Matrix Cross-Connecting Fiber Optical Switch

User Manual

Equipment safety information

Please strictly follow the instructions in this manual. Otherwise, any improper operations may unintentionally damage the product or even cause personnel injury.

Special attention terms：

sure to keep the input and output pigtail end faces clean before use. If the output end faces are dirty, it is easy to burn the output pigtail end face and weaken the output power. When cleaning the fiber end face or inserting the patch cord, turn off the input light first.

2. When in use, please do not stare at the fiber end face to avoid eyes being injured by the laser.

3. Please avoid anything especially liquid in this equipment, or the equipment may be a failure or damaged.
4. Please avoid using the below environment.
   - Direct sunshine or high temperature
   - The environment with drastic changes in temperature
   - An environment with lots of dust or wet.
   - An environment with a strong electric or magnetic field
   - An environment with corrosive, flammable, explosive, and chemical gas.

5. Please turn off the power and contact us directly for advice when facing the below issues:
   - When rain or other liquid into equipment
   - Equipment falls from the high place, and the chassis broken
   - The equipment exudes a burning smell.
   - Equipment could not work

If you have any problem, please contact us. Do not disassemble the product by yourself. Otherwise, it will cause irreparable damage.

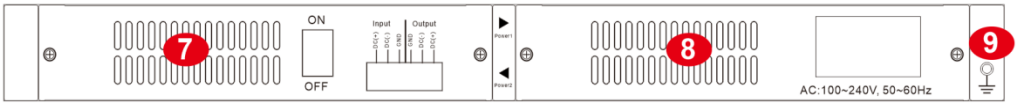
Contact

1 Managed Chassis Introduction

1.1 Managed Chassis Appearance

1U Front panel

1U Side panel



1U Back panel

Description:

①NMC Main control card slot

②Service card slot, maximum Support 3 service cards, our service cards all can be mixed interpolation and hot plug

③ Fan slot, Support for hot fan swap, and independent replacement

④Stretchable lug

⑤Lug instillation position

⑥Side vent

⑦Power one slot can plug in AC/DC power supply, Support hot swap

⑧Power two slots can plug in AC/DC power supply, Support hot swap

⑨Grounding screw

1.2 Managed Chassis component description

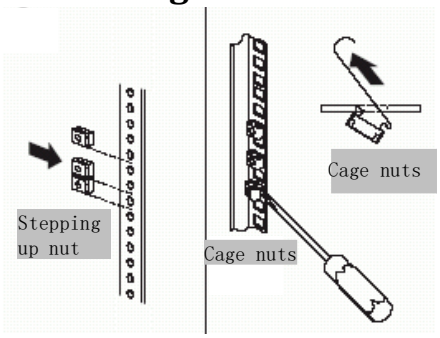
Component 1	Power supply card 1
Component 2	Power supply card 2
Component 3	Fan card
Component 4	Main control card, 100/1000M Ethernet interface,100/1000M SFP interface

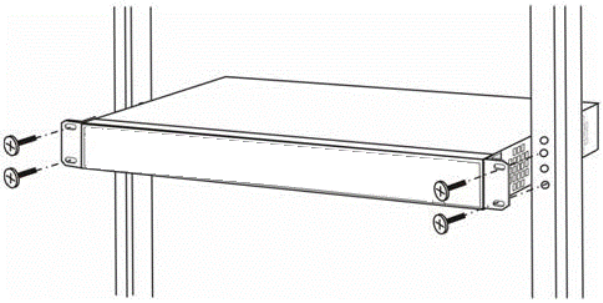
1.3 Managed Chassis correlation parameters

Parameters		Unit	Specifications
Environment Parameter	Working temperature	℃	-10~ 60℃

	Storage temperature	℃	-20℃~ 75℃
	Relative humidity	℃	5% ~ 95% No condensation
Size	1U	mm	482.6W×300D×44.5H
Power Supply	AC	V	100~240,50~60hz
Consumption	1U	W	< 50 (Max)

1.4 Managed Chassis installation





(1) Please fix the lugs on the managed chassis and make sure the screws have been tightened to avoid the device dropping to the ground.

(2) Please make the managed chassis inside the cabinet and make sure the screws have been tightened, to avoid the device dropping to the ground.

(3) Please insert AC/DC power source correctly according to the interface type of power card.

(4) Please check the screws of all boards to make sure the screws have been tightened to avoid equipment cannot work well because of board loose.

(5) The cooling air outlets are located on either side, so make sure air circulation on both sides is normal.

(6) Please keep the slot room clean and constant in temperature.

2 Ethernet Card Function Description

2.1 NMC Network management card

NMC function

The Network management card is used to manage the network by supporting the management interface of Ethernet communication. Through WEB or OTN3000 monitor online software, all function cards could be monitored and set.

