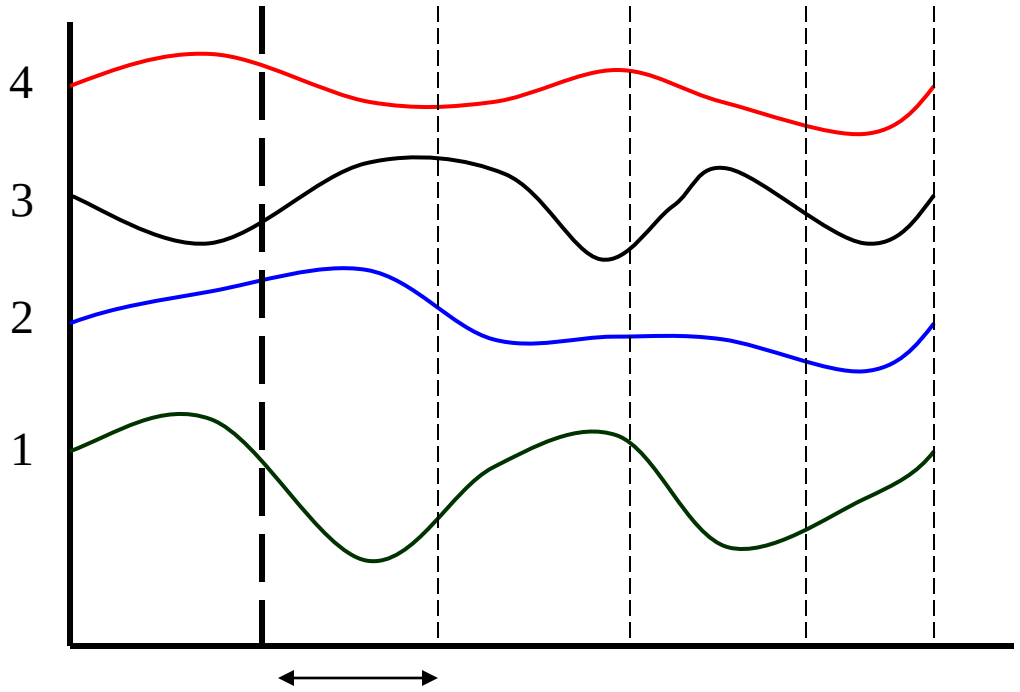
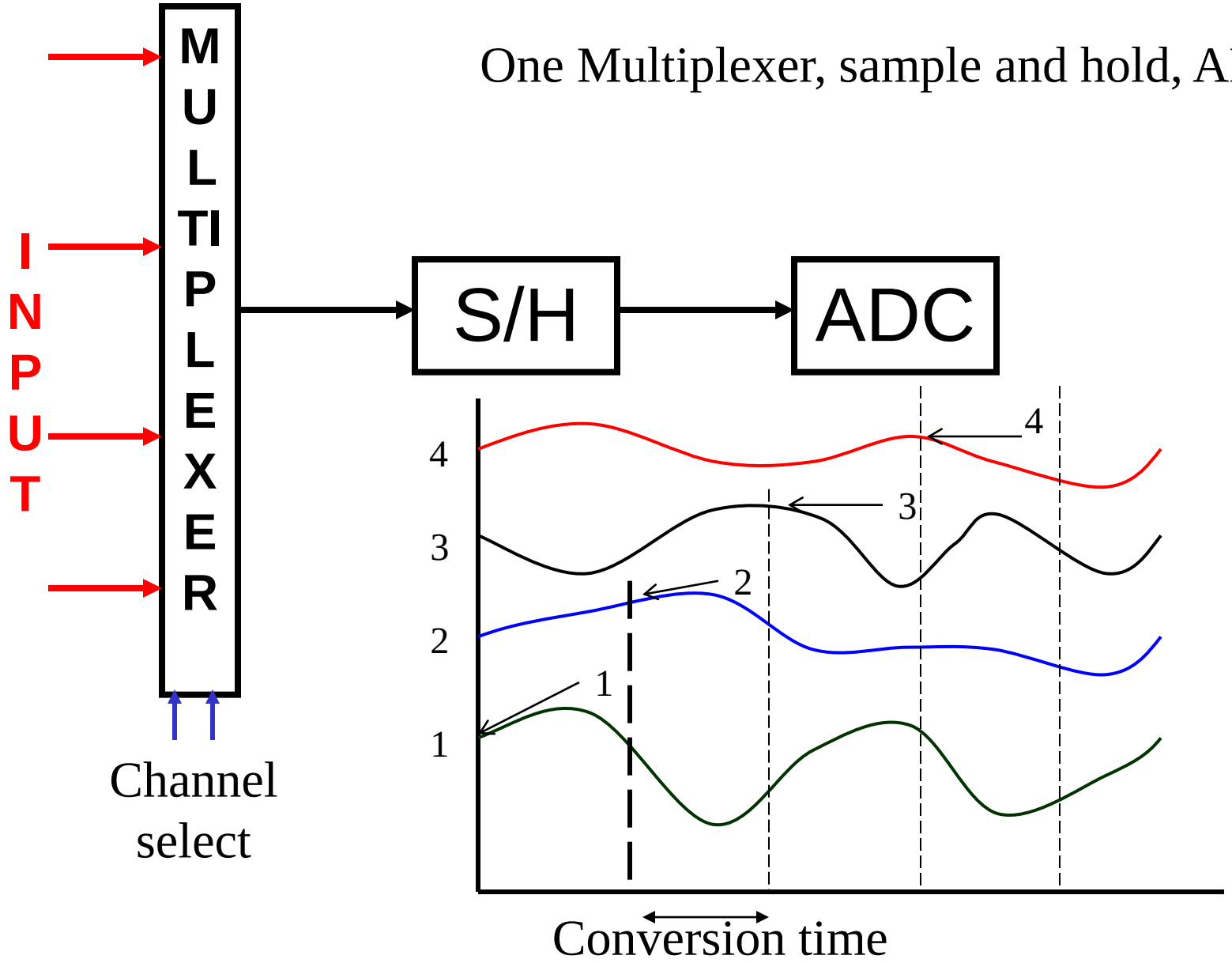
AE 242
Aerospace Measurements Laboratory

