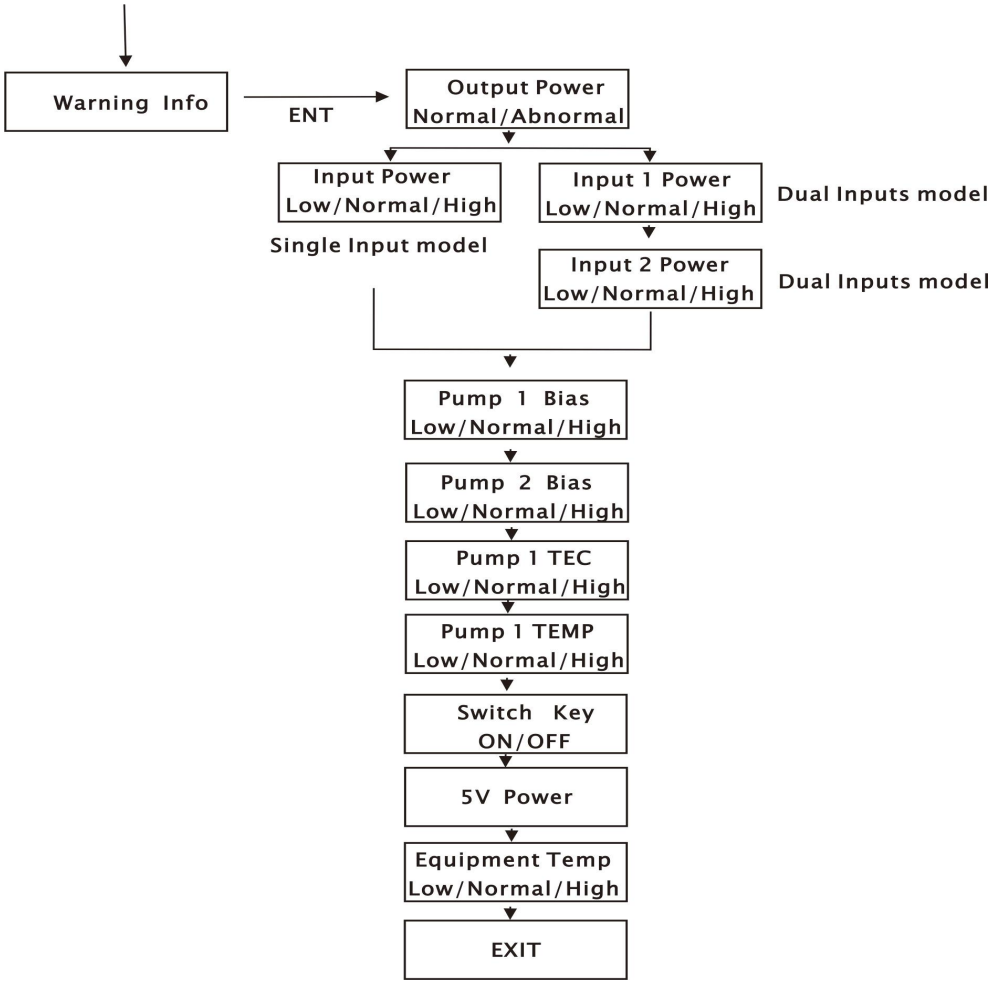
3	Power1	Power Socket1	Hot plug in/out supported
4	Power2	Power Socket 2	Hot plug in/out supported

3.5 Front Panel Operation

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


XXXXXXXXX
Each OutPwr
Model No.
Total OutPwr
Working Channel
Channel 1/2
Current working channel
Channe 1/2
(Do not display in single input model)
Input 1 Power
(Do not display in single input model)
Input 2 Power
(Do not display in single input model)
Input Power
Input power (single input model)
Input power after optical switch (Dual input model)
Pump 1 Current
Pump 1 Temp
Pump 1 TEC
Current
Pump 2 Current
Equipment Temp
Switch Mode
Auto
ENT
Switch Mode
Manual
Mode switching Manual/Auto
Switch To
Disabled
Switch To
Channel 1/2
Press ENT to switch to Input 1 or Input 2
Parameters Info
ENT
+5V Power
Power 1
Power 2
Serial Number
Firmware Version
EXIT


Setting Info
ENT
Setup Outpwr
+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
OSW MODL
ENT
Setting OSW
Setup OK
Press ▲▼ button to change
Range +8dBm~-6dBm
Press ENT to confirm
To set the
threshold of
optical switch
Maintain -6dB
OFF
ENT
Maintain Setting
OFF/ON
Setup OK
Press ▲▼ button to turm on/off
ON: -6dB
OFF: -6dB down off
-6dB by one button
EXIT
Note: After device restart, maintain
-6dB function off and the device
will return to normal output



IV. Products Series

Total Output Power		No. of Output Port	Output Power per Port
dBm	mW		
41	12500	64	19.5
		128	16.0
		256	---
42	16000	64	20.5
		128	17.0
		256	---
43	25000	64	21.5
		128	18.0
		256	---
44	32000	64	22.5
		128	19.0
		256	---

V. Notes

5.1 Static-sensitive pump laser is applied in the EYDFA, please note that electrostatic protection should be applied in the storage of the EYDFA and it should not be stored with corrosive material, and the storage temperature should be between - 40 ℃ and + 85 ℃.

5.2 As the output power of EYDFA is high, please do not turn on the power supply before the EYDFA is connected to the system or the output ports are not equipped with protection sleeves. Please do not to plug in/out the patch cord when the device is working , otherwise it may burn the output interface, resulting the decrease of the output power.

5.3 Please don’t now attempt to look into the optical connectors when power applied, eye damage may result.

5.4 Please don’t block the cooling holes of the device and keep it in good ventilation

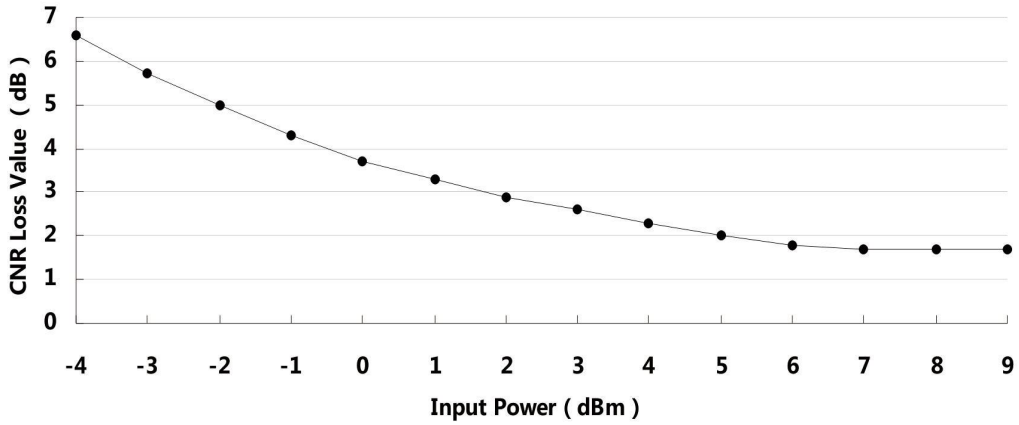
5.5 Please use anhydrous industrial alcohol instead of medical alcohol to wash the fiber connector if necessary after the power supply of the device turned off.

