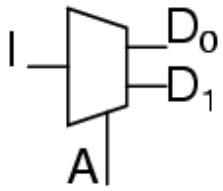
DE-MULTIPLEXER

A demultiplexer, sometimes abbreviated dmux, is a circuit that has one input and more than one output. It is used when a circuit wishes to send a signal to one of many devices. This description sounds similar to the description given for a decoder, but a decoder is used to select among many devices while a demultiplexer is used to send a signal among many devices.

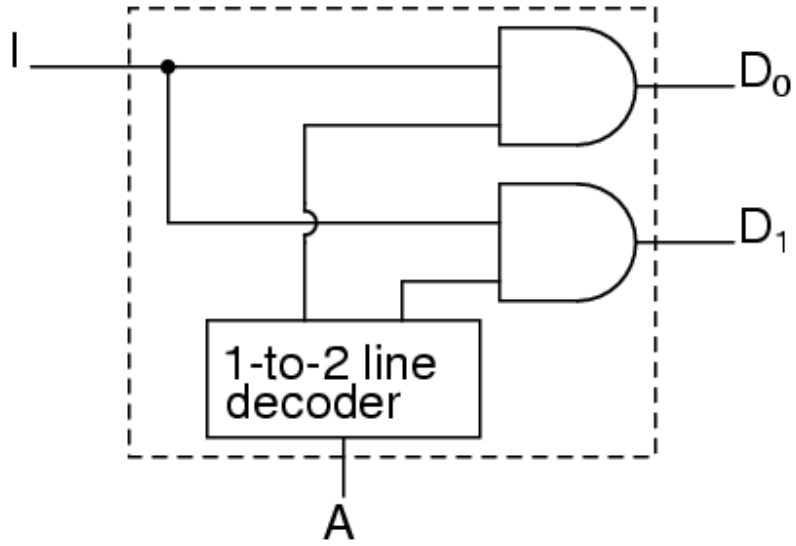
A demultiplexer is used often enough that it has its own schematic symbol