Timing for various ADCs



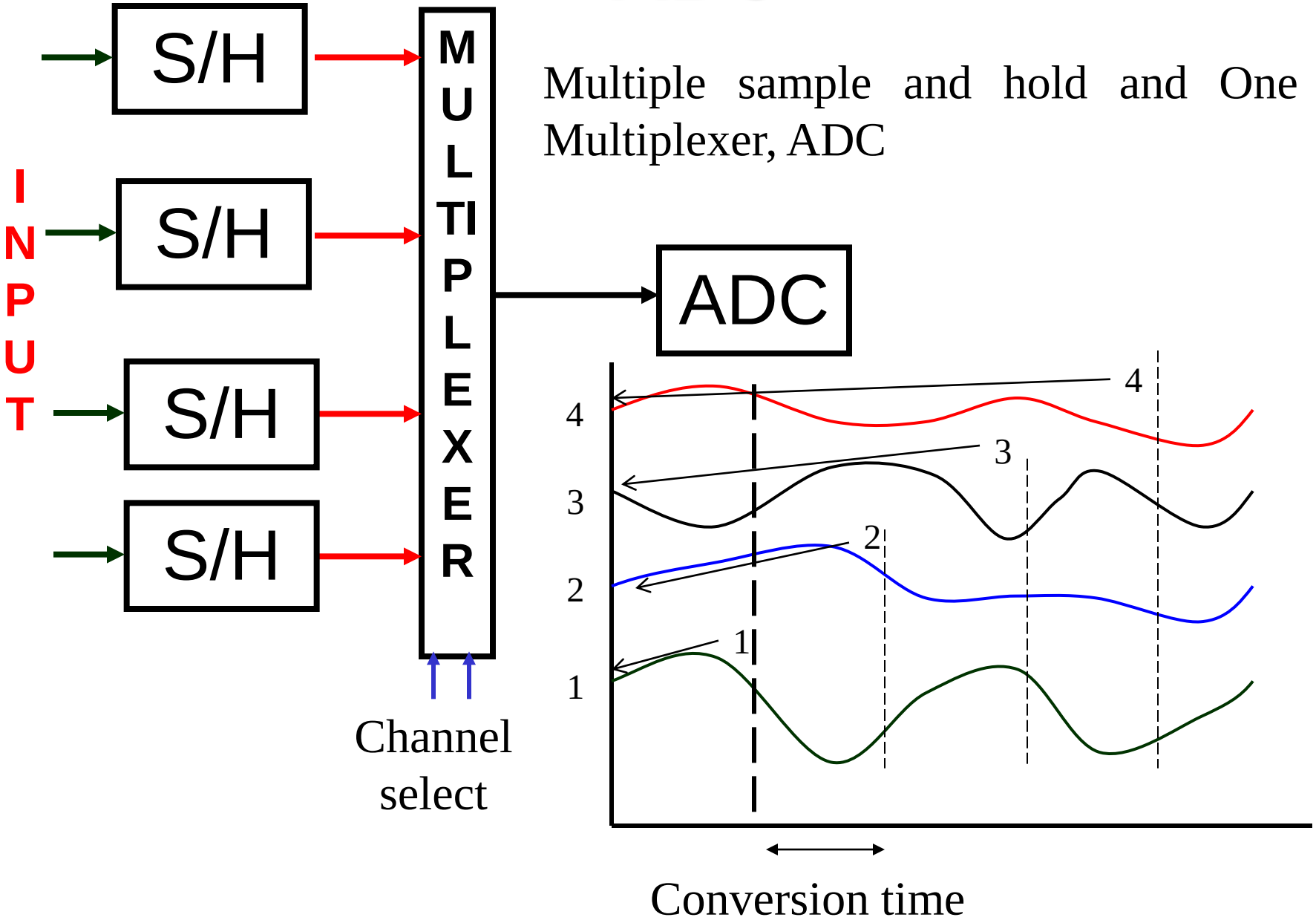
ADC

One Multiplexer, sample and hold, ADC