5.6 For high power EYDFA , it is easy to burn the fiber output interface and decrease the output power , so the advised best value on each port is lower than 19dBm.

5.7 Please don't test the EYDFA repeatedly, otherwise the fiber connector interface may be hurt and the output power decreased.

5.7 The change of input optical power has a great influence on CNR. The higher input power, the higher the CNR, the lower input power, and the worse the CNR, as shown in the following figure:

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 Green INPUT Yellow OUTPUT Green	Single optical input	Connect another input	Dual Model
3	STATUS Red INPUT Yellow OUTPUT Red	No input or input too low	Adjust the value of input power	
4	STATUS Red INPUT Green OUTPUT Red LCD Display "KEY OFF"	The key turned to OFF	Turn the key to ON	
5	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 EYDFA 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	
6	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	
7	LCD display shows output is about 6dB	Checking if the "Maintain -6dB"function in "Setting Info" enabled	Turn off "-6dB" function	
8	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 under19dBm	

VII. Warranty Terms

HM64E series EYDFA are covered by CATCAST. WARRANTY AS NEGOTIATED , which starts from the initial date of your purchase. We provide its customer whole-life technical supports. If warranty is expired, repair service only charges parts (if required). In the event that a unit must be returned for service, before returning the unit, please be advised that:

7.1 Warranty mark pasted on the housing of unit must be in good conditions.

7.2 A clear and readable material describes model number, serial number and troubles should be offered.

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

7.4 Returned unit(s) must be prepaid and insured. COD and freight collect can not be acceptable.

NOTE: we **do not** assume responsibility for damage caused by improper packing of returned unit(s).

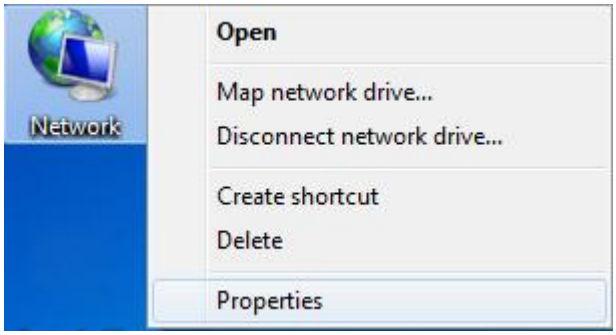
The following situation is not covered by warranty:

1. The unit fails to perform because of operators' faults.
2. Warranty mark is modified, damaged and/or removed.
3. Damage caused by Force Majeure.
4. The unit has been unauthorized alteration and/or repaired.
5. Other troubles caused by operators' faults.

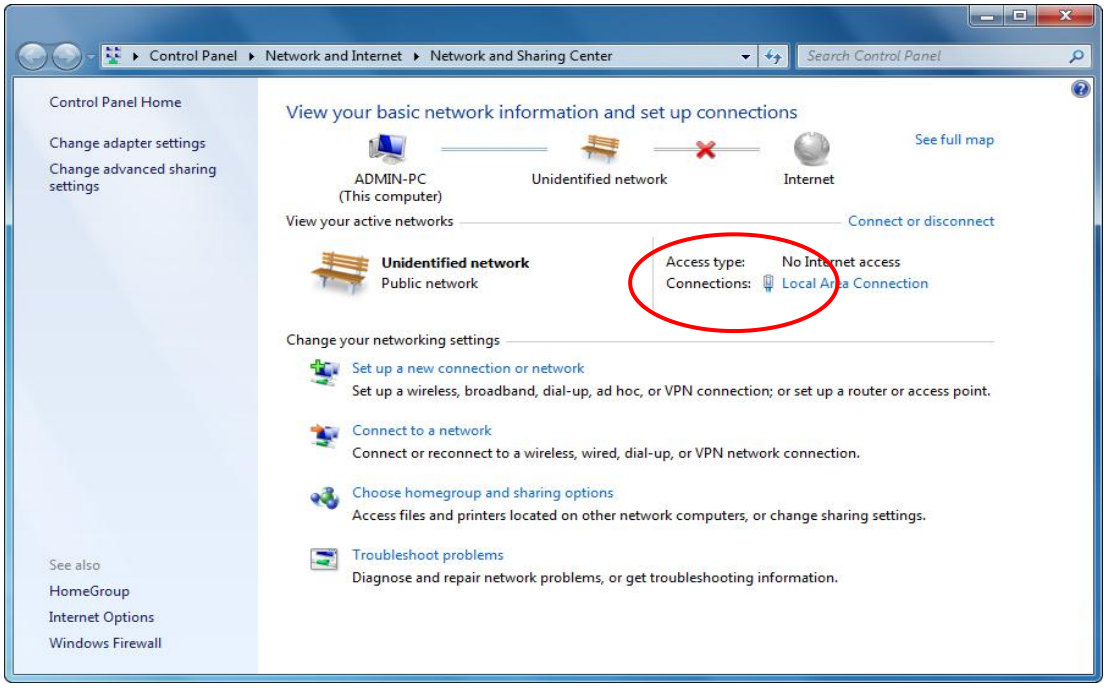
Ⅷ. Web Server

Web server is built in SNMP module. Users can directly view the basic operating parameters and network parameters of the device through the web browser. Popular web browsers include IE of Microsoft, Chrome of Google, Firefox of Mozilla, Opera of software ASA's, etc. The built-in web server of SNMP supports these popular browsers very well. The following diagrams are illustrated by opera browser.

8.1 First of all, Please find the IP address of the device in the LCD panel menu. The default IP address is 192.168.1.122. Set the IP address of the computer to the same network segment as the device, find the "network" icon on the desktop of windows system, select the icon, right-click the mouse, and select "properties" in the pop-up menu

