

Coders and Decoders

Exercises:

1. Download the ICs datasheets needed for measurements (BCD to 7-segment decoder, BCD-Gray encoder, Gray-BCD, BCD-DEC, DEC-BCD, BCD-OCT, OCT-BCD code converters datasheets: puma.unideb.hu/~misak, <http://alldatasheet.com>).

2. Read and learn:

- number systems, operations and codes ([1], P.46-112).
- encoders, decoders, code converters ([1], P.316-331).

3. Design and implement:

- the BCD to 7-segment decoder;
- Aiken to BCD decoder;
- Gray to BCD, BCD to Gray decoders;

Write solutions to the measurement protocol! Propose IC types for problems realization! Examine the designed circuits by Tina circuit simulator! Describe circuits operation and write your experiences in measurement protocol!

4. Browse the 3rd laboratory work from laboratory handbook [2]!

5. Design the BCD to 7-segment decoder circuit (Inputs: BCD code, realized by alternating switches, the produced BCD code must be visible on breadboard 10 segment LED-bar; output: 7448 IC, 7 segment display)! Prepare the circuit diagram with IC pin marking!

6. Build the circuit! Examine its operation! Compare its practical operations with expected (planned) operation! Describe and write your experiences in measurement protocol!

BIBLIOGRAPHY

[1] Floyd T. L. Digital fundamentals. New Jersey: Pearson Prentice Hall, 2006.

[2] Szász Cs. Digital electronics basics (Laboratory handbook), Debrecen: DE MFK, 2003 (in Hungarian).

[3] Magyar B. Digital ICs (74xx series). Budapest: Műszaki Könyvkiadó, 1982 (in Hungarian).