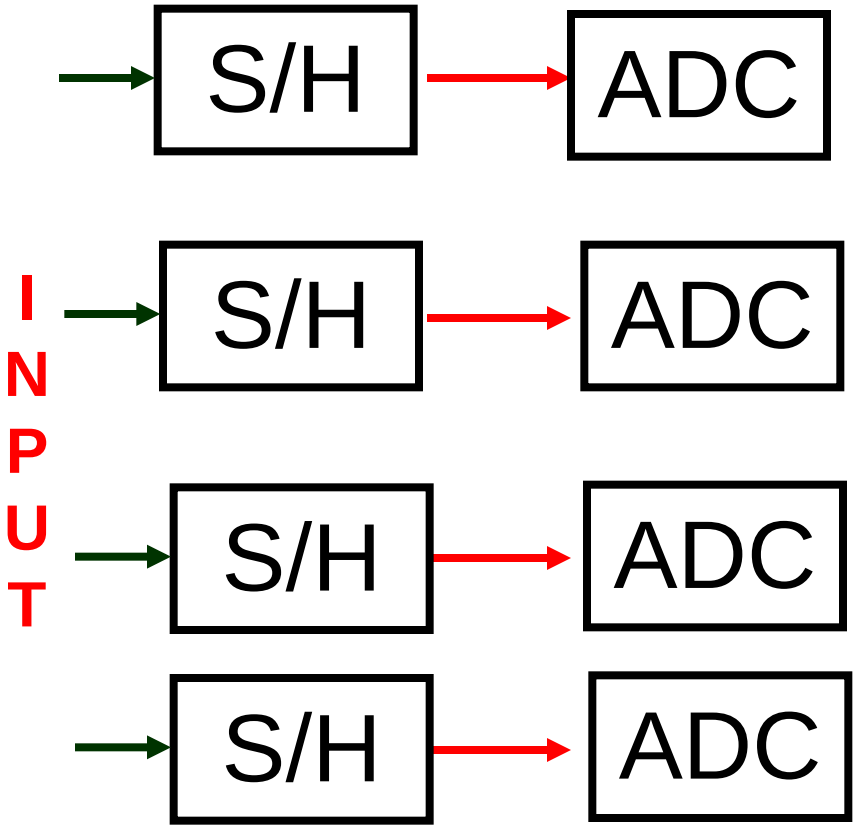
ADC

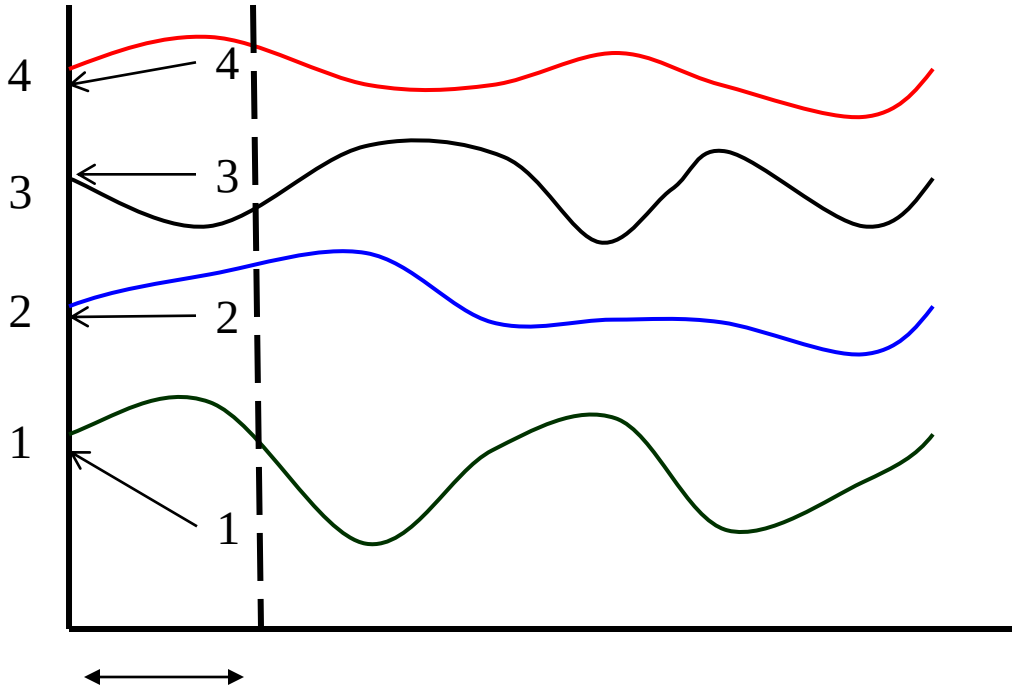
Multiple sample and hold and One Multiplexer, ADC



