

Wrap Tracking

Local application WRAP

Robert Goodwin
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A motor whose read back shows a potentiometer reading, but which requires many turns to properly position the motor, needs some help to track the number of times the potentiometer reading “wraps.” This note describes a simple WRAP local application to support this.

The read back provided ranges from near 0 to near the maximum positive value of 10 volts, or $0x7FFF$. the logic must notice when the reading “wraps” from near 10 volts to near 0, or *vice versa*. It simply compares the present reading with that measured on the previous (10 Hz) cycle. (The reading takes many cycles to go through its entire range.) When an unusually large change is seen, a result counter is updated, either by subtracting 1 or adding 1.

In detail, calculate the difference in two successive readings. If that difference is more than $0x4000$, which is about half the full range, then decrement the result counter, since the reading must have switched from being near zero to being more nearly max. If the difference is less than $-0x4000$, then increment the counter, since the reading just changed from being near maximum to being near zero. If the difference is between $-0x4000$ and $+0x4000$, then leave the counter alone. To prevent confusion in case the reading near zero is too negative, such that a detected change might be larger than $0x7FFF$, so that could seem to be negative, use 32-bit arithmetic.

Parameters layout

<i>Field</i>		<i>Size</i>	<i>Meaning</i>
ENABLE	B	2	Usual local application enable Bit#
WRAP	C	2	Read back Chan# being monitored for large changes
COUNT	C	2	Counter result Chan#

By defining the counter result channel to be a dummy settable channel, a user can easily clear the counter, if desired. When such a channel is set, both the reading and the setting are set to the value specified. But WRAP will always update the reading, incrementing or decrementing it from its whatever is its present value; *i.e.*, it always reads it before modifying it.

Since WRAP is such a trivial local application, it can be used as a model for writing another.