

Displays

Networks and Embedded Software

Module 4.2.2

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Indicator Lamps (1)

- Indicates information
 - Lamp itself has no information
 - Information comes from context

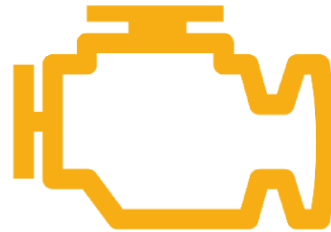


Okay



Error

Function
Indicator



Engine Malfunction
Indicator Lamp



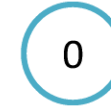
3 Third floor



2 Second floor



1 First floor

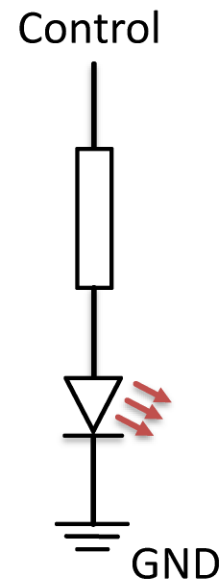


0 Basement floor

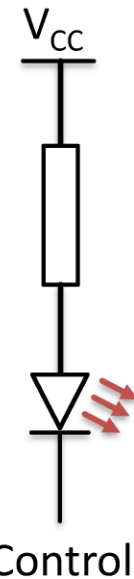
Elevator Floor
Indicator

Indicator Lamps (2)

- Light-Emitting Diodes
 - Switched on or off by control pin
 - Two operation
 - Active high (on = 1)
 - Active low (on = 0)



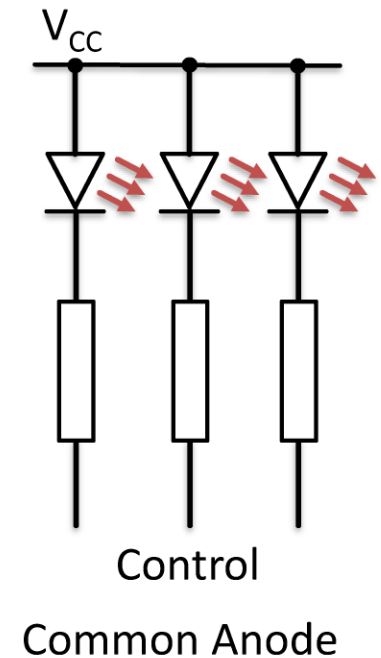
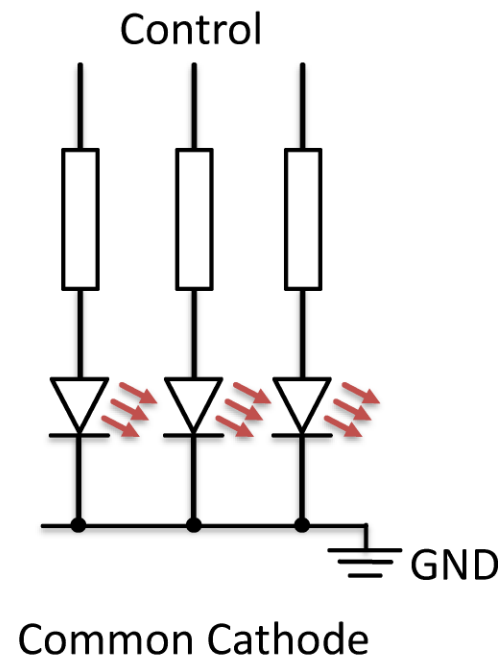
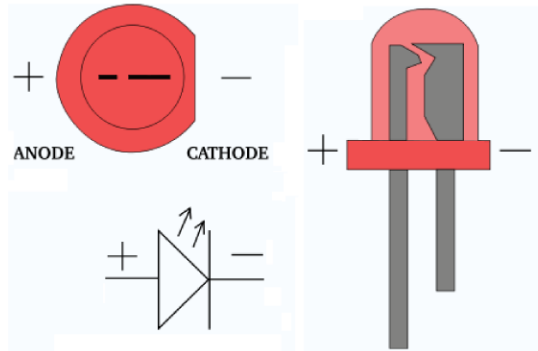
Active High LED