Card Appearance

Indicator introduction:

Indicator		Notes	Normal state	Alarm state
P1		Power 1	Greenlight	Light-off
P2		Power 2	Greenlight	Light-off
RUN		NMU Run	The light flashes every 1	Light-off or flashes
F1		SFP1	The light flashes	Light-off
F2		SFP2	The light flashes	Light-off
N/A				

Communication interface:

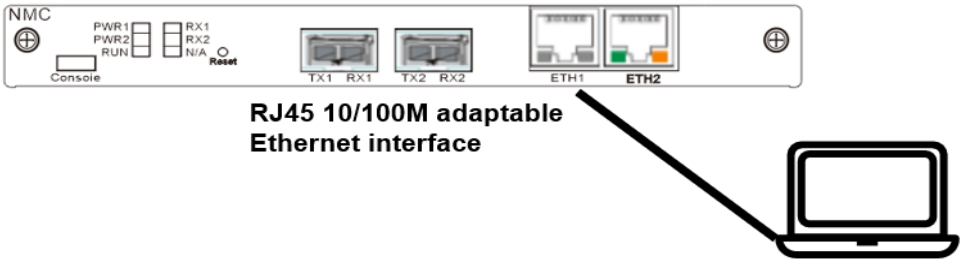
Interface name	Interface function	Interface type
ETH	Internet communication	RJ-45
Console	Upgrade interface	Micro USB

IP address Reset:

Name	Function	Operation
Reset	Reset IP address	Press "reset" for 7~8 seconds until the "run" light turns to green

Tips: During the IP reset, please make sure the power supply is on and not do any other operations; after "run," a light flash in normal means IP reset is done.

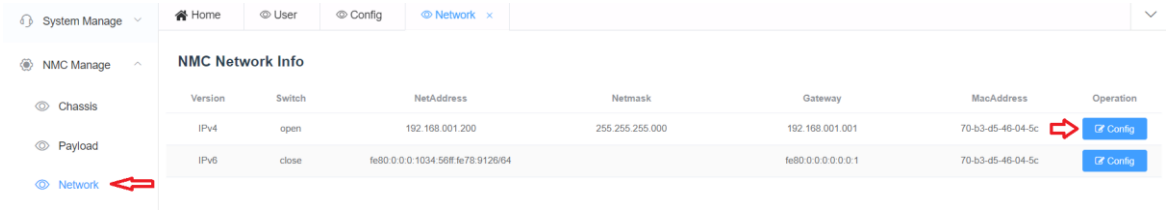
Web Management



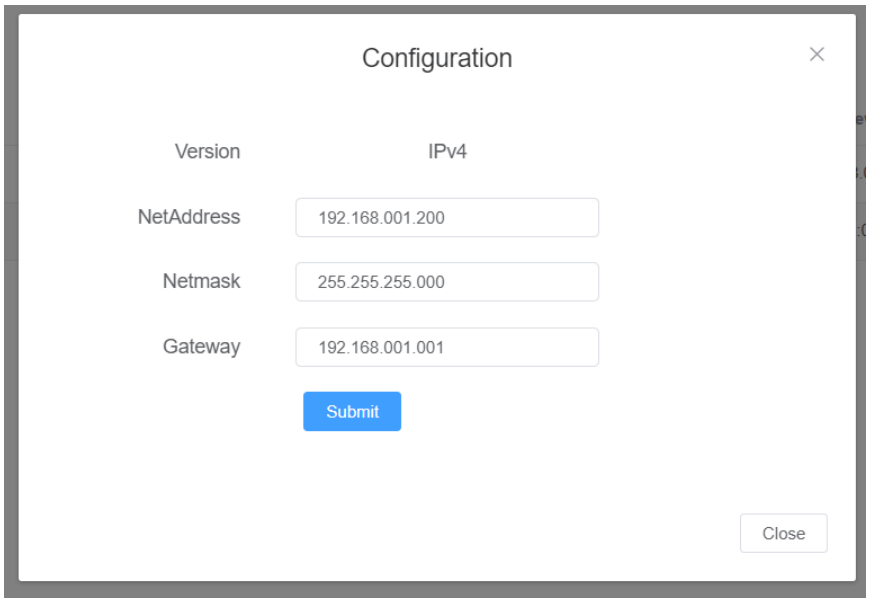
Use Twisted pair cable to connect ETH1 or ETH2 with your computer and configure the device and computer in the same IP segment, then type the IP address from the website banner in your computer to go into the WEB management interface, **WEB address：192.168.1.200:8081, default user name for WEB： admin, password： admin.**

