

# Fiber to the Desktop



**NETWORK SMARTER**

# Introduction

Fiber to the Desk (FTTD) is the practice of using fiber-optic cables to connect computer workstations to the company network instead of copper cables. Although installation costs are higher than copper for some applications, the advantages of security and futureproofing outweigh the extra expense.

Fiber cables do not radiate electromagnetic energy (EMI) like copper cables, which deters hackers from eavesdropping on the traffic they carry. This makes them an attractive option for security-conscious organizations that want data protection from the network core to the desktop device.

High-security environments like defense installations, banking, and other critical organizations that need the most stringent data protection should consider fiber to the desk.

Fiber cables are also capable of carrying massive amounts of data at high speed. Unlike copper cables that need upgrading for higher speeds, fiber cables can keep pace with increasing network demands, which makes them perfect for future-proof applications

Applications where FTTD is an ideal choice:

- High-security networks like defense installations, financial, healthcare and other critical applications
- Virtual networks using thin clients
- Local area networks with extended distances to workstations
- Locations where the power for copper Ethernet extenders is limited or unavailable
- Businesses increasing bandwidth capacity
- Operations moving large amounts of high-speed data

## Advantages of Fiber Cables

### Security

Copper cables can be easily “tapped” because they emit electromagnetic signals, enabling hackers to eavesdrop on traffic without disturbing the cable. Intercepting traffic on a fiber optic cable is more difficult because light emits no EMI and cable tampering can be detected.\*

### Future Proof

Installing fiber ensures your network can keep up with the growth in traffic over time. A fiber cable can carry traffic at Gigabit, 10G or 100G speed, which simplifies network upgrades without the need for expensive re-cabling.

### Distance

Copper cables can transmit data over a maximum distance of 300 feet (100m). Depending on the type of fiber cable, distances can range from 1500 feet to several miles, enabling easier and cheaper deployments in large buildings and campuses.

### Speed & Reliability

Fiber is immune from EMI caused by machinery, fluorescent lights, etc. so high-speed data transfer is more reliable in electronically noisy environments. Fiber also has fewer compatibility issues - if a network segment of copper uses a lower standard cable, it reduces the performance of the entire segment. E.g., if a Cat5 patch cable is used in a Cat6a network, overall performance will degrade to the level of the Cat5 cable.

### Lower Cost

Fiber cabling used to be more expensive than copper, but as demand has increased, manufacturing costs have dropped. Installation costs for fiber are now comparable to copper and often less overall. Additionally, once installed, maintenance costs are much lower than copper, and future upgrades are not required.

\* Active Fiber Monitoring is a feature of Allied Telesis switches that detects changes in light levels on fiber cables, caused when cables are moved or disturbed during tapping.

# Considerations When Using Fiber and Copper Cables

Although fiber cabling has many advantages, copper is still commonly used in most networks, so joining both types of cable is necessary. This is the function of a media converter—a small device with a copper port and a fiber port.

Media converters are easy to install and easy to use. Many are Layer 1 network devices, making them entirely transparent for traffic, so they can be installed without affecting existing network configurations. Although media converters require no management because they aren't usually configurable, some have functions that improve the manageability of the devices they connect. Allied Telesis media converters provide a range of features to improve troubleshooting and simplify network administration.

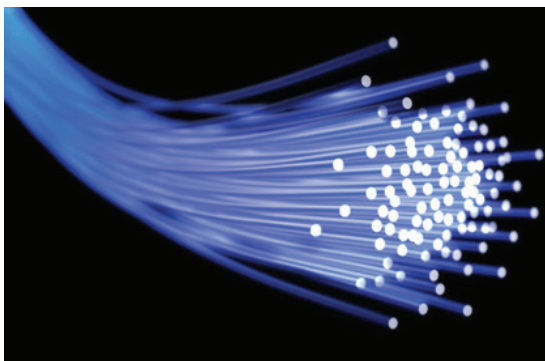
## **MissingLink and Smart MissingLink**

These features are designed to expose subtle connection problems and make them easier to find and resolve. The media converter monitors network

connections and provides notification when network segments fail, allowing network managers to quickly identify the source and location of failures to minimize downtime. Without this feature, a failure in a link within two media converters is invisible to the network and is difficult to resolve quickly.