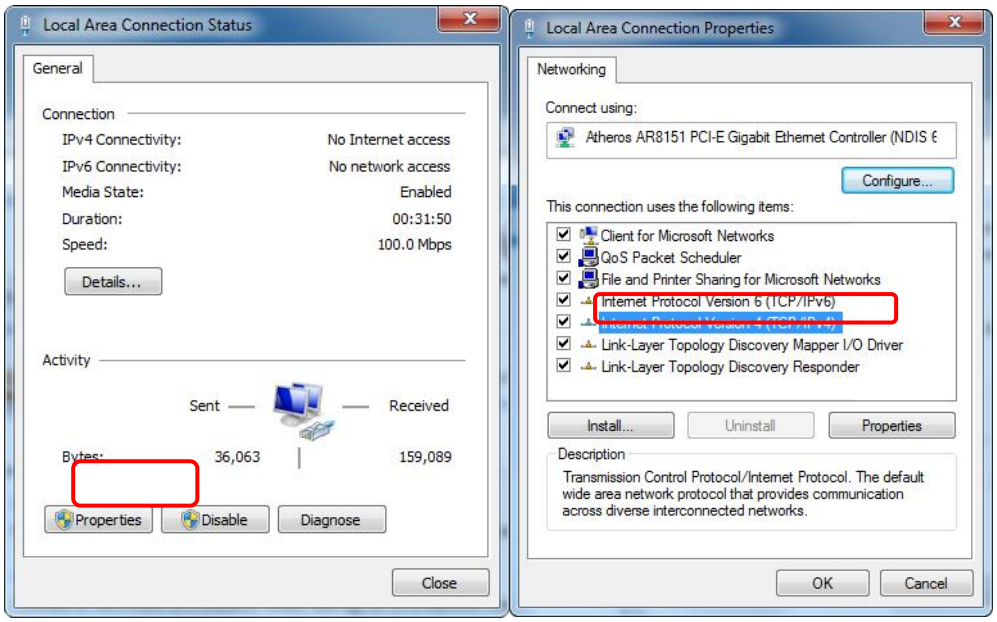


Click "Local Area Connection" in the pop-up version

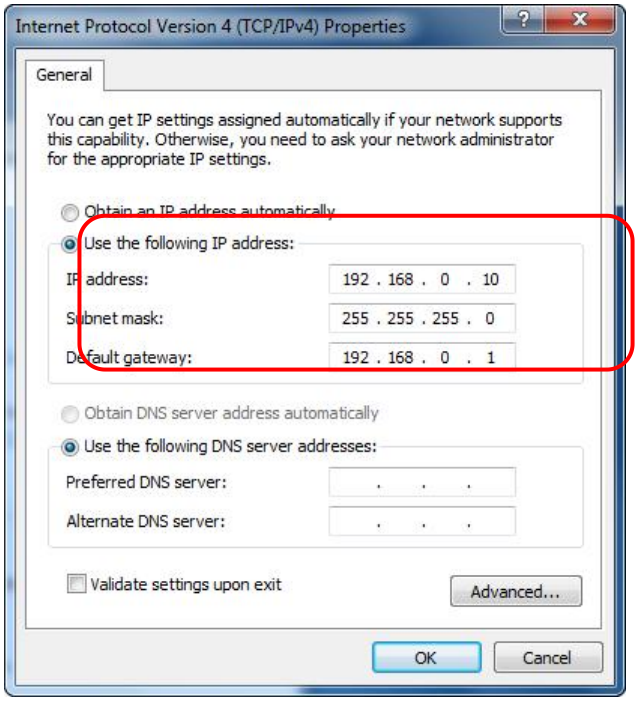


In the “Local Area Connection Status” menu, select “Properties”, and then double-click

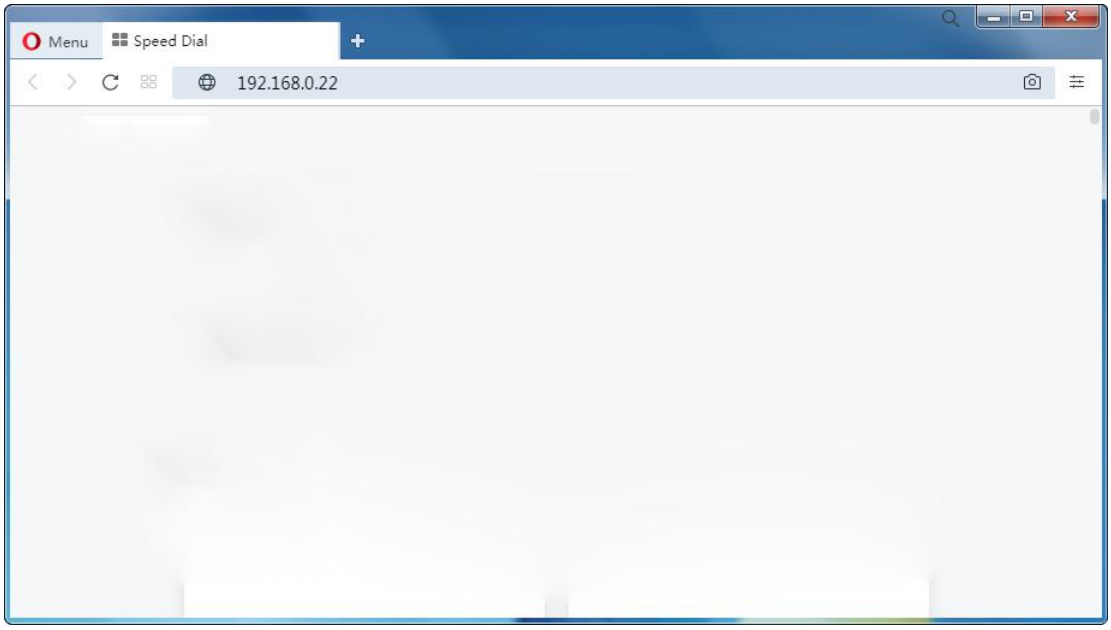
“Internet Protocol Version 4 (TCP / IPv4)”.



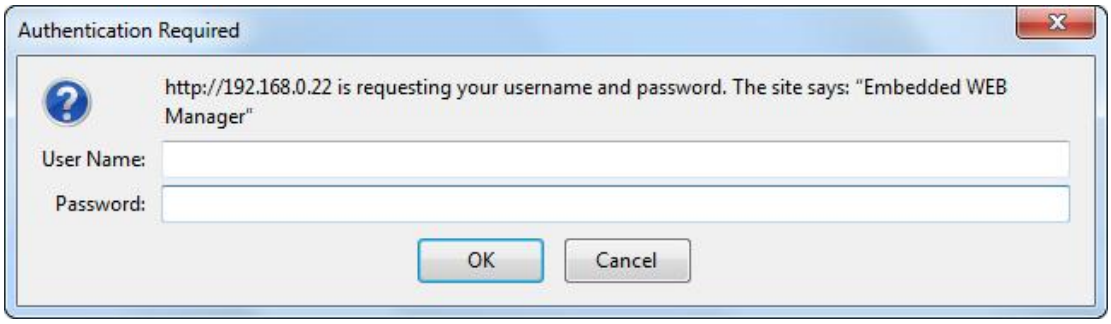
Set the IP address to make the IP address and the device in the same network segment, so that the computer can access the device.