2.2 Modify WEB Address

1. Open “NMC Manage” Menu, and click “Network”

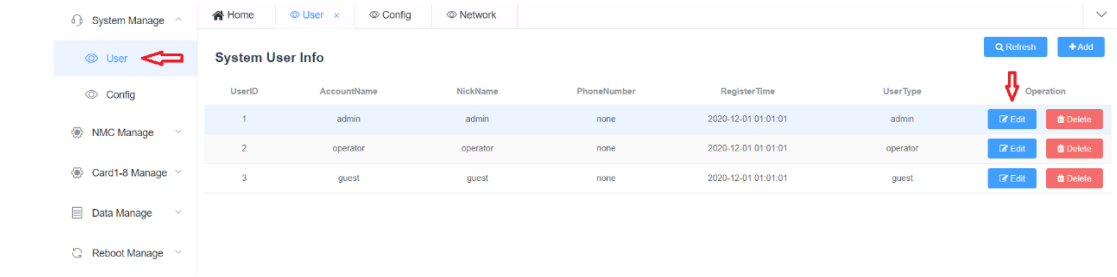


2. Click ”Config” of IPv4 to modify the WEB address

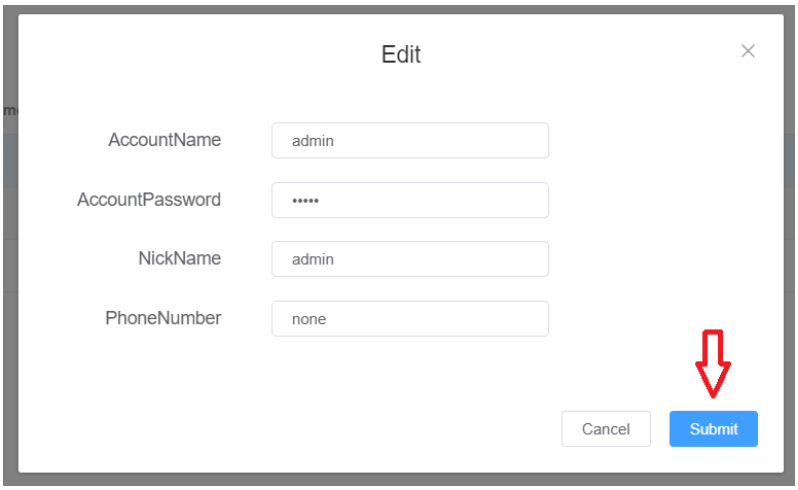


2.3 Modify User Name and Password

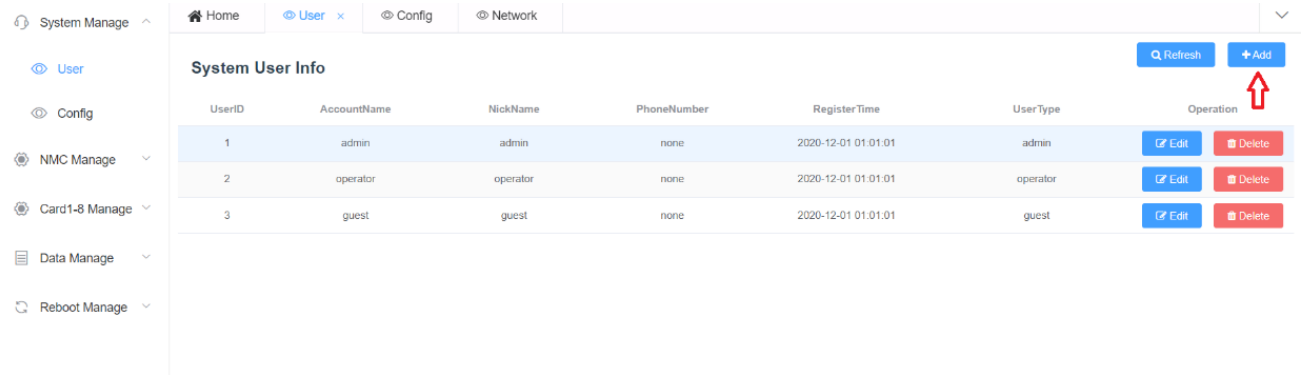
1. Open “System Manage” Menu, and click “User”

