

Lab 3 Intro

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Lab 3 Intro

- Goal: Use **Integrated Circuit (IC)** Logic in a hardware design
 - Read and understand digital logic IC **Specification Pinouts**
 - Implement, and Validate a design using digital logic ICs
 - Build the design from the schematic on the breadboard
 - Exercise the design using the AD2
 - Validate the design using your understanding of digital logic
 - Make your own pin selections and verification connections (part 2)

Lab 3 Intro

- **Integrated Circuit:**
 - Integrated circuits are complex electronic components that perform specific functions
- **IC Specification:**
 - Document that provides all the necessary information required to use an integrated circuit
 - Function
 - Connections
 - Input requirements
 - Output capabilities
 - Operating limits
- **Pinout:**
 - Integrated circuits typically have many input/output connections
 - VDD and Gnd for power
 - Multiple inputs
 - Multiple outputs
 - A pinout is a map of physical connections to logical connections
 - Pinouts are described in the associated IC specification
 - The specifications for the ICs used in this class are at the top of the lab webpage (under resources)

Lab 3 Intro

- Process
 - Collect all the required components (ICs)
 - See the [IC Package Connections](#) slides for identification information
 - Wire up the ICs using the [Lab 3 And Gate Schematic](#)
 - See the [IC Package Connections](#) slides for pin orientation information
 - Use the [Lab 3 Component Pinouts](#) slides for pinout information
 - Be sure the ICs are straddling the center spacer on the breadboard
 - Setup the AD2 to drive the inputs and measure the outputs
 - VDD from V+, Gnd from Gnd
 - Circuit inputs come from the [Patterns](#) generator (Multi-bit Patterns)
 - Follow the directions in the [Schematic Simulation via University Waveform Viewer](#) slides to setup the inputs
 - Use the AD2 connections identified in the schematic
 - Circuit outputs Connect to the [Logic](#) inputs on the DE10
 - Use the AD2 connections identified in the schematic
 - Start the AD2 [Supplies](#) and [Patterns](#)
 - View the output in the AD2 [Logic](#) window

Lab 3 Intro

- Part 2
 - Use the same process steps as part 1
but
 - You must choose your own IC pins to use
 - You must choose your own AD2 inputs and outputs to use