Accelerator Control Components

National Electrostatics Corp.

7540 Graber Rd., P.O. Box 620310, Middleton, WI 53562-0310 USA

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Fiber Optic Telemetry System



The NEC fiber optic telemetry system is designed for maximum versatility and convenience. The fiber optic bundles are terminated with convenient optical connectors. Four sizes of housings are available to allow a telemetry system designed to meet your precise requirements.

APPLICATIONS

The NEC fiber optic telemetry system has proven reliable for transmitting signals between electrically isolated areas differing in potentials ranging from kilovolts to megavolts.

This is a very versatile system that can be customized to your specific needs. A single housing can transmit and receive both analog and binary status signals. A maximum of 32 channels (analog) or 44 channels (binary status) can be transmitted or received from a single housing. The NEC fiber optic telemetry system is used in laboratories throughout the world as part of NEC Pelletron[®] accelerator systems for monitoring and control of accelerator functions.

DESIGN

The NEC fiber optic telemetry system is designed for maximum convenience and flexibility. Polymer optic fibers are collected into bundles and connected to chassis units with a positive latching optical connector. This allows the quick connect and disconnect of fiber cables.

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Fiber Optic Telemetry System

SIGNAL TYPES

Analog Signals-

The transmitter accepts 0-10 VDC signals into a 1MW input impedence. The receiver produces a corresponding 0-10 VDC signal, 10mA max, with a 0.1% linearity.

Binary Signals-

The transmitter accepts either contact closures or 0-1.4 VDC signals as logical zero; either an open contact or a 4-24 VDC signal is a logical one. Input impedence is at least 100kW. The optical receiver output can appear either as a contact closure, a 24 VDC signal or a TTL-level signal.

CHASSIS UNITS

Housings are available in four sizes depending on the number of signal processing boards to be included. The smallest housing (size 1) contains the unit power supply and space for one signal processing board. A size 2 housing also contains the unit power supply with space for two signal processing boards. A size 3 housing contains the unit power supply with space for four signal processing boards. The largest size (size 4) has space available for eight signal processing boards. The power supply is contained in a separate size 4 housing.

Housing Size	No. of processing boards	Power Supply
1	1	included
2	2	included
3	4	included
4	8	in separate size 4 housing

The optic cable connects directly to the front of each unit with the positive latching optical connector. Input and output connectors for electrical signals are also easily accessible on the front of each housing.

SIGNAL PROCESSING BOARDS

Signal processing boards are listed under specifications in this section. The variety of boards available allows the precise capability desired at minimum cost. Analog signal transmitter and analog receiver boards are available to handle one to four channels. Status signal transmitter and status signal receiver boards are available to handle one to six channels. In addition, a high power status receiver board is available which will activate contact closures rated at 115 VAC, 1A. The standard status receiver board will control 10W maximum with 250mA maximum or 100V maximum. Special purpose boards are also available.

OPTICAL FIBER BUNDLES

The NEC system uses a high quality polymer fiber capable of transmitting bi-phase encoded signals across voltages ranging from kilovolts to megavolts. These fibers are grouped into bundles with a maximum number of 22 fibers terminating in a single optical connector. These bundles can also be equipped with feedthroughs for use in pressurized systems. The maximum recommended length is 30 meters (approximately 100 feet).

SAMPLE SYSTEM

The NEC telemetry system can handle a maximum of 44 status channels or 32 analog channels in the largest, size 4 housing. However, this system can be designed to handle precisely the number of channels desired at a minimal cost. For example, a system designed to carry four channels analog transmission and four channels status transmission in each direction for a total of 16 channels is described in the price list.

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TELEPHONE: 608-831-7600 + FAX: 608-831-9591 + E-MAIL: nec@pelletron.com + WEB-SITE: http://www.pelletron.com

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SPECIFICATIONS

The NEC fiber optic telemetry system is designed for maximum flexibility. Number and type of channels can be selected for your specific requirements.

Fibers		
Туре:	Polymer optic fiber, 1mm O.D. Unjacketed - for use in million Volt pressured systems Jacketed - for use in open-air	
Length:	15 meters (50 feet): increased lengths by special order (30 meters maximum)	
Max. no. of fibers:	22 (per connector)	
Analog Channels	(one channel per fiber)	
Linearity:	0.1%	
Resolution:	1:4000	
Bandwidth:	10Hz	
Signal Voltage Range:	0 to $+10$ VDC standard,	
	100mV sensitivity, negative polarity and other full scale voltages optional.	
Circuit Board Types	(Input power requirement: 115 VAC, 3A, 50/400Hz)	
Type OTA:	Optical Analog Transmitter Board	
	1 to 4 channels which accept 0 to 10 VDC input signals	
	1 MOhm input impedance	
Type ORA:	Optical Analog Receiver Board	
	1 to 4 channels which produce 0 to 10 VDC output signals	
	Maximum current output 10mA	
Type OTS:	Optical Status Transmitter Board	
	1 to 6 channels which accept 24 VDC signals or contact closure inputs	
Type ORS:	Optical Status Receiver Board	
	1 to 6 channels which produce contact closure, 24 VDC (100mA) signals,	
	or low = true TTL outputs	
Type ORTAS:	Up to 4 channels,	
	One each of the types (OTA, ORA, OTS, ORS), discussed above	
Type ORSHP:	Optical Status Receiver Board, High Power Option	
5 1	Identical to type ORS, except has 1 to 6 channels of higher power relay	
	contacts and occupies 2 slot widths in chassis	
	Contacts rated 120 VAC, 1A	



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