## **Remote Power Cycle**

This feature is supported on our PoE media converters. It allows an administrator to reset a connected PoE device, like a VoIP phone or IP camera, without physically going to the device's location. To do this, the administrator simply logs into the switch connected to the media converter's fiber port and disables the fiber link. When the fiber link is disabled, the media converter automatically cycles the PoE power on its copper port, which will reboot the connected PoE device.



## **Considerations When Using Fiber and Copper Cables**

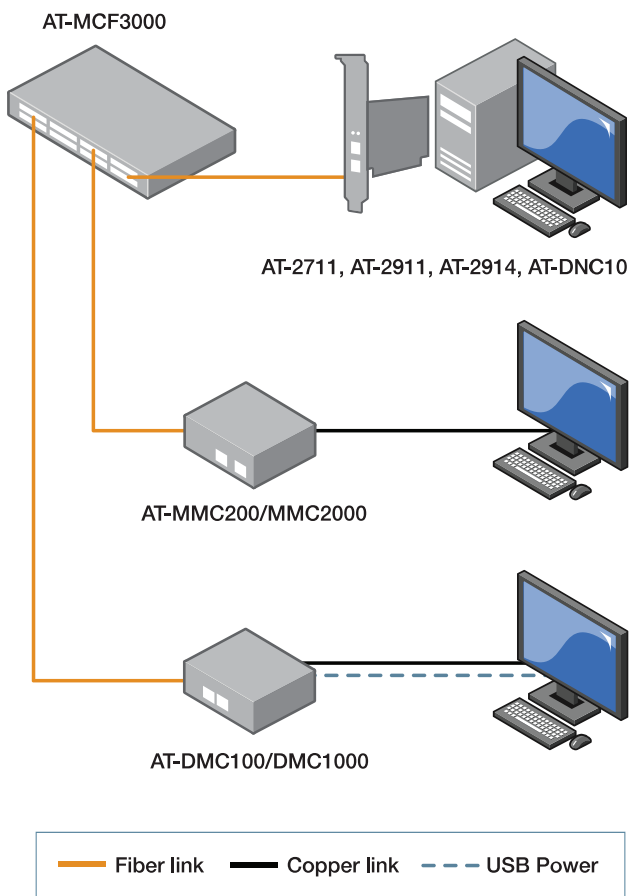
# Fiber to the Desk Scenarios

## Fiber to Desktop Computers

The most secure solution is to install a fiber NIC (Network Interface Card) into the PCI slot of a desktop computer. The NIC has a fixed optical connector or an SFP slot where different modules can be used to support speeds from 100M to 10 Gigabit.

Sometimes, it is not feasible to install a NIC and the desktop computer is equipped with only an RJ-45 copper network port. For these cases, a media converter is required.

## Fiber to Desktop Computers



### Fiber NIC

- PCIe bus fiber NICs are securely installed within PC and provide a fiber connection between main computer room and desktop location

### Media Conversion

- Provides connection between fiber infrastructure and embedded copper NIC
- USB-powered media conversion uses line or USB power in mini media converter which is ideal for limited space environments or where power is not available

### Fiber to Desktop Computer with VoIP Phone

Most IP phones come with two RJ-45 copper ports. One connects to the network and the other to the computer's NIC. This conveniently uses only a single cable to the desk and enables the IP phone to be powered by PoE through the network cable.

