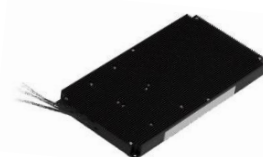


Multicast Fiber Optical Switch – Lossless

(2x16, 4x16, 8x16, 16x16, up to 168x168)

The MCSW Series Multicast Fiber Optical Switches enable simultaneous connection of one input to all outputs without loss. They support fully non-blocking, conflict-free switching of any number of optical inputs to any outputs, with complete configuration flexibility. The system is entirely passive and supports data transmission speeds up to 100 GHz. The MCSW integrates fiber splitters, optical amplifiers, and optical switches to form an NxM multicast switch, where both N and M can range from 1 to 168 channels. It is available in a compact module or a rackmount system with RS232 or Ethernet connectivity, all with a user-friendly GUI interface. Because different types of amplifiers are used to support various wavelength bands, pricing is sensitive to the selected wavelength range. The ordering table (Part Number) lists available control interface options. We also provide a set of standard control commands to assist customer engineers with software integration. For added convenience, a custom interface coding service is available upon request for an additional fee.

Each switch driver includes a GUI for programming and a command set (API) so customers can develop their own control software. Python and LabVIEW interface libraries; integration support is available for a fee.



Features

- Low Latency
- High Reliability
- Compact
- Tap Monitoring

Specifications ^[1]

Parameters		Min	Typical	Max	Unit
Operating Wavelength		1310	1540	1620	nm
Insertion Loss		-5		1	dB
Latency ^[1]		5		50	dB
Return Loss			45		dB
Cross Talk On/Off Ratio			55		dB
PDL				0.05	dB
Switching Time	MEMS	0.1	10	20	ms
	CL	1	10	50	μs
	NS	10	100	100	ns
Switch Durability		10 ¹³			cycle
Attenuation Range ^[2]		35			dB
Optical Power				500	mW
Operating Temperature		0		70	°C
Storage Temperature		-40		85	°C
Working Power		DC: 12~48V; AC: 110~220V (50/60 Hz)			
Fiber Type		SMF-28 or equivalent			

Notes:

[1]. Fiber length delay out from the front panel

[2]. Output power control option

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

Applications

- Reduce Network Opex
- ROADM
- Stock Trading



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P +1 781-935-1200

E sales@agiltron.com

W www.agiltron.com

Information contained herein is deemed to be reliable and accurate as of the issue date. We reserve the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Optowares Corporation in the U.S. and other countries.

Multicast Fiber Optical Switch – Lossless

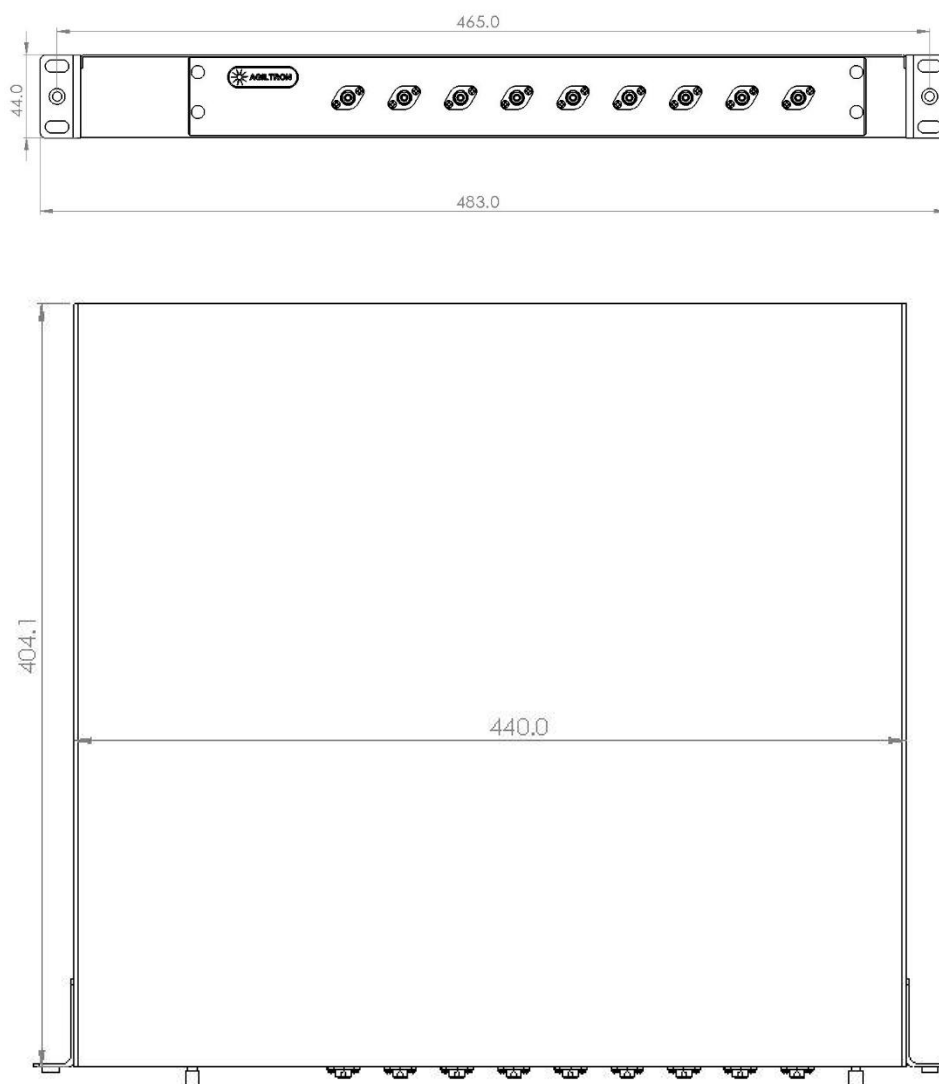
(2x16, 4x16, 8x16, 16x16, up to 168x168)

