

# **Network Security** *by* **Data Diode**

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White Paper

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Lightware Visual Engineering

## Network Security by Data Diode

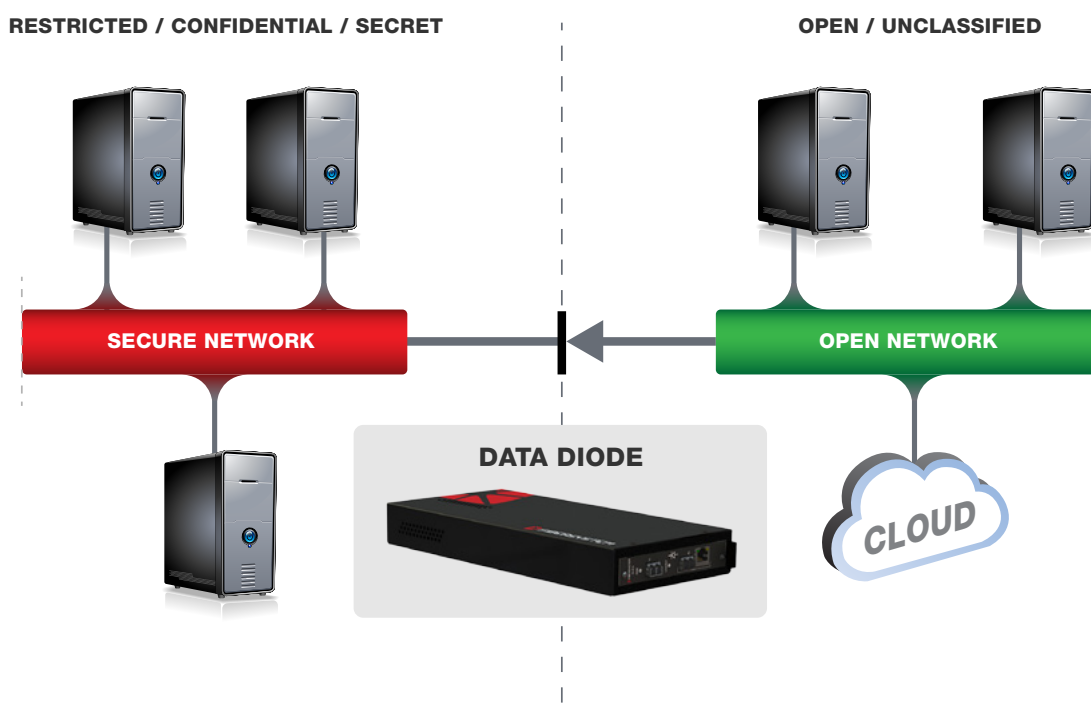
A data diode (also referred to as a unidirectional security gateway or network) is a network device allowing data to travel only in one direction to guarantee information security.

They are most commonly found in high security environments where there are connections between two or more networks of different security levels. This technology is used in nuclear power plants, electric power generation, defense and similar other facilities with high.

Data diodes only allows data to pass from the 'low' side of a network connection to the 'high' side, and not the other way around. This solution benefits the users of the high side network, as their data is kept confidential while they can still have access to data from the low side. This is especially important if sensitive data is stored on a network which requires connectivity with the Internet. In case of an unprotected network data would be vulnerable to intrusions from the Internet, but by creating a unidirectional network setup which separates high side with sensitive data, and a low side with Internet connectivity, the high side can access the Internet without risking security breach.

There is no shared circuitry beyond the one-way connection, so data diodes are considered by many regulatory bodies to effectively create a physical separation between networks. The hardware-based nature of data diodes renders them to be the highest possible level of security besides disconnecting networks completely.

Once implemented, a data diode cannot be changed in any way. When a diode is breached, all physical channels for transmission are shut down.



Audio/Video signal related network applications basically aim to attain the same secure environment like in the case of IT data networks. A video signal network of a plant monitoring application or CCTV installation recordings ensure the integrity of signals by sending the unprocessed video signal stream to safe storage and keep the network safe from hijackers trying to connect to the company network through the video signal wire.

Lightware has developed and also uniquely modified products and designed applications for secure installations with unidirectional data flow.

Here are a few instances of how data diode operation is achieved in Lightware devices:

- EDID is generated locally, so there is no EDID related traffic between transmitter and receiver units
- There is no HDCP related data communicated between transmitter and receiver.
- Hotplug signal is exclusively switched in the transmitter, where the sink hotplug signal is not getting detected.
- There is no reverse direction laser emission in the receiver, so not even accidental light impulses can travel backwards.

Lightware's UBEX extender line provides factory built-in data diode option, guaranteeing strictly unidirectional video signal data flow:

[HDMI-OPT-TX100s and RX 100s](#)

[HDMI-3D-OPT-TX210As](#)

[DVI-OPT-TX110s and RX110s](#)

UBEX Ultra Bandwidth Optical Extenders (under development)

Please note that the above links point to the non-secure versions of these extenders.  
Please contact Lightware sales for further inquiries:

<http://www.lightware.eu/sales-contact>