

# Fiber Optics for Correctional Facilities

Fiber-optics plays an integral part in various aspects of the correctional market including:

- Remote visitation within the facility
- Remote arraignment in conjunction with associated courthouses
- Video & audio surveillance within the facility, exercise yards, perimeter security, etc.

Correctional facilities are well-suited for fiber as many of the cable runs can be quite long including both indoor and outside installations. Exercise yards afford an ideal location for fiber-optics, particularly in lightning prone areas. One of the key features of fiber-optics is its immunity to lightning. Reliable video surveillance is of paramount importance in correctional facilities. In the presence of lightning, any camera located outdoors is a prime target. Without fiber, the lightning pulse can travel down the copper video cable potentially damaging the entire communications/surveillance center. Utilizing fiber for transporting the video from the CCTV to the communication center isolates any lightning-induced pulse to the equipment at the camera location only – thus protecting the center.

Fiber also easily allows the facility to transport many signals over an individual fiber. This affords the user the ability to consolidate the signals from one or more locations and multiplex them over a very small number of fibers – reducing equipment and installation costs.

Remote visitation and arraignment are closely related in that they both allow long distance audio and video communications without jeopardizing the safety of the personnel. These systems also minimize the expenses associated with transporting inmates to and from locations common to either the visitor or the presiding judge as it would be in an arraignment case.

The quality of video over an IP network is dependent on several factors including the speed of the network, number of nodes and cameras on the network. Latency associated with PTZ control can become an issue in certain situations. Real-time fiber systems, on the other hand, provide live, full-resolution video without the quality constraints of an IP system. At the main security location, the video & audio can be recorded in realtime leaving nothing to the imagination or legal interpretation. In some states, there are some legal implications of using digitized, compressed video for remote arraignment. Real-time video is the required and preferred method for this arraignment. If ‘networking’ the video is important, the video can be converted to an IP signal after it is received and recorded at the headend location in real time. In this type of ‘hybrid’ system architecture, the quality of the video is maintained as long as possible and practical before it is converted to a less than optimal IP format.

Since fiber is also ‘signal proof’, different quantities and types of signals can be easily multiplexed on an individual fiber. This offers the facility expansion capabilities not available in traditional copper solutions. Fiber’s advantages make it the obvious choice for correctional and courthouse system architectures. Related fiber products include:

MERIDIAN PART NUMBER	DESCRIPTION
DXA/DXB-1V2A1G-2	BI-DIRECTIONAL VIDEO, AUDIO, DATA, 1 MM FIBER, REMOTE VISITATION PRODUCT
DT/DR-4V4A-2	4-CH VIDEO & AUDIO TX/RX, REMOTE VISITATION
DT/DR-16A-2	16-CH AUDIO TX/RX, 1 MM FIBER, AUDIO TRANSPORT PRODUCT
DT/DR-8V-2	8-CH VIDEO TX/RX, 1 MM FIBER, VIDEO TRANSPORT PRODUCT
ST/SR-1W2A1G/2A1G-2	VIDEO, AUDIO & DATA MONITORING PRODUCT, 1 MM FIBER
PT-100MB	SMALL VIDEO, CAMERA MOUNTED TX
PR-130R	3-CH VIDEO RX CARD

# Mecklenburg County Jail, Charlotte, North Carolina

Meridian Technologies was chosen as the fiber optic equipment supplier used within the Mecklenburg County Jail facilities in Charlotte, NC for remote visitation within the facility. The systems incorporate bi-directional video & audio fiber optic transport equipment. There are presently six visitation stations located at the main entrance to the facility, each with its own video & audio communication channels. The video & audio signals are routed from the main PBX system to the equipment bay located in the access space above the inmate housing units. Each of the eight inmate housing units has two such visitation stations for a total of sixteen channels of video & audio. There are two of these equipment bay locations, one for each of the four inmate housing units.



A combination of video & audio multiplexers was used to transmit these various signals to and from the visitors' center to the associated inmate locations. All of the signals are transmitted over standard 62.5/125µm multimode fiber. Due to fiber count limitations, wavelength multiplexing was used to consolidate a number of the video & audio channels onto one fiber. Special care had to be taken in the system design to ensure that the multimode fiber's bandwidth could support the optical transmission data rate of the equipment. As such, the shorter wavelength (850nm) having a lower overall fiber bandwidth was used to transmit 8 audio channels while the longer wavelength (1300nm) with a high fiber bandwidth was used to transmit the 8 video channels. As a result, the system provided high-quality video and audio over the long distances required while keeping within the bandwidth constraints of the fiber and maintaining adequate optical loss budget.

Expansion capabilities have been provided so that this visitation center can be easily expanded with no impact on the existing fiber system while providing a cost-effective and efficient way to add more remote visitation locations as demand dictates.

The fiber transmission equipment incorporates a number of diagnostic features to afford fast and efficient troubleshooting of the entire system – from camera and microphone to the monitor and speaker. At each location, indicator lights provide indication of the operational status of each incoming signal as well as the condition of the fiber transmitter, receiver and fiber infrastructure.

Michael Barry, Meridian's managing director has commented that "... these systems are important and essential in the judicial and correctional marketplace." He continues, "... our fiber technology acts as an information bridge both within the correctional facility between visitors and inmates and also between the courthouse and correctional facility for remote arraignment, helping to expedite the judicial process and ensure the safety of all parties involved in such functions. We are pleased to be part of this market and continue to provide products to meet the ever-increasing demands of these markets".

Meridian Technologies has provided fiber transmission solutions to a number of other county, state and federal correctional facilities and is a premier provider of fiber optic transmission equipment for security, audio/video, government, military and transportation systems. Meridian's website is [www.meridian-tech.com](http://www.meridian-tech.com) which provides information on these and many other fiber products. They can also be reached at [sales@meridian-tech.com](mailto:sales@meridian-tech.com) or by phone (516-285-1000).

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