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TECHNICAL NOTE TNDA20

Title: The Scale Factor and Counter Display Rounding

Product(s): Red Lion Counters

All Red Lion counters will increment the display's least significant digit when the next lower, non-shown, digit is 5 or greater. For example: If the counter receives 10 pulses/foot and the display is showing whole feet, the scale factor would be 0.1. The 1/10ths place is not being displayed, but does exist in the internal count register. The internal count register will increment by .1 each time a pulse is received at the input. In theory, the display should display 0 until all ten counts are received, then the display will increment to 1. However, Red Lion counters will round up the next highest digit on the display, in this case the 1's digit. When the internal register reaches 5 counts, or a .5 value, the display increments to 1. When the internal register reaches 15 counts, or a 1.5 value, the display increments to 2, and so on. Since the output follows the display value, the output will fire at 5, 10, 15….. pulses rather than 10, 20, 30, 40, etc.

To correct this problem and improve the accuracy of the count, increase the resolution of the display. This is done by moving the counter's decimal point one position to the left and the scale factor decimal point one position to the right. In the above example, the counter receives 10 pulses/ft and the display is in whole feet. By changing the decimal point position so the display is in tenths of a foot, 0.0, the scale factor will now be 1.0. In this case, there is no rounding and the pieces have an accuracy of a tenth of a foot instead of six inches. If a rotary pulse generator with a 100 pulses/ft is used and the counter decimal point is set to display 0.00, the accuracy will be $1/100^{th}$ of an inch.

Links to other related topics:

Visit the Red Lion Controls Virtual Help Desk to watch tutorials on this subject and others at:

http://www.redlion.net/Support/VirtualHelpDesk.html