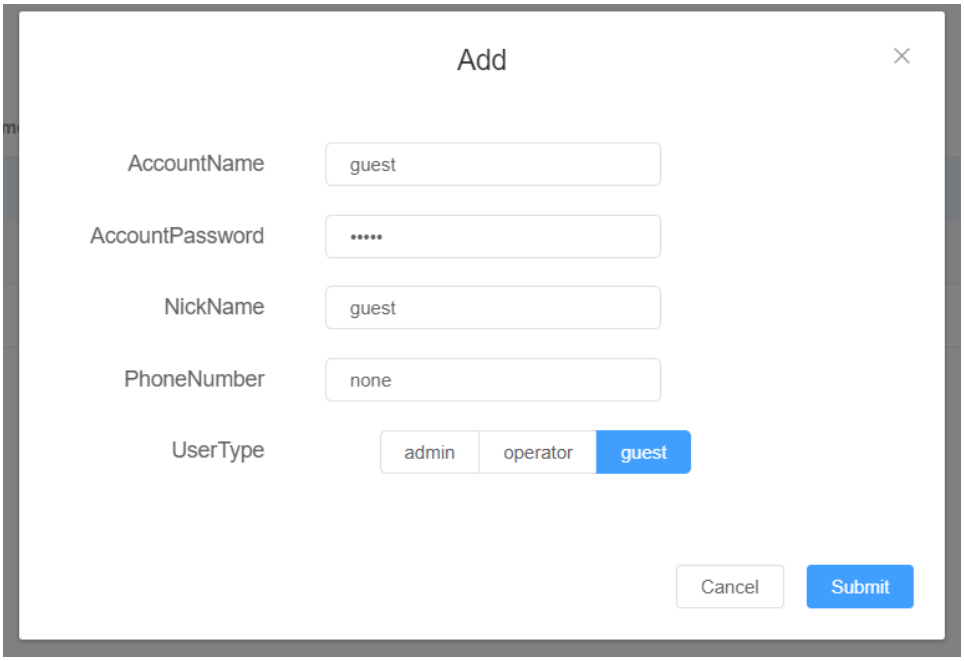


2. Click “Edit” to modify each user’s setting, and click “submit” to finish the setting.



3. In addition to the system default three users, click "Add" to all more users

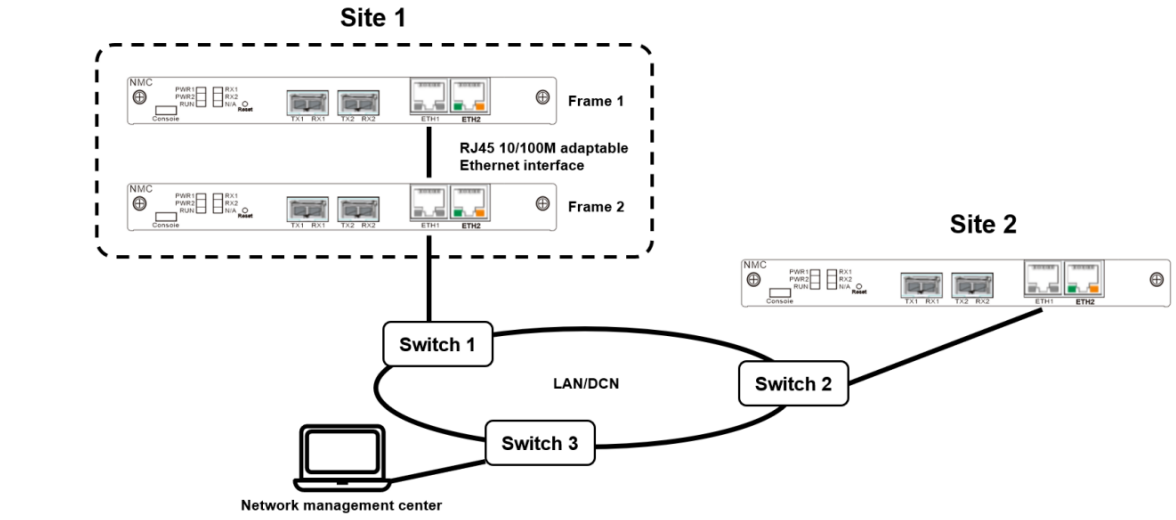


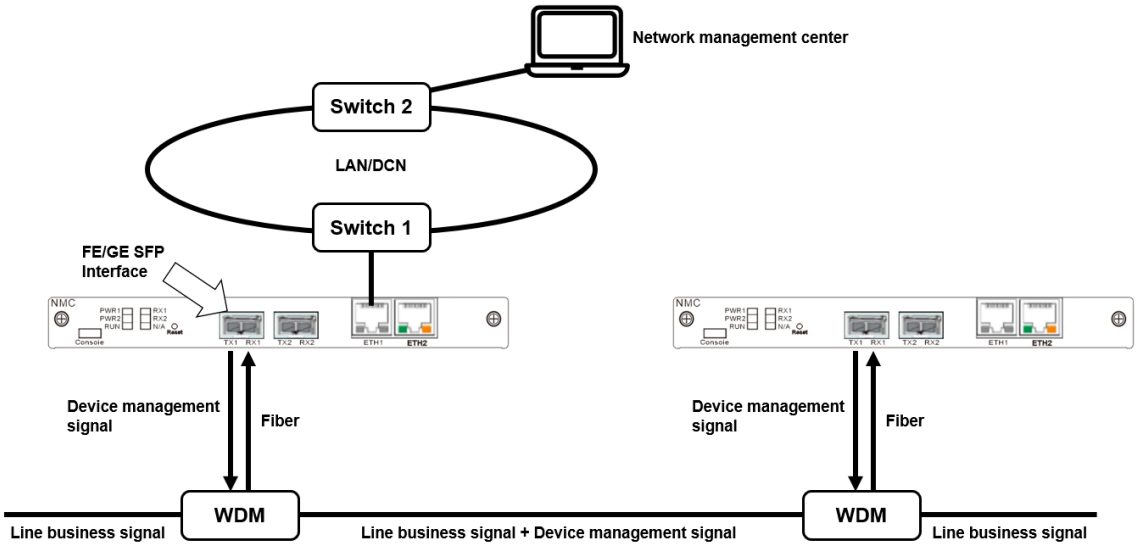


2.4 NMC instructions

The equipment management signal and business signal use the same optical fiber transmission.

