

Overview:

In many data transmission applications it is often desirable to configure a loop, ring-type or drop-and-repeat data bus in order to allow a “master” or host controller to talk and/or listen to various local “slave” units. When these units are located very far apart from each other, or in an area that is prone to high EMF levels or lightning strikes, a fiber optic transmission system may be just the ticket. Such a system will allow long distances to be traversed with no concern as to noise pickup, ground loops or other types of interference. CSI manufactures two fiber optic data transmission systems that are ideal for such applications: the FIBERLINK model 5012 Universal Data Transceiver and the FIBERLINK model 5002 RS-232 Micro Transceiver.

by all local stations (including the master). In addition, any signal transmitted by a local station will also ultimately return back to the master. The fact that the original signal transmitted from the master is ultimately received by the master allows the installer to verify the overall integrity of the loop.

There are two basic requirements of such a system. First, only one station may be permitted to transmit data at any one time. Secondly, when not transmitting data, the input to any transceiver must be in the logic zero (or low) state. Since most master/local systems employ this mode of operation, implementation is simple and straightforward.

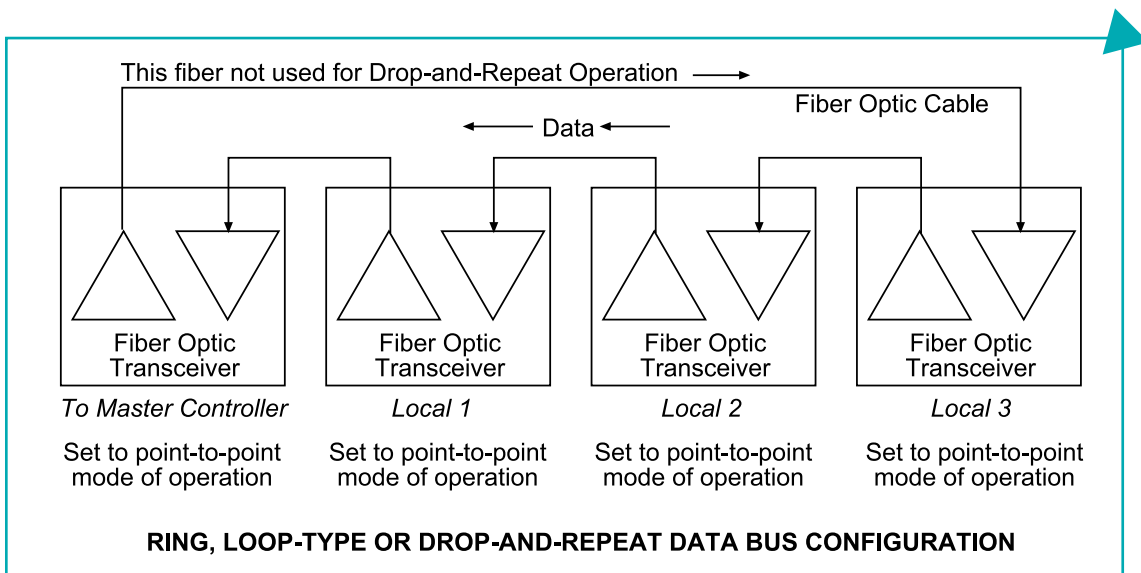
In the drop-and-repeat configuration, all signals transmitted by the master are received by all local stations. Since the return fiber path is not used in this configuration, the data is essentially transmitted in one direction only.

Details:

Both transceivers can be user-configured (by means of integral DIP-type switches) and connected to form a loop-type or a drop-and-repeat data bus as shown in the diagram below. In the loop-type configuration, any signal transmitted by the master controller will be repeated around the loop and received

Suggestions:

When configuring a data bus as described here, be sure that your transceivers can accommodate the data rate you plan to use. Also check that the optical loss budget for the transceivers will not be



exceeded. If you will be using Fiberlink Universal Data Transceivers, all units within the loop will be able to communicate with each other, even if set for different protocols. When using Fiberlink RS-232 Micro-Transceiver units, only RS-232 will be supported.

When using a loop-type configuration, remember that the transmitted signal will travel around the loop and appear at the output of the master receiver port. If desired, this output can be used to signify that the loop is intact. If this feature is not needed, you should configure the software to ignore the received "echo".

Also, when using a loop-type configuration, it is extremely important to set the fiber optic transceiver connected to the master to "break" the loop (as shown). Otherwise, a logic 1 signal could "lock up" the loop and prevent further data transmission. When using RS-485 two-wire protocol, it is also important to set the "turn-around time" properly so that a complete data word is transmitted before the transceiver reverts to the high impedance receive state. The Fiberlink Universal Data Transceiver provides a wide range of user-selectable time intervals for just this purpose.

CSI Products Used In This TECHnique:

- Universal Data Transceiver 5012
- Universal Data Trans. Card Version..... 5018
- RS-232 Micro-Transceiver 5002

Related TECHniques:

- Educational Guide: *An Introduction to Fiber Optics*
- Educational Guide: *An Introduction to Fiber Optic Cable and Connectors*