1xN MEMS Optical Switch Rackmount

GEZHI's MEMS Optical Switch, MEMs Fiber Switches are based on integrated silicon MEMS technology and is available in multichannel 1x4, 1x8, 1x16, 1x24, 1x32, 1x64, 1x128 up to 1x256 and matrix MxN Mems optical switch 8x8, 16x16, 16x64, 64x64 channels. Inside the switch package both the CMOS/TTL compatible driver. The array of MEMS optical switches can be controlled individually and are bidirectional so they can be used in either a 1xN or Nx1 orientation.

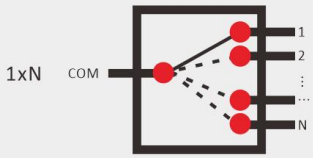
GEZHI' s MEMS 1xN optical switches offer excellent optical performance, high reliability over a very long lifetime. They have been tested and proven in the telecommunication, aerospace and other demanding applications.

Features	**Applications**
● SerialNet, High Reliability, High Stability ● LCD display panel. Visual display, Convenient operation ● Transparent transmission signal. High stability and reliability ● Channel and time interval of automatic scanning can be set up ● RS232 Control and RJ45 Ethernet Remote Management	● FITL ● Automatic Measurement ● Optical Network Remote Monitoring Cable Monitoring and Maintaining system

1U Rackmount

2U Rackmount

Optical Path



Technical Index

Parameter	Unit	1x8	1x12	1x16	1x24	1x32	1x64	1x128	1x256
Wavelength Range	nm	850/1310 for MM or 1260~1650 for SM or customized							
Testing Wavelength	nm	850/1310, 1310/1550 or customized							
Insertion Loss (Max)	dB	≤1.0	≤1.5	≤1.5	≤1.7	≤1.7	≤2.0	≤2.2	≤2.4
Return Loss	dB	MM ≥ 30, SM ≥ 45							
Crosstalk	dB	MM ≥ 30, SM ≥ 45							
PDL	dB	≤0.10							
WDL	dB	≤0.30							
TDL	dB	≤0.30							
Repeatability	dB	≤0.02							
Switching Time	ms	≤8 (Adjacent Channel)							
Optical Power	mW	≤500							
Fiber Type	um	9/125							
Connector	/	FC, SC, LC, ST, SMA or customized							
Monitor Port	/	RJ45 & RS232 or customized							
Working Power Supply (Plug Tyep)	V	AC: 220V (50/60Hz) or DC: 36V~72V							
Operating Temperature	℃	-10~+60							
Storage Temperature	℃	-40~+85							
Rack mount Dimensions	mm	1U L483XW230XH44.5 (Up to 32 channel) customization is available.							
		2U L483XW230XH89 (Up to 128 channel) customization is available.							
		3U L483XW230XH133.5 (Up to 256 channel) customization is available.							

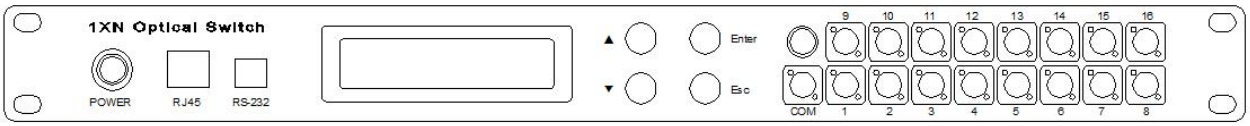
Ordering Information **MEMS-1xN-X-XX-X-XX-XX-XX-XX**

MEMS	Mode	Wavelength	Package	Fiber Type	Power Supply	Connector
1x4	S=SM	85=850nm	1U=1U Rackmount	M5=50/125	AC=Single 85~265V	00=None
1x8	M=MM	13=1310nm	2U=2U Rackmount	M6=62.5/125	DC=Single 36~72V	FP=FC/UPC
1x16		15=1550nm	3U=3U Rackmount	S9=9/125	AA=Dual 85~265V	FA=FC/APC
1x32		85/13=850/1300	4U=4U Rackmount	S=Specify	DD=Dual 36~72V	SP=SC/UPC
1x64		13/15=1310/1550nm	S=Specify		AD=AC85~265V+DC36~75V	SA=SC/APC
1x128		S=Specify				LP=LC/UPC
S=Specity						LA=LC/APC
						S=Specify