There are two ways to use a single fiber from the network to provide data and power to a connected device, like a VoIP phone:

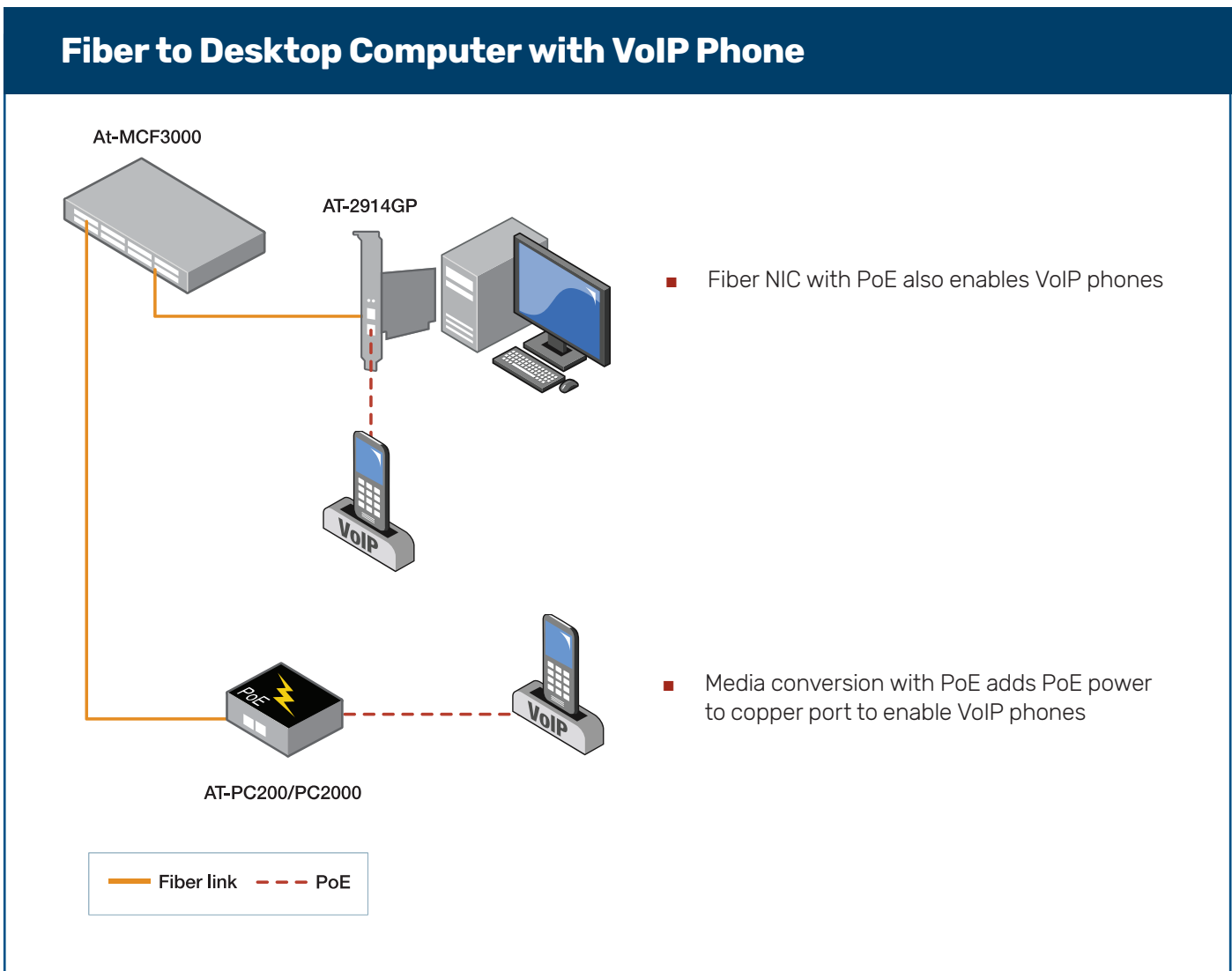
#### Option 1

Use a special NIC card equipped with a fiber connection and an RJ-45 PoE port. The NIC card includes a switch to manage traffic coming from the IP phone and any

traffic generated by the desktop itself. This enables the NIC to add VLAN information to the traffic, even when the PC is asleep, to identify the source of the traffic and keep it separate on the network. At the same time, the NIC can provide PoE power to a device connected to the RJ-45 port. Allied Telesis has two NICs suitable for this option: the 2914GP or the 2911GP/SFP that can take an SFP module to support any fiber connector type and distance.