Active Low LED

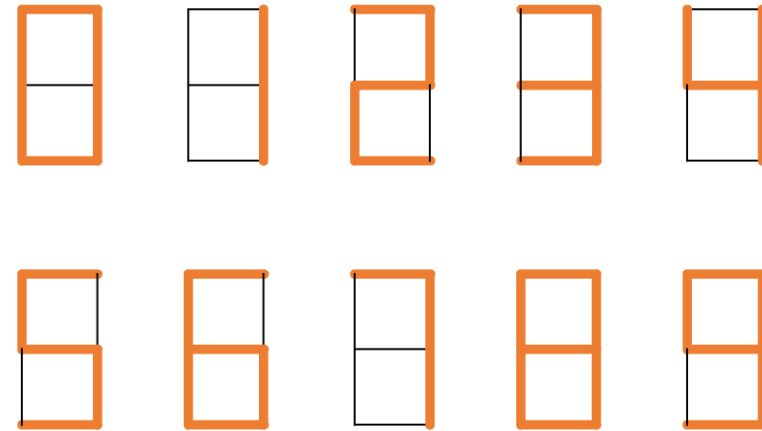
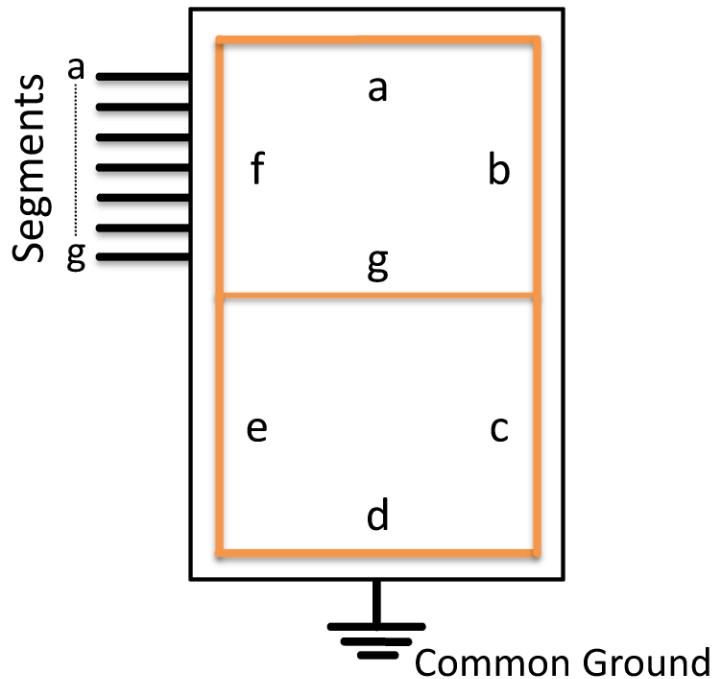
Indicator Lamps (3)

- LEDs can be combined
 - Common Cathode
 - Active High
 - Common Anode
 - Active Low



Seven-Segment Displays (1)

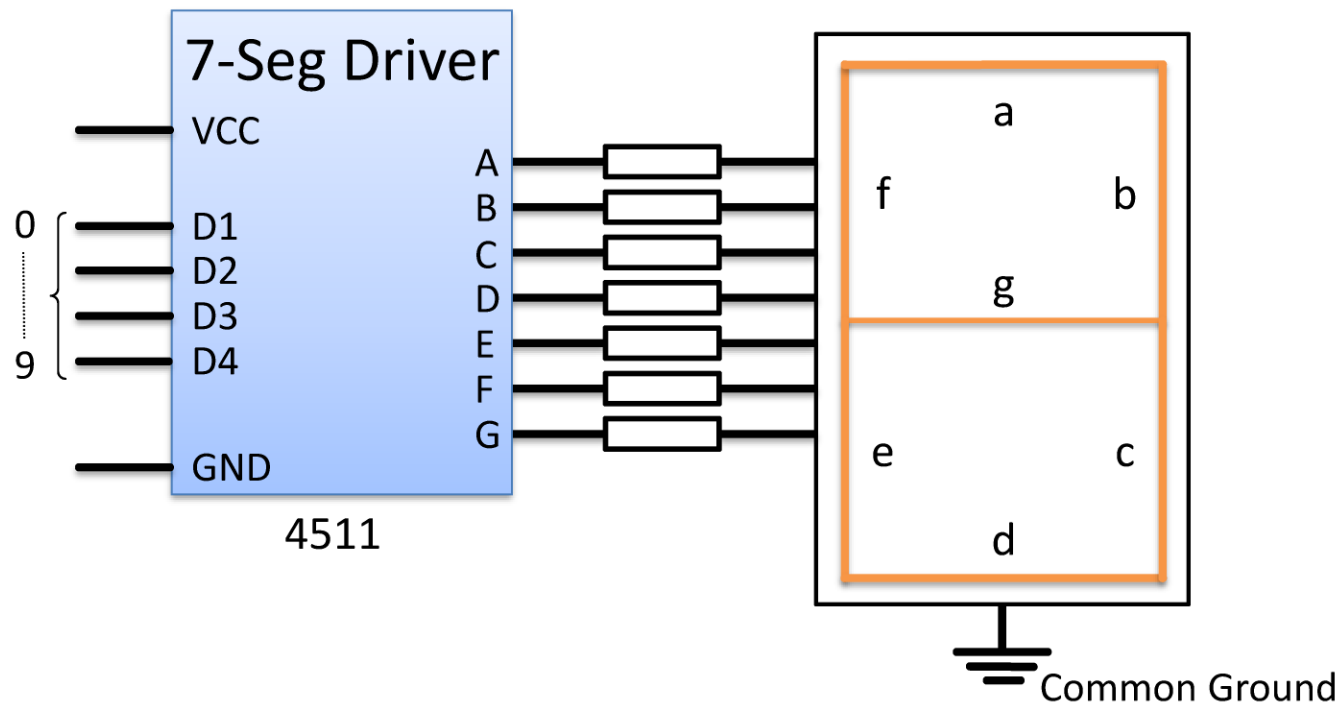
- Mode of Operation
 - Seven segments display a number



