



Securing Smart Infrastructure



Why Fend?

Fend physically protects you from cyberattack. Fend makes robust, affordable data diodes to protect industry, utilities, critical infrastructure, and our modern way of life. Fend's products are:

- Made in the USA
- Designed for harsh environments
- Built for years of continuous operation

Configuration Options

Fend Hardware



Keep an eye on remote or standalone equipment. Bring your legacy systems online so you can stay ahead of maintenance needs.

- pumping stations
- rooftop air conditioners
- oil and gas operations
- solar equipment

Small form factor and plug-and-play installation provide maximum versatility.

Fend Cloud



Set alerts, analyze trends, and use the power of predictive analytics to get the most out of your equipment and improve operational efficiency.

Maximize productivity of your maintenance teams. If your equipment is part of the majority of unconnected equipment today, start getting the benefits of smart infrastructure now!

Codes

DUNS: 080992384 • CAGE: 80LY7 • NAICS: 541715

Ready to protect your infrastructure with Fend?

Learn more at www.fend.tech or write info@fend.tech

TECHNICAL INFORMATION

Operating Parameters

Fend's patented hardware was designed from the ground up for industrial and rugged applications needing an affordable, stable, easy-to-use solution that physically keeps attackers away from protected networks and equipment. The following table describes Fend's diode design specifications:

Specifications (Model FD-5M-SE1-XE2-B2 / Ethernet)

Maximum data throughput ¹	1.0 Mbps
Dimensions (L x W x H), inches	4.7 x 3.4 x 2.0
Operating voltage	12-48VDC, 1.5A max
Provided power supply(s)	100-240VAC 1.0A in, 12VDC 1.5A out ²
Diode power consumption (max)	3.0 W
Design operating temperature range	-30C to +85C
Designed and manufactured	USA
Connections:	
Output side	DC Barrel Connector (optional screw-in secure connector)
	Ethernet RJ-45
Input side	DC Barrel Connector (optional screw-in secure connector)
	Ethernet RJ-45
	Serial RS-422/485 Combicon MC connector
Protocols supported: ⁶	FTP/FTPS ^{3,4,5}
	TCP/IP, UDP
	Modbus Serial, Modbus TCP
	BACnet-MSTP, BACnet-IP
	LON-IP

¹ Data throughput may vary based on protocol and application

² Customer can provide their own power supply as long as the output meets the input ratings of the diode. The Fend Data Diode is designed to be installed in industrial settings such as equipment rooms, control rooms, and IT closets where only adults are normally present.

³ FTP 250kbps max transfer rate, FTPS 128kbps max transfer rate

⁴ 30MB max file size

⁵ Tested with Windows Native FTP, WinSCP, XLReporter, CoreFTP

⁶ Custom protocol support available

Encryption:

Output side	AES-256
Input side	AES-256

Additional Features:

Denial of service (DOS) protection

Anti-Tamper protection

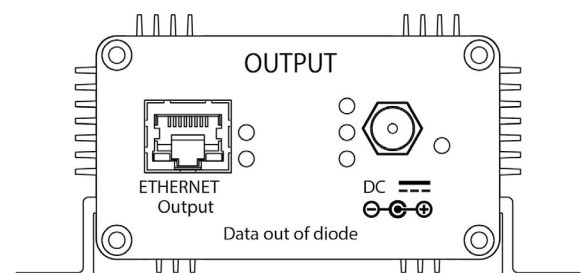
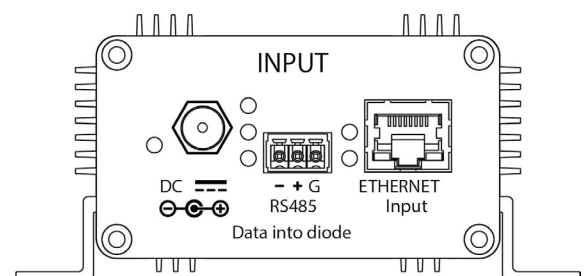
Battery Backup

Factory or field configurable

Optional secure hosting of data/files in AWS cloud

ETL/FCC Certified

Full optical isolation with independent grounding of each side of the diode



TECHNICAL INFORMATION

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Specifications (Model FD-5M-SE1-SE2-B2 / Ethernet + Serial)

