

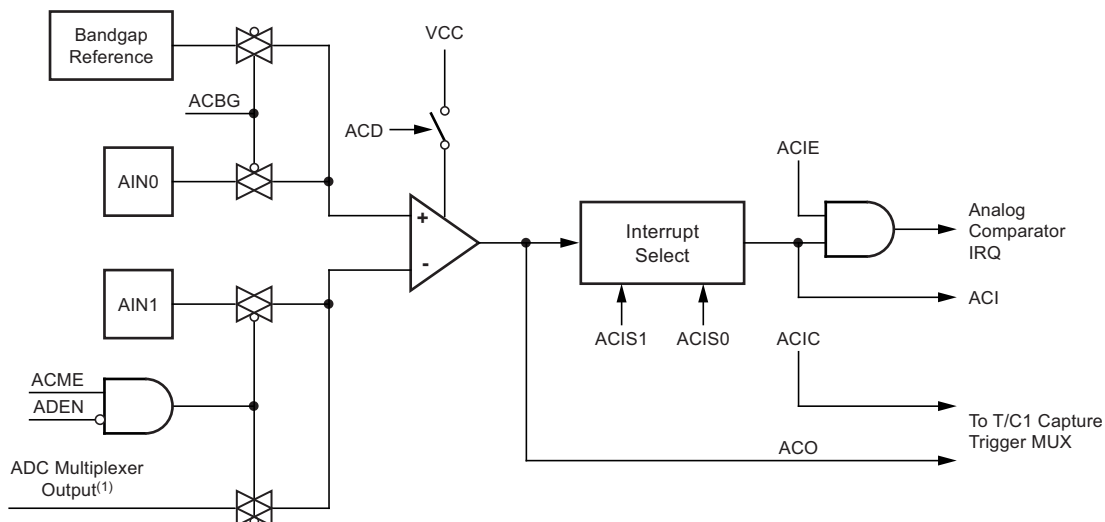
## 22. Analog Comparator

### 22.1 Overview

The analog comparator compares the input values on the positive pin AIN0 and negative pin AIN1. When the voltage on the positive pin AIN0 is higher than the voltage on the negative pin AIN1, the analog comparator output, ACO, is set. The comparator's output can be set to trigger the Timer/Counter1 input capture function. In addition, the comparator can trigger a separate interrupt, exclusive to the analog comparator. The user can select interrupt triggering on comparator output rise, fall or toggle. A block diagram of the comparator and its surrounding logic is shown in [Figure 22-1](#).

The power reduction ADC bit, PRADC, in [Section 9.10 “Minimizing Power Consumption” on page 36](#) must be disabled by writing a logical zero to be able to use the ADC input MUX.

**Figure 22-1. Analog Comparator Block Diagram<sup>(2)</sup>**



- Notes:
1. See [Table 22-1](#).
  2. Refer to [Figure 1-1 on page 3](#) and [Table 13-9 on page 70](#) for analog comparator pin placement.

### 22.2 Analog Comparator Multiplexed Input

It is possible to select any of the ADC7..0 pins to replace the negative input to the analog comparator. The ADC multiplexer is used to select this input, and consequently, the ADC must be switched off to utilize this feature. If the analog comparator multiplexer enable bit (ACME in ADCSRB) is set and the ADC is switched off (ADEN in ADCSRA is zero), MUX2..0 in ADMUX select the input pin to replace the negative input to the analog comparator, as shown in [Table 22-1](#). If ACME is cleared or ADEN is set, AIN1 is applied to the negative input to the analog comparator.

**Table 22-1. Analog Comparator Multiplexed Input**

ACME	ADEN	MUX2..0	Analog Comparator Negative Input
0	x	xxx	AIN1
1	1	xxx	AIN1
1	0	000	ADC0
1	0	001	ADC1
1	0	010	ADC2
1	0	011	ADC3
1	0	100	ADC4
1	0	101	ADC5
1	0	110	ADC6
1	0	111	ADC7