



| Boolean Signals | |
|-----------------|------------|
| LD.MAR | GateMARMUX |
| LD.MDR | GateMDR |
| LD.REG | GatePC |
| LD.CC | GateALU |
| LD.PC | LD.IR |
| MEM.EN | |

| MUX Name | Possible Values |
|----------|--------------------------------------|
| ALUK | ADD, AND, NOT, PASSA |
| ADDR1MUX | PC, BaseR |
| ADDR2MUX | ZERO, offset6, PCOffset9, PCOffset11 |
| PCMUX | PC+1, ADDER, BUS |
| MARMUX | ZEXT, ADDER |
| SR2MUX | SR2, SEXT |
| R.W | R, W |

CS2110 Reference Sheet

| | | | | | | | | | | | | | | | | |
|------------|------|----|----|----|----|----|---|-----|---|---|---|------|---|-----|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| ADD | 0001 | | | | DR | | | SR1 | | | 0 | 00 | | SR2 | | |
| ADD | 0001 | | | | DR | | | SR1 | | | 1 | imm5 | | | | |

| | | | | | | | | | | | | | | | | |
|------------|------|----|----|----|----|----|---|-----|---|---|---|------|---|-----|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| AND | 0101 | | | | DR | | | SR1 | | | 0 | 00 | | SR2 | | |
| AND | 0101 | | | | DR | | | SR1 | | | 1 | imm5 | | | | |

| | | | | | | | | | | | | | | | | |
|------------|------|----|----|----|----|----|---|----|---|---|--------|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| NOT | 1001 | | | | DR | | | SR | | | 111111 | | | | | |

| | | | | | | | | | | | | | | | | |
|-----------|------|----|----|----|----|----|---|-----------|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| BR | 0000 | | | | N | Z | P | PCoffset9 | | | | | | | | |

| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------|------|----|----|----|-----|------------|---|-------|---|---|--------|---|---|---|---|---|
| JMP | 1100 | | | | 000 | | | BaseR | | | 000000 | | | | | |
| JSR | 0100 | | | | 1 | PCOffset11 | | | | | | | | | | |
| JSRR | 0100 | | | | 0 | 00 | | BaseR | | | 000000 | | | | | |

| | | | | | | | | | | | | | | | | |
|------------|------|----|----|----|----|----|---|-----------|---|---|---------|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| LD | 0010 | | | | DR | | | PCoffset9 | | | | | | | | |
| LDI | 1010 | | | | DR | | | PCoffset9 | | | | | | | | |
| LDR | 0110 | | | | DR | | | BaseR | | | offset6 | | | | | |
| LEA | 1110 | | | | DR | | | PCoffset9 | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|------------|------|----|----|----|----|----|---|-----------|---|---|---------|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| ST | 0011 | | | | SR | | | PCoffset9 | | | | | | | | |
| STI | 1011 | | | | SR | | | PCoffset9 | | | | | | | | |
| STR | 0111 | | | | SR | | | BaseR | | | offset6 | | | | | |

| | | | | | | | | | | | | | | | | |
|-------------|------|----|----|----|------|----|---|-----------|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| TRAP | 1111 | | | | 0000 | | | trapvect8 | | | | | | | | |

| Trap Vector | Assembler Name |
|-------------|----------------|
| x20 | GETC |
| x21 | OUT |
| x22 | PUTS |
| x23 | IN |
| x25 | HALT |

| Device Register | Addr |
|--------------------|-------|
| Keybd Status Reg | xFE00 |
| Keybd Data Reg | xFE02 |
| Display Status Reg | xFE04 |
| Display Data Reg | xFE06 |