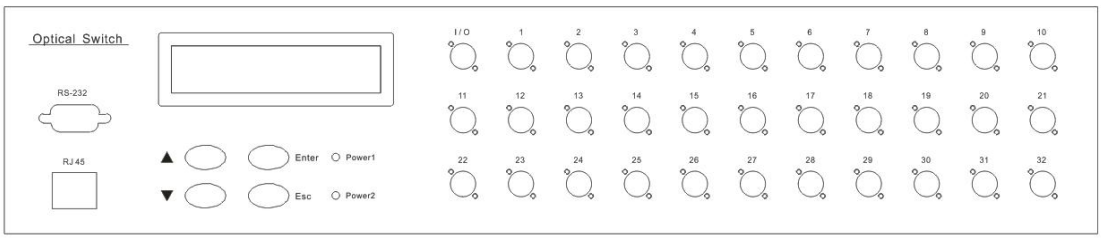
Panel to Explain

Front Panel

1x16 Optical Switch 19" 1U Rack mount

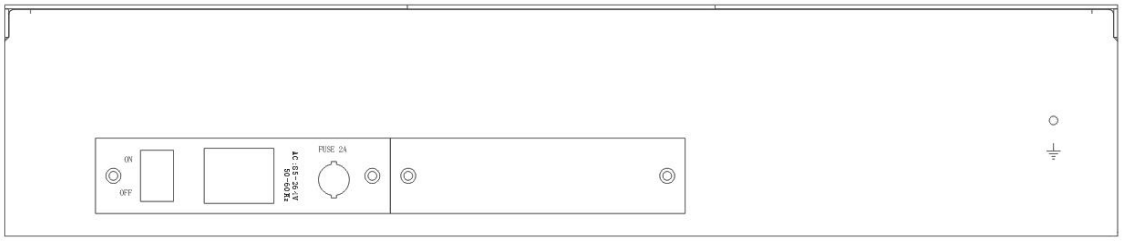


1x32 Optical Switch 19" 2U Rack mount



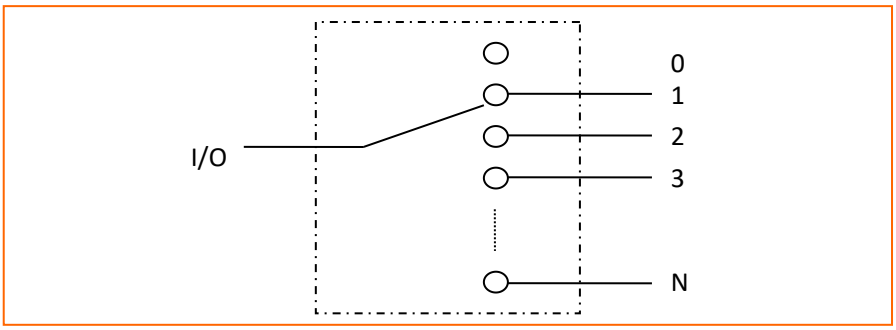
- Power: Master switch of power supply
- RJ45:Communications network management interface ;
- RS-232: Rs- serial interface ; RS232 serial communication interface;
- LCD:Devices that display information directly;
- ▲: Key to move up; ▼: Key to move down; Enter: Key to determine;
- Esc: Key to cancel;
- com,1~32:Fiber interface;

Back Panel



- AC:85~265V: Power cord interface;
- ON/OFF: Master switch of power supply ;

Optical Route



Communication Interface

(1)、RS-232

When connected to the computer, the DB9 serial port crosswire of both ends should be applied. It means that #2,#3 cable of both ends should be connected crossed,#5 cable should be abutting jointed, and the rest could be left out.

(2)、RJ45

When connected to the computer through switch, through lines should be applied.(The accurate order is 1-orange white,2-orange,3-green white,4-blue,5-blue white,6-green,7-brown white, 8-brown.)

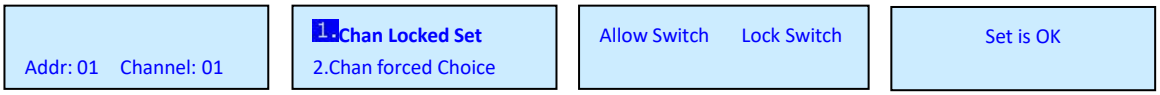
When connected to the computer directly, cross wire should be applied.(One end is l-orange white,2-orange, 3-green white,4-blue,5-blue white,6-green,7-brown white,8-brown. Another end is 1-green)

Panel operation

(1)、Keys latching:send order through communication ports to set keys on panels, please refer to "communication agreement introduction".User can not set parameters on panels, when keys are latched.

