

Fiber Broadcast/Video Camera Switch

The optocamSWITCH (CASW) allows MxN routing of both fiber optic signal and power for cameras within broadcast studios, outside broadcast vehicles and location facilities. The unit accommodates M camera inputs and offers N cross-point outputs. It eliminates the need for high cost and bulky matrix patch fields using SMPTE patch cables. The OCSW offer switching of unlimited camera positions, across several studios or locations and control rooms. In addition to sealed front panel routing switches the supplied LAN-based remote control software shows switching and reports camera status and is designed to be integrated into existing broadcast production automation systems to allow real-time control of complex wiring structures. The optical switch is based on MEMS technology designed to reliably operate over 20 years. By avoiding the need to expose and reconnect fiber faces and power conductors during patching, the optioamSWITCH eliminates mechanical wear, costly maintenance, and possible mechanical failure. The matching adaptor provides constant power to the cameras avoiding long camera power cable transitionally associated with studios. When switched off the optocamSWITCH saves the router settings which are restored on reboot, a valuable feature when preconfiguring outside broadcast events. Fiber connections are via standard LC duplex fiber connectors. Units are powered by 12V DC plug power adaptor and 110-220 ACV. An auxiliary 12V redundant power supply inlet socket and earth terminal are also rear mounted. LAN Ethernet connection is via a standard RJ45 cat5e patch cord. A user friendly GUI is provided with a memory disk packaged inside the box. Front panel push button with LED is an option for manual override to directly connect the broadcasting to a specific camera.

The order table includes a list of standard control interfaces. Additionally, we provide a list of commands to assist customer engineers in coding. For those who require it, we offer a code-writing service for customer interfaces at an additional charge.

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

- Vibration Resist
- Dual Power
- Pluggable
- High Speed
- Easy to Use
- Low Cost
- Reliable

Specifications ^[1]

Parameters	Min	Typical	Max	Unit
Operating Wavelength	1260		1620	nm
Insertion Loss ^{[1], [2]}		1.0	1.3	dB
Insertion Loss Uniformity			0.5	dB
Return Loss		45		dB
Cross Talk On/Off Ratio		55	70 ^[3]	dB
PDL			0.05	dB
Optical Switching Time		10	100	ms
Repeatability			±0.05	dB
Durability	10 ⁸		10 ¹³	cycle
Operating Temperature	-10		65	°C
Storage Temperature	-40		85	°C
Interface	RJ45, Console, SFP, CLI, SSH, Telnet, SNMP			
Power Supply	DC: 12~48V; AC: 110~220V (50/60 Hz), 50W, Dual and Hot Swappable			
Fiber Type	SMF-28 or equivalent			
Chassis Type	19" Rack, 1U Supports 4 pluggable with Dimension 44.5x482.6x300mm			
Internal Cooling Fan	Included			
Relative Humidity	5-95%			

Notes:

- [1]. Excluding connectors.
- [2]. Multimode IL measure @ Light Source CPR<14 dB.
- [3]. Special order for 70dB

