INST=PM[PC]

OFF=SEXT16(INST[11:0])

OFF=Z? SEXT16(INST[9:3]):0

REG=1, INST[7:4]

REG=INST[8:4]

VAL1=RF[REG]

ADDR=RF[26], RF[27]

VAL=INST[11:8], INST[3:0]

REG2=INST[9], INST[3:0]

VAL2=RF[REG2]

VAL=VAL1

VAL2=INST[11:8], INST[3:0]

VAL=VAL1 - VAL2

VAL=VAL1 + VAL2

Update SREG

VAL=OFF + PC

PC=VAL

RF[REG] = VAL

PC = PC + 1

VAL = RAM[ADDR]

RAM[ADDR] = VAL

rjmp

breq

ld, subi, cpi

ld, st, add, sub, cp

rjmp

breq

ldi, subi, cpi

ld, st

add, sub, cp

subi, cpi

sub, cp

add

st

ld

add

st

-fetch

decode

execute

memory

write back

SEXT16: sign extend to 16 bits
Note that this MUX ALONE selects the bottom value when select line is 0 and TOP value when select line is 1. The reason is I overlooked it when drawing all the diagrams and its too much work to go fix it.