LXT318 — Remote Performance Monitoring Applications

Application Note

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As of January 15, 2001, this document replaces the Level One document known as *AN066*.

Application Note

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1.0 Introduction

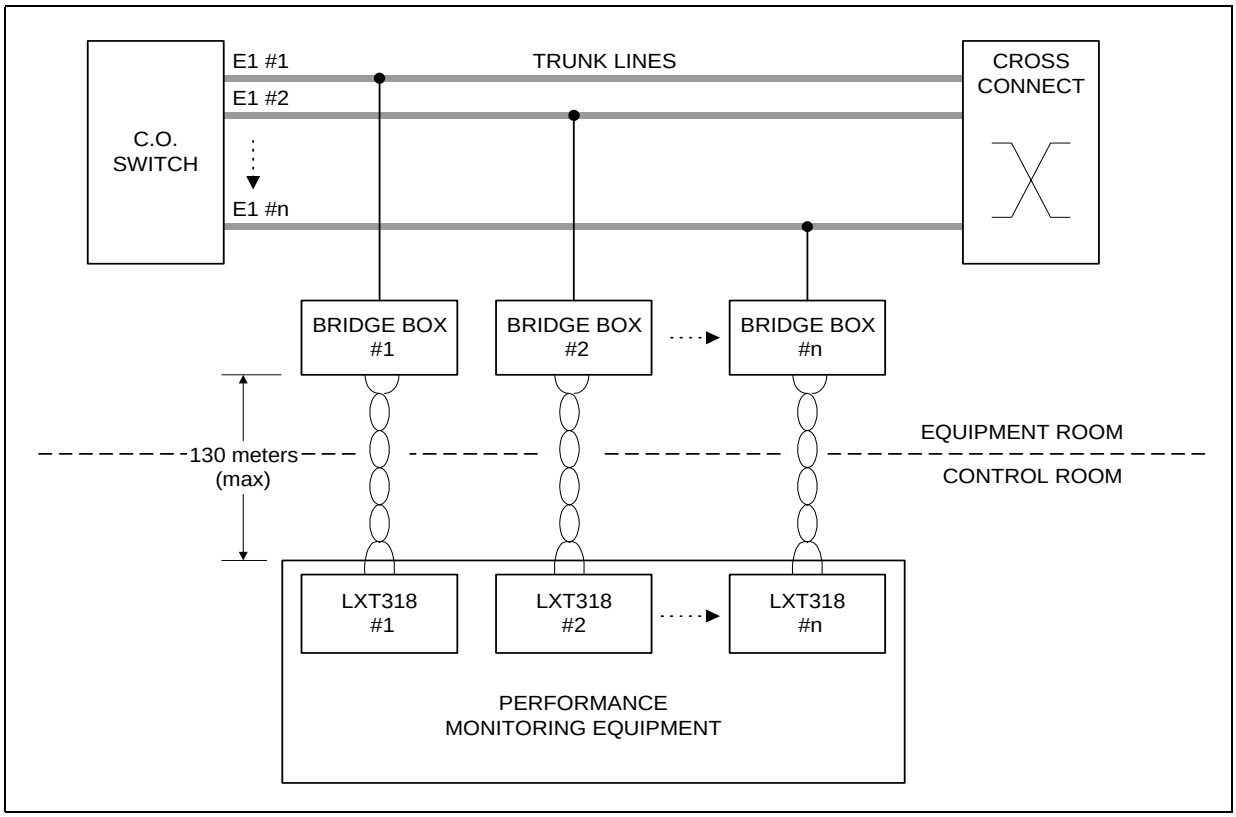
The LXT318 is a fully integrated transceiver for E1 Network Termination Unit (NTU) and ISDN Primary Rate Interface (ISDN PRI) applications at 2.048Mbps.

Excellent performance also makes the LXT 318 very attractive for test equipment applications. Offering robust performance, the transceiver recovers signals with as much as 43 dB of attenuation over 0.6 mm (22 AWG) twisted-pair wire. In addition, the LXT318 also provides selectable HDB3 decoding, LOS detection and CTR12/13 compliant jitter transfer performance.

Traditional E1 test equipment has been connected to the network by a short drop cable, typically no more than a few meters long. The LXT 318, however, supports non-intrusive remote monitoring applications with up to 130 meters of cable. As shown below, this feature allows network operators to remotely monitor network performance from a centrally located control room.