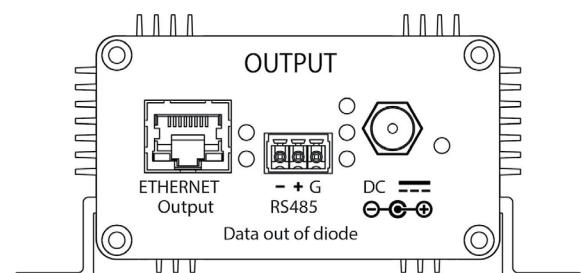
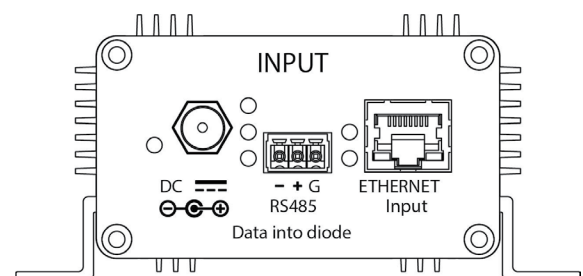
Maximum data throughput ¹	1.0 Mbps
Dimensions (L x W x H), inches	4.7 x 3.4 x 2.0
Operating voltage	12-48VDC, 1.5A max
Provided power supply(s)	100-240VAC 1.0A in, 12VDC 1.5A out ²
Diode power consumption (max)	3.0 W
Design operating temperature range	-30C to +85C
Designed and manufactured	USA
Connections:	
Output side	DC Barrel Connector (optional screw-in secure connector)
	Ethernet RJ-45
	Serial RS-422/485 Combicon MC connector
Input side	DC Barrel Connector (optional screw-in secure connector)
	Ethernet RJ-45
	Serial RS-422/485 Combicon MC connector
Protocols supported: ⁶	FTP/FTPS ^{3,4,5}
	TCP/IP, UDP
	Modbus Serial, Modbus TCP
	BACnet-MSTP, BACnet-IP
	LON-IP

Encryption:

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Input side	AES-256

Additional Features:

Denial of service (DOS) protection
Anti-Tamper protection
Battery Backup
Factory or field configurable
Optional secure hosting of data/files in AWS cloud
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Full optical isolation with independent grounding of each side of the diode



- 1 Data throughput may vary based on protocol and application
- 2 Customer can provide their own power supply as long as the output meets the input ratings of the diode. The Fend Data Diode is designed to be installed in industrial settings such as equipment rooms, control rooms, and IT closets where only adults are normally present.
- 3 FTP 250kbps max transfer rate, FTPS 128kbps max transfer rate
- 4 30MB max file size
- 5 Tested with Windows Native FTP, WinSCP, XLReporter, CoreFTP
- 6 Custom protocol support available

TECHNICAL INFORMATION

Operating Parameters

Fend's patented hardware was designed from the ground up for industrial and rugged applications needing an affordable, stable, easy-to-use solution that physically keeps attackers away from protected networks and equipment. The following table describes Fend's diode design specifications:

Specifications (Model FD-5M-SE1-CE2-B2 / Ethernet + Cellular)

Maximum data throughput ¹	1.0 Mbps
Dimensions (L x W x H), inches	4.7 x 3.4 x 2.0
Operating voltage	12-48VDC, 1.5A max
Provided power supply(s)	100-240VAC 1.0A in, 12VDC 1.5A out ²
Diode power consumption (max)	6.0 W
Design operating temperature range	-30C to +85C
Designed and manufactured	USA
Connections:	
Output side	DC Barrel Connector (optional screw-in secure connector)
	Ethernet RJ-45
	4G cellular LTE modem (Verizon / AT&T)
Input side	DC Barrel Connector (optional screw-in secure connector)
	Ethernet RJ-45
	Serial RS-422/485 Combicon MC connector
Protocols supported: ⁶	FTP/FTPS ^{3,4,5}
	TCP/IP, UDP
	Modbus Serial, Modbus TCP
	BACnet-MSTP, BACnet-IP
	LON-IP

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Encryption:

Output side	AES-256
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Additional Features:

Denial of service (DOS) protection

Anti-Tamper protection

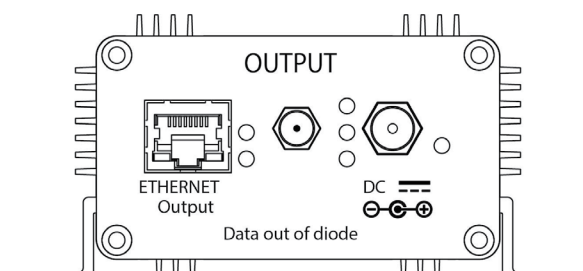
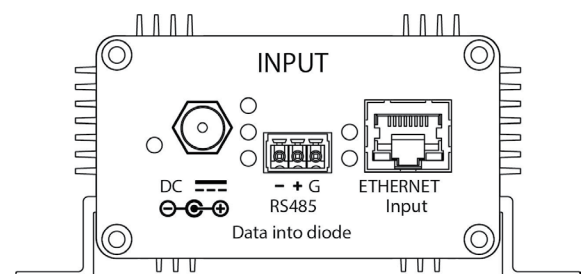
Battery Backup

Factory or field configurable

Optional secure hosting of data/files in AWS cloud

ETL/FCC Certified

Full optical isolation with independent grounding of each side of the diode



DATA DIODES PROTECT

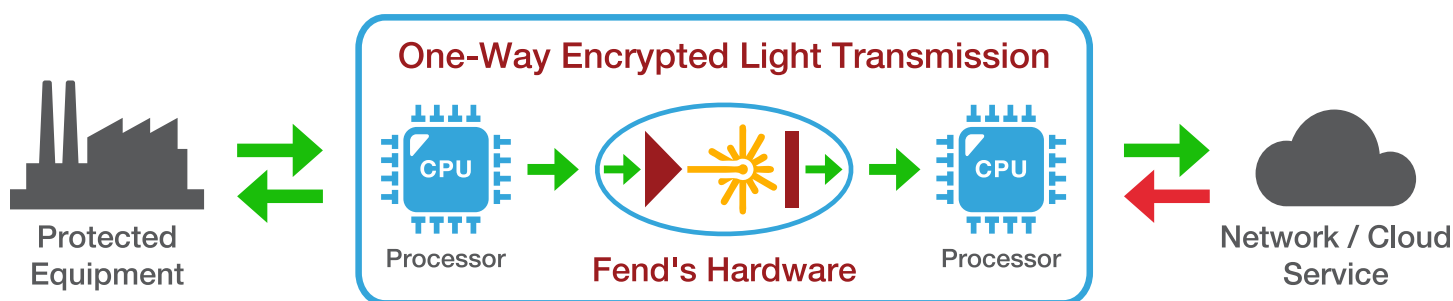
Critical Infrastructure

The Problem

Firewalls and software-based security won't keep you safe in an age of attackers using rentable botnets, unlimited cloud computing, and artificial intelligence. Hackers can exploit equipment connections to:

- Disable utility infrastructure
- Inject ransomware
- Steal customer information
- Destroy industrial equipment

The Solution

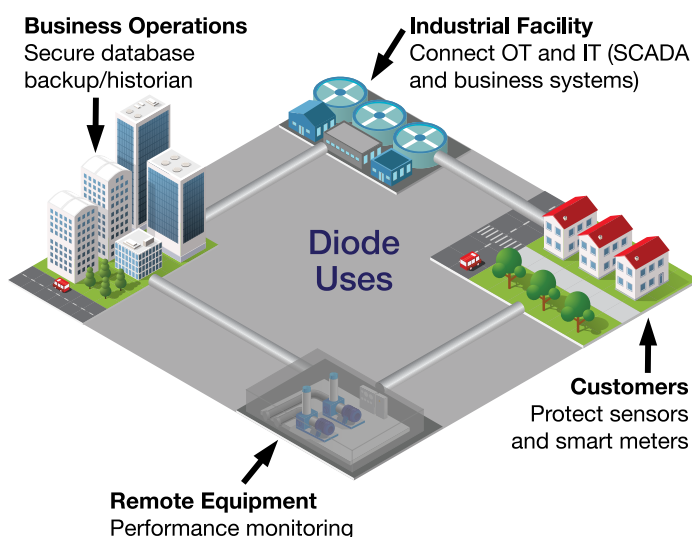


How do data diodes work?

Data diodes send data in only one direction using a beam of light. All inbound traffic is stopped by the diode. Hackers cannot physically reach your network or protected equipment.

Who uses data diodes?

- Military Systems
- Energy Production
- Water Utilities
- Intelligence Community



For More Information

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