Equipment management signal and business signal are transmitted independently



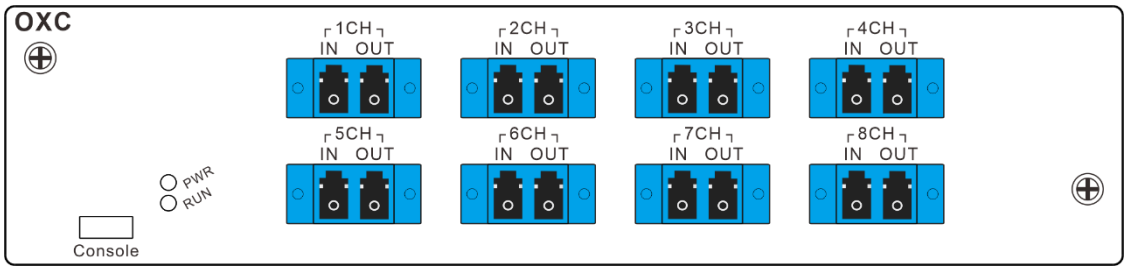


3 Matrix Switch

3.1 Card function

MEMS optical cross-connect switch is a Matrix Optical Switch that allows the simultaneous connection of multiple input to output fibers in a fully non-blocking, all-optical, cross-connect configuration. An M×N OXC is built by cascading M 1×N switches and N 1×M switches. Every input has a 1×N switch, while every output has an M×1 switch. The output fibers of each 1×N are spliced to the N side of each M×1 to allow any input to connect to any output.

3.2 Card Appearance



Indicator Definition:

Indicator	Notes	Normal state	Alarm state
PWR	Board power	Greenlight	Light-off
RUN	Board run	The light flashes every 1 second	Light-off or flashes irregularly

Fiber Port Definition:

Interface name	Notes	Interface type
IN	Optical signal input port	LC/UPC
Out	Optical signal output port	LC/UPC

Communication Definition:

Interface type	Function	Interface type
Console	Upgrade interface	Micro USB

3.3 Switch Spec

System parameters	Unit	Technical parameters
Wavelength	nm	1525~1568
MxN		12×12
Insertion Loss	dB	≤1.8, typical 1.6

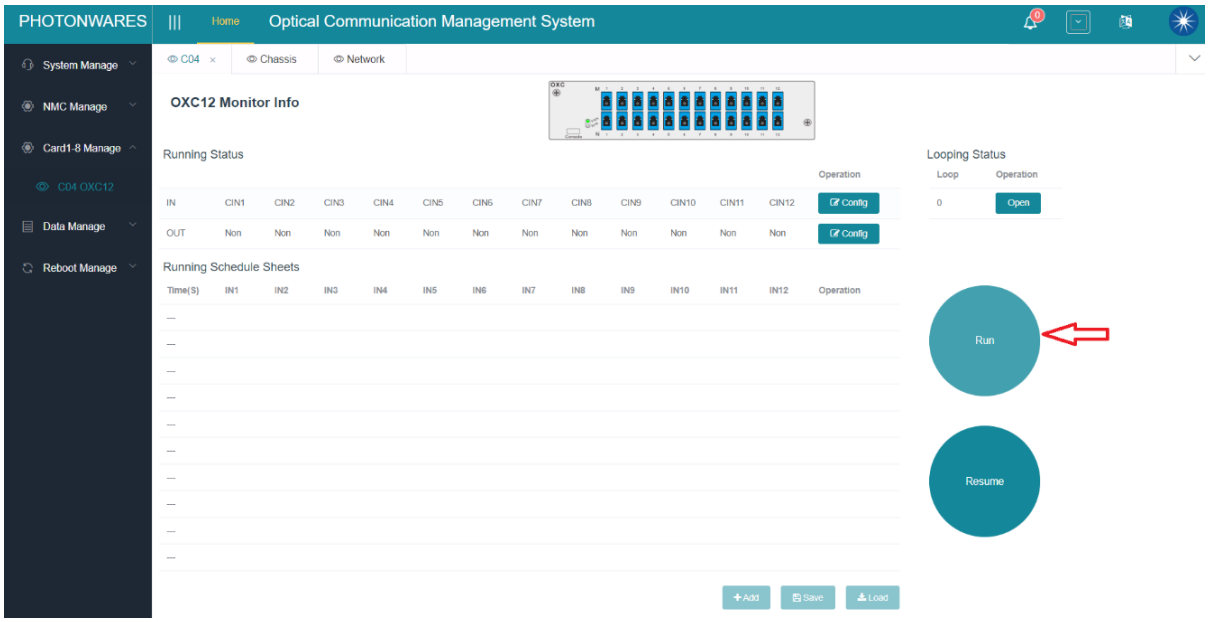
Return Loss	dB	≥45
Repeatability	dB	≤0.1
Crosstalk	dB	≥60
Polarization Dependence Loss	dB	≤0.2
Consumption Wavelength Dependence	dB	≤0.4 @S
Temperature Dependence Loss	dB	≤0.4
Switch Time	ms	≤10
Durability	cycle	≥1x10^9
Maximum Optical Power	mW	≤500

