

Industrial Serial-to-Fiber Converter

Prime Connect 4056s

The Optech Network Solutions Prime Connect 4056s is an industrial serial-to-fiber converter designed to extend RS-232, RS-422 and RS-485 communication over fiber-optic networks. It provides reliable electrical isolation between serial equipment and fiber infrastructure while reducing the impact of electromagnetic interference and electrical disturbances.

The Optech Network Solutions Prime Connect 4056s is an industrial serial-to-fiber converter supporting RS-232, RS-422, and RS-485 communication. It extends serial connectivity over fiber while providing electrical isolation and helping reduce electromagnetic interference.

Supporting multi-mode and single-mode fiber configurations, the converter enables long-distance communication based on the selected optical interface. It supports serial baud rates from 50 bps to 921.6 kbps, with transmission distances dependent on the fiber configuration.

Designed for industrial and utility environments, the Prime Connect 4056s supports point-to-point and fiber-ring architectures, automatic baud-rate detection, and RS-485 data-direction control. It is suitable for applications requiring reliable serial connectivity

Benefits

- RS-485 Direction Control
- Point-to-Point Connectivity
- Fiber-Ring Network Support
- Electrical Isolation Protection
- Configurable RS-485 Termination
- Industrial Metal Enclosure

Features

- Multi-Protocol Serial Support
- Serial-to-Fiber Conversion
- Multi-Mode Fiber Support
- Single-Mode Fiber Support
- Long-Distance Serial Communication
- Automatic Baud-Rate Detection

Applications

- Industrial Automation
- SCADA Communication
- PLC Connectivity
- RTU Communication

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- Substation Communication
- Remote Equipment Monitoring
- Energy Infrastructure

Technical Specification

Product Type	Serial-to-Fiber Converter
Serial Interfaces	RS-232 / RS-422 / RS-485
Serial Port Count	2 Serial Channels
Supported Serial Modes	RS-232 / RS-422 / RS-485
Baud Rate	50 bps–921.6 kbps
Non-Standard Baud Rates	Supported on Request
Data Direction Control	Automatic RS-485 Direction
Network Topology	Point-to-Point / Fiber-Ring
Fiber Interface	Optical Fiber Interface
Fiber Types	Multi-Mode / Single-Mode
Multi-Mode Fiber Distance	Up to 5 km
Single-Mode Fiber Distance	Up to 40 km
Multi-Mode Wavelength	Approximately 850 nm
Single-Mode Wavelength	Approximately 1310 nm
Fiber Connector	Configuration-Dependent Connector
RS-232 Signals	TxD, RxD, GND
RS-422 Signals	Tx+, Tx–, Rx+, Rx–, GND
RS-485 Four-Wire Signals	Tx+, Tx–, Rx+, Rx–, GND
RS-485 Two-Wire Signals	Data+, Data–, GND
RS-485 Termination	Configurable Termination Resistance
RS-485 Biasing	Configurable Pull-Up/Pull-Down
Conversion Latency	Low-Latency Conversion
Power Input	12–48 VDC
Power Input Count	1 Input
Overload Protection	Supported
Reverse Polarity Protection	Supported
Power Connection	Industrial Terminal Block

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Power Consumption	Approximately 70–140 mA*
Enclosure Material	Rugged Metal Enclosure
Ingress Protection Rating	IP30
Dimensions With Mounting Ears	Approximately 90 × 100 × 22 mm
Dimensions Without Mounting Ears	Approximately 67 × 100 × 22 mm
Product Weight	Approximately 320 g
Installation Method	Wall / Panel Mounting
Standard Operating Temperature	0°C to 60°C
Wide-Temperature Operating Range	-40°C to 75°C
Storage Temperature Range	-40°C to 85°C
Operating Humidity	5%–95% RH, Non-Condensing
Fiber-Based Isolation	Serial-to-Fiber Electrical Isolation
Interference Protection	EMI / Electrical Noise Protection
Status Indicators	Power / Serial / Fiber
Cooling Method	Passive Enclosure Cooling
Mounting Accessories	Configuration-Dependent Mounting Hardware

Serial Communication			
Supports multiple serial communication standards, allowing it to interface with a wide range of industrial and utility equipment.			
RS-232	**RS-422**	**RS-485 4-Wire**	**RS-485 2-Wire**
TxD	Tx+	Tx+	Data+
RxD	Tx-	Tx-	Data-
GND	Rx+	Rx+	GND
	Rx-	Rx-	
	GND	GND	

Fiber Communication	
The Prime Connect 4056s can be configured for different fiber communication requirements.	
Multi-Mode Fiber	**Single-Mode Fiber**
Typical wavelength: 850 nm	Typical wavelength: 1310 nm
Typical transmission distance: up to 5 km	Typical transmission distance: up to 40 km
Suitable for shorter-distance industrial and facility networks	Suitable for long-distance industrial, utility and remote-site communication
Distance depends on the selected optical interface and fiber characteristics	Actual distance depends on optical power, fiber characteristics, connectors and system link budget

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Fiber-Ring Operation
The Prime Connect 4056s can be deployed in a fiber-ring architecture where supported by the selected optical configuration.
A fiber-ring topology can provide an alternative communication path between network nodes, making it suitable for applications where communication continuity and network resilience are important.
The achievable ring size and total fiber distance depend on the selected optical interfaces, fiber characteristics and network design.

Automatic Baud-Rate Detection
The Prime Connect 4056s supports automatic baud-rate detection, allowing the converter to adapt to supported serial communication rates without requiring frequent manual configuration.

Electrical Isolation & Interference Protection
By converting electrical serial communication to optical fiber, the Prime Connect 4056s provides isolation between connected serial equipment and the fiber communication network.
Fiber communication also helps reduce the effects of:
Electromagnetic interference
Ground-potential differences
Electrical noise
Long-distance copper transmission issues
Electrical transients between interconnected equipment

Environmental Specifications	Protection & Reliability Features	Package Contents
		Prime Connect 4056s package can include:
Standard Temperature Version	Overload current protection	
	Reverse-polarity protection	1 × Prime Connect 4056s converter
Operating Temperature: 0℃ to 60℃	Fiber-based electrical isolation	Mounting accessories
Storage Temperature: -40℃ to 85℃	Industrial metal enclosure	Power connection accessories, as applicable
Relative Humidity: 5%to 95%RH, non-condensing	Configurable RS-485 termination	Installation guide
	Configurable RS-485 biasing	Product documentation
Wide Temperature Version	Passive thermal management	
	Wide-temperature operating option	
Operating Temperature: -40℃ to 75℃		
Storage Temperature: -40℃ to 85℃		
Relative Humidity: 5%to 95%RH, non-condensing		

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