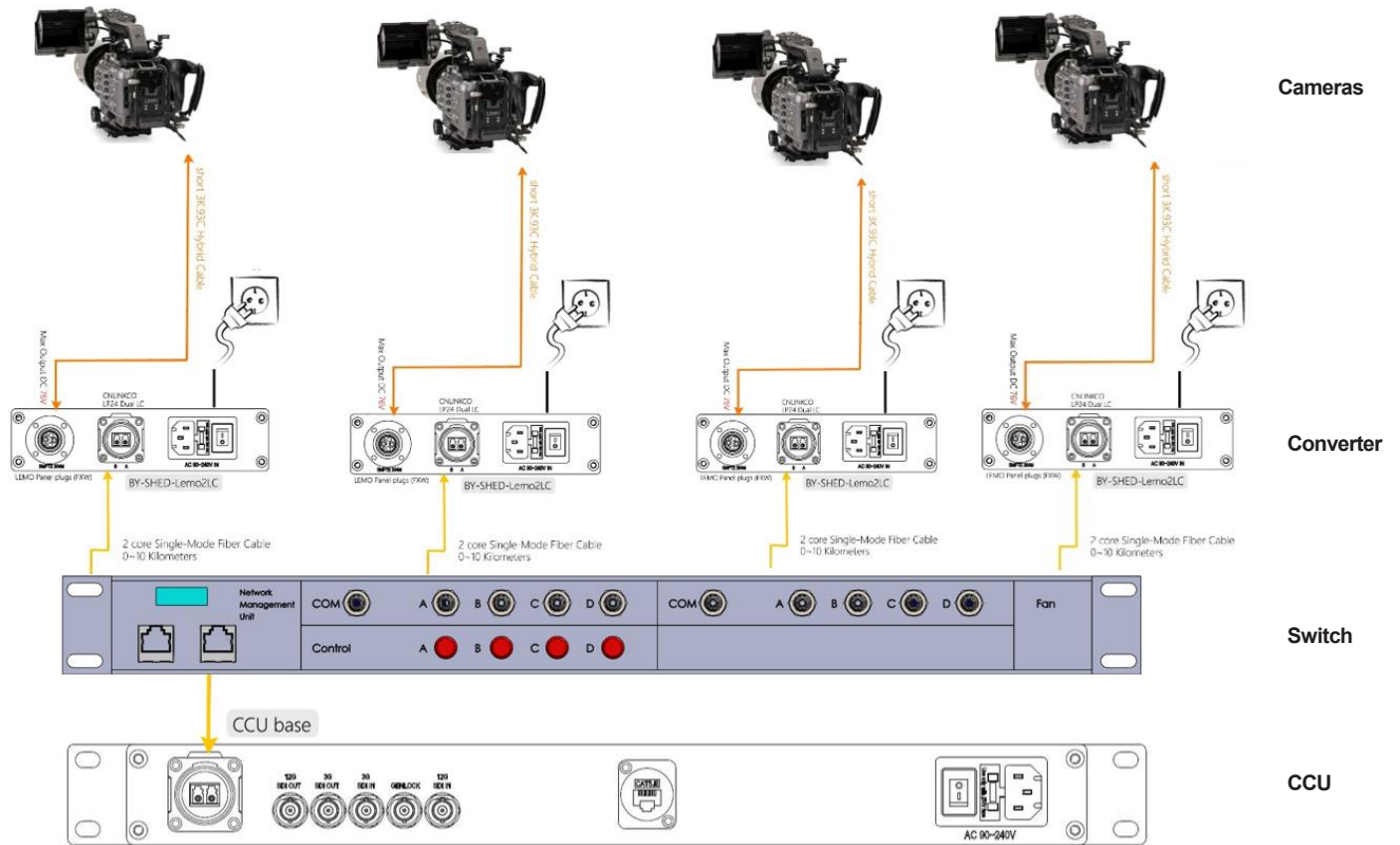
Applications

- Network
- Shipboard



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Camera Connection Diagram



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

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Dimensions (mm)

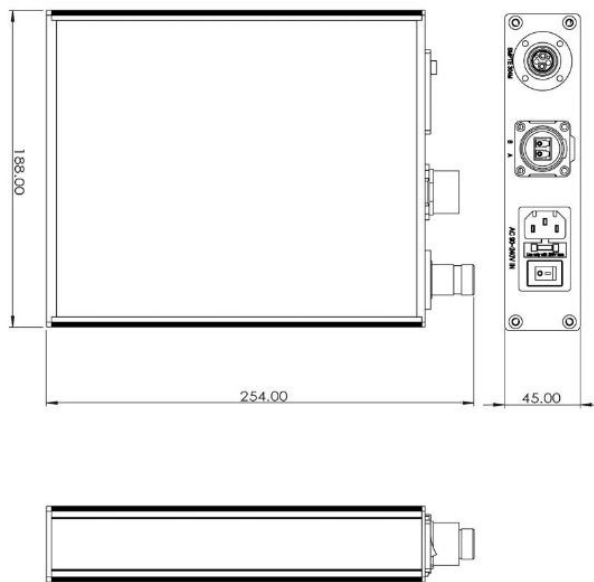
DIMENSIONS WITHOUT EARS: 16.75"W x 1.75"H x 10.63"D. (42.5 x 4.4 x 27.1 cm)

DIMENSIONS WITH EARS: 19.0"W x 1.75"H x 10.63"D. (48.3 x 4.4 x 27.1 cm)

WEIGHT: Approximately 4.7 lbs. (2.2 kg)



Switch



Converter

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Electrical/Computer Connection

DISPLAY: (4) Front panel LED's displays switch position and power status.

REMOTE: (1) RJ45 female connector on rear panel accepts 10/100 Base-TLAN access Ethernet for Remote Control.

