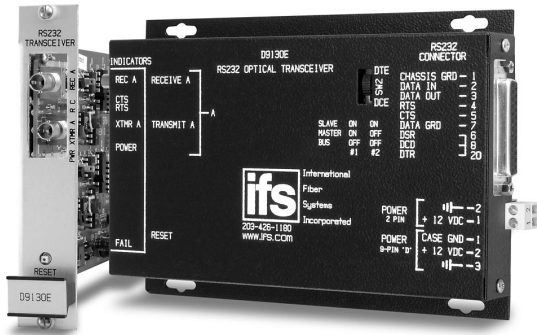




# PRODUCT SPECIFICATION RS-232/422 POINT-TO-POINT/ LINE TERMINATING DATA TRANSCEIVER

# D9100E SERIES



## DESCRIPTION

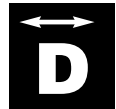
The IFS D9100E series consists of fully-digital transceiver units designed for implementing point-to-point or star traffic signalization/communications data networks. These environmentally hardened units are ideal for use in unconditioned out-of-plant or roadside installations and may also be utilized in channelized linear drop-and-repeat communications networks as either the local end-of-line transceiver unit or as the master beginning-of-channel device. Optional battery back-up capability provides the highest level of network reliability in the event of loss of local 115 VAC prime operating power. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. LED indicators are provided for rapidly ascertaining equipment operating status, and these units are available in either stand-alone or rack mount configurations.

## APPLICATION EXAMPLES

- ITS Traffic Signalization Networks
- Access Control Systems
- Building Automation and Environmental Control Systems
- Computer/Data Equipment
- Fire & Alarm Systems

## FEATURES

- One or Two Fiber Versions Available
- Optional Internal Battery Back-up Provides a Minimum of 12 Hours Operating Time in the Event of Loss of 115 VAC Prime Operating Power, and Maintains Continuous Channel Communications
- LED Status Indicators Provide Rapid Indication of Critical Operating Parameters
- User-Selectable DTE or DCE Interface Ensures Ease of Installation and Maximum Versatility
- Solid-State Current Limiters on all power lines provide unconditional equipment protection
- Wide Optical Dynamic Range: Optical Attenuators are Never Required
- NTCIP Compatible
- Tested and Certified by an Independent Testing Laboratory for Full Compliance with the Environmental Requirements (Ambient Operating Temperature, Mechanical Shock, Vibration, Humidity with Condensation, High-Line/Low-Line Voltage Conditions and Transient Voltage Protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Robust Design Ensures Extremely High Reliability In Unconditioned Out-of-Plant/Roadside Environments
- User-Configurable Optical and Electrical Anti-Streaming Provides Network protection against faulty streaming controller operation
- Comprehensive Lifetime Warranty



Available at:  
[www.ifs.com](http://www.ifs.com)

- A & E Specifications, (CSI)
- AutoCAD Drawings
- Operation Manuals
- Technical Bulletins

## ORDERING INFORMATION

	PART NUMBER	DESCRIPTION	FIBERS REQUIRED	OPTICAL PWR BUDGET	MAX. DISTANCE*
<b>MULTIMODE 62.5/125µm**</b>	D9110E	Transceiver (850 nm, LED)	2	14 dB	2.2 miles (3.5 km)
	D9110EWDMA	Transceiver (850/1310 nm, LED)	1	14 dB	2.2 miles (3.5 km)
	D9110EWDMB	Transceiver (1310/850 nm, LED)	1	14 dB	2.2 miles (3.5 km)
	D9120E	Transceiver (1310 nm, Laser)	2	14 dB	8 miles (13 km)
<b>SINGLEMODE 9/125µm</b>	D9130E	Transceiver (1310 nm, LED)	2	23 dB	42 miles (69 km)
	D9130EWDMA	Transceiver (1310/1550 nm, Laser)	1	23 dB	42 miles (69 km)
	D9130EWDMA	Transceiver (1550/1310 nm, Laser)	1	23 dB	42 miles (69 km)
<b>ACCESSORIES</b> ♦	PS-12VDC 12 Volt DC Plug-in Power Supply (Included) PS-12VDC-230 12 Volt DC Plug-in Power Supply, 230 VAC Input (Included if specified at time of order)				
<b>OPTIONS</b>	Add '-R3' to Model Number for R3 Rack Mount (Requires R3 Rack purchased separately) Add '-SC' to Model Number for SC Optical Connectors (For single mode equipment only) Add '-FC' to Model Number for FC Optical Connector (For single mode equipment only) Add '-C' for Conformally Coated Printed Circuit Boards Add '-B' Suffix for NIMH Battery Back-Up Option				

\* Optical transmission distance is limited to optical loss of the fiber and any additional loss introduced by connectors, splices and patch panels. Distance can also be limited by fiber bandwidth. \*\* For 50/125 Fiber, subtract 4 dB from Optical Power Budget.

