7.4 Demultiplexer

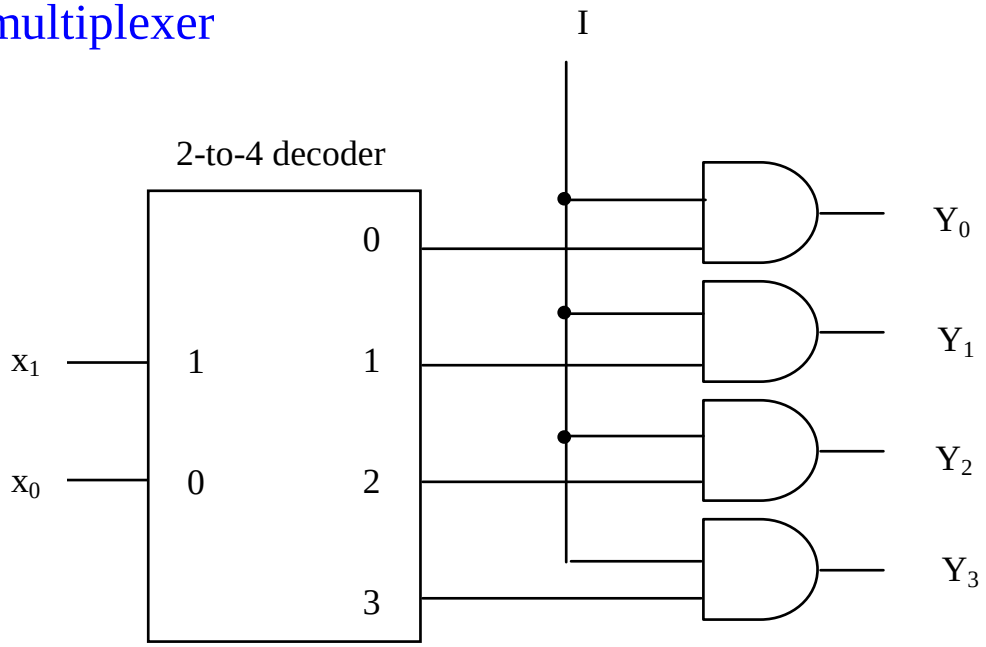


Figure 7.24 Example of a de-multiplexer.

2-to-4 decoder with enable EN (Section 7.1.4)	Demultiplexer
$D_0 = EN\ (x_1' x_0')$	$Y_0 = I\ (x_1' x_0')$
$D_1 = EN\ (x_1' x_0)$	$Y_1 = I\ (x_1' x_0)$
$D_2 = EN\ (x_1 x_0')$	$Y_2 = I\ (x_1 x_0')$
$D_3 = EN\ (x_1 x_0)$	$Y_3 = I\ (x_1 x_0)$

EN input of decoder as data input for demultiplexer

Demultiplexer with Enable

$Y_0 = I \bullet EN \bullet (x_1' x_0')$

$Y_1 = I \bullet EN \bullet (x_1' x_0)$

$Y_2 = I \bullet EN \bullet (x_1 x_0')$

$Y_3 = I \bullet EN \bullet (x_1 x_0)$

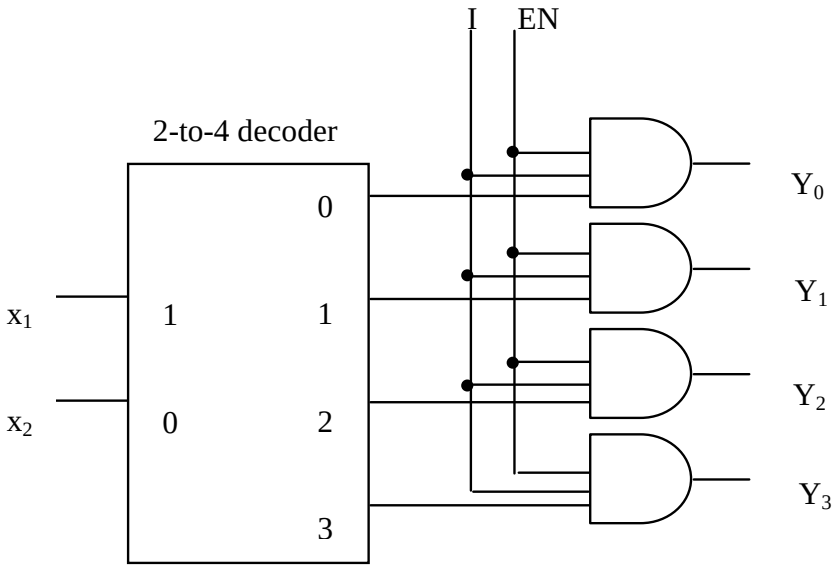


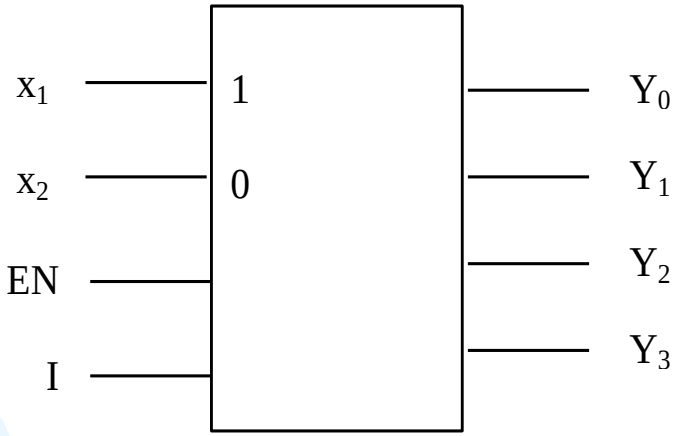
Figure 7.25 A de-multiplexer with enable input.