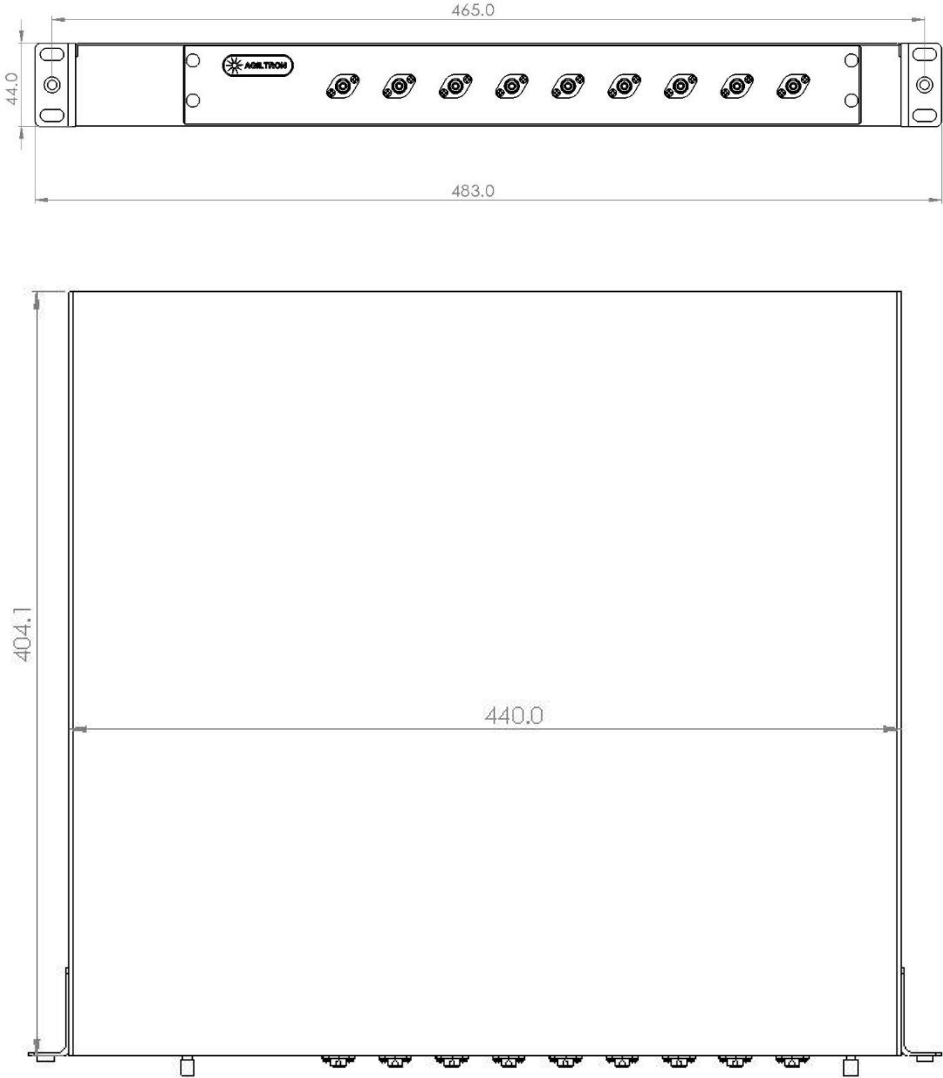
POWER SUPPLY: 110VAC-220VAC, 50Hz/60Hz receptacle.

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Mechanical Dimensions (mm)

1U Rack Mount



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Ordering Information (Part Number)

Switch and Converter

Prefix	Type	Channel	Wavelength	Fiber Type	# of Converter	Front Pushbutton	Connector ^{[1][3]}	Interface Code ^[2]
CASW-	Standard = 1 Special = 0	2 = 02 4 = 04 6 = 06 12 = 12 ... NM = NM	1270-1620nm = 1 850nm = 2 1310nm = 3 850/1310 = 4	SMF28 = 1 MM50/125 = 5 MM62.5/125 = 6 Special = 0	1 = 01 2 = 02 3 = 03 10 = 10 12 = 12 ... MN = MN	Yes = 1 No = 0	Duplex LC/PC = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 MPO = Y	Non = N Python = P LabVIEW = L

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

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

* Rack Mount Depth ~ 430mm.

[3]. The connector cannot be installed directly onto bare fiber, as it 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 can remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SM28 fiber and decreases further with smaller core fibers.

Cable From Camera to Converter

Prefix	Type	Length *	1	1	1 1	1	1
CACV-	Standard = 1 Special = 0	Standard = 1 Special = 0					

* Standard cable length is 6 meters

Cable From Converter to Switch

Prefix	Type	Length *	1	1	1 1	1	1
CVSW-	Indoor = 1 Outdoor = 2	10m = 010 50m = 050 100m = 100 150m = 150 200m = 200 300m = 300 Special = 000					

Cable From Switch to CCU

Prefix	Type	Length *	1	1	1 1	1	1
SWCU-	Standard = 1 Special = 0	Standard = 1 Special = 0					

* Standard cable length is 2 meters

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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")  
  
#####
```

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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())

#####
```

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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