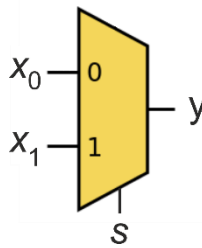


Multiplexer

A **multiplexer** (or **mux**), also known as a **data selector**, is a device that selects between digital input signals and forwards it to a single output line. A multiplexer of 2^n inputs has n select lines (s_0 to s_{n-1}), which are used to select which input line to send to the output¹⁾.

The 2-to-1 multiplexer shown below has two inputs x_0 and x_1 , a selector input s , and an output y .

Symbol	Truthtable	Function																														
	<table><tr><th>s</th><th>x₁</th><th>x₀</th><th>y</th></tr><tr><td rowspan="4">0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td></tr><tr><td rowspan="4">1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></table>	s	x ₁	x ₀	y	0	0	0	0	0	1	1	1	0	0	1	1	1	1	0	0	0	0	1	0	1	0	1	1	1	1	$\mathbb{B}^3 \rightarrow \mathbb{B}: y = \bar{s}x_0 + sx_1$
s	x ₁	x ₀	y																													
0	0	0	0																													
	0	1	1																													
	1	0	0																													
	1	1	1																													
1	0	0	0																													
	0	1	0																													
	1	0	1																													
	1	1	1																													

Property	Settings	Meaning
Size	Standard	2/4/8: 2^n ($n = 1, 2, 3$) Number of data inputs with selection lines s_0 to s_{n-1} .
Data Bits	Multi-Bit	Number of bits of each input line = Number of bits of output line
Delay	Delays	Propagation delay from each x_i and each s_i to y $t_{pd} = t_{plh} = t_{phl}$
Rejection Limit	Delays	Inertial delay for all inputs x_i All signal spikes shorter than the rejection limit are canceled. This is called pulse rejection: $t_{pd} \geq t_{inertial}$

¹⁾ <https://en.wikipedia.org>