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

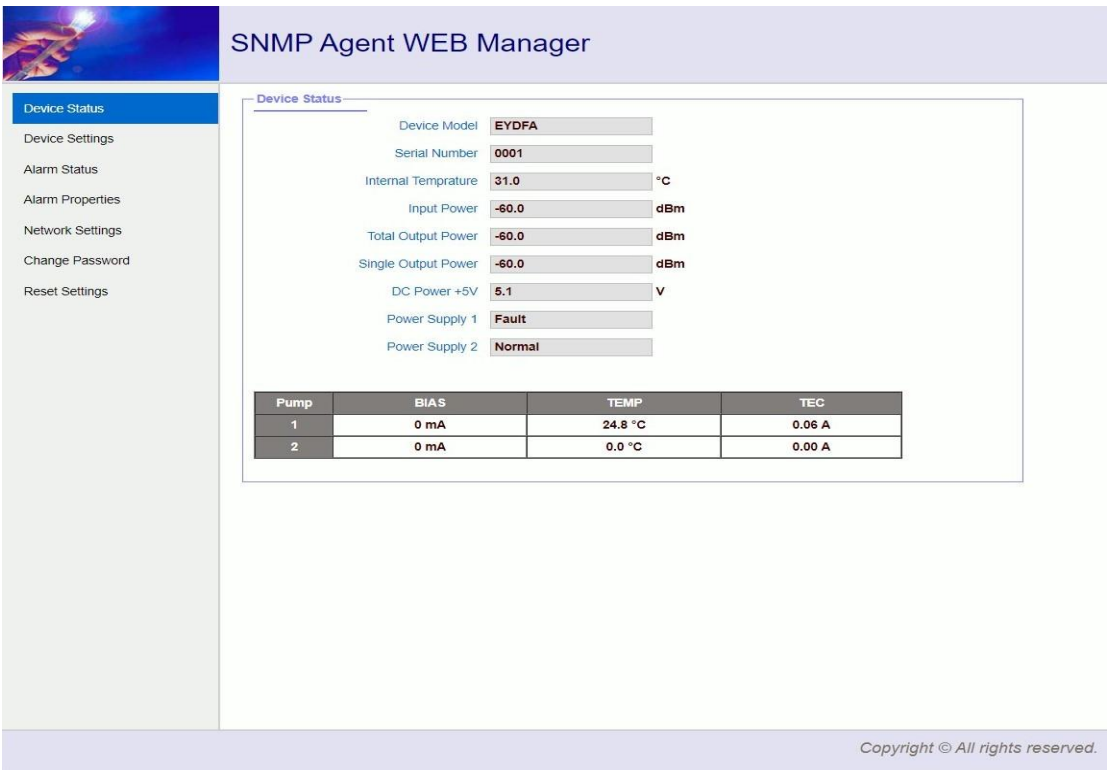


The browser will pop up a login box

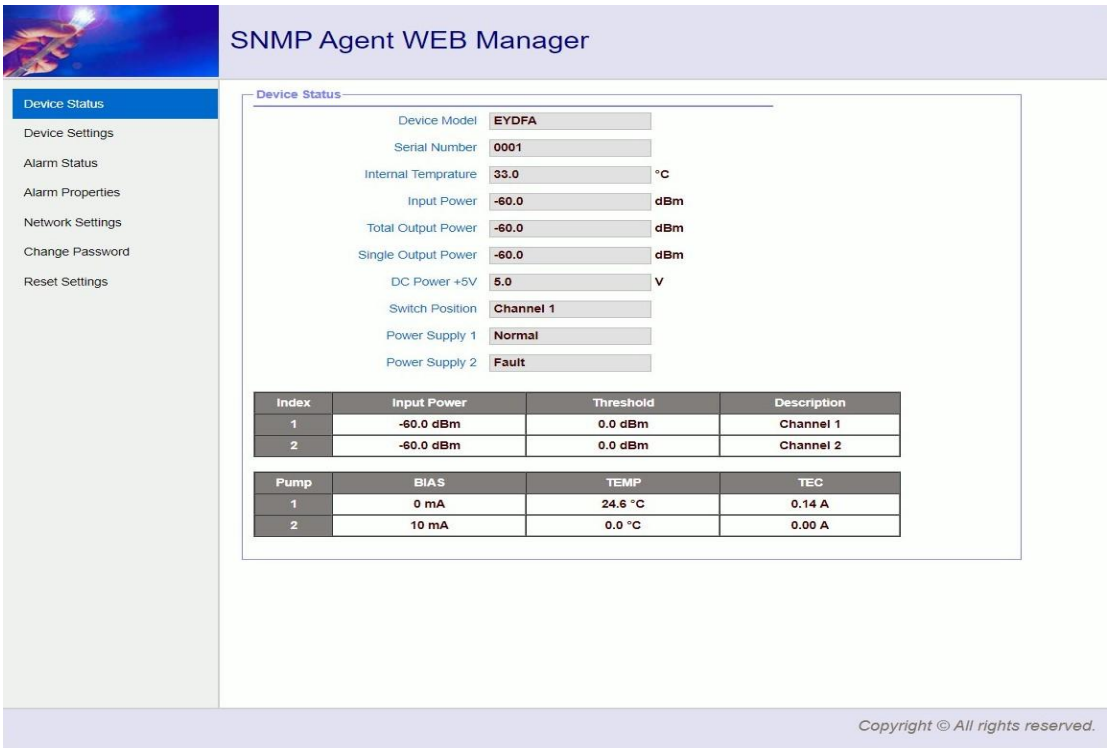


In the pop-up login user name box, enter User Name: "admin" (Note: all lowercase letters), password: "123456", and then enter.

8.3 The browser displays the device status page by default

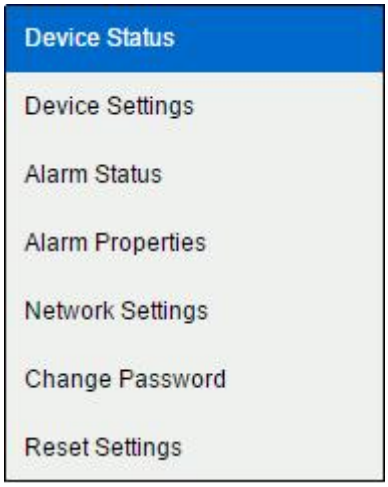


Real Time Device Status Page（For Single Input Model）

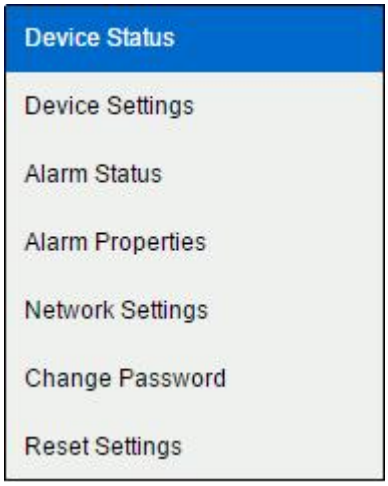


Real Time Device Status Page（For Dual Inputs Model）

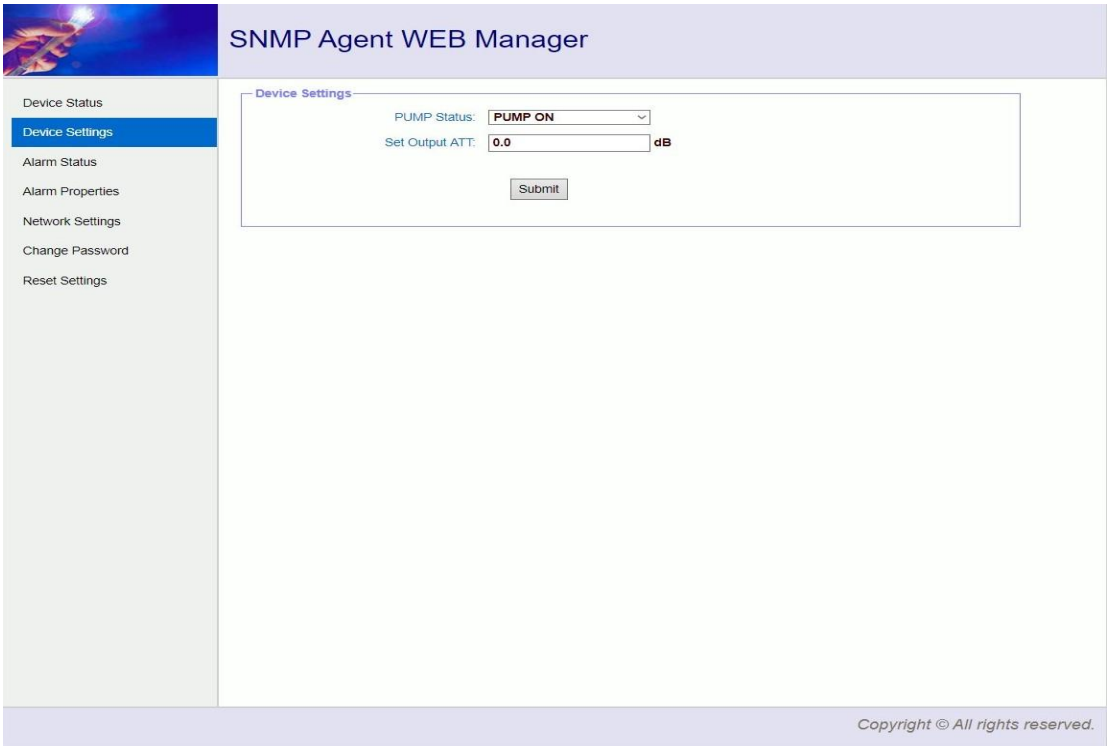
8.4 The left side of the page is the menu navigation bar. Click to enter the corresponding menu page



