

ORION™ FEATURES AND BENEFITS

Large-Scale Network Solution

The Orion™ system can handle large numbers of video and data channels that can be transmitted simultaneously. There is never any loss of video transmission quality, as the MPEG-2 video compression rate does not need to be reduced, regardless of the total video channel count. This may not be true of competing designs using Wavelet video compression, where the compression rate must be reduced once a critical video channel count has been exceeded.

Plug-and-Play Installation

Each Orion™ system is pre-configured at the factory to your exact system requirements. This ensures ease of installation, as no electrical or optical adjustments are ever required. Optical attenuators are never required, even with Orion™ node-to-node distances of one meter or less, eliminating the troublesome nuisance of installing attenuators in the field.

Scalable Solution

The modular design of the Orion™ system provides the flexibility for easily incorporating system location changes, additional Orion™ modules, and system reconfiguration to accommodate future system growth and upgrades. The Orion™ system cannot become obsolete; as new communications interface modules become available, they may be easily inserted directly into an existing installed system. If the card cage at an Orion™ node becomes fully populated, additional card cage units may be easily added to increase the channel capacity at any time.

Broadcast Quality Video

The Orion™ video interface uses state-of-the-art MPEG-2 compression. This is the same high quality compression method used by Digital Broadcast Satellite Systems (DBSS) and the latest generation HDTV broadcast systems.

Transparent to Data Encoding

The Orion™ data interface is totally transparent to the most commonly utilized data-encoding schemes currently available, allowing for a broad range of compatibility with all major CCTV PTZ control signals, traffic signal control equipment, and other RS-232, RS-422, 2-Wire or 4-Wire RS-485 communications and terminal interface-compatible equipment.

Compatible with Multiple System Manufacturers

Multiple camera manufacturers' equipment can easily be integrated on an Orion™ network. From an RS-232 port or API, the Orion™ system is simple to interface with CCTV, and Access Control equipment manufacturers.

Environmentally Hardened

Robust design ensures reliable performance over the ambient operating temperature range of -40 degrees to +74 degrees C. The Orion™ system is ideally suited for installation in difficult out-of-plant or unconditioned roadside environments. *Free air environment

Highly Fault-Tolerant Design

The Orion™ system can also be configured in fully-redundant self-healing ring architecture, allowing for the highest possible network reliability. The unique Orion™ card cage design virtually eliminates the possibility of single-point failures.

Lifetime Warranty

Our confidence in the long-term reliability of the Orion™ system is such that we provide this equipment with the exclusive IFS Lifetime Warranty.



ORION™ NETWORK MANAGEMENT

The Orion™ system includes a state-of-the-art network management system that continuously monitors the integrity and operating status of the network. The panel of each module provides status indicating LEDs that provide local status of each module at each node. System parameters that can be monitored locally are Video Present, Data In/Out, Contact Status, Data Mode, Optical Lock and Power. In addition, critical operating parameters of the system's performance such as laser temperature are transmitted in-band with the signals data stream to allow remote monitoring at the head-end to ensure safe and reliable performance of every node and signal status on the network.

Flexible Configurations

The Orion™ system can be configured in many different ways. The chart below is an example of the many different combinations of camera input and monitor output options available.

SYSTEM W/ALL VIDEO CHANNELS ACTIVE	VIDEO		VIDEO & FULL DUPLEX DATA		VIDEO & FULL DUPLEX DATA & CC MONITORING	
	Video Input	Video Output	Video Input	Video Output	Video Input	Video Output
	128	128	113	113	102	102
SYSTEM W/SWITCHED VIDEO CHANNELS	11,868 Max	128	11,880 Max	113	128	99
					256	85
					384	71
					512	56
					640	42
					768	28
				896	13	

FIGURE A.

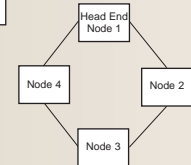
Orion™ System Linear "Insert & Repeat" Network

- Video only
- Contact Closure Monitoring



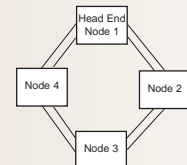
Orion™ System Network

- Video
- Data and PTZ Control
- Network Diagnostics
- 1 Fiber Between Each Node



Orion™ System "Self-Healing" Ring Network

- Video
- Data and PTZ Control
- Network Diagnostics
- Self-Healing for Network Redundancy
- 2 Fibers Between Nodes



International Fiber Systems, Inc.