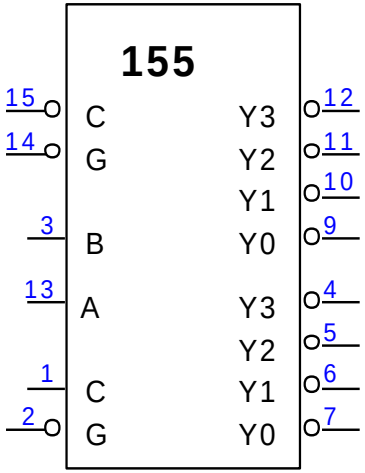
Demultiplexer with Enable

Data input: I
Control signals: x_1, x_2
Enable (Strobe): EN
Outputs: Y_0, Y_1, Y_2, Y_3

Decoder with Enable

Inputs: x_1, x_2
Enable (strobe): EN, I
Outputs: Y_0, Y_1, Y_2, Y_3





74155 Dual 2-to-4 Decoders/Demultiplexers

EN (active-high) → G (active-low)

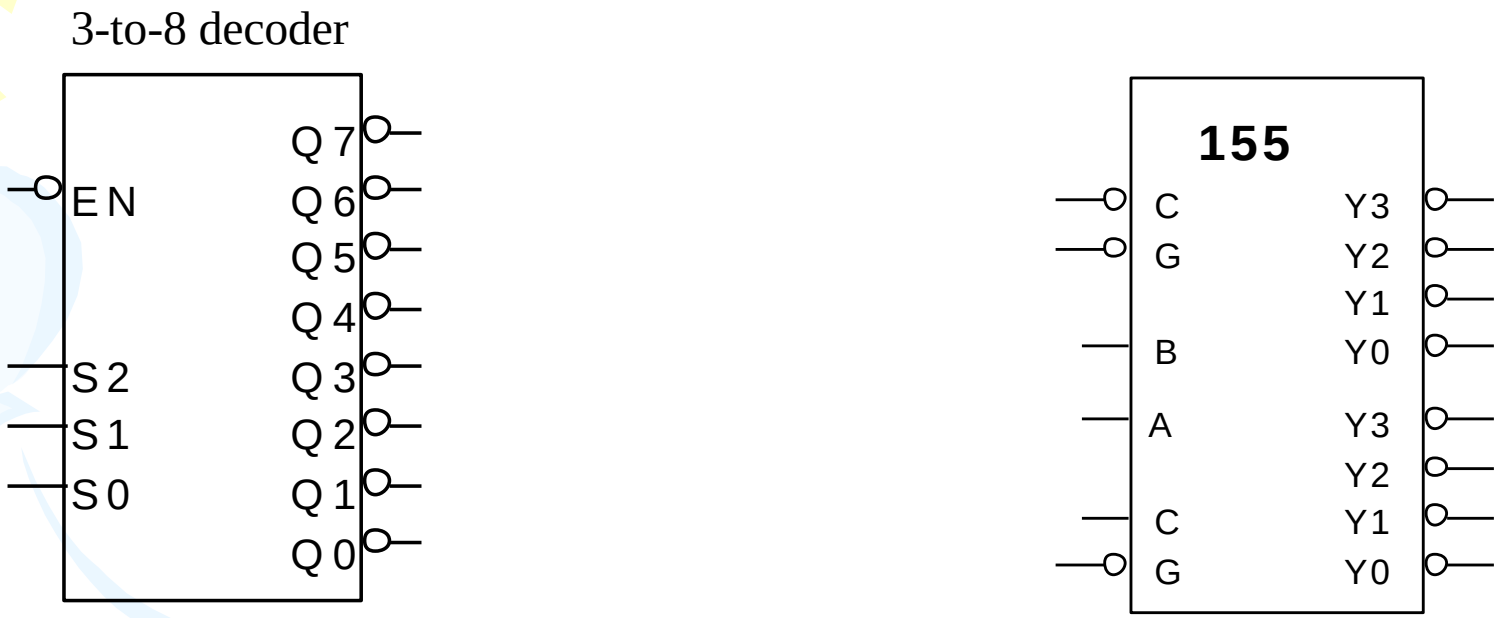
I (active-high) → C (active-low in 1), C (active-high in 2)

x_1, x_2 → B, A respectively

Active-high outputs → Active-low outputs

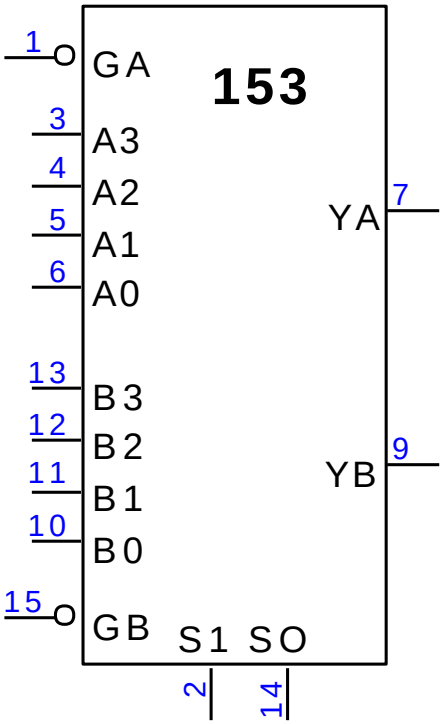
Conversion of 74155 to 3-to-8 Decoder

See Figure 7.4 for conversion.



74153 Dual 4-to-1 Multiplexer

Active-low strobe G. Active-high output.



Conversion of 74153 to 8-to-1 Multiplexer

See Figure 7.19 for conversion.