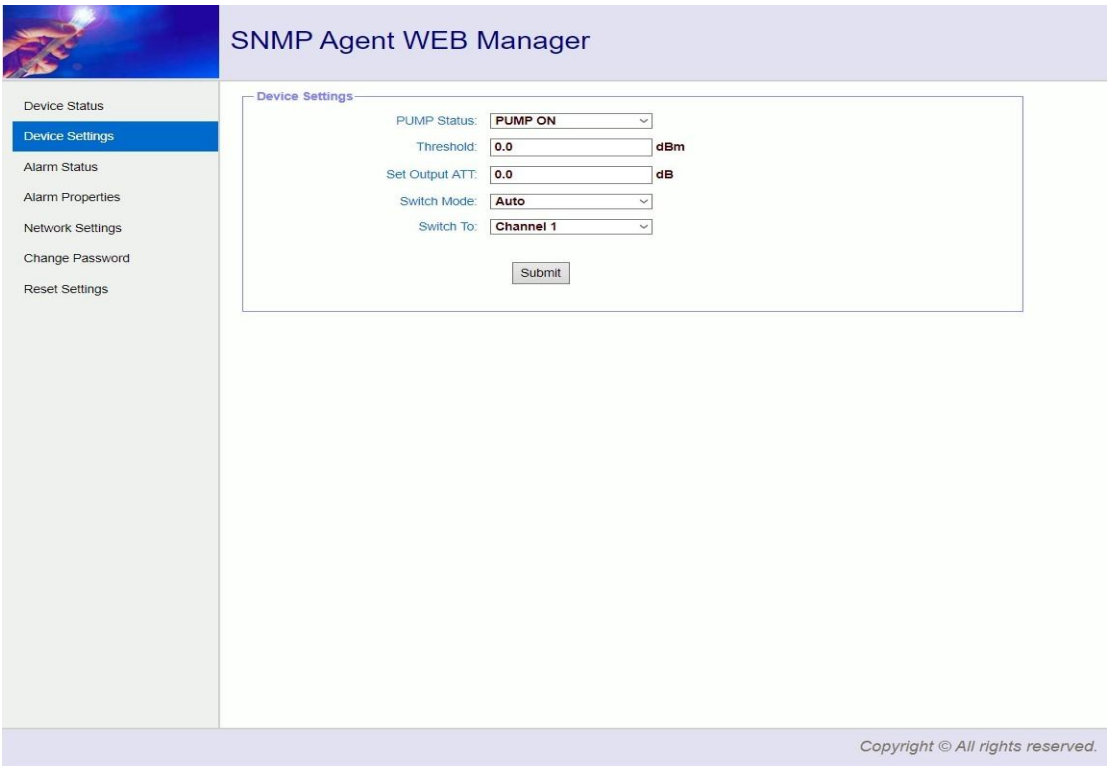
Page Navigation Bar（For Single Input Model）