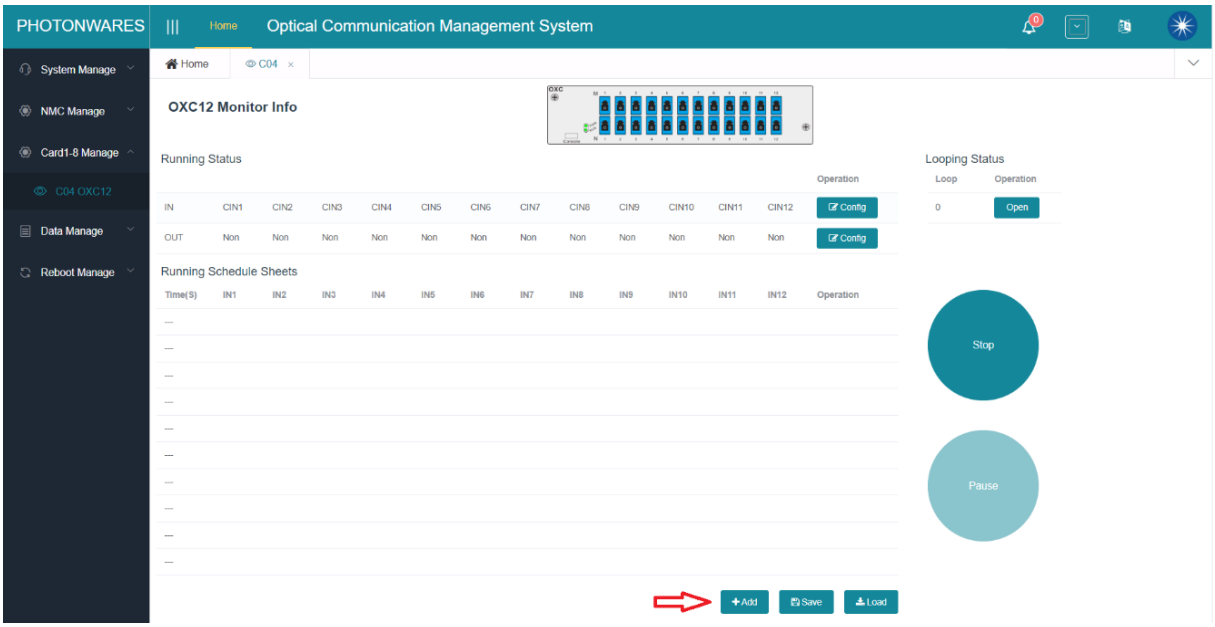
3.4 Single OXC Switching State Setting

a. Define and arrange input fiber port

b. Enter the corresponding output port bellow.

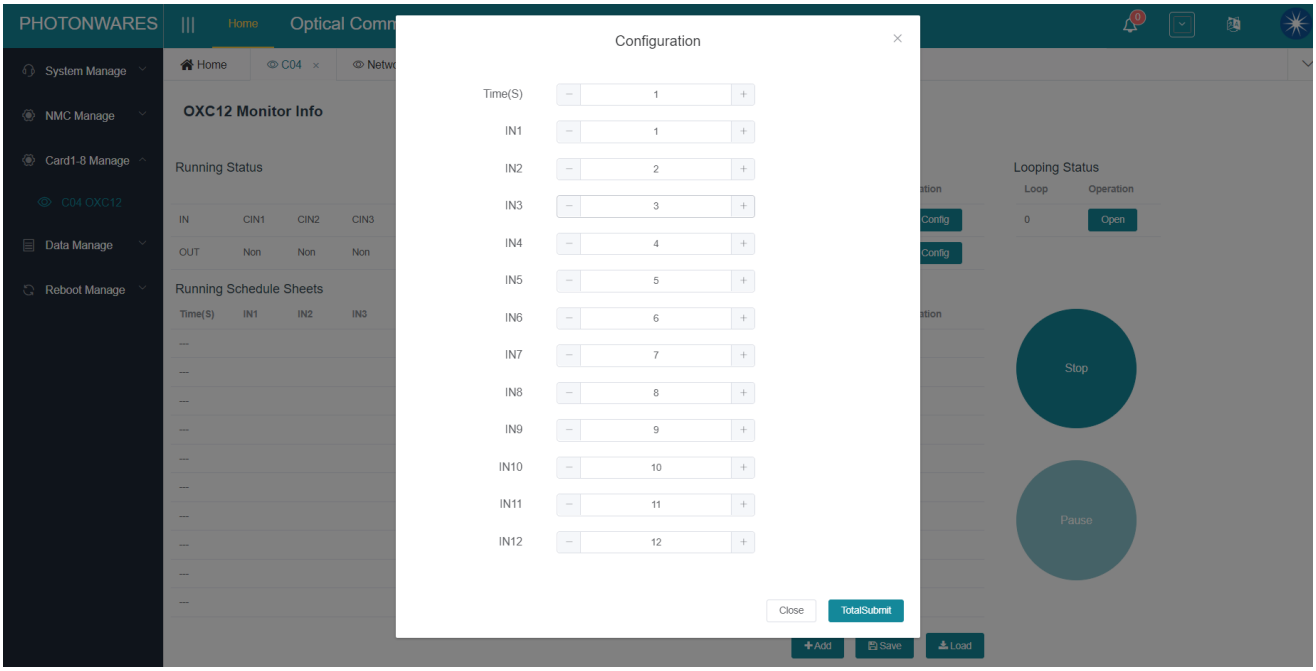
c. Enter the time duration for this OXC switching state.