ADC

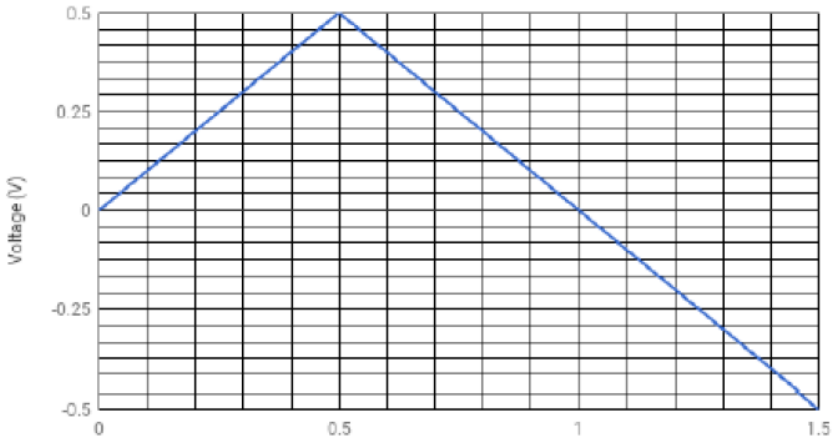
Multiple sample and hold and ADCs





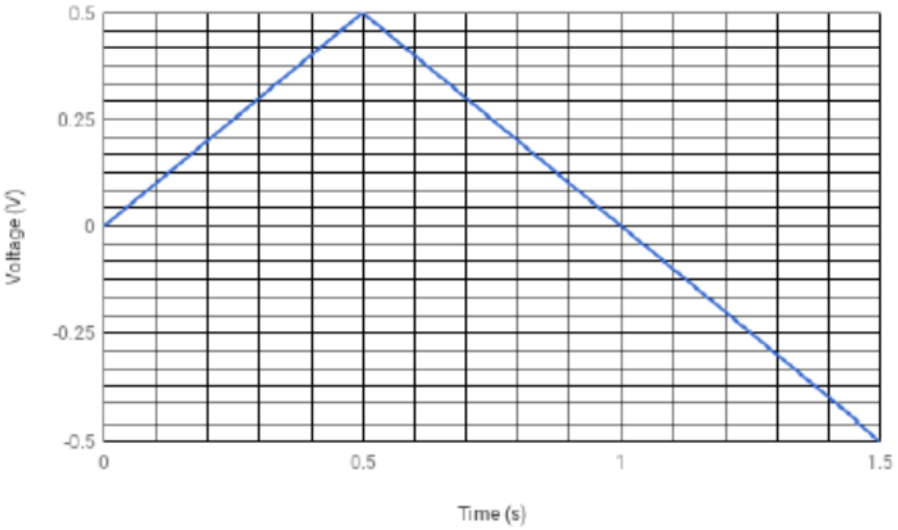
Conversion time

Q1) Figure given below shows a voltage changing with time. This voltage is given as input to a two channel analog to digital conversion system (at any given instant both input channel will same voltage. System a) one two channel multiplexer +One sample and hold + one ADC connected in series. System b) Two sample and hold + one two channel multiplexer + One ADC. Assume ADC conversion time as 0.1 sec , 0 digital value is for 0 volt and 500 digital value is equal to 0.5 V. Fill the values of ADC recorded at the given time instants. (6)



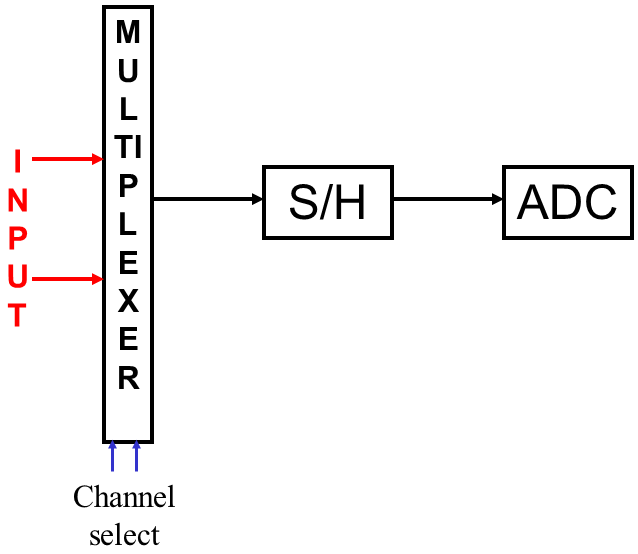
Time	Voltage	case-a		case-b	
		Channel1	Channel2	Channel1	Channel2
0	0				
0.1	0.1				
0.2	0.2				
0.3	0.3				
0.4	0.4				
0.5	0.5				
0.6	0.4				
0.7	0.3				
0.8	0.2				
0.9	0.1				
1	0				
1.1	-0.1				
1.2	-0.2				
1.3	-0.3				
1.4	-0.4				
1.5	-0.5				