Number Representation

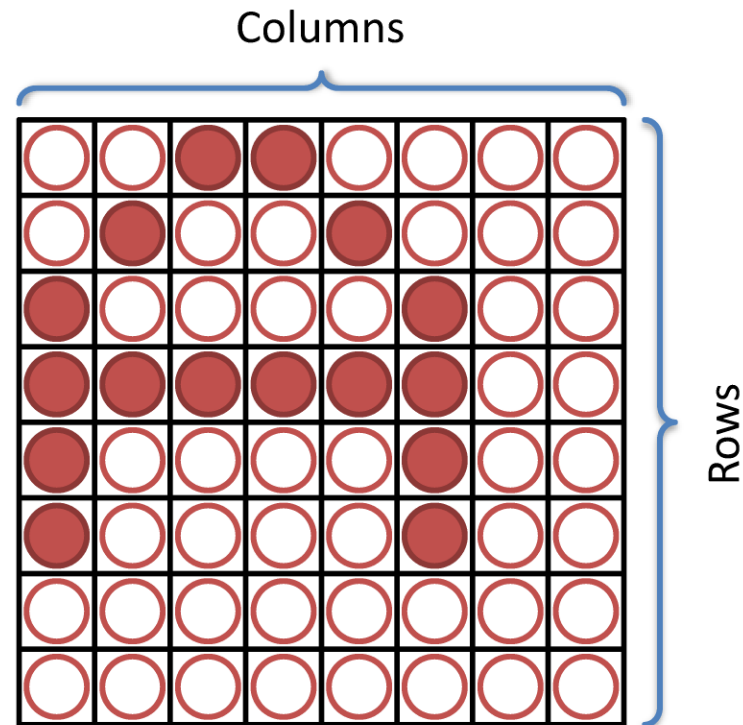
Seven-Segment Displays (2)

