

Configuring a Simple Fiber Optic Data Bus

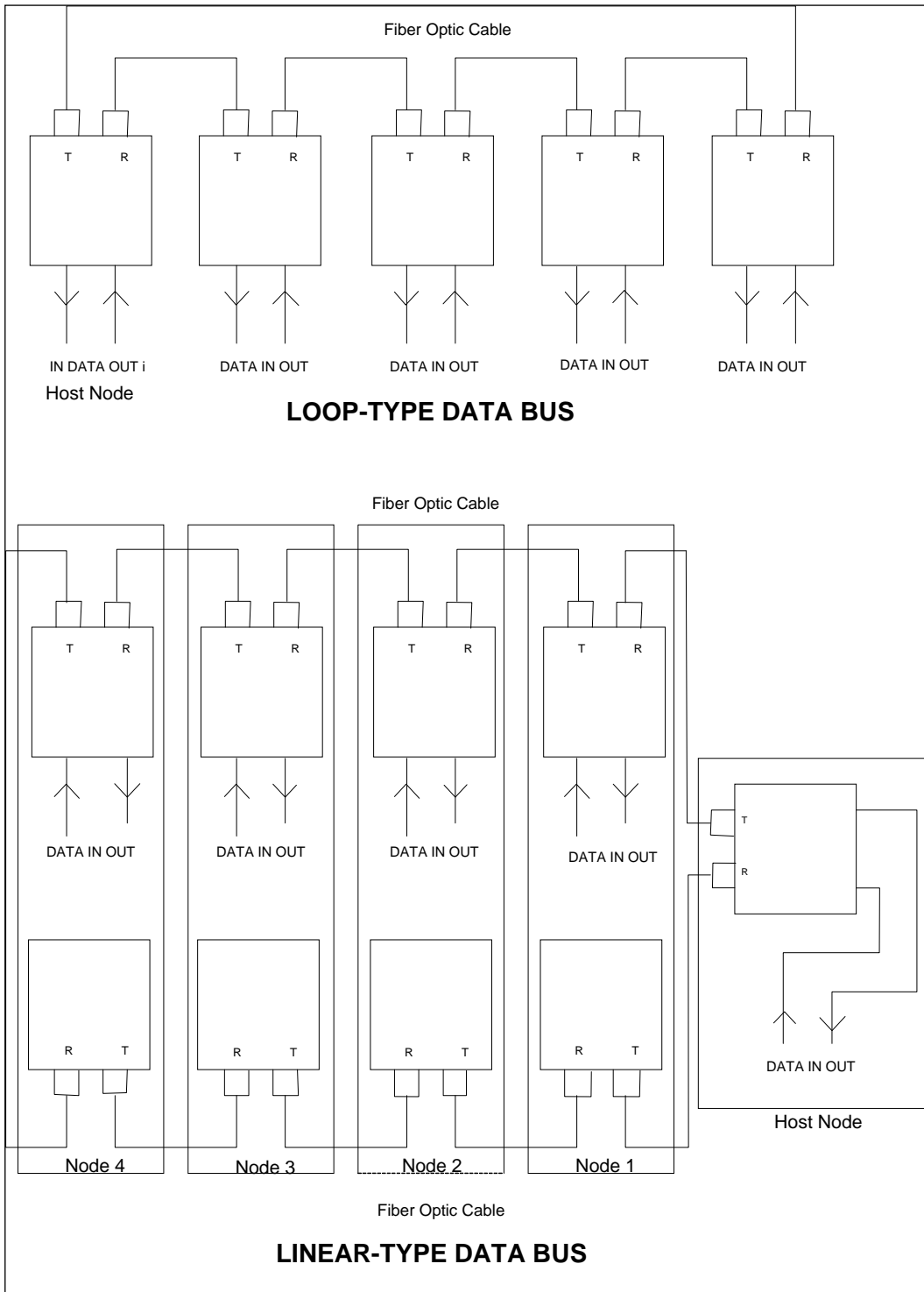
When digital data signals must be routed to several locations from a single host controller over long distances, the use of fiber optic transmission techniques can assure high quality noise-free signals at each “node” without the problems normally encountered with copper cable. Since the fiber optic interconnecting cable in such a system is virtually immune to electrical interference, it can be routed wherever convenient without regard the proximity of electrical noise producers. In addition, costs need not necessarily be a detriment especially where high quality performance is critical.

The first drawing shows a ring or loop-type data bus using relatively inexpensive components. Each transmitter/receiver pair will deliver high quality digital data signals over distances of a mile or two between units with multimode optical fiber or tens of miles between units with single-mode optical fiber. The system will also operate from –35 to +75°C thereby allowing it to be used both indoors and outdoors.

In operation a data signal from a host controller is connected to the first fiber optic transceiver in the loop. This device produces an optical output which is then routed to the next transceiver. Here the optical signal is detected and an electrical output provided. In addition, the data signal is also optically transmitted to the next transceiver in the loop and the process repeats until all transceivers receive (and output) the signal. Once the transmission of the signal from the host is completed any local location can then provide its own “reply” data signal which will then be transmitted around the loop (in the same manner) until it eventually arrives back to the controller. Since all data signals eventually wind up at the host transceiver, the initial host signal can be used as an indication of system integrity or simply ignored.

The diagrams both employ **Litelink**[®] Data Transceivers. The DX-7001 Universal Data Transceiver is user-configurable to RS-232, RS-422, RS-485 or TTL. Any DX-7001 transceiver can be set to the same or any of these protocols and the system will do all of the necessary conversions to assure accurate communications between all nodes in the system. Installation only requires a screwdriver and some patch cables and can be accomplished quickly and inexpensively. For RS-232 use only, the **Litelink**[®] DX-7101 may be employed in the exact same configuration. This unit features a 25 pin DB type connector making installation even simpler.

The second drawing shows a linear-type data bus. In this example two fiber optic transceivers are needed at each node, one for transmission and reception and the other for use as a repeater. Operation is similar to the first case except that the long return fiber is eliminated due to the second “repeater” at each node.



For more information contact **Liteway Inc.** at 516-931-2800 or at sales2@liteway.com