2. Analog to Digital Converter (ADC)

2.1 Understanding ADC

ADC (Analog to Digital Converter) is a component or circuit that converts analog signals (continuous values) into a digital representation (discrete values in the form of binary numbers) so they can be processed by digital systems such as microcontrollers or computers.

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2.2 Stages of the ADC Conversion Process

In general, the ADC process is divided into **four main stages**:

No	Stage	Explanation
1	**Sampling**	Capturing (sampling) values from an analog signal at specific discrete points in time. The higher the sampling frequency, the more accurate the digital representation.
2	**Filtering**	Cleaning the signal from noise before conversion to ensure the conversion results are more accurate. *NOTE: This is usually not discussed much in ADC methods*
3	**Quantizing**	Converting the analog value at a single discrete point in time into a specific level representation. The number of levels is determined by the ADC resolution (e.g., 10-bit = 1024 levels).
4	**Encoding**	Converting the level value from quantization into digital binary code per discrete time unit.

We won't go deep into this process, as you will study it directly in the Telecommunications lab next semester □□

2.3 Illustration of the ADC Process

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