- Seven-Segment Driver



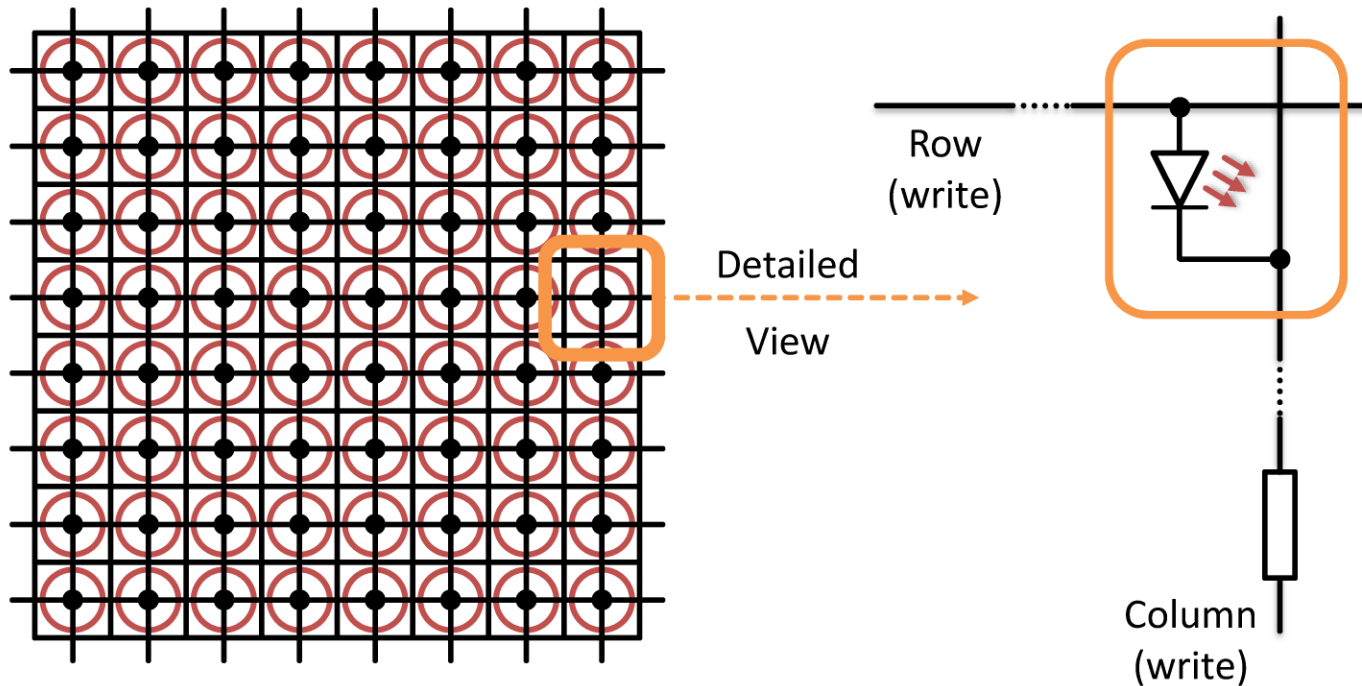
Dot-Matrix Displays (1)

- LEDs arranged in a block
 - Arranged in
 - Columns
 - Rows
 - Example
 - 8×8 dot-matrix



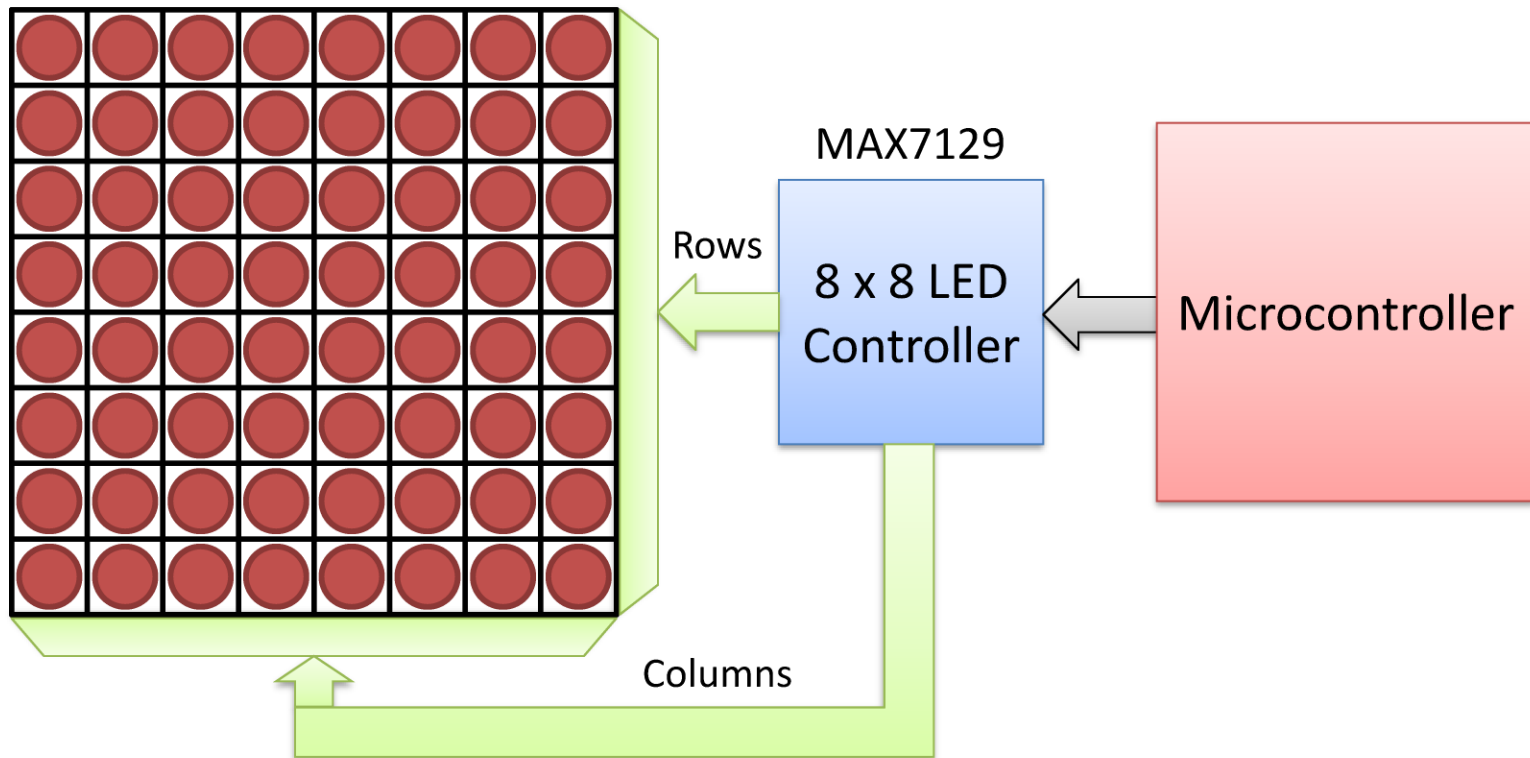
Dot-Matrix Displays (2)

