Macrocell Configuration

Software compilers support the three different OMC modes as different device types. Most compilers have the ability to automatically select the device type, generally based on the register usage and output enable (OE) usage. Register usage on the device forces the software to choose the registered mode. All combinatorial outputs with OE controlled by the product term will force the software to choose the complex mode. The software will choose the simple mode only when all outputs are dedicated combinatorial without OE control. The different device types can be used to override the automatic device selection by the software. For further details, refer to the compiler software manuals.

When using compiler software to configure the device, the user must pay special attention to the following restrictions in each mode.

In **registered mode** pin 1 and pin 11 are permanently configured as clock and output enable, respectively. These pins cannot be configured as dedicated inputs in the registered mode.

In **complex mode** pin 1 and pin 11 become dedicated inputs and use the feedback paths of pin 19 and pin 12 respectively. Because of this feedback path usage, pin 19 and pin 12 do not have the feedback option in this mode.

In **simple mode** all feedback paths of the output pins are routed via the adjacent pins. In doing so, the two inner most pins (pins 15 and 16) will not have the feedback option as these pins are always configured as dedicated combinatorial output.

ATF16V8B Registered Mode

PAL Device Emulation / PAL Replacement

The registered mode is used if one or more registers are required. Each macrocell can be configured as either a registered or combinatorial output or I/O, or as an input. For a registered output or I/O, the output is enabled by the OE pin, and the register is clocked by the CLK pin. Eight product terms are allocated to the sum term. For a combinatorial output or I/O, the output enable is controlled by a product term, and seven product terms are allocated to the sum term. When the macrocell is configured as an input, the output enable is permanently disabled.
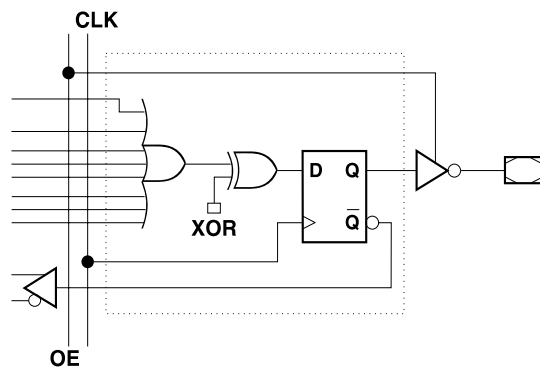
Any register usage will make the compiler select this mode. The following registered devices can be emulated using this mode:

16R8 16RP8

16R6 16RP6

16R4 16RP4

Registered Configuration for Registered Mode[1][2]

Notes: 1. Pin 1 cotrols common CLK for the registered outputs. Pin 11 controls common OE for the registered outputs. Pin 1 and Pin 11 are permanently configured as CLK and OE.
2. The development software configures all the architecture control bits and checks for proper pin usage automatically.

Combinatorial Configuration for Registered Mode[1][2]
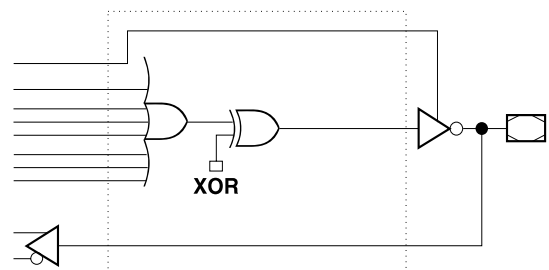
Notes: 1. Pin 1 and Pin 11 are permanently configured as CLK and OE.
2. The development software configures all the architecture control bits and checks for proper pin usage automatically.

Registered Mode Logic Diagram