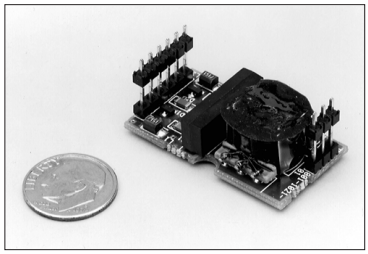
# TPT/XF Twisted Pair Transceivers
# Models 50010-10, 50020-10, 50010R-10, and 50020R-10



- Complete LonWorks® communication transceivers
- Differential Manchester encoded signaling for polarity-insensitive network wiring
- Transformer isolation for common mode rejection
- 78 kilobits per second bit rate (TPT/XF-78) at 1400 meters worst case[1]; 1.25 megabits per second bit rate (TPT/XF-1250) at 130 meters worst case[1]
- +5VDC input voltage
- Designed to comply with FCC and VDE Level B requirements
- UL, CSA, TÜV Recognized component
- LonMark® certifiable

## Description

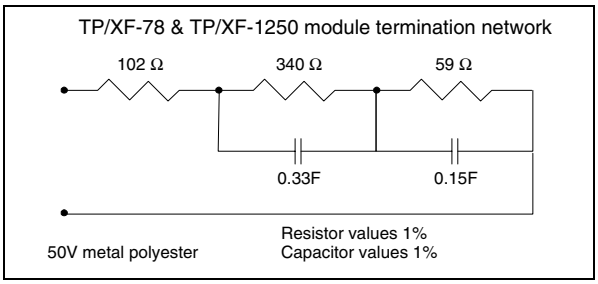
The TPT/XF Twisted Pair Transceivers provide a simple, cost-effective method of adding a LonWorks transceiver to any Neuron® Chip-based control system. The TPT/XF transceivers consist of transformer-isolated differential Manchester encoded communication transceivers and connectors for power, the Neuron Chip communications port (CP) lines, and the twisted pair network data bus. The small size of the transceivers permits them to be mounted almost anywhere on a printed circuit board assembly, either as a socketed or soldered component. The TPT/XF transceivers are available as either a 78kbps transceiver (Models 50010-10 and 50010R-10) or 1.25Mbps transceiver (Models 50020-10 and 50020R-10). The TPT/XF transceivers can communicate with TP/XF control modules operating at the same bit rate for those applications using both types of devices.

Models 50010R-10 and 50020R-10 are compliant with the European Directive 2002/95/EC on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment.

The TPT/XF transceivers use transformers to isolate them from the twisted pair network bus. This design provides excellent common mode rejection and permits the system to operate in electrically noisy environments. It also reduces the susceptibility of the system to ground loops caused by the use of multiple node power supplies that float relative to ground. This architecture makes the transceivers ideal for communicating over long distances in industrial environments. The transceivers are self-contained network transceivers, and require only a +5VDC power source, a Neuron 3120® Chip or Neuron 3150® Chip and associated memory, an oscillator, and application electronics to form a complete node.

Using TPT/XF transceivers can save hundreds of hours of development time compared with designing custom transceivers. The TPT/XF transceivers are designed to comply with FCC and VDE requirements, minimizing time consuming and expensive laboratory transceiver testing. As UL, CSA, and TÜV Recognized components, the transceivers can be integrated into products with minimal additional safety testing. The transceivers meet the LonMark interoperability guidelines and are economically priced for OEM applications. In addition, the 78kbps and 1.25Mbps transceivers fit in the same mounting holes, allowing a common motherboard to be used with both devices.

Echelon offers a comprehensive range of development tools, network interfaces, routers, and network service tools to simplify the task of designing products using the transceivers. Technical support for the transceivers is available through Echelon's LonSupport™ Premier technical assistance program.



## Specifications

| | |
|---|---|
| Function | Twisted pair transceiver |
| Data Communications Type | Transformer-isolated, Differential Manchester coding |
| Isolation Between Network and I/O Connectors[2] | 0-60 Hz (60 seconds): $1000V_{RMS}$<br>0-60 Hz (continuous): $277V_{RMS}$ |
| Common Mode Range | 0-60 Hz $277V_{RMS}$ |
| Electrostatic Discharge Network Connector | No errors to 15,000V, no hard failures to 20,000V tested per MIL-STD 883 |
| EMI | Designed to comply with FCC Part 15 Level B and VDE 0871 Level B |
| Listings | UL 1950, CSA C22.2 No. 950, TÜV EN60950 |
| Bit Rate | TPT/XF-78: 78kbps<br>TPT/XF-1250: 1.25Mbps |
| Maximum Nodes Per Channel | TPT/XF-78: 64 (0 to +70°C), 44 (-40 to +85°C)<br>TPT/XF-1250:[4] 64 (0 to +70°C), 32 (-20 to +85°C), 16 (-40 to +85°C) |
| Network Bus Wiring | Level 4, 22AWG twisted pair[3] |
| Network Bus Length<br>TPT/XF-78:<br>TPT/XF-1250: | <br>1400 m (4600 feet) worst case[1]<br>130 m (430 feet) worst case[1] |
| Maximum Stub Length | TP/XF-78: 3 m (9.8 feet)<br>TP/XF-1250: 0.3 m (12″) |
| Network Bus Polarity | Polarity insensitive |
| Power-down Bus Protection | High impedance when unpowered |
| Supply Voltage | +5VDC ±5% |
| Typical Supply Current | 10mA |
| Communication Port Connector | 1 x 6 0.64 mm x 0.64 mm (0.025″ x 0.025″) post, 2.54 mm (0.1”) centers, tin plated |
| Network Connector | 1 x 3 0.64 mm x 0.64 mm (0.025″ x 0.025″) post, 2.54 mm (0.1”) centers, tin plated |
| Network Terminators | Required at both ends of network |
| Operating Temperature | -40 to +85°C |
| Non-operating Temperature | -40 to +85°C |
| Operating Humidity (non-condensing) | 25-90% RH @ +70°C |
| Non-operating Humidity (non-condensing) | 95% RH @ +70°C |
| Dimensions | 38 mm x 15 mm x 20 mm, (1.5″ x 0.59″ x 0.8″) |
| Recommended Hole Pattern | 0.041″ diameter holes on 0.1″ grid |

## Ordering Information

| **Product** | **Echelon Model Number** |
|---|---|
| TPT/XF-78 Module | 50010-10, 50010R-10 |
| TPT/XF-1250 Module | 50020-10, 50020R-10 |
| *LonWorks TPT Twisted Pair Transceiver Module User's Guide* (order separately–not shipped with product) | 078-0025-01 |

**Notes:**

*1. Worst case distance figures are based on variations in node distribution, node temperature, node voltage, wire characteristics, transceiver characteristics, and Neuron Chip characteristics, and allow for an average wire temperature of up to +55°C.*

*2. Safety agency hazardous voltage barrier requirements are not supported.*

*3. For wire specifications, see* Junction Box and Wiring Guidelines for Twisted Pair LonWorks Networks, *005-0023-01 Rev D or later.*

*4. Proper operation of TPT/XF-1250 segments requires that no more than eight (8) TPT/XF-1250 and/or TP/XF-1250 modules be used in any 16-meter (53 feet) sections of bus wiring.*

** Neuron Chips and TPT transceivers were not designed for use in equipment or systems which involve danger to human health or safety or a risk of property damage and Echelon assumes no responsibility or liability for use of the Neuron Chips or TPT Transceivers in such applications.*