- Electrical Setup



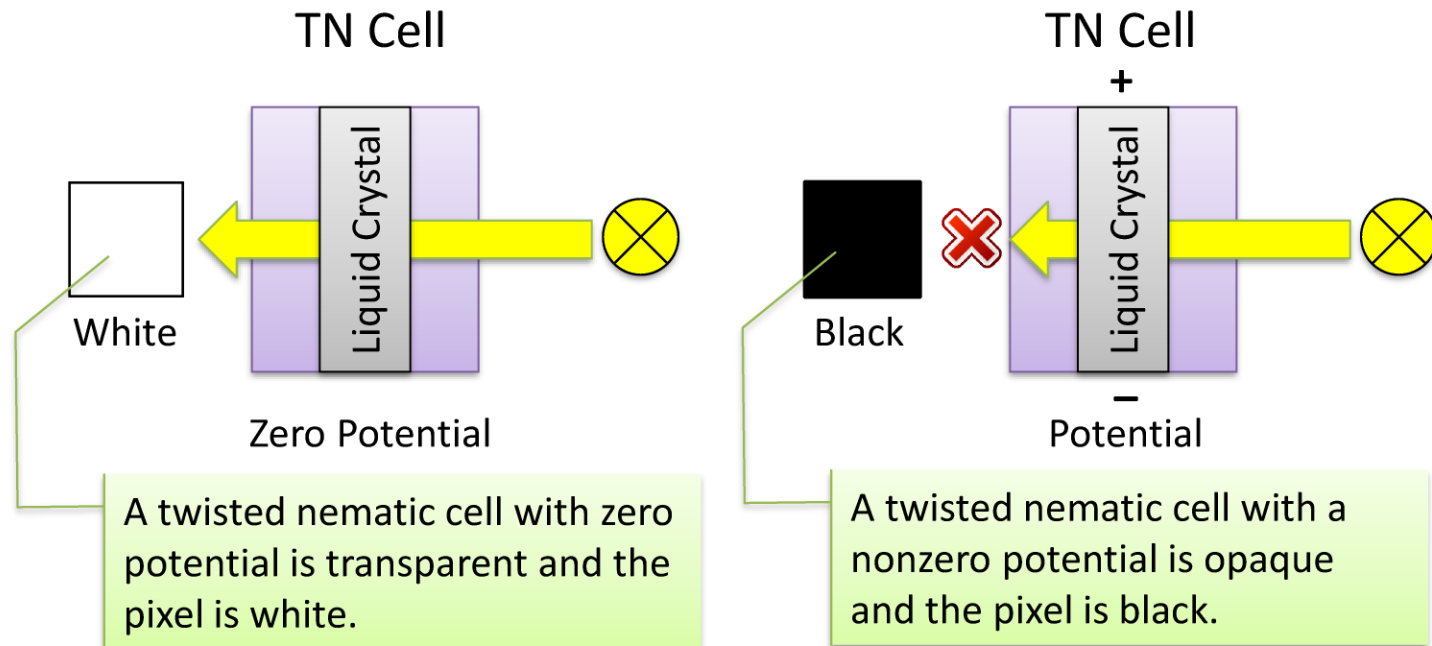
Dot-Matrix Displays (3)

- Dot-Matrix Controller



Liquid-Crystal Display (1)

- Functional Principle



Liquid-Crystal Display (2)

- LCD Controller

