



Instruction Set

Version: 0.5.0

Total Instructions Supported: 73

Operand Size: Up to 2 operands, each of 64-bits



Operand Types

Instructions in SASM accept a variety of operand types:

??? example "Immediate Values"

```
0, 1, 2, 3
```

??? example "Constants"

```
M, N, 0, P
```

??? example "Registers"

```
L0, L1, L2, L3
```



Register Dereferencing

SASM registers are identified by **unique IDs**. Each register can be accessed either as a **reference** or as a **value** using *compile-time functions*.

```
ref(L1) ; reference to register L1  
val(L1) ; value stored in register L1
```

These are **compile-time functions** that tell the assembler how to interpret operands.



Related References

- [Compile-time Functions](#)
- [Register Reference](#)

Instruction Set - Quick Reference

=== "ARITHMETIC"

=== "INTEGER"

OPCODE	INST
13	[ADDI](Arithmetic/Addition.md#__tabbed_1_1)
14	[SUBI](Arithmetic/Subtraction.md#__tabbed_1_1)
15	[MULI](Arithmetic/Multiplication.md#__tabbed_1_1)
16	[DIVI](Arithmetic/Division.md#__tabbed_1_1)
17	[MODI](Arithmetic/Modulus.md#__tabbed_1_1)

=== "UNSIGNED"

OPCODE	INST
18	[ADDU](Arithmetic/Addition.md#__tabbed_2_1)
19	[SUBU](Arithmetic/Subtraction.md#__tabbed_2_1)
20	[MULU](Arithmetic/Multiplication.md#__tabbed_2_1)
21	[DIVU](Arithmetic/Division.md#__tabbed_2_1)
22	[MODU](Arithmetic/Modulus.md#__tabbed_2_1)

=== "FLOAT"

OPCODE	INST
23	[ADDF](Arithmetic/Addition.md#__tabbed_3_1)
24	[SUBF](Arithmetic/Subtraction.md#__tabbed_3_1)
25	[MULF](Arithmetic/Multiplication.md#__tabbed_3_1)
26	[DIVF](Arithmetic/Division.md#__tabbed_3_1)

=== "UNDOCUMENTED"

=== "RELATIONAL"

=== "INTEGER"

OPCODE	INST
35	[EQI](reference/missing)
36	[GEI](reference/missing)
37	[GTI](reference/missing)
38	[LEI](reference/missing)
39	[LTI](reference/missing)
40	[NEI](reference/missing)

=== "UNSIGNED"

OPCODE	INST
--------	------

	OPCODE	INST
	----	-----
41	[EQU]	(reference/missing)
42	[GEU]	(reference/missing)
43	[GTU]	(reference/missing)
44	[LEU]	(reference/missing)
45	[LTU]	(reference/missing)
46	[NEU]	(reference/missing)

=== "FLOAT"

	OPCODE	INST
	----	-----
47	[EQF]	(reference/missing)
48	[GEF]	(reference/missing)
49	[GTF]	(reference/missing)
50	[LEF]	(reference/missing)
51	[LTF]	(reference/missing)
52	[NEF]	(reference/missing)

=== "TYPE CASTING"

	OPCODE	INST
	----	-----
57	[I2F]	(reference/missing)
58	[U2F]	(reference/missing)
59	[F2I]	(reference/missing)
60	[F2U]	(reference/missing)

=== "MEMORY ACCESS"

	OPCODE	INST
	----	-----
61	[READ1U]	(reference/missing)
62	[READ2U]	(reference/missing)
63	[READ4U]	(reference/missing)
64	[READ8U]	(reference/missing)
65	[READ1I]	(reference/missing)
66	[READ2I]	(reference/missing)
67	[READ4I]	(reference/missing)
68	[READ8I]	(reference/missing)
69	[WRITE1]	(reference/missing)
70	[WRITE2]	(reference/missing)
71	[WRITE4]	(reference/missing)
72	[WRITE8]	(reference/missing)

=== "SEQUENCE CONTROL"

	OPCODE	INST
	----	-----
1	[INVOK]	(reference/missing)
2	[RETVL]	(reference/missing)
8	[CALL]	(reference/missing)
9	[LOOP]	(reference/missing)

```
| **27** | [JMPU](reference/missing) |
| **28** | [JMPC](reference/missing) |
| **33** | [RET](reference/missing) |
```

=== "BINARY OPERATIONS"

```
| OPCODE | INST |
|-----|-----|
| **34** | [NOT](reference/missing) |
| **53** | [ORB](reference/missing) |
| **54** | [XOR](reference/missing) |
| **55** | [SHR](reference/missing) |
| **56** | [SHL](reference/missing) |
| **29** | [ANDB](reference/missing) |
| **30** | [NOTB](reference/missing) |
```

=== "MISC"

```
| OPCODE | INST |
|-----|-----|
| **0**  | [DONOP](reference/missing) |
| **3**  | [PUSHR](reference/missing) |
| **4**  | [SOPR](reference/missing) |
| **5**  | [SHUTS](reference/missing) |
| **6**  | [SETR](reference/missing) |
| **7**  | [GETR](reference/missing) |
| **10** | [PUSH](reference/missing) |
| **11** | [SPOP](reference/missing) |
| **12** | [SWAP](reference/missing) |
| **31** | [COPY](reference/missing) |
| **32** | [DUPS](reference/missing) |
```

INSTRUCTION DOCUMENTATION TEMPLATE:

[*OPCODE*] — [*OPERATION*] {#[*OPCODE*]}

=== "[*OPCODE*] Example"

```
```linenums="1" hl_lines="1 3 5"
```

```
```
```

=== "[*OPCODE*] Properties"

| Opcode | Operand Type | Destination |
|--------|--------------|---------------|
| 00 | 64-bit Value | L_ (implicit) |

Identified as mnemonic `#[OPCODE](#[OPCODE])`, `[OPCODE]` is used to