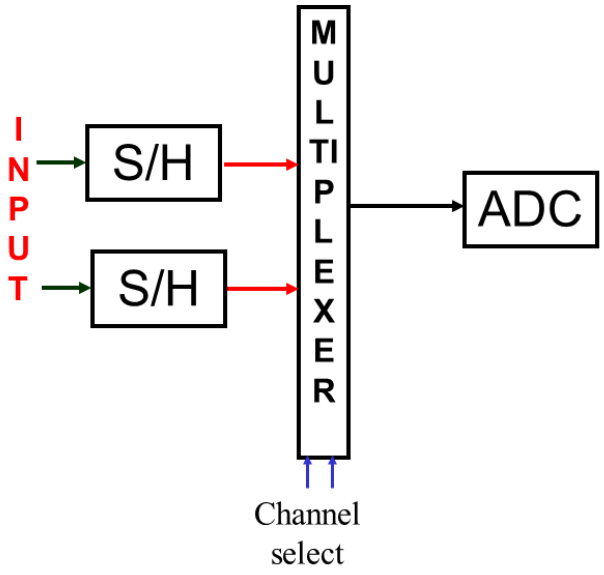
ADC



Time	Voltage	case-a		case-b	
		Channel1	Channel2	Channel1	Channel2
0	0				
0.1	0.1				
0.2	0.2				
0.3	0.3				
0.4	0.4				
0.5	0.5				
0.6	0.4				
0.7	0.3				
0.8	0.2				
0.9	0.1				
1	0				
1.1	-0.1				
1.2	-0.2				
1.3	-0.3				
1.4	-0.4				
1.5	-0.5				

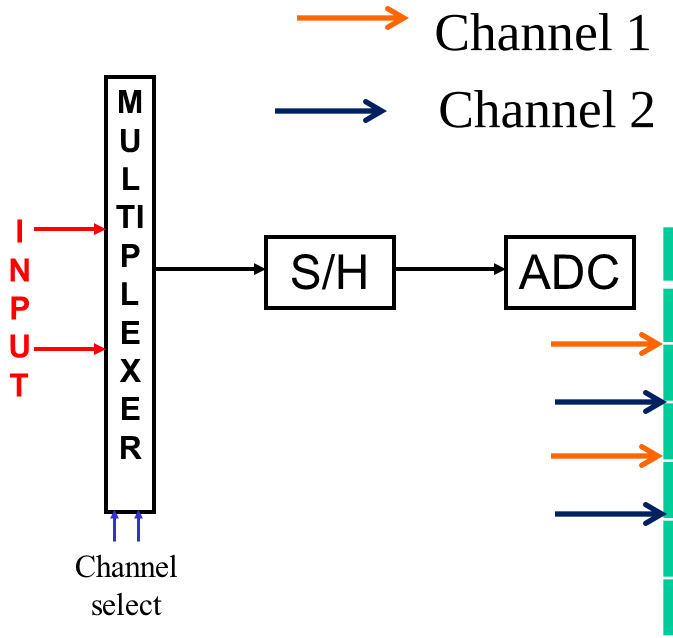
ADC





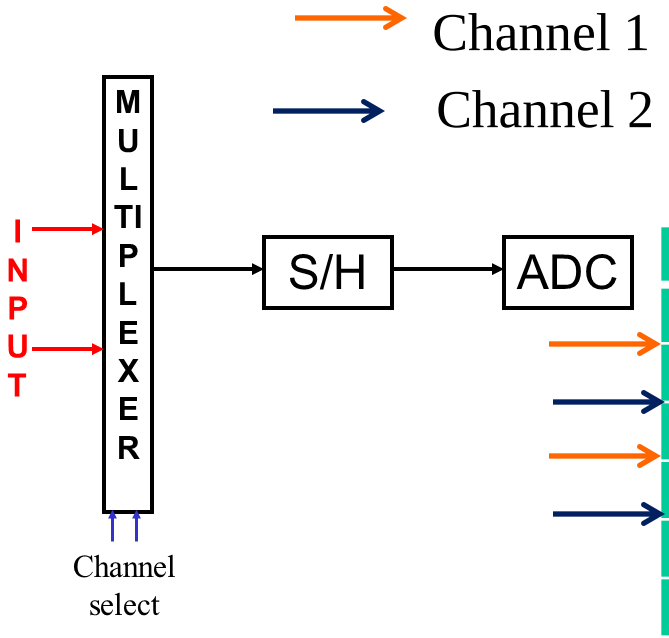
Time	Voltage	case-a		case-b	
		Channel1	Channel2	Channel1	Channel2
0	0				
0.1	0.1				
0.2	0.2				
0.3	0.3				
0.4	0.4				
0.5	0.5				
0.6	0.4				
0.7	0.3				
0.8	0.2				
0.9	0.1				
1	0				
1.1	-0.1				
1.2	-0.2				
1.3	-0.3				
1.4	-0.4				
1.5	-0.5				