Page Navigation Bar（For Dual Inputs Model）

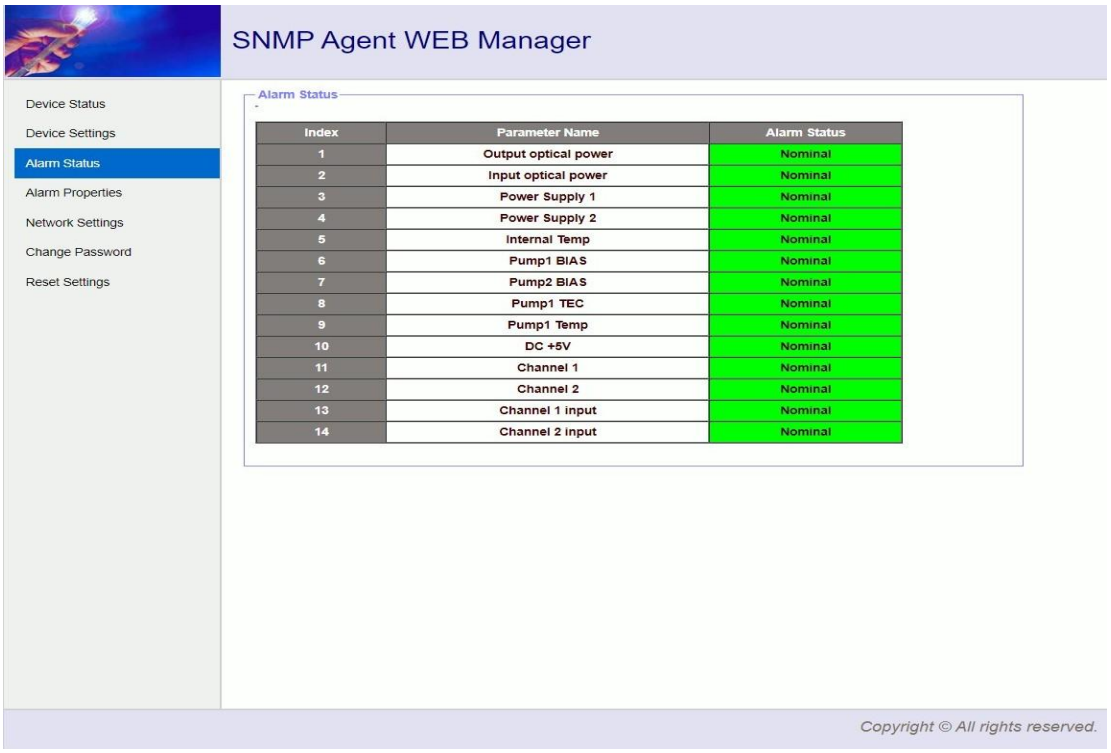


Device Setting Page（For Single Input Model）

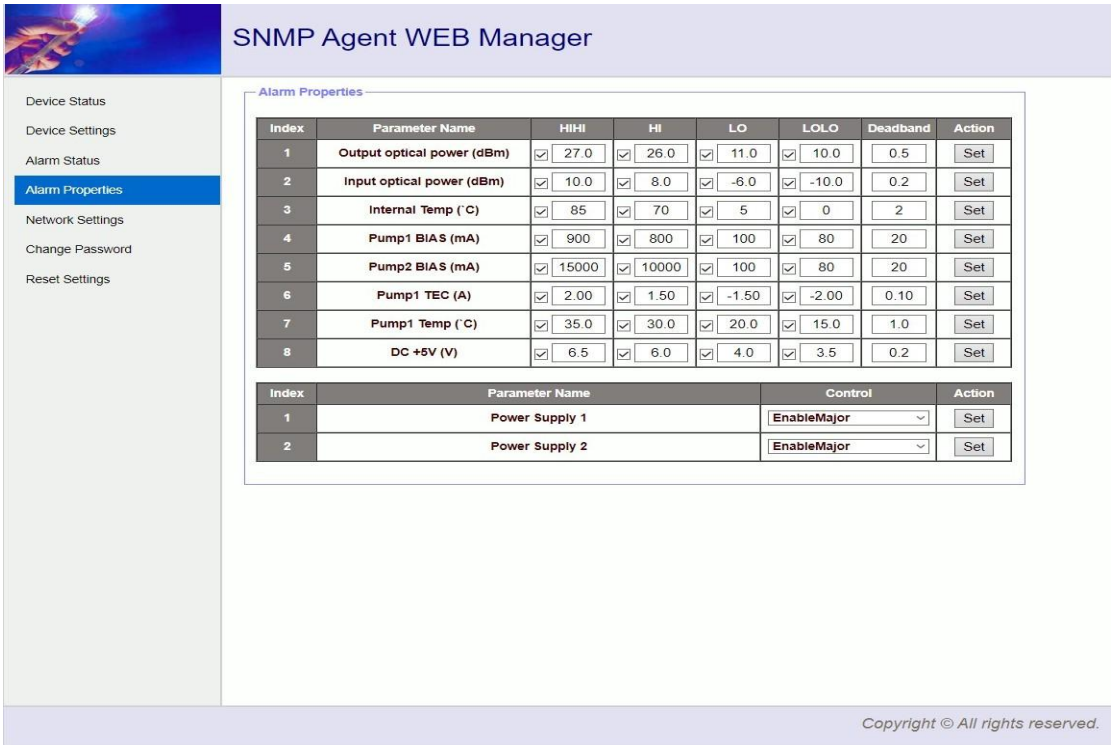


Device Setting Page（For Dual Inputs Model）

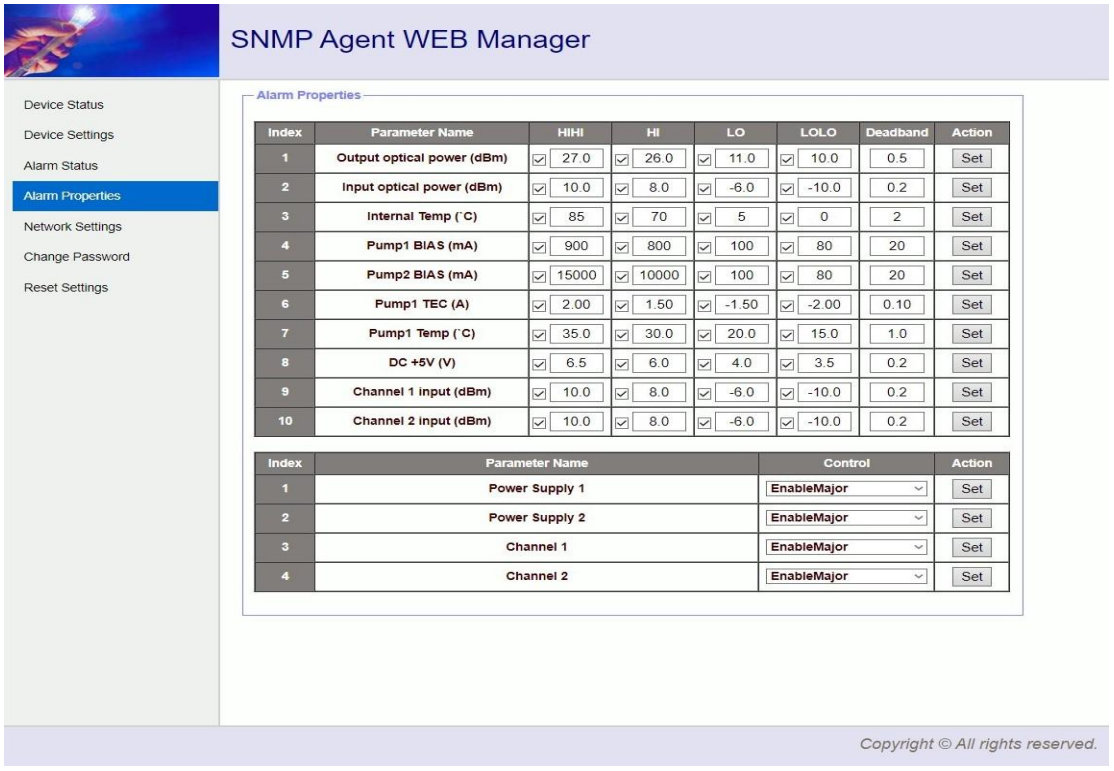
Alarm Status Page（For Single Input Model）



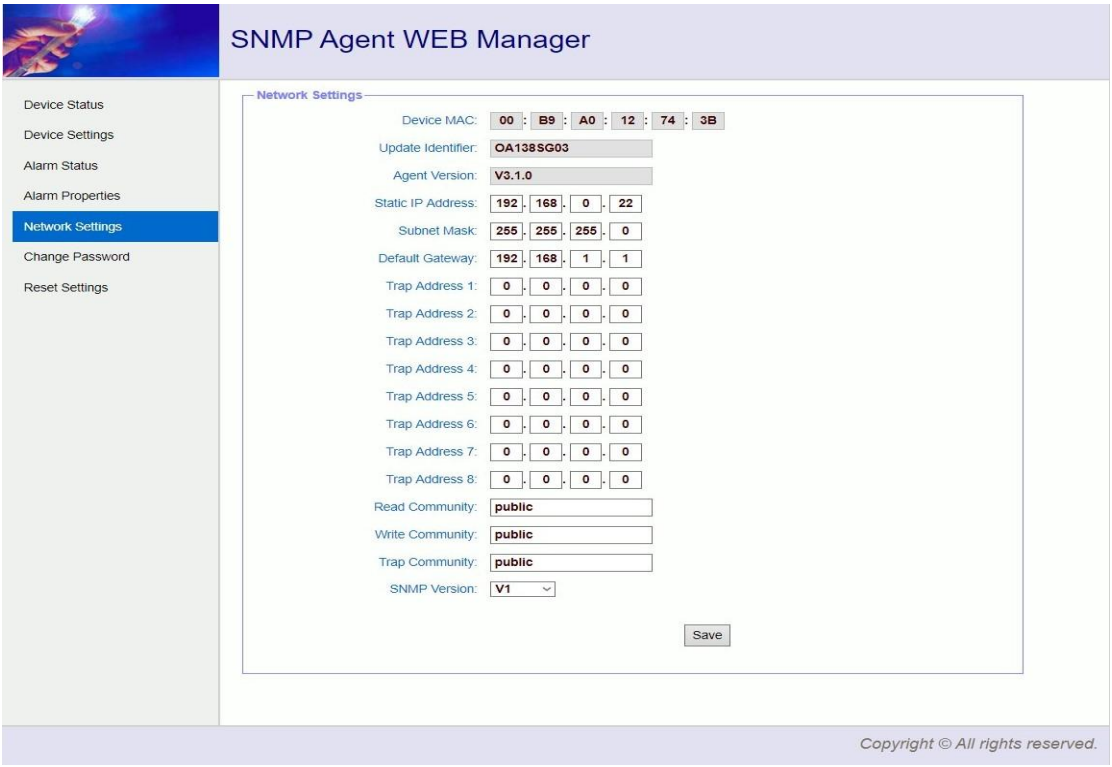
Alarm Status Page（For Dual Inputs Model）



