**REVISION OF SECTION 614**

**OPTICAL TRANSCEIVER**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

**Subsection 614.01 shall include the following:**

This work consists of furnish and installation of fiber optic modems for the CDOT controller cabinets. The fiber optic modems shall be compatible with the existing system.

**Subsection 614.08 (n) *Optical Transceiver*, is hereby added to the Standard Specifications and shall include the following:**

(n) Optical Transceiver

1. *General System Requirements* - The unit shall be a multi-drop data modem designed to accept RS-232, RS-422 and 2 & 4 wire RS-485 signals and optically transmits these signals in either string or dual, counter-rotating, self-healing rings with either single or dual masters. The units shall be available as either shelf-mount or rack-mount units.

The unit shall consist of:

a] Alarm dry contact output

b] Selectable anti-streaming

c] Local and remote loop back test/diagnostics

d] Configurable as either a master or a slave

e] Bus, single ring or dual redundant, counter rotating capabilities

The unit shall have LED’s to provide status information which shall include as a minimum:

a] Link A – Receiving Optical Signal

b] Link B – Receiving Optical Signal

c] Alarm

d] Data Transmit A present

e] Data Receive A present

f] Data Transmit B present

g] Data Receive B present

The unit shall operate on external power from a standard 3-prong receptacle that will supply 90 to 135 VAC 60 Hz.

* Power 90-135 VAC 50-60 Hz < 2 Watts
* Temperature -37oC to +74oC
* Humidity 5-95% Non-Condensing
* Fiber Interface ST Type Connectors
* Fiber 1310 nm Single Mode fiber

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**REVISION OF SECTION 614**

**OPTICAL TRANSCEIVER**

Shelf Mount Units shall consist of:

* 1. LED displays for Alarm, Power, Master/Slave, Fiber Link A, Fiber Link B, Data TX, Data RX, Handshake TX and Handshake RX.
  2. Able to be assigned a unique address without disassembly for network diagnostic identification.
  3. Have an Rs-232 interface to a Diagnostic computer
  4. Capable of being programmed as either a master or slave unit
  5. Have complete data re-clocking and regeneration
  6. Include the necessary power cord and transformer

Rack Mount Units shall consist of

1. Have the same operational functions as the shelf mount Unit
2. Connectivity to the remote computer network management and diagnostic software will be via RS-232 or USB orts.
3. Fit in a standard 19” rack

2. *Testing Requirements -* The Contractor shall supply two units of optical transceivers to the Engineer for specification compliance testing and approval. If the product passes the specification compliance testing and approval evaluation, the Contractor will be notified to complete the order. If the product does not pass the specification compliance testing and approval evaluation by the Department, the test units will be returned to the Contractor. The Contractor shall supply additional units until satisfactory test results are achieved

**Subsection 614.13 shall include the following:**

Optical Transceiver will be measured by the number of units fully operational and tested in accordance with this specification or as directed by the Engineer and shall include all wiring for hook-up and related labor and material required for completion of the installation. All necessary documentation and testing shall also be included in the contract bid price.

**Subsection 614.14 shall include the following:**

Pay Item Pay Unit

Optical Transceiver Each