This application note describes the use of the LXT318 in a remote non-intrusive mode to insure that live network traffic is not interrupted.

Figure 1. Remote Monitoring Systems



2.0 Circuit Description

Figure 2 and Figure 3 show monitoring applications using the LXT318. Figure 2 presents a solution for 120 Ω twisted-pair transmission line and Figure 3 presents a solution for 75Ω coaxial cable.

The 500 Ω resistors (R1 and R2) limit the loading effect on the transmission line. The signal on the line stays virtually unchanged (amplitude reduction is less than 5%) when the monitoring test unit is connected as shown in Figure 2 and Figure 3.

Using resistors R1 and R2, the signal at point B-B is attenuated by approximately 20dB from point A-A. The resistive nature of the loss will cause overequalization of the signal if applied directly to the receiver of the LXT318. To avoid overequalization, a bridge box containing capacitor C1 and a 2:1 (step down) transformer has been added. Note that capacitor C1 and transformer T1 add some non-linear components to the overall attenuation at point C-C. Up to 130 meters of twisted-pair access cable can be added between point C-C and the Monitoring Equipment (point D-D).

Resistor R3 (termination resistor) has a value of 120 Ω and is required to reduce reflections on the line. T2 is a 1:2 (step-up) transformer used to increase the amplitude of the signal to the receiver. Pulse Engineering T1/E1 transformer PE-65351 (1:2) is recommended.

It should be noted that the signal at point A-A can be up to 6dB below the nominal value (specified by G.703).

The LXT318 displays very good jitter tolerance and jitter attenuation performance when used in monitoring applications. When using a pullable quartz crystal (as specified in the LXT318 data sheet), the circuit described in this application note meets G.823 jitter tolerance as well as G.736 and CTR12/12 jitter transfer requirements.

Figure 2. LXT318 in Performance Monitoring Application (120 Ω twisted-pair system)

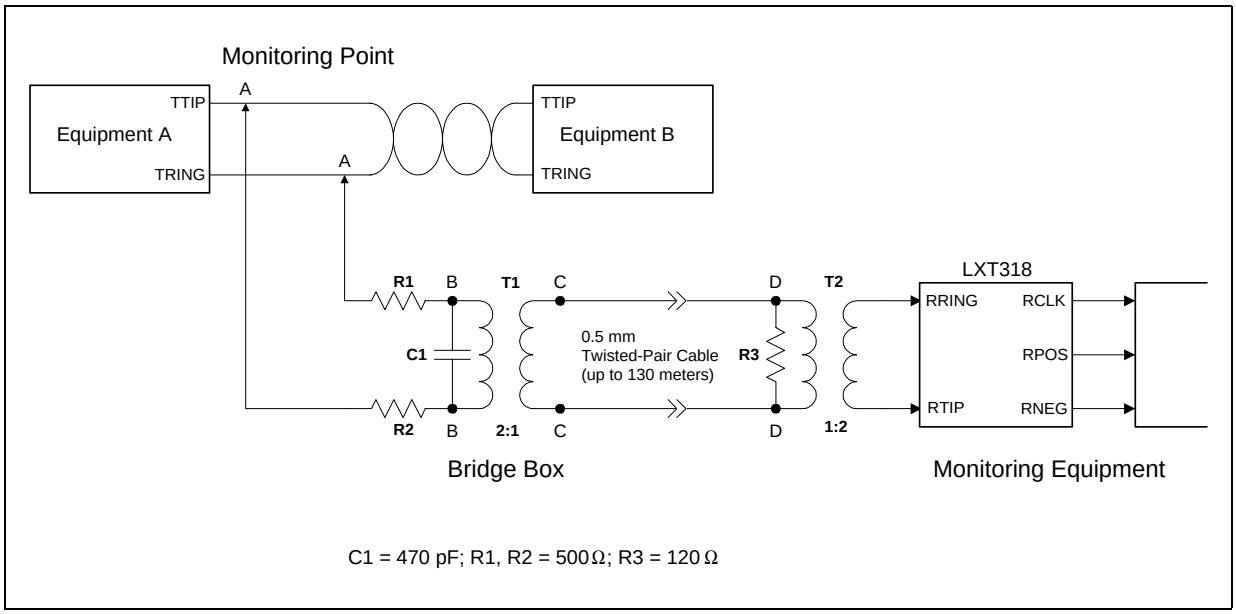


Figure 3. LXT318 in Performance Monitoring Application (75 Ω coax cable system)