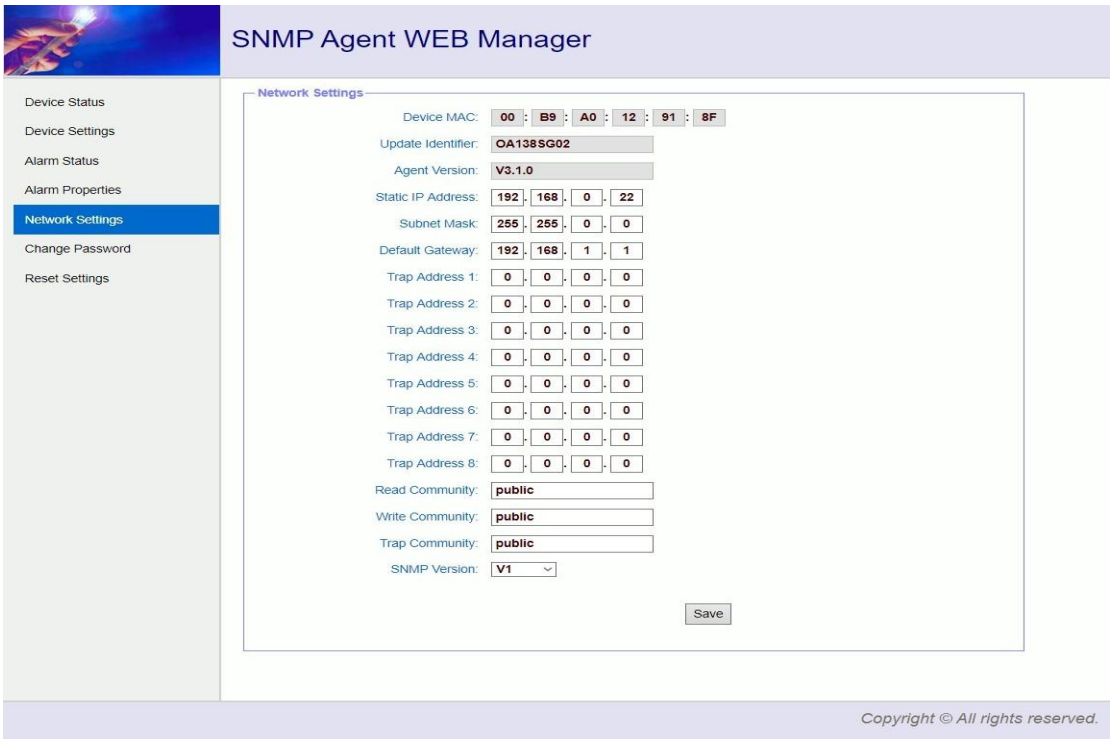
Alarm Properties Setting Page（For Single Input Model）



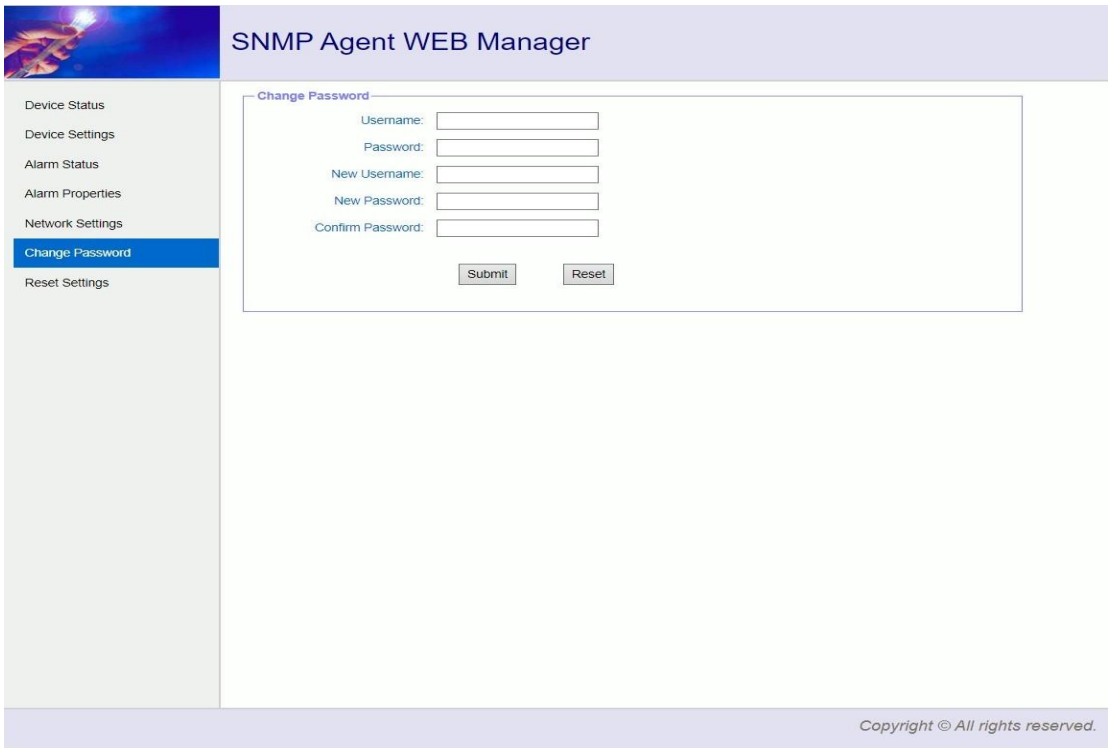
Alarm Properties Setting Page（For Dual Inputs Model）