ADC

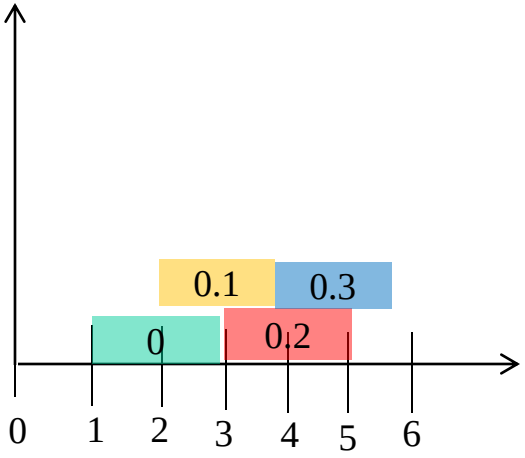


Time	Voltage	case-a		case-b	
		Channel1	Channel2	Channel1	Channel2
0	0	0	0	0	0
0.1	0.1	0	0		
0.2	0.2	0	0.1		
0.3	0.3	0.2	0.1		
0.4	0.4	0.2	0.3		
0.5	0.5		0.3		
0.6	0.4				
0.7	0.3				
0.8	0.2				
0.9	0.1				
1	0				
1.1	-0.1				
1.2	-0.2				
1.3	-0.3				
1.4	-0.4				
1.5	-0.5				

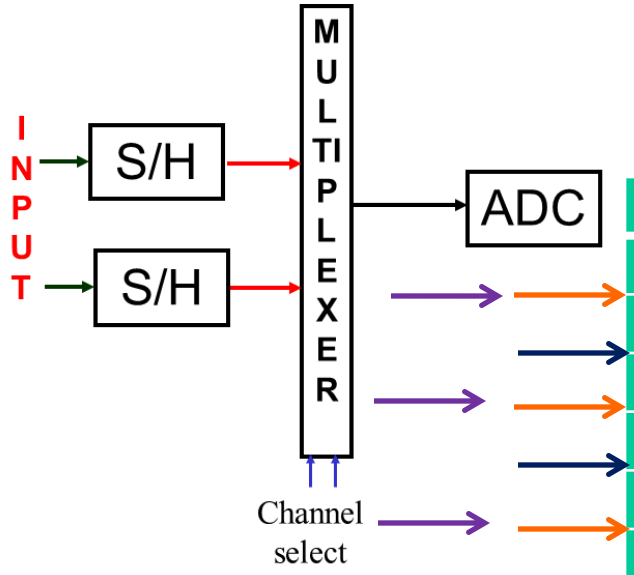
ADC



Time	Voltage	case-a		case-b	
		Channel1	Channel2	Channel1	Channel2
0	0	0	0	0	0
0.1	0.1	0	0		
0.2	0.2	0	0.1		
0.3	0.3	0.2	0.1		
0.4	0.4	0.2	0.3		
0.5	0.5		0.3		
0.6	0.4				
0.7	0.3				
0.8	0.2				
0.9	0.1				
1	0				
1.1	-0.1				
1.2	-0.2				
1.3	-0.3				
1.4	-0.4				
1.5	-0.5				



S/H Channel 1 and Channel 2



Time	Voltage	case-a		case-b	
		Channel1	Channel2	Channel1	Channel2
0	0	0	0	0	0
0.1	0.1	0	0		
0.2	0.2	0	0		
0.3	0.3	0.2	0		
0.4	0.4	0.2	0.2		
0.5	0.5	0.4	0.2		
0.6	0.4	0.4	0.4		
0.7	0.3		0.4		
0.8	0.2				
0.9	0.1				
1	0				
1.1	-0.1				
1.2	-0.2				
1.3	-0.3				
1.4	-0.4				
1.5	-0.5