

Network Cables

The following section identifies the type of cabling that may be used in a TP/FT-10 twisted pair LONWORKS network. The recommendations presented herein are intended to assist network integrators and OEMs and are provided for informational purposes only.

For more information and detailed explanations on network topology and wire length restrictions refer to the [Junction Box and Wiring Guideline for Twisted Pair LONWORKS® Networks](#). These guides can be downloaded from Echelon's web site at www.echelon.com.



- As a general rule, the TP/FT-10 channel communication cables should not be run close to high voltage power cables.
- All wiring must comply with applicable national, state and local wiring electrical codes, ordinances, and regulations.


Parameter	Details
Nickname	Free Topology
Raw Bit rate	78kbps
Packets per second	144/168
Peak traffic	180/210
Topology	Free, Bus
Termination	<ul style="list-style-type: none"> - One per segment in free topology - Two per segment in bus topology
Maximum number of devices per segment	64  A maximum of 128 devices per channel can be installed on a TP/FT-10 when a router or repeater is used. See Extending the Network on page 49 for more information.

Table 3-1 TP/FT-10 Channel Attributes

TP/FT-10 Cable Specifications

Two types of cable are recommended for TP/FT-10 channel installations.

Type 1:

22 AWG (Ø0.65mm), 1 twisted pair (1P), stranded conductor (STR), tinned copper (TNC), PVC insulation, PVC jacket, **unshielded**, plenum FT6, CSA 600V, UL 300V.

Parameter	Details
Conductor Gauge (AWG)	22 AWG (see also Metric Conversions for Wire Gauge on page 106)
Conductor Count	2 Conductors (twisted pair)
Conductor Type	Stranded conductor
Material	Tinned copper
Plenum	Plenum rated
NEC Rating	UL listed art 800 plenum
CSA	Flame rated

Table 3-2 TP/FT-10 Type 1 Cable Attributes

LonWorks Communication Bus Fundamentals



Untwisted wires or cables containing flat or parallel untwisted conductors must not be used on an LONWORKS twisted pair channel. The use of these wires/cables may result in improper network operation and could, in certain circumstances, result in damage to nodes connected to such a channel.

In a **bus** topology, the maximum wire length is 1400 meters (4593 feet). The maximum stub length on a TP/FT-10 channel is 3 meters (10 feet). A stub is a section of unterminated transmission line that branches off the main transmission line of interest. The branch line is terminated as an open circuit.

In a **free** topology, the maximum length is 400 meters (1312 feet) node-to-node and 500 meters (1640 feet) total wire length.



In the event that the limits on the number of transceivers or total wire distance are exceeded, then one FTT physical layer repeater can be added to interconnect two segments and double the overall system capability.

Type 2:

16 AWG (Ø1.3mm), 1 twisted pair (1P), stranded conductor (STR), tinned copper (TNC), PVC insulation, PVC jacket, **unshielded**, plenum FT6, CSA 600V or UL 300V.

Parameter	Details
Conductor Gauge (AWG)	16 AWG (see also Metric Conversions for Wire Gauge on page 106)
Conductor Count	2 Conductors (twisted pair)
Conductor Type	Stranded conductor
Material	Tinned copper
Plenum	Plenum rated
NEC Rating	UL listed art 800 plenum
CSA	Flame rated

Table 3-3: TP/FT-10 Type 2 Cable Attributes

In **bus** topology, the maximum wire length is 2700 meters (8858 feet). The maximum stub length on a TP/FT-10 channel is 3 meters (10 feet).

In **free** topology, the maximum length is 500 meters (1640 feet) node-to-node and 500 meters (1640 feet) total wire length.



For more information about extending the network to a sensor, see [Connecting to the LAN through an Allure EC-Smart-View Sensor](#) on page 79.