♦ All accessories are third party manufactured.

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# TECHNICAL SPECIFICATION RS-232/422 POINT-TO-POINT/ LINE TERMINATING DATA TRANSCEIVER

## D9100E SERIES

### SPECIFICATIONS

#### DATA

Data Interface: RS-232 C/D, 422  
 Data Rate: DC to 100 kbps  
 Bit Error Rate: <1 in 10<sup>9</sup> @ Maximum Optical Loss Budget  
 Anti-Streaming Time-out: 4, 8, 16, 32, 64 Seconds, or Infinity (disabled)  
 Operating Mode: Asynchronous, Simplex or Full-Duplex

#### WAVELENGTH

850 or 1310 nm, Multimode  
 1310 nm, Singlemode

#### NUMBER OF FIBERS

1 or 2 (see ordering information)

#### CONNECTORS

Power: Terminal Plug with Screw Clamps\*  
 Data: Type DB-25S  
 Optical: ST, SC or FC (see ordering information)

#### OPTICAL EMITTER

850 or 1310 nm, Multimode: LED  
 1310 nm, Singlemode: Laser Diode

#### LED INDICATORS

1. Transmit Data, Optical Channel A(TD-1)
2. Receive Data, Optical Channel A(RD-1)
3. Receive Data, Optical Channel B(RD-2)
4. Power On (PWR)
5. Fault / Antistreaming Activated
6. Request to Send (RTS)
7. Clear to Send (CTS)

### ELECTRICAL & MECHANICAL

Power: 12 VDC @ 250 mA  
 Surface Mount: From Rack  
 Rack: 1 (2 slots required for units with '-B' Battery Back-Up Option.)  
 Number of Rack Slots: Automatic Resettable Solid-State Current Limiters  
 Current Protection: Meets IPC Standard  
 Circuit Board: 7.0 x 4.9 x 1.0in., 17.8 x 12.5 x 2.5 cm.  
 Size (in./ cm.) (LxWxH): 7.0 x 4.9 x 2.0 in., 17.8 x 12.5 x 5.0 cm. with "-B" Battery Option  
 Shipping Weight: < 2 lbs./0.9 kg

### ENVIRONMENTAL

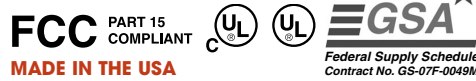
MTBF: > 100,000 hours  
 Operating Temp: -40° C to +74° C, ambient  
 Storage Temp: -40° C to +85° C, ambient  
 Relative Humidity: 0% to 95% (non-condensing)†

### BATTERY BACK-UP OPTION\*

Internal, Rechargeable Nickel Metal Hydride Battery  
 Operating Period: 12 Hours, Minimum

- \* Optional Type DB-9P: Specify connector style at time of order.
- † May be extended to condensation conditions by adding suffix '-C' to model number for conformal coating.
- \* Add suffix '-B' to Model Number for Battery Back-Up

### AGENCY COMPLIANCE



### MADE IN THE USA

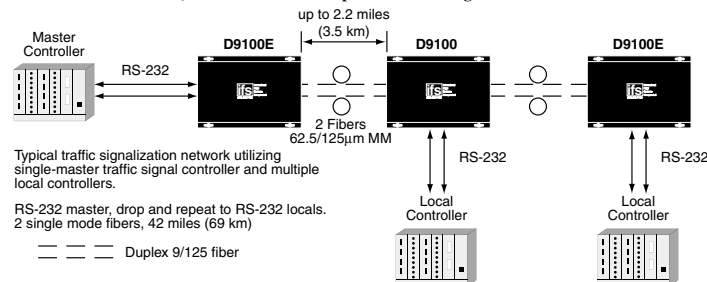
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

### OPTICAL POWER BUDGET

FIBER	WAVELENGTH	TRANSCEIVER			OPTICAL PWR BUDGET	MAX. DISTANCE*
		MODEL	OUTPUT PWR	SENSITIVITY		
Multimode 62.5/125µm**	850 nm	D9110E	25 µw (-16 dBm)	1 µw (-30 dBm)	14 dB	2.2 miles (3.5 km)
		D9110EWDMA D9110EWDMB				2.2 miles (3.5 km)
		D9120E				8 miles (13 km)
Singlemode 9/125µm	1310 nm	D9130E	200 µw (-7 dBm)		23 dB	42 miles (69 km)
		D9110EWDMA D9110EWDMB				42 miles (69 km)
	1310/1550 nm					

\* Optical transmission distance is limited to optical loss of the fiber and any additional loss introduced by connectors, splices and patch panels. Distance can also be limited by fiber bandwidth. \*\* For 50/125 Fiber, subtract 4 dB from Optical Power Budget.

### SYSTEM DESIGN



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Due to our continued effort to advance technology, product specifications are subject to change without notice.  
 10/06/04