Orion™ Intelligent Transportation Systems (ITS) Applications

The flexibility and simplicity of installation and system integration offered by the Orion™ system presents numerous benefits to ITS-specific users. Conventional wide-area networks employed for ITS applications typically rely upon costly SONET-based optical backbones for the transmission of video and data from numerous roadside locations to the central/head-end location. Although SONET is a mature and reliable multiplexing system, it requires CODECs to encode the CCTV camera video at a T-1 or fractional T-1 data rate for insertion onto the SONET network, and channel banks for inserting and recovering low speed data. Video CODECs and channel banks add to the overall cost and complexity of the system, and T-1 or fractional T-1 compressed video typically results in a less than 30 frame per second image refresh rate with degraded image quality. This is clearly not representative of the current industry-accepted benchmark for video transmission; true broadcast quality. Although MPEG-2 video CODECs are available, they require significant and costly SONET bandwidth to insert a true MPEG-2 compressed video channel, and the number of video channels that can be transmitted through the SONET backbone becomes limited. The MPEG-2 video compression utilized by the Orion™ system exceeds current standards for television broadcast network transmission quality, and no video CODECs are required, as the system is completely transparent to the NTSC or PAL composite baseband video. Truly transparent transmission of full-motion video with zero artifacts or distortion data can be transmitted through the Orion™ system from any location in the field, directly back to the traffic operations center, with no additional physical transmission layers required.

Since the Orion™ system inputs and outputs composite baseband video, any Orion™ node within the network may be optically extended by the addition of a simple point-to-point video transmitter/receiver combination. The data channels may also be optically extended by the incorporation of an RS-232 point-to-point, linear point-to-multipoint, or self-healing ring transceiver network, resulting in a low-cost and extremely wide area network capable of supporting large quantities of traffic controllers in an ATM closed loop signalization network.

Very few SONET multiplexing systems are environmentally hardened, requiring costly conditioned shelters to protect the equipment. Conversely, the Orion™ may be easily and readily deployed in an unconditioned roadside environment.

As the Orion™ system supports the RS-232, RS-422 and 2-Wire or 4-Wire RS-485 data communications protocols commonly utilized within the transportation market, data for traffic signalization, VMS/CMS control, and CCTV pan-tilt-zoom, control applications may be seamlessly integrated within one common communications network and fiber optic infrastructure. Additionally, the Orion™ network can be fully managed and the operational health of the entire system remotely diagnosed through the GUI network management system. Depending upon the users needs, the network may be configured as a linear insert, drop and repeat topology; in a ring topology, or as an optical self-healing ring for the greatest possible level of network reliability.



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ORION™

Fiber Optic Communication System

**SUPPORTS UP TO 11,880
VIDEO INPUTS, AND
CAN ACTIVELY MONITOR
UP TO 128 REAL-TIME
VIDEO OUTPUTS.**



ifs International
Fiber
Systems
Incorporated

**ANALOG AND DIGITAL FIBER OPTIC VIDEO,
AUDIO AND DATA COMMUNICATION PRODUCTS**

THE ORION™ SYSTEM IS THE FIRST COST-EFFECTIVE AND PRACTICAL SOLUTION DESIGNED SPECIFICALLY FOR LARGE-SCALE FIBER OPTIC VIDEO SURVEILLANCE NETWORKS.

ORION™ FIBER OPTIC COMMUNICATION SYSTEM



The Orion™ Fiber Optic Communication System provides a fully integrated, cost-effective solution for the transport and management of video and data communications over a single-mode optical fiber network. The Orion™ system is ideally suited for a communications network routed over a wide area to multiple locations. Typical applications include airports, light rail, highways and campus environments.

Unmatched Capabilities

The Orion™ system utilizes "state-of-the-art" MPEG-2 compression providing video performance that exceeds broadcast quality standards. The major benefit of MPEG-2 compression is the ability to simultaneously transmit a large number of video channels over the network with virtually no loss in video performance. In addition to superior video performance, each video channel supports the transmission of bi-directional data and relay/contact closures. The embedded "virtual" matrix switching capability and software Application Programmable Interface (API) or point-to-point RS-232 provides CCTV manufacturers complete compatibility and control. The system provides remote operation to the user when switching any video source on the network to any video output.

