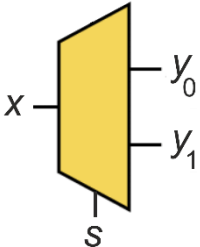


Demultiplexer

A **demultiplexer** (or **demux**), also known as a **data distributor**, is a device that takes a single input line and routes it to one of several digital output lines. A demultiplexer of 2^n outputs has n select lines, which are used to select which output line to send the input¹⁾.

The 1-to-2 demultiplexer shown below has one input x , a selector input s , and two outputs y_1 and y_0 .

Symbol	Truthtable	Function																		
	<table><tr><th>s</th><th>x</th><th>y₀</th><th>y₁</th></tr><tr><td rowspan="2">0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td></tr><tr><td rowspan="2">1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td></tr></table>	s	x	y ₀	y ₁	0	0	0	0	1	1	0	1	0	0	0	1	0	1	$\mathbb{B}^2 \rightarrow \mathbb{B}^2$: $y_0 = \bar{s}x, y_1 = sx$
s	x	y ₀	y ₁																	
0	0	0	0																	
	1	1	0																	
1	0	0	0																	
	1	0	1																	

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

¹⁾ www.electronics-course.com