#### Option 2

Use a PoE media converter that can supply power to connected devices. The Allied Telesis PC200/2000 Series media converters can supply up to 30W of PoE power.



## Fiber to Laptop or Small Form-Factor Computer

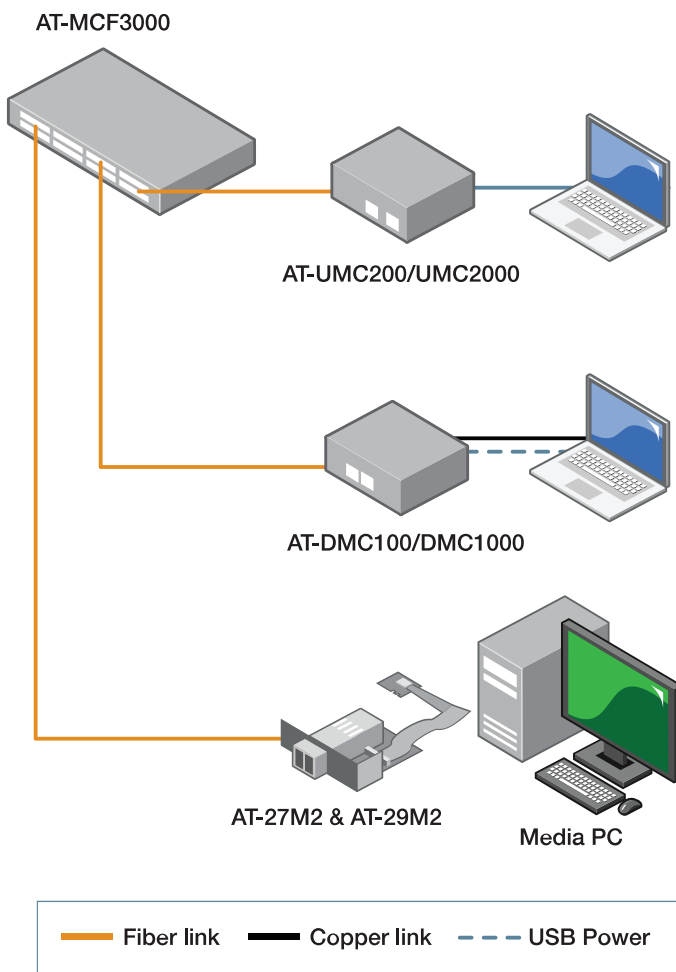
Since laptops are not usually equipped with RJ-45 interfaces, the easiest way to connect to a fiber network is with a media converter able to work as a USB network card. The ability to power the converter directly from the USB port adds further convenience to this solution.

The Allied Telesis UMC200 and UMC2000 Series media converters use the USB port on the laptop for both power and data transfer. If the laptop is equipped with an RJ-45 port, then the DMC Series media converters

provide conversion from RJ-45 to fiber and are powered from USB. Both the DMC1xxx and UMC2xxx Series enable fiber to run directly to the laptop for maximum data security.

These solutions are ideal for federal applications that need secure data transfer or networks that are susceptible to electrical “noise” (e.g. industrial). The small length of copper cabling minimizes the risk of interference to the traffic for reliable data transfer. Additionally, USB power simplifies installation and reduces the overall power consumption of the solution.