OXC WEB INTERFACE

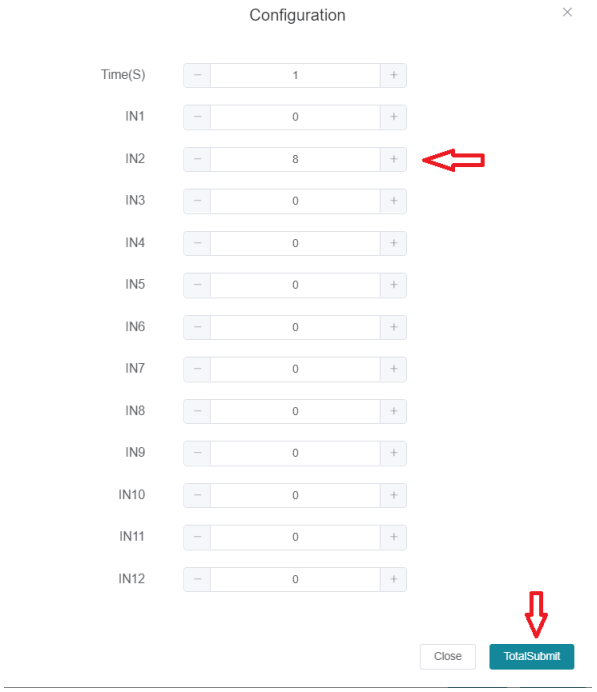
1. Click "Run." The switch will perform the connection according to the setting and last to the duration time.
2. When it becomes "Stop," one could add the OXC channels here.
3. Click "Add," and the OXC channels configuration window will come out



OXC Configuration window

4. One could configure time and the output channel (CH 0~12) for each input channel (CH 1~12); This Matrix switch is a 12X12 switch. "0" in output channel means "not connect to any channel," and "1~12" means "output channel 1~12".

5. Each channel configuration could be done separately; for example, as below shows, only input channel two is connected to output channel 8, and the other channels are not connected.



Tips: When you set several different input channels connected to the same output channel by mistake, the system will validate the configuration one by one. For example, when you set channel 2 to output channel 8, channel 1 to output channel eight, and channel 5 to output channel 8, then the final one, input channel 5 to output channel 8, will come into effect.