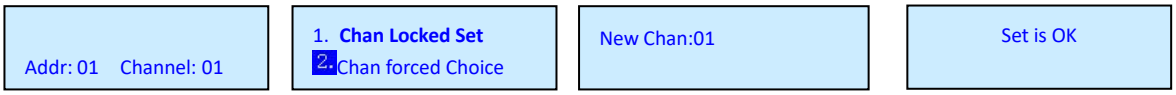
(2)、Chan Locked Set

- Press "enter" to login menu
- Press "▲" or "▼" to select "Chan Locked Set",press "enter" to enter
- Press "▲" or "▼" to select allow or lock switch,press "enter" to finish.
- Press "Esc" to back to previous step during the whole operation process.(Tips: when press "▲" or "▼",the switching will be act immediately.



(3)、Chan forced choice

- Press "enter" to login menu
- Press "▲" or "▼" to select"Chan foced choice",press "enter" to enter
- Press "▲" or "▼" to set the new channel, press "enter" to finish.
- Press "Esc" to back to previous step during the whole operation process.(Tips: when press
- "▲" or "▼",the switching will be act immediately.

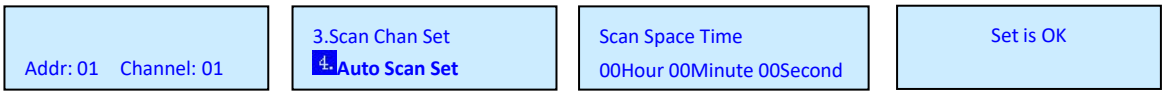


(4)、Scan Chan Set

- Press “enter” to login menu
- Press “▲” or “▼” to select "Scan Chan Set” ,press “enter” to enter
- Press “▲” or “▼” to set the starting channel,press “enter” to finish
- Press “▲” or “▼” to set the end channel, press “enter” to finish.
- Press“Esc”to back to previous step during the whole operation process. (Tips: when press “▲”or“▼”,the switching will be act immediately.

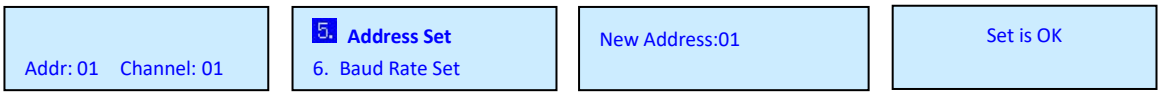
(5)、Auto Scan Set

- Press “enter” to login menu
- Press “▲” or “▼” to select “Auto Scan Set” ,press “enter” to enter
- Press “▲” or “▼” to set time of hour minute second,press “enter” to finish.
- Press"Esc”to back to previous step during the whole operation process. (Tips: when press “▲”or“▼”,the switching will be act immediately.



(6)、Address Set

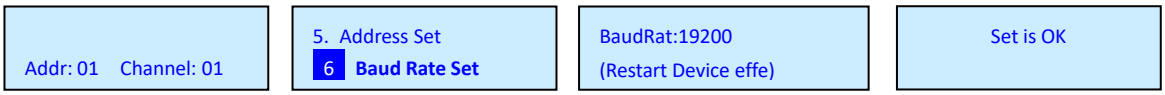
- Press “enter” to login menu
- Press “▲” or “▼” to select "Address Set” , press “enter” to enter
- Press “▲” or “▼” to set the address of the device, press “enter” to finish.
- Press “Esc” to back to previous step during the whole operation process. (Tips: when press “▲” or “▼” ,the switching will be act immediately.



(7)、Baud Rate set

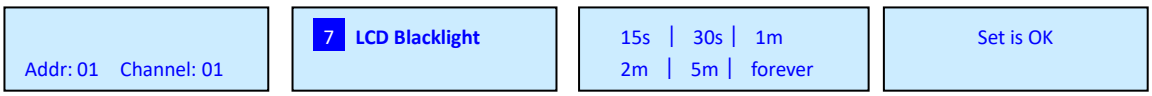
Optional baud:1200,2400,4800,9600,19200,57600,115200,usual set is 19200.(please re-start to enforce baud set.)

- Press “enter” to enter menu
- Press “▲” or “▼” to select “Baud Rate Set” ,press “enter” to enter
- Press “▲” or “▼” to select baud rate,and press “enter” to enter
- Press “Esc” to back to previous step during the whole operation process



(8)、LCD Blacklight

- Press “enter” to enter menu
- Press “▲” or “▼” to select “LCD Backlight” ,press “enter” to enter
- Press “▲” or “▼” to select delayed time,and press “enter” to enter
- Press “Esc” to back to previous step during the whole operation process



Programmed-controlled

The device can get controlling signal from PC through RS-232(or RS-485)to realize the real-time monitoring (using the serial port or serial port monitoring system software); it can also remote monitoring via Ethernet port.

