

Overview:

In a fiber optic data transmission system, it is sometimes necessary to convert from one protocol into another so that different types of equipment may “talk” to each other. When converting from RS-232 into RS-422 or RS-485, for example, external “protocol” converters are often used to make the proper conversion. These must be mounted in the vicinity of the fiber optic transmitters and receivers, adding to the cost and complexity of the installation.

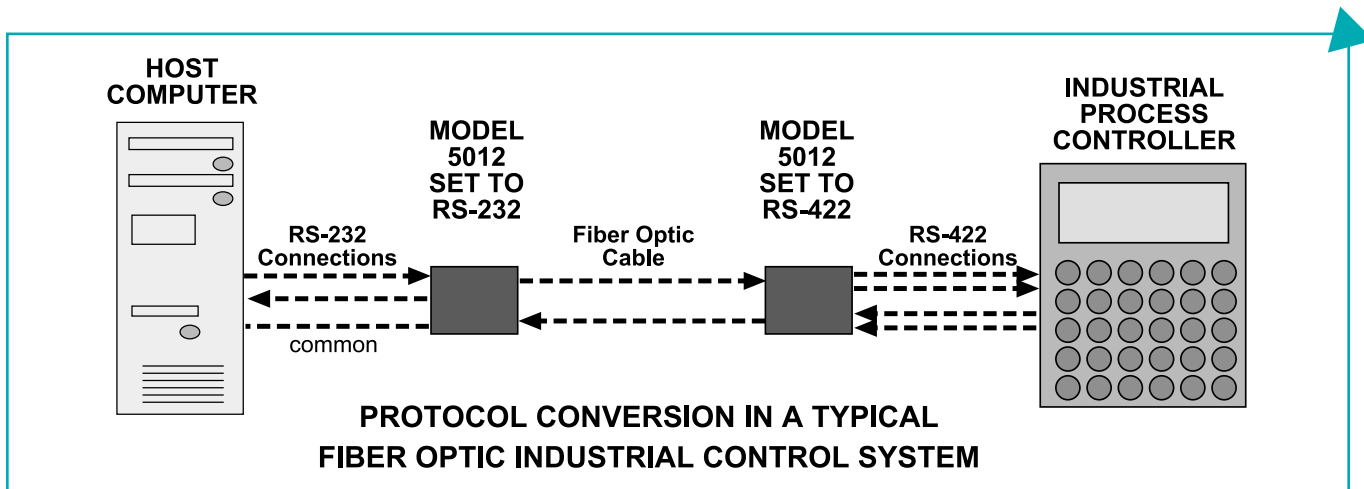
This TECHnique describes how the FIBERLINK model 5012 Universal Data Transceiver can provide a desirable alternative to using protocol converters within a fiber optic transmission system. This easy-to-use unit performs such conversions directly, without the need for any additional equipment, thereby resulting in a much simpler installation.

Details:

The Universal Data Transceiver, designed to support RS-232, RS-422 and RS-485 signals, converts all data passing through it into pulses of light. All protocols are reduced to this common denominator by the unit’s internal circuitry. Because of this, converting from one protocol to another is as simple as

setting each transceiver for the desired input and output protocol. The circuitry does the rest. The accompanying diagram shows just how simple a typical RS-232 to RS-422 conversion can be.

The Universal Data Transceiver can also accommodate RS-485 two-wire conversions to and from RS-232 or RS-422. When performing such conversions, the transceiver units use the same two signal leads for both transmitting and receiving data. Therefore, it is necessary for the units to alternately switch between a transmit and receive state. The units can either be “told” when this switch must occur by an externally provided signal, often referred to as the RTS or *return to sender* line, or by internally sensing the actual data being transmitted. Dip switches allow the user to select whether the external or internal method will be used. When the external mode is selected, the system software provides the enable signal and the unit switches whenever the enable (RTS) line goes high. When the internal data sense mode is used, the leading edge of data being received enables the output driver. After the transmission of the last data character, the transceiver then waits one character time before reverting to the receive mode. Provision is made to adjust this “waiting” or “turn-around” time interval for the most commonly used data rates.



Page 2: USING THE UNIVERSAL DATA TRANSCEIVER FOR PROTOCOL CONVERSION

Suggestions:

When using more than one protocol, be certain that the various signal types, data rates and waiting states can be accommodated by the software in use by the overall system. This is particularly important when using slow RS-232 equipment in conjunction with much faster RS-422 equipment. When combining RS-485 and RS-232 or RS-422 equipment, be sure that the software in use allows for turn-around times, as well as for the number of times a master will “poll” a local unit before an error is detected.

Also, remember to pay attention to the polarity of the various protocols. Simply interchanging the + and – data leads can mean the difference between proper operation and no operation at all.

CSI Products Used In This TECHnique:

- Universal Data Transceiver 5012

Related TECHniques:

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