IN2→OUT8

IN1→OUT8

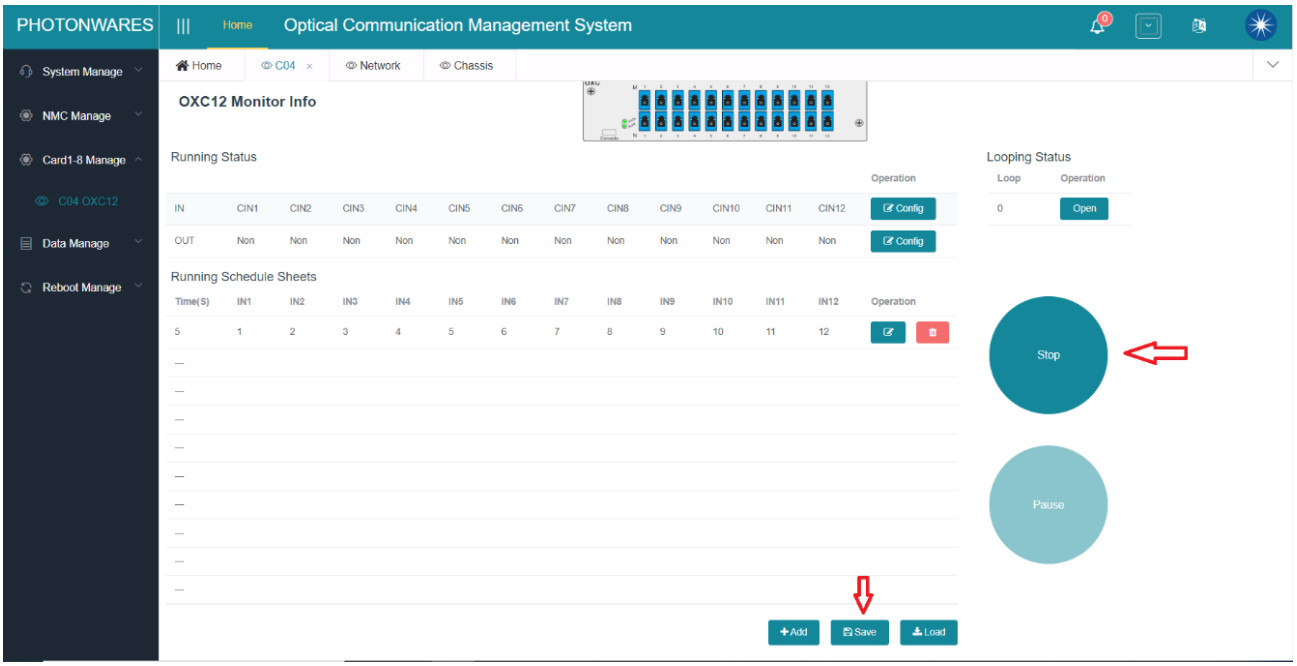
IN5→OUT8

The final one, IN5→OUT8, will come into effect.

IN2→0

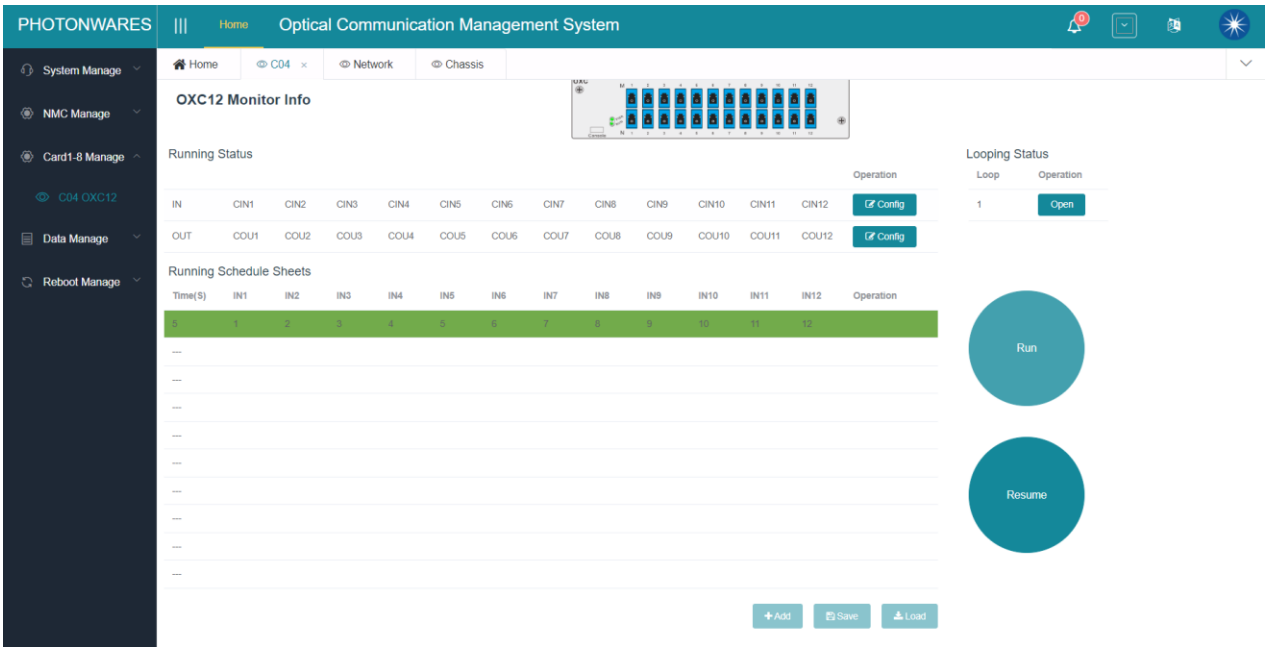
IN1→0

After IN5 is connected to OUT8, the IN2、IN1 will be disconnected.



3.5 Consecutive OXC Switching State Setting

6. The GUI can set 10 different switching states and durations that run consecutively, one after the other.
7. First, one needs to fill in the output channels for each input channel and then click "Total Submit."
8. After finishing the configuration, click "save" to save the setting, and then click "stop." When it becomes "run," the saved OXC cards will be executed in order.



Tips: For batch configuration, the configuration will be in order, from IN1 to IN8.

3.6 Default OXC Switching State

When the switch's powered off, all the channels will be disconnected. After the switch is powered on again, it will be returned to the same connection state prior powering off.