Program order

(1)This device can operate one command per time.It usually can enter the next command until the information return.

(2)Input any command only by capital letters,and "_" is underlining.

(3)In actual operation, the command input begins with"<",and ends with ">"

Program order

Order	Describe	Sample
<AD01_RESET>	Reset <AD01_RESET>	
<ADXX_S_YYY> Note: can stop automatically scan	Set the current channel XX value: 00~99 (means the current address of the device) YYY value: 00~128 (means switch to the next channel) Successful return:<ADXX_OK> Failure to return: <ADXX_E1>or<ADXX_E2>	<AD01_S_064> Means that switch of address 01 change to channel 64, if the total channel is above 64, Successful return:<AD01_OK> If the total channel is below 64, Failure to return:<AD01_E1>
<ADXX_C_YYY> Note: can stop automatically scan	Set the current channel XX value: 00~99 (means the current address of the device) YYY value: 00~128 (means switch to the next channel) The instruction does not return any value!! We must caution the instruction, so as to avoid the misoperation of optical switch.	<AD01_C_064> Means that switch of address 01 change to channel 64 Note: no information is returned.
<ADXX_B_YYY_E_ZZZ>	Set autoscan channel XX value: 00~99 (means the current address of the device) YYY value: 00~128 (means the starting channel) ZZZ Value: 00~128 (means the ending channel) Successful return:<ADXX_OK> Failure to return:<ADXX_E>or<ADXX_E2>	<AD01_B_001_E_008> Means that the scanning channels are as follows: 1,2,3.....8,1 <AD01_B_008_E_002> Means that the scanning channels are as follows: 83.....N,1,2,8
<ADXX_B_E_?>	Query auto scan channel Return: <ADXX_YYY_ZZZ> XX value: 00~99 (means the current address of the device) YYY Value: 00~128 (means the starting channel) ZZZ value: 00~128 (means the ending channel)	<AD_B_E_?> Return <AD01_004_008> Means the starting channel is 004, the end of the channel is 008
<ADXX_T_CHN?> Note: can stop automatically scan	Query the current channel Return:<ADXX_YY> (the total channel is below 100) XX value: 00~99 (means the current address of the device) YY value: 00~99 (means the current channel) Or return <ADXX_YYY> (the taol channel is above 100) XX value: 00~99 (means the current address of the device) YY value: 00~128 (means the current channel)	<AD01_T_CHN?> If the current channel is 2 and the total channel is below 100), Return:<AD01_02>; The total channel is above 100) Return:<AD01_002>
<ADXX_M_STA?> Note: can stop automatically scan	Query the current running stage of optical switches Return:<ADXX_OK> (means normal operation) Or return <ADXX_E1>(means data overflow) Or return <ADXX_E2>(means that run the error)	<AD01_M_STA?> If the optical switch is operating normally and return <AD01_OK> If the optical switch is running the error and

		return <AD01_E2>
<ADXX_A_YY>	Set auto scan time interval and start up XX value: 00~99 (means the current address of the device) YY value: 00~99 (means scan interval time, the specific time is YY * 100ms, 00, the default is 100ms) Successful return: <ADXX_YY> (means the current channel) Description: this command returns an autoscan through the channel.	<AD01_A_10> If the current channel is 2 and the total channel is below 100), Return <AD01_02>, time delay 1000ms If the current channel is 2 and the total channel is above 100), Return <AD01_002>, time delay 1000ms
<ADXX_F_YY>	Set autoscan time interval and start up XX value: 00~99 (means the current address of the device) YY value: 00~99 (means scan interval time, the specific time is YY * 100ms, 00, the default is 100ms) Successful return: <ADXX_OK> Description: this command does not return to the auto scan channel.	<AD01_F_10> Successful return: <AD01_OK> Optical switch every 1000ms switch once, but no information is returned.
<ADXX_A_T_HH_MM_SS> Note: when the "HH_MM_SS" is "00_00_00", it can be stopped automatically.	Set auto scan time interval and start up XX value: 00~99 (means the current address of the device) HH value: 00~99 (means the hours of time that represents the scan interval) MM value: 00~59 (means the minutes of time that represents the scan interval) SS Value: 00~59 (means the seconds of time that represents the scan interval) Successful return: <ADXX_YY> (means the current channel) Description: this command returns an auto scan through the channel. HH_MM_SS stop scanning for 00_00_00 (return:<ADXX_OK)	<AD01_A_T_01_02_30> Optical Switch every 01 hours 02 minutes 30 seconds to switch, If the current channel is 2 and the total channel is below 100), Return <AD01_02>, time delay 1000ms If the current channel is 2 and the total channel is above 100), Return <AD01_002>, time delay 1000ms
<ADXX_F_T_HH_MM_SS> Note: when the "HH_MM_SS" is "00_00_00" ,it can be stopped automatically.	Set auto scan time interval and start up XX value: 00~99 (means the current address of the device) HH value: 00~99 (means the hours of time that represents the scan interval) MM value: 00~59 (means the minutes of time that represents the scan interval) SS Value: 00~59 (means the seconds of time that represents the scan interval) Successful return:<ADXX_OK> Description: this command does not return to the autoscan channel.. HH_MM_SS stop scanning for 00_00_00	<AD01_F_T_01_02_30> Successful return:<AD01_OK> Optical switch every 01 hours 02 minutes 30 seconds to switch, but no information is returned.
<ADXX_U_VALUE>	Set the baud rate of serial port XX value: 00~99 (means the current address of the device) VALUE value: one of 1200、2400、4800、9600、19200、57600、115200. Successful return:<ADXX_OK>	<AD01_U_9600> Means that the baud rate is set to 9600 <AD01_U_19200> Means that the baud rate is set to 19200