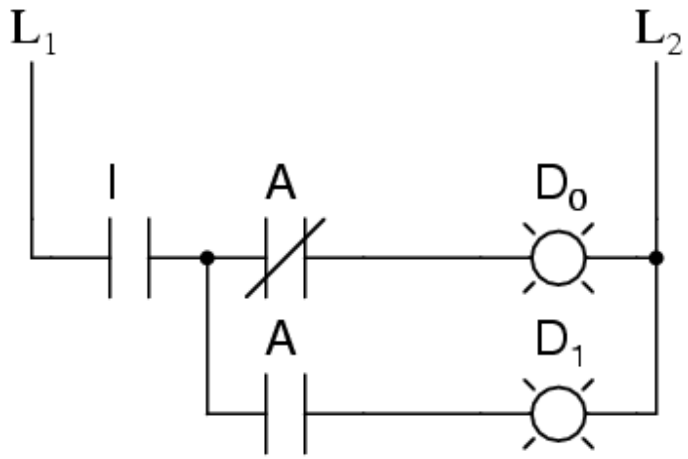


The truth table for a 1-to-2 demultiplexer is

I	A	D_0	D_1
0	0	0	0
0	1	0	0
1	0	1	0
1	1	0	1

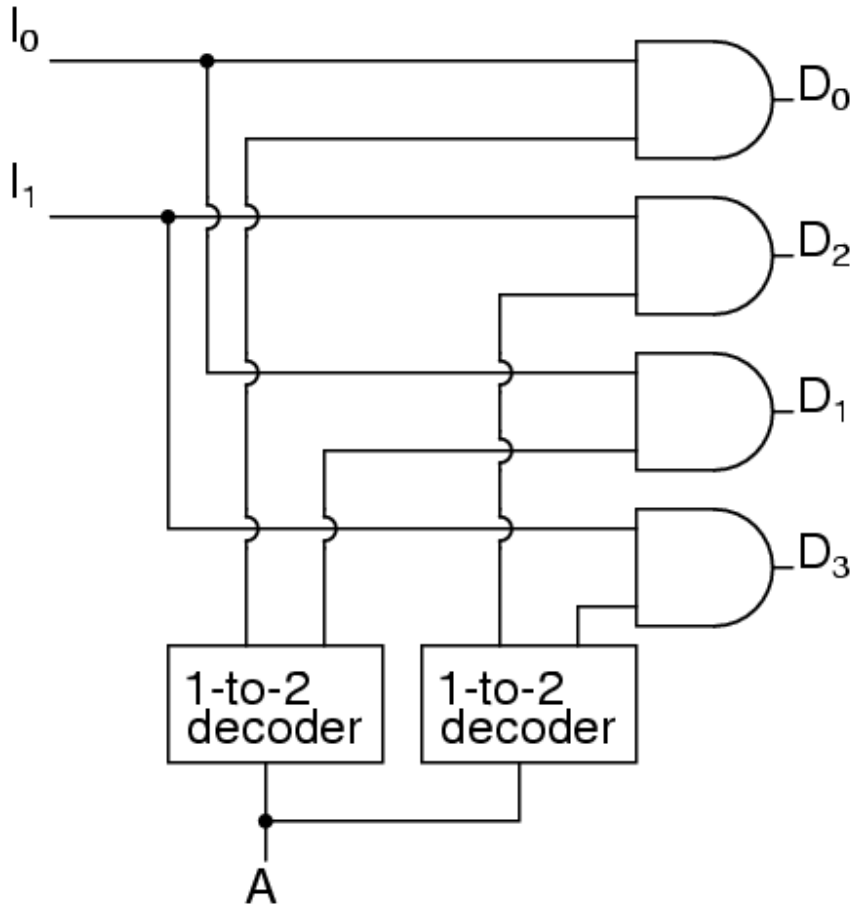
Using our 1-to-2 decoder as part of the circuit, we can express this circuit easily



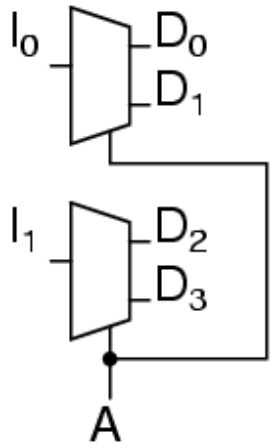


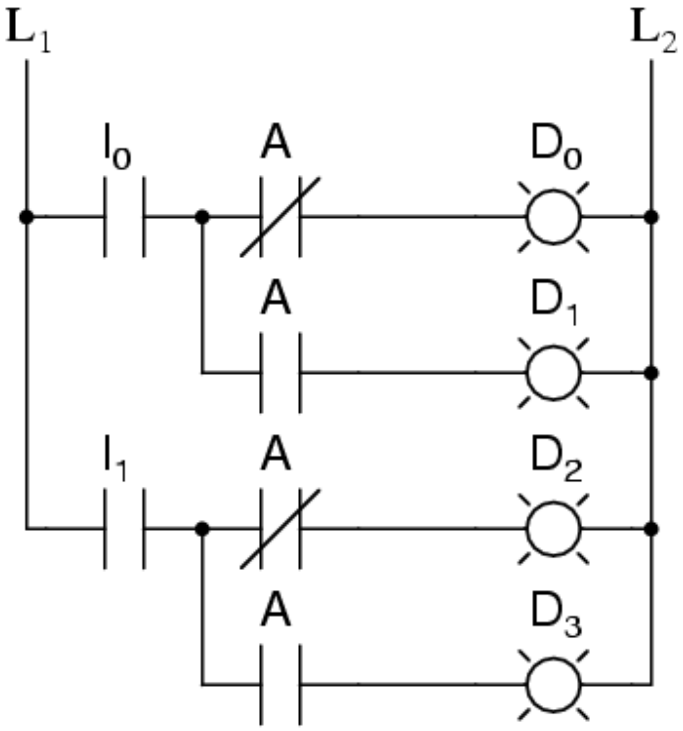
This circuit can be expanded two different ways. You can increase the number of signals that get transmitted, or you can increase the number of inputs that get passed through. To increase the number of inputs that get passed through just requires a larger line decoder. Increasing the number of signals that get transmitted is even easier.

As an example, a device that passes one set of two signals among four signals is a "two-bit 1-to-2 demultiplexer". Its circuit is



or by expressing the circuit as





shows that it could be two one-bit 1-to-2 demultiplexers without changing its expected behavior.

A 1-to-4 demultiplexer can easily be built from 1-to-2 demultiplexers as follows.