🧠 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, O, 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 DOCUMENTATION TEMPLATE:

??? abstract "[MEMONIC] — *[Operation]*"

```
=== "Properties"

    | Property        | Value                       |
    |-----------------|-----------------------------|
    | **Opcode**      |      |
    | **Type**        |      |
    | **Operand Type**|      |
    | **Destination** |      |

=== "Algorithm"

    ```
    [ALGO]
    ```

=== "Example"

    ```
        [EXAMPLE]
    ```
```

INSTRUCTIONS NOT DOCUMENTED:

```
INST_DONOP,
INST_INVOK,
INST_RETVL,
INST_PUSHR,
INST_SPOPR,
INST_SHUTS,
INST_SETR,
INST_GETR,
INST_CALL,
INST_LOOP,
INST_PUSH,
INST_SPOP,
INST_SWAP,

INST_JMPU,
INST_JMPC,
INST_ANDB,
INST_NOTB,
INST_COPY,
INST_DUPS,
INST_RET,
INST_NOT,
INST_EQI,
INST_GEI,
```

```
  INST_GTI,
  INST_LEI,
  INST_LTI,
  INST_NEI,
  INST_EQU,
  INST_GEU,
  INST_GTU,
  INST_LEU,
  INST_LTU,
  INST_NEU,
  INST_EQF,
  INST_GEF,
  INST_GTF,
  INST_LEF,
  INST_LTF,
  INST_NEF,
  INST_ORB,
  INST_XOR,
  INST_SHR,
  INST_SHL,
  INST_I2F,
  INST_U2F,
  INST_F2I,
  INST_F2U,
  INST_READ1U,
  INST_READ2U,
  INST_READ4U,
  INST_READ8U,
  INST_READ1I,
  INST_READ2I,
  INST_READ4I,
  INST_READ8I,
  INST_WRITE1,
  INST_WRITE2,
  INST_WRITE4,
  INST_WRITE8,
```