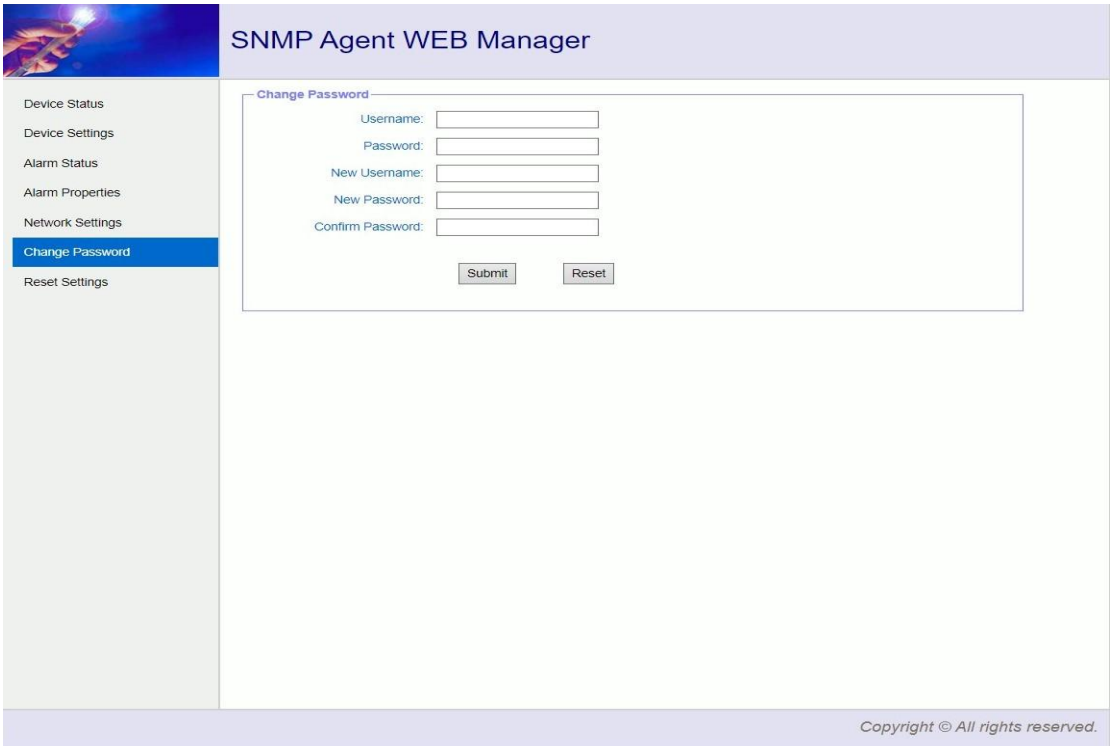
Network Setting Page（For Single Input Model）



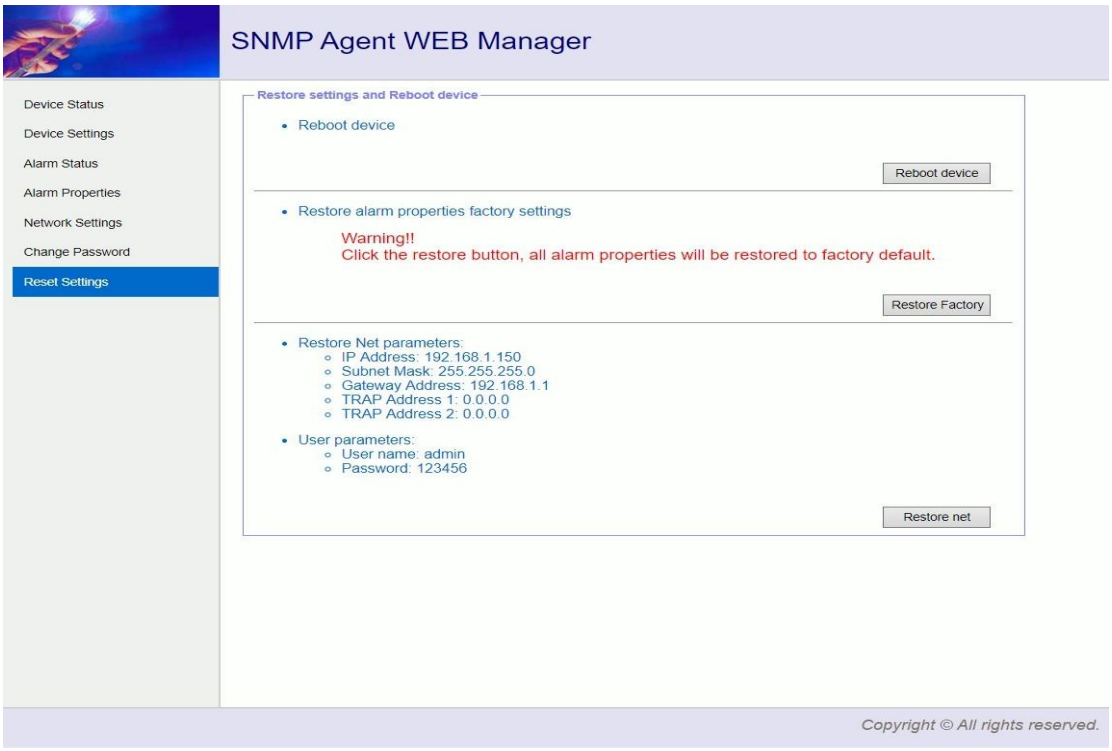
Network Setting Page（For Dual Inputs Model）



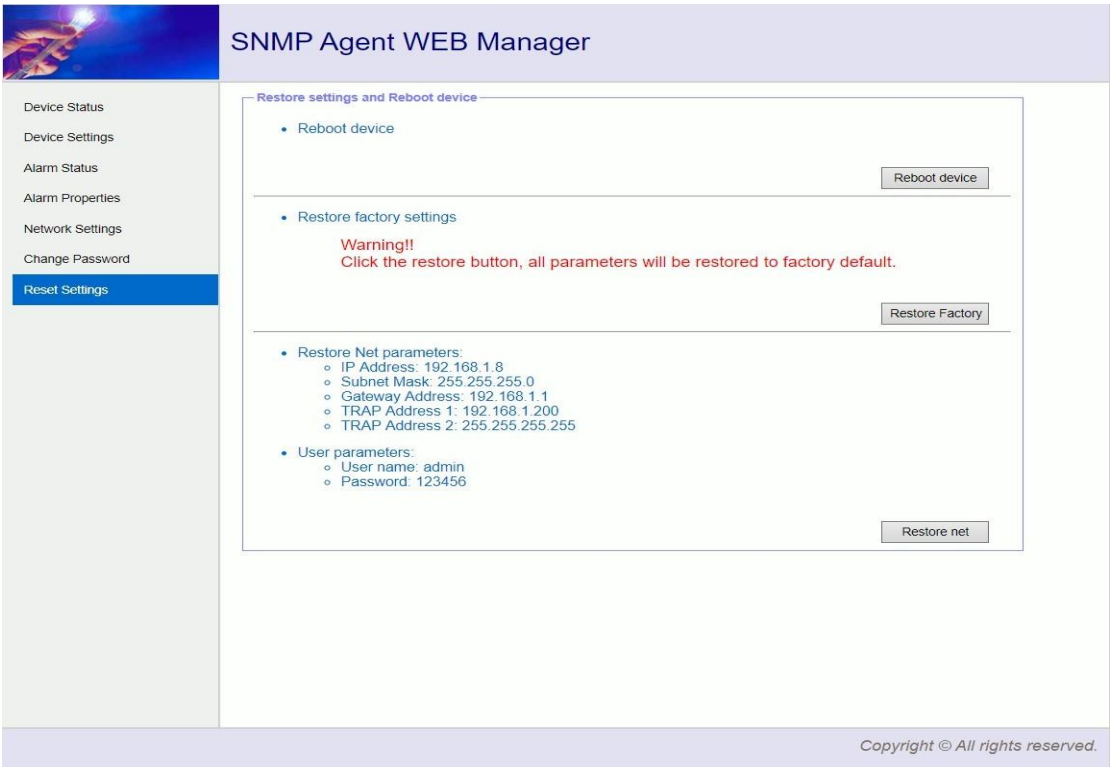
Page to Change User Name and Password（For Single Input Model）



Page to Change User Name and Password（For Dual Inputs Model）



Restore Page（For Single Input Model）



Restore Page（For Dual Inputs Model）