## Fiber to Laptop or Small Form-Factor Computer



### USB to Fiber Ethernet Adapter

- Provides fiber connectivity point for laptops, tablets or thin clients; powered directly from USB port

### RJ-45 to Fiber Ethernet Adapter

- Provides fiber connectivity point for laptops, tablets or thin clients; powered directly from USB port

### M.2 Fiber Network Interface Card

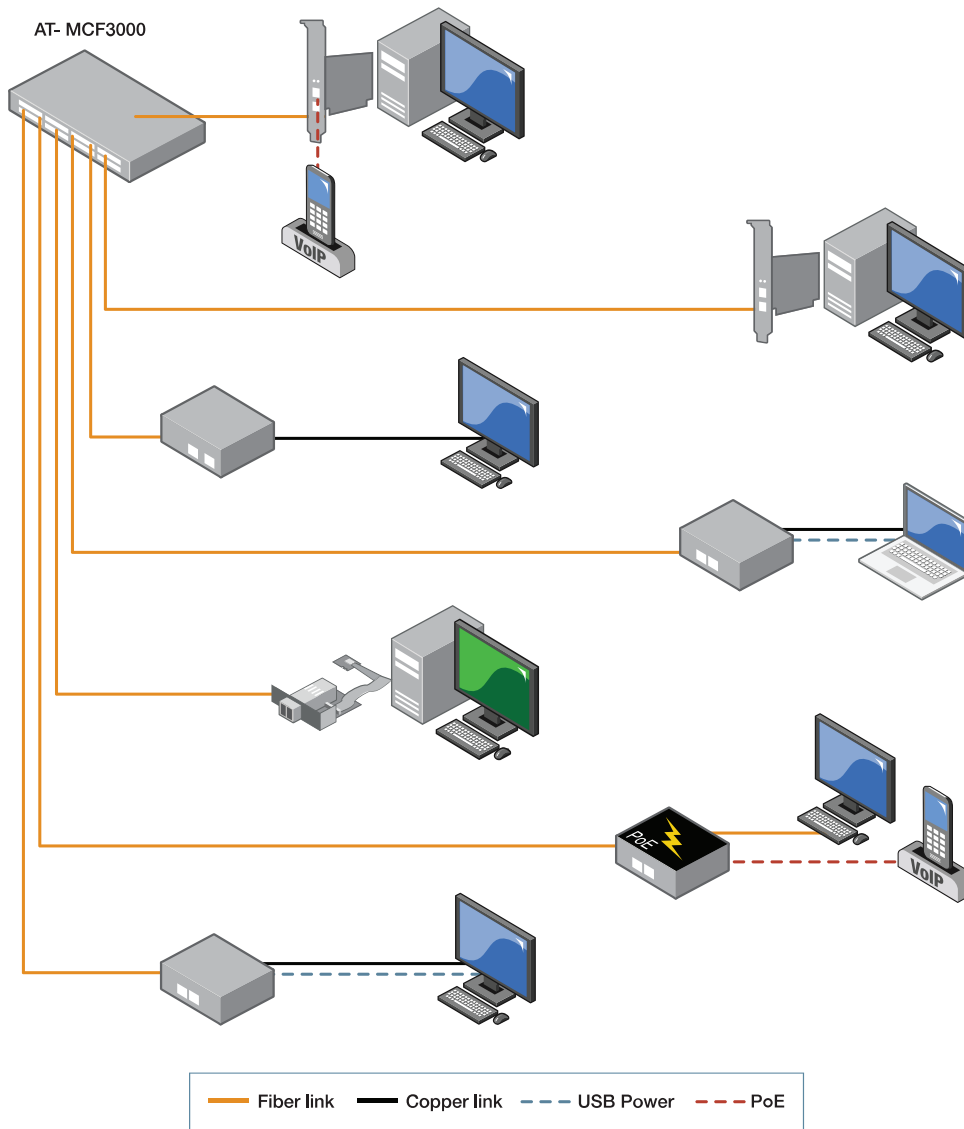
- Provides fiber connectivity point for micro PCs, mini PCs and thin clients

### FTTD Network Distribution

Managing a large-scale FTTD deployment can be daunting because of the number and types of fiber connections. Different fiber cable types and different fiber cable lengths that require specific optical

transceivers only add to the complexity. For these kinds of applications, using managed fiber distribution equipment can save time and operating costs by providing visibility for maintenance and troubleshooting on each of the fiber links.