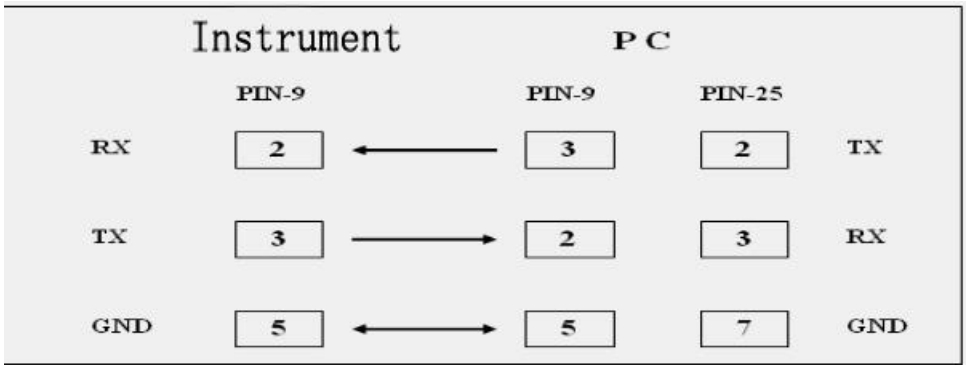
<ADXX_KEY_Y>	Set or query for the use of the device keys XX value: 00~99 (means the current address of the device) Y value: 0 means prohibit to use, 1 means allow to use Successful return:<ADXX_OK> or Y value: ? means query Successful return: <ADXX_KEY_0>or<ADXX_KEY_1>	<AD01_KEY_1> Means that the key allow to use <AD01_KEY_0> Means that the key prohibit to use <AD01_KEY_?> If the key allow to use and return <AD01_KEY_1> If the key prohibit to use ; Return <AD01_KEY_0>
<ADXX_LOCK_Y>	Set or query the channel switching function of the device panel is provided XX value: 00~99 (means the current address of the device) Y value: 1 means locking. 0 means allowing Successful return:<ADXX_OK> or Y value: ? means query Successful return:<ADXX_LOCK_0> or <ADXX_LOCK_1>	<AD01_LOCK_1> Means that on the panel to prohibit switching channels; <AD01_LOCK_0> Means on the panel to allow switching channels; <AD01_LOCK_?> If the panel is forbidden to switch and return <AD01_LOCK_1> If the panel is allow to switch and return <AD01_LOCK_0>
<ADXX_G_YY>	Change device address XX value: 00~99 (means the current address of the device) YY value: 00~99 (means the ner address of the device) Successful return: <ADYY_OK>	<AD01_G_03> Means that the change in the device address is 03 Successful return: <AD03_OK>
ADXX_MAX_?>	Query the total number of channels for optical switch XX value: 00~99 (means the new address of the device) Successful return: <ADYY_MAX_124>	Successful return: <AD01_MAX_124> Means the total number of channels for optical switch is 12

Serial ports connection and control

(1) 、RS-232 pins definition and connection

① RS-232 pins definition: DB9 pins, #2-RXD, #3-TXD, #5-GND, other pins can not connect.

② RS-232 connect with equipment and PC:



RS232 connection