

ADC (Analog to Digital Converter)

Arduino's analog pins can convert an analog voltage into a 10-bit digital value. The component responsible for this function is identified as the ADC (Analog to Digital Converter). Arduino can only measure one analog value every 112 microseconds. According to the Nyquist-Shannon theorem, the sampling rate must be at least twice the frequency of the signal; however, even this may yield poor reconstruction quality. A common rule suggests using a sampling rate ten times higher than the signal frequency for better results. This approach leads to improved signal reconstruction. For DIY projects requiring higher precision, utilizing dedicated IC like ADS7816 with Arduino is recommended; following datasheets ensures proper implementation. While building complex ADC systems isn't advisable due to DAC requirements, simpler designs like flash ADC can be constructed using comparators and resistors.