Scalable Solution

The Orion™ system's modular design offers a highly scalable solution that allows the user the option of expanding the system as their application requirements change. Depending on the configuration, the system allows a combination of up to 11,880 video inputs or up to 128 video outputs to be utilized at any time. The Orion™ system can be configured in a drop-and-insert architecture for simple and easy installation of multiple nodes on the network. For those applications where network reliability is of utmost importance, the Orion™ system can be configured in a self-healing ring architecture offering a fully redundant transmission system. Video and data signals can be inserted or dropped at any node providing an extremely flexible solution.

Network Management

The Orion™ system's operating performance can be monitored locally at each node via status indicating LEDs on each encoder, decoder and optical transceiver module. In addition, full network management capabilities provide remote monitoring of the system's operational performance via an easy to use, yet powerful, graphic user interface (GUI) on the Windows® OS platform from a supplied PC. If a failure of any kind occurs, instant notification of that fault is transmitted back to the user in the control center.



ORION™ SYSTEM CARD CAGE

The Orion™ Card Cage System incorporates a fault-tolerant power supply design that reduces the possibility of a single point-of-failure that can cause a complete shutdown of the affected node. Automatic resettable solid-state current limiters on all power rails of each module provide unconditional protection. All modules are fully "Hot-Swappable"; no operating power shutdown is required in the remote event of a module failure and replacement. In addition, no forced air cooling is required, as is used in some competing designs, further enhancing the long-term reliability of the system and eliminating any requirement for periodic maintenance. The card cage can fully accommodate any combination of up to 14 Video Input Modules, Video Output Modules, and Optical Transceiver Modules, or any other Orion™ communications interface modules that may be introduced in the future. Should the card cage become fully loaded with Orion™ modules, additional card cage units may easily be added to the node to increase the initial channel capacity, or to expand it in the future.

ORION™ VIDEO INPUT MODULE

The Orion™ Video Input Module (VIM) provides one video input port, a bi-directional data port, and two relay/contact closures for alarm events. The Video Input Module is typically placed at nodes distributed throughout the network. One or several Video Input Modules are placed at each node location where video, data, audio or contact closure signals can be inserted onto the network. The signal inputs of each Video Input Module can be remotely switched through the GUI network management system to one or more Video Output Modules located anywhere within the network. The video signal is compressed using industry-standard MPEG-2 compression and is transmitted to one or more Video Output Modules (VOM) on the network. The camera PTZ control channel is a full duplex data channel (either RS-232, RS-422, 2 Wire or 4 Wire RS-485 data formats) that broadcasts all camera control signals from one or more control centers to all video cameras. It also transmits all return PTZ data signals from any camera to all Video Output Modules.



ORION™ VIDEO OUTPUT MODULE

The Orion™ Video Output Module (VOM) provides one video output port, a bi-directional data port and two relay/contact closures for alarm events. The VOMs are typically installed at the head-end or central video monitoring location of the network. A signal from any video input module can be remotely switched to one or more video output modules anywhere on the network by means of the GUI network management system. Video output modules can also be placed anywhere on the network providing a means for remote video monitoring and control. The video output module converts the MPEG-2 digital video information and displays that video image from any camera to a specific monitor. The video receiver module has one data channel that is used for PTZ camera control.



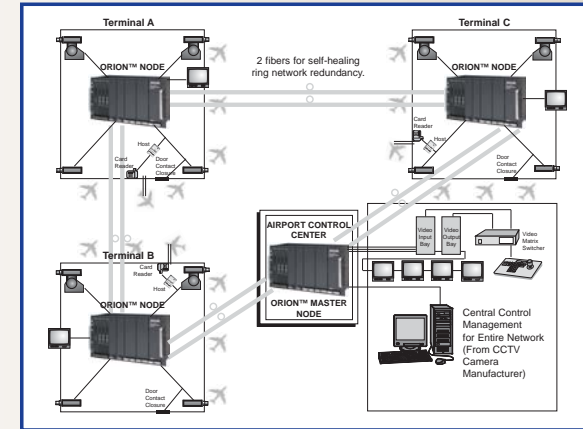
ORION™ OPTICAL TRANSCEIVER MODULE

The Orion™ Optical Transceiver Module (OTM) interfaces to the fiber optic network using single-mode fiber. Each OTM provides one optical transmitter port and one optical receiver port. One Optical Transceiver Module is required at the Orion™ head-end equipment and at each Orion™ node within the network to configure a linear video-only insert and repeat architecture utilizing only one optical fiber. For video and data transmission, one optical fiber between each node in a ring topology is required. For high reliability, the system can be supplied as a "self-healing-ring network" wherein two optical cards (OTM) are installed at each node and two complete optical paths are required.



