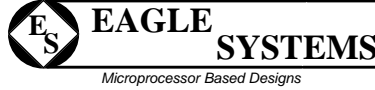


CRC Generating Example

File: es001.doc
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1.0 CRC Generation

A multi-byte CRC error checking protocol should be used on all data transmissions between the host and slave nodes of an RS-485 communications system. The multi-byte protocol provides an error detection accuracy of 100% because of the CRC-16 two byte checksum appended to each message.

The sending system will calculate a CRC and append it to the message. The receiving system will calculate a new CRC based on the entire message – including the appended CRC bytes. The resulting CRC should be 0x0000. If the CRC calculated by the receiving system is not equal to zero, then an error occurred in the transmission and all data should be ignored.

CRC-16 16 bit CCITT polynomial used:

$$\chi^{16} + \chi^{15} + \chi^2 + \chi^1$$

CRC is good at detecting all kinds of errors, especially those that occur in bursts over a long period of time. Refer to the chart below for the CRC-16 error checking accuracy¹.

CRC-16 Error Checking Accuracy	
Single Bit Errors:	100 percent
Double-Bit Errors:	100 percent
Odd-Numbered Errors:	100 percent
Burst Errors Shorter than 16 bits:	100 percent
Burst Errors of exactly 17 bits:	99.9969 percent
All other burst errors:	99.9984 percent

¹Error Checking Accuracy Table values taken from Tanenbaum, Andres, S., Computer Networks, Prentice-Hall, 1981.