## FTTD Network Distribution



The MCF3000 Series of Multi-channel Modular Media Converters provide an end-to-end managed media conversion system able to support multi-mode and single-mode fiber.

# Media Converter Features

Allied Telesis media converters enable the connection of disparate cabling types in networks where many cabling types exist. Network segments may operate at different speeds, and rate-converting media converters can also convert between speeds. This enables customers to keep pace with changing technology and integrate high-bandwidth devices into their network without replacing equipment.

From standalone units to chassis-based blades, Allied Telesis media converters are highly configurable to meet every need. The following table lists the features of each of the Allied Telesis series of media converters.

SERIES	TYPE	SPEED	MAX FIBER DISTANCE	TEMPERATURE RANGE	POE	MISSING LINK	REMOTE POWER-CYCLE
MMC200	Fiber/Copper	100M	20km	0C to 50C	No	✓	No
MMC2000	Fiber/Copper	1G	SFP	0C to 50C	No	✓	No
MMC10G	Fiber/Copper	10G	SFP+	0C to 50C	No	✓	No
DMC100	Desktop mini Fiber/Copper	100M	2km	0C to 40C	No	✓	No
DMC1000	Desktop mini Fiber/Copper	1G	550m	0C to 40C	No	✓	No
UMC200	Desktop mini Fiber/USB-C	100M	2km	0C to 50C	No	✓	No
UMC2000	Desktop mini Fiber/USB-C	1G	550m	0C to 50C	No	✓	No
PC200	Fiber/PoE	100M	2km	0C to 50C	✓	✓	✓
PC2000	Fiber/PoE	1G	550m/SFP	0C to 50C	✓	✓	✓
IMC200	Industrial Fiber/PoE	100M	2km	-40C to 75C	✓	✓	✓
IMC2000	Industrial Fiber/PoE	1G	SFP	-40C to 75C	✓	✓	✓







## Suitable for Federal Use

### **JITC certified**

The US Department of Defense (DoD) Information Network Approved Products List (DODIN APL) is used to ensure that US DoD entities select products that meet stringent interoperability and cybersecurity requirements. Joint Interoperability Test Command (JITC) is responsible for certifying all US DoD IT equipment and has approved several Allied Telesis switch families for use in classified DoD networks.

### **Secure Supply Chain**

Ensure that what you order is what you get with our secure supply chain—and that your orders are not delayed by US Customs with our C-TPAT certification. Allied Telesis has consistently demonstrated that its supply chain security policies, procedures and controls exceed the required criteria, and as a result, we have been awarded the highest certification (Tier 3). For our customers, this means expedited shipping and confidence that our supply chain has been certified secure.

### **NDAA Compliant**

Section 889 of the National Defense Authorization Act (NDAA) prohibits federal agencies, their contractors and grant or loan recipients from procuring or using “telecommunications and video surveillance equipment or services” from specific Chinese companies as a “substantial or essential component of any system, or as critical technology as part of any system.” All Allied Telesis products comply with the requirements of Section 889 of the act.

### **TAA Compliant Products**

TAA compliance is mandatory for US government purchases and ensures that products are manufactured only in the USA or other approved countries. We have an extensive list of TAA compliant switches, media converters, transceivers and network cards.

## Your Partner for Fiber to the Desk Applications

With more than two million units deployed in virtually every major United States military command, Allied Telesis government-certified solutions are the only options to consider for secure desktop and IP phone connectivity to fiber networks.

Our products are easy to sample and easy to buy through several major contract vehicles including 2GIT, ITES, SEWP IV, and GSA, and through distribution and small business partners. Our “Federal friendly” sales process makes network deployment easy, quick and hassle-free.

**Contact Our Federal Sales Team for More Information.**