ORION™ FOUR PORT DATA INTERFACE MODULE

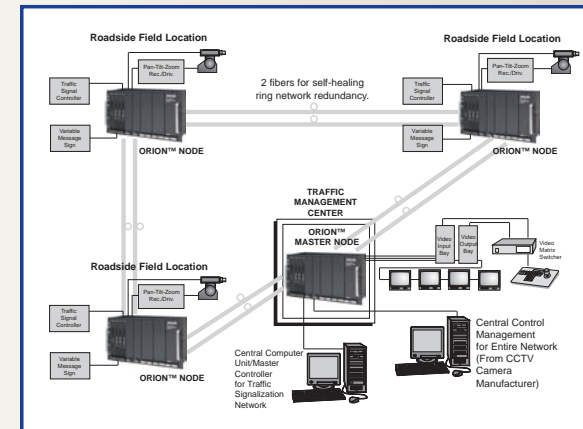
The Orion™ Four Port Data Interface/Output Module (DIM) has the capability of directly inserting four individual channels of full-duplex data on to the Orion™ Network. This module was designed for applications where additional data channels are to be inserted on to the network. The Orion™ Data Interface Module is transparent to data encoding, and can support RS-232, RS-422, 2 Wire or 4 Wire RS-485 data without any adjustments. Multiple data interface modules and video can be placed in the same node without limitations. The Orion™ system provides full "drop and insert" capabilities, allowing any of the data signals to be added, monitored or dropped at any node within the system.



Specifically designed for large scale video surveillance networks.

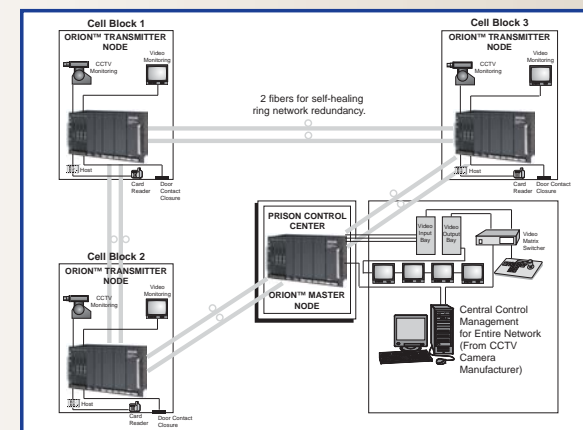
AIRPORT AND MULTIPLE BUILDING SECURITY

- 300 Cameras x 80 Monitor Matrix Switch
- Up to 80 active central monitors to review any of 300 video camera locations.
- Transmitted with each video channel is bi-directional data for access control or PTZ control, and two contact closure channels.
- 2 fibers for self-healing ring network redundancy.
- Monitor access from any gate.
- Contact closure triggers alarm event for location monitoring.



TRAFFIC/ INTELLIGENT TRANSPORTATION SYSTEMS

- 512 Cameras x 56 Video Outputs-Matrix Switch
- Up to 56 active central monitors to review any of 512 video camera locations.
- Multiple bi-directional data signals are transmitted for CCTV, PTZ control and Traffic Signaling Controller.
- 2 fibers for self-healing ring network redundancy.
- Camera PTZ control from any camera location.



PRISON AND CAMPUS FACILITIES

- 300 Cameras x 80 Monitor Matrix Switch
- Up to 80 active central monitors to review any of 300 video camera locations.
- Transmitted with each video channel is bi-directional data for access control or PTZ control, and two contact closure channels.
- Real-time video monitoring available in each location.
- 2 fibers for self-healing ring network redundancy.
- Monitor audio from any video monitor location and audio review from central control.
- Camera PTZ control from any camera location.



- Intelligent Transportation System
 - Incident Detection
 - Video Detection Systems
 - CCTV Surveillance
 - Traffic Signaling Networks
 - VMS/CMS Control
- Security
 - CCTV Surveillance
 - Access Control
- Building Automation
 - Access Control
 - HVAC Control
 - Lighting