Mechanical Dimensions (Unit: mm)

Standard network rack Box: The height is related connector selection, we will select the minimum height.

Module: the size is related to the fiber port counts

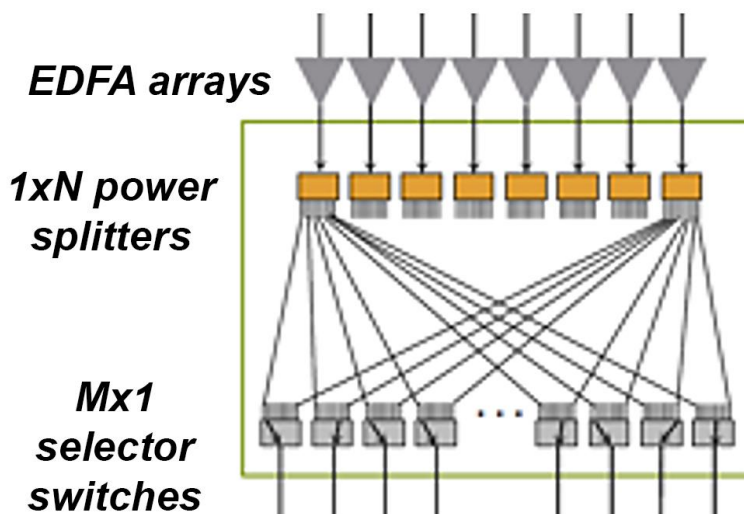
1U Rack Mount



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Optical Diagram (2x4 Example)



Ordering Information (Part Number)

Prefix	Input	Output	Wavelength	Amplifier ^[1]	Package ^[2]	Speed ^[3]	Control	Fiber Type	Fiber Length	Connector ^{[4][6]}	Interface Code ^[5]
MCSW-	2 = 2 3 = 3 4 = 4 8 = 8 10 = A 12 = B Special = 0	2 = A2 3 = A3 4 = A4 10 = 10 12 = 12 14 = 14 26 = 26 MN = MN Special = 00	C-band = 5 1310 = 3 L-band = 6 C+L = 7	No = 1 Yes = 2	Module = 1 Rack = 2	50ms = 1 10μs = 2 100ns = 3 50ns = 4	RS232 = 1 Ethernet = 2 TTL = 3	SM28 = 1 Special = 0	0.5m = 1 1m = 2 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 LC/PC = 7 Duplex LC/PC = 8 LC/APC = A LC/UPC = U MPO = Y Special = 0	Non = N Python = P LabVIEW = L

[1]. Using an amplifier, the insertion loss is set at zero for all channels. Without amplifier, the loss is splitting ratio of an income signal

[2]. Rack Mount Depth ~ 430mm.

