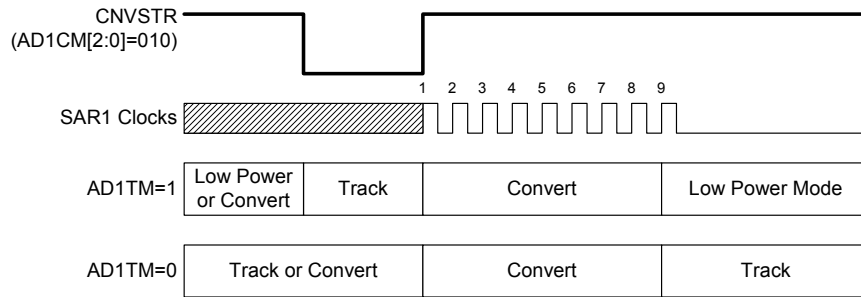
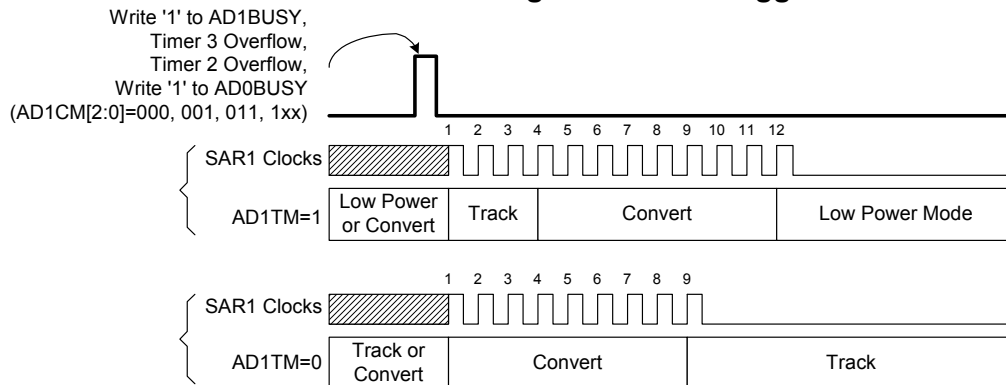


Figure 7.2. ADC1 Track and Conversion Example Timing

A. ADC Timing for External Trigger Source



B. ADC Timing for Internal Trigger Source



7.2.3. Settling Time Requirements

When the ADC1 input configuration is changed (i.e., a different MUX or PGA selection), a minimum settling (or tracking) time is required before an accurate conversion can be performed. This settling time is determined by the ADC1 MUX resistance, the ADC1 sampling capacitance, any external source resistance, and the accuracy required for the conversion. Figure 7.3 shows the equivalent ADC1 input circuit. The required ADC1 settling time for a given settling accuracy (SA) may be approximated by Equation 7.1. Note that in low-power tracking mode, three SAR1 clocks are used for tracking at the start of every conversion. For most applications, these three SAR1 clocks will meet the tracking requirements. See Table 7.1 for absolute minimum settling time requirements.

Equation 7.1. ADC1 Settling Time Requirements

$$t = \ln\left(\frac{2^n}{SA}\right) \times R_{TOTAL} C_{SAMPLE}$$

Where:

SA is the settling accuracy, given as a fraction of an LSB (for example, 0.25 to settle within 1/4 LSB)

t is the required tracking time in seconds

R_{TOTAL} is the sum of the ADC1 MUX resistance and any external source resistance.

n is the ADC resolution in bits (8).

Figure 7.3. ADC1 Equivalent Input Circuit

