**Tabelas da Unidade de Controle da ULA.**

**Ordenação bits ULActrl:**

|  |  |
| --- | --- |
| **Ordenação dos bits de Controle da ULA (ULActrl)** | **Ponto de Controle** |
| 3 (MSB) | inverteA |
| 2 | inverteB |
| 1 | Seleção bit 1 |
| 0 (LSB) | Seleção bit 0 |

**Tabela de operação da ULA MIPS DLX:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrução** **(opcode hex)** | **Opcode** **(opcode bin)** | **Funct** (**bin)** | **ULA** **Executa** | **ULActrl** **(bin)** | **ULAop** **(N bits)** |
|  | 6 bits | 6 bits |  | 4 bits |  |
|  | **31 ~ 26** | **5 ~ 0** |  | **InvA, InvB, Sel[1,0]** |  |
| **Tipo R:** |  |  |  |  |  |
| ADD (0x00) | 000000 | 100000 | (add) | 010 | 10 |
| SUB (0x00) | 000000 | 100010 | (sub) | 110 | 10 |
| AND (0x00) | 000000 | 100100 | (and) | 000 | 10 |
| OR (0x00) | 000000 | 100101 | (or) | 001 | 10 |
| SLT (0x00) | 000000 | 101010 | (slt) | 111 | 10 |
| **Tipo I:** |  |  |  |  |  |
| LW (0x23) | 100011 | 000000 | (add) | 010 | 00 |
| SW (0x2B) | 101011 | 000000 | (add) | 010 | 00 |
| BEQ (0x04) | 000100 | 000000 | (sub) | 110 | 01 |

**Tabela de operação da ULA MIPS DLX:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrução** **(opcode hex)** | **Opcode** **(opcode bin)** | **Funct** (**bin)** | **ULA** **Executa** | **ULActrl** **(bin)** | **Tipo R** |
|  | 6 bits | 6 bits |  | 4 bits |  |
|  | **31 ~ 26** | **5 ~ 0** |  | **InvA, InvB, Sel[1,0]** |  |
| **Tipo R:** |  |  |  |  |  |
| ADD (0x00) | 000000 | 100000 | (add) | 010 | 1 |
| SUB (0x00) | 000000 | 100010 | (sub) | 110 | 1 |
| AND (0x00) | 000000 | 100100 | (and) | 000 | 1 |
| OR (0x00) | 000000 | 100101 | (or) | 001 | 1 |
| SLT (0x00) | 000000 | 101010 | (slt) | 111 | 1 |
| **Tipo I:** |  |  |  |  |  |
| LW (0x23) | 100011 | 000000 | (add) | 010 | 0 |
| SW (0x2B) | 101011 | 000000 | (add) | 010 | 0 |
| BEQ (0x04) | 000100 | 000000 | (sub) | 110 | 0 |

**Tabela com o Resumo do Controle da ULA**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Instrução** **(opcode hex)** | **Tipo R** | **OpCode** | **Funct** **(6 bits)** | **ULA** **Executa** | **ULActrl** **(4 bits)** |
| LW (0x23) (I) | 0 | 100011 | 000000 | (add) | 010 |
| SW (0x2B) (I) | 0 | 101011 | 000000 | (add) | 010 |
| BEQ (0x04) (I) | 0 | 000100 | 000000 | (sub) | 110 |
| ADD (0x00) (R) | 1 | 000000 | 100000 | (add) | 010 |
| SUB (0x00) (R) | 1 | 000000 | 100010 | (sub) | 110 |
| AND (0x00) (R) | 1 | 000000 | 100100 | (and) | 000 |
| OR (0x00) (R) | 1 | 000000 | 100101 | (or) | 001 |
| SLT (0x00) (R) | 1 | 000000 | 101010 | (slt) | 111 |
| ORI (0x00) (I) | 0 | 001101 | 000000 | (or) | 001 |
| ANDI (0x00) (I) | 0 | 001100 | 000000 | (and) | 000 |
| BNE (0x00) (I) | 0 | 000101 | 000000 | (sub) | 110 |
| SLTI(0x00) (I) | 0 | 001010 | 000000 | (slt) | 111 |
| JR (0x00) (R) | 1 | 000000 | 001000 | - | 000 |
| ADDI (0x00) (I) | 0 | 001000 | 000000 | (add) | 010 |