[3]. Ethernet limit to 50ms speed. RS232 limit to 10μs . TTL can reach 100 and 50 ns speed.

[4]. Regular fiber connector has PER ~22dB. Connector with PER >27 dB is available using special process

[5]. GUI and a command set (API) are included. Python **\$560**. LabVIEW interface libraries **\$750**

[6]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

Note:

- Number of ports (MN) can be up to 168

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Ethernet Remote Control with Python

Several options: Telnet, HTTP/JSON API, or VISA Raw Socket mode (SCPI over TCP/IP)

```
#####
Telnet:

import telnetlib

HOST = "192.168.0.1"
PORT = 23

#####
username = "admin"
password="admin"
#####
tn=telnetlib.Telnet (HOST, PORT)

reply=tn.read_until(b"username:", timeout=10)
print(reply.decode("ascii")) #debug
tn.write(username.encode("ascii")+b"\r\n")

reply=tn.read_until(b"password:", timeout=10)
print(reply.decode("ascii")) #debug
tn.write(password.encode("ascii")+b"\r\n")

reply=tn.read_until(b"telnet>", timeout=10)
print(reply.decode("ascii")) #debug

tn.write(b"setswitch 31 32 0 0\r\n")
reply=tn.read_until(b"telnet>", timeout=10)
print(reply.decode("ascii")) #debug

tn.write(b"runswitch\r\n")
reply=tn.read_until(b"telnet>", timeout=10)
print(reply.decode("ascii")) #debug

tn.write(b"quit\r\n")

#####
```

Multicast Fiber Optical Switch – Lossless

(2x16, 4x16, 8x16, 16x16, up to 168x168)

Ethernet Remote Control with Python (ending)

Several options: Telnet, HTTP/JSON API, or VISA Raw Socket mode (SCPI over TCP/IP)

```
#####
API:
import requests

BASE_URL = "
TOKEN = "TOKEN"
def api_post(path, payload):
    r = requests.post(
        BASE_URL + path,
        json=payload,
        headers={"X-Auth-Token": TOKEN},
        timeout=3,
    )
    r.raise_for_status()
    return r.json()

def api_get(path):
    r = requests.get(
        BASE_URL + path,
        headers={"X-Auth-Token": TOKEN},
        timeout=3,
    )
    r.raise_for_status()
    return r.json()

# Set port 3
print(api_post("/api/set_permanent_port", {"port": 3}))
# Read status
print(api_get("/api/status"))

#####
pyVISA:
import pyvisa

HOST = "192.168.0.1"
TOKEN = "TOKEN"

rm = pyvisa.ResourceManager()

inst = rm.open_resource(f"TCPIP0::{HOST}::5025::SOCKET")
inst.read_termination = "\n"
inst.write_termination = "\n"
inst.timeout = 2000 # ms

print("IDN:", inst.query("*IDN?").strip())

# Set port
inst.write("SWITCH:PERMANENTPORT 3")
print("PORT?:", inst.query("SWITCH:PERMANENTPORT?").strip())

# Status
print("STATUS:", inst.query("SWITCH:STATUS?").strip())

#####
```

Multicast Fiber Optical Switch – Lossless

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Questions and Answers

Q: If the device were to fail, would the switch continue to pass the fiber light through the switch as configured before failure? When power is restored, does the IN/OUT configuration before failure remain in place?

A: This depends, if one mirror fails, it only affects the light go through that mirror. Yes, when power back up it will go to the previous points

Q: When power is restored, does the IN/OUT configuration before failure remain in place?

A: Yes, when power back up it will go to the previous flightpath

Q: If power to the device were shutoff, would the device continue to pass the fiber light as configured before failure?

A: This function is call latching. We uniquely offer MEMS latching switch but cost more.

Q: With the Ethernet Control Option, does the switch support SNMPv3

A: Yes. This internet standard protocol allows user to write their own control code

Q: With the Ethernet Control Option, what type of encryption does the SNMPv3 use?

A: MD5/DES

Q: With the Ethernet Control Option, could this device be controlled by multiple users at different locations and all users will also see the configuration updates?

A: Yes

Q: With the Ethernet Control Option, could this switch be controlled by multiple users at different locations and all users will also see the configuration updates?

A: Yes

Q: With the Ethernet Control Option, does the user need to install any software on their computer other than a web browser?

A: No