

DataIO UniSite 82S100 Dumping V1.00

DataIO UniSite Programmable Logic Binary Format

The DataIO File Operations->Save File function outputs a binary file. The UniSite User Manual has some notes about using this raw format with logic devices:

“Note: The More/File Operations/Load File command is a transfer for an absolute binary format. The programmer must receive a JEDEC format for logic devices.”

“A saved file is stored in RAM Image Binary format. If you want to store a file in some other format, use the Transfer Data/Output to Disk command.”

That said, the programmer doesn't prohibit the Save File of a logic device in RIB format and in the simple case of a read & save of an 82S100 the resulting format is as follows:

<u>Byte Offset</u>	<u>:</u>	<u>Description</u>
0 ... 3	:	<4 bytes, 32-bit number, matches file size, 250>
4 ... 7	:	<4 bytes, 32-bit number, matches file size, 250>
8 ... 248	:	<fuse map>
249	:	<1 byte, NULL 0x00 terminator>

MAME Programmable Logic Binary Format

The logic device binary format used in MAME is documented in the source code for Jedutil:

<u>Byte Offset</u>	<u>:</u>	<u>Description</u>
0 ... 3	:	<4 bytes, 32-bit number, number of fuses, 1928>
4 ... 244	:	<fuse map>

Dumping Using JEDEC File Transfer

The resulting UniSite V5.80 “standard” JEDEC output from the 82S100 read does not match the MAME JEDEC output from Jedutil and the conversion of the Data IO JEDEC file to MAME binary format yields incorrect data. The DataIO fuse map for the 82S100 is documented on page 43 of the “981-0251_ProgrammableLogicDiagramPackage_Sep90” manual for which the general layout of the fuse map matches Jedutil but the none-inverting/inverting “I” inputs are swapped (i.e., I0 & ~I0, I1 & ~I1 etc.) as highlighted in the diagram below. It's not known why the DataIO dump is swapped.

There is a hack of MAME's Jedutil to perform this transformation available:

<https://github.com/prswan/arduino-mega-ict/blob/47f0c2b90bdee2b3790468ef90444a05343afe8e/utilities/82S100/jedparse.cpp#L176>

```
for ( ; cursrc < srcend; cursrc++)
    if (*cursrc == '0' || *cursrc == '1')
    {
        uint32_t jedcurfuse = curfuse;

        /* Special handling to correct the fuse order from the
        DataIO UnitSite read of an 82S100. The fuse order
        translation is 01234567 => 10325476 applied to the
        AND matrix block (4 bytes of 5). Thus, the lower
        bit of the fuse address is inverted.

        0000000E: A5 5A
        0000000F: FE FD
        00000013: A9 56
        00000014: FD FE
        00000018: A6 59
        */
        if (data->dataio_swap)
        {
            if ((jedcurfuse < 1920) &&
                ((jedcurfuse % 40) < 32))
            {
                jedcurfuse = curfuse & ~0x1UL;
                jedcurfuse |= (curfuse & 0x1) ^ 1;
            }
        }

        jed_set_fuse(data, jedcurfuse, *cursrc - '0');
        if (LOG_PARSE) printf(" fuse %u = %d\n", curfuse, 0);
        if (curfuse >= data->numfuses)
            data->numfuses = curfuse + 1;
        curfuse++;
    }
}
```

Reference Data I/O Dump of Zaccaria Cat'n Mouse IC 10M

Data I/O*

```
QP0028* QF1928* G0 *
L0000
111111110111111101001111111111
11011010111111110111111101101011
111111110111011111111111111111
01100111101111110010010011111111
111111110011011111111111110110
111111110111111100101111111111
01101101111111111111111101011011
111111100111011111111111111111
01010111111111110000000011111111
1111111011001110111101010110100*
L0320
1111111111111111011001110110110
0100100111111111111111101100111
011110010010010111111111111111
01100111011101010010010011111111
11101111101010111111111101101101
11111111111101110101011111111111
1111011011111111111111010101011
1111111110110111010111111010101
1010100111111110110110100000000
000000000000000000000000000000*
L0640
11111111111111111111111111111111
11111111111111111111111111111111
11111111111111111111111111111111
11111111111111111111111111111111
11111111111111111111111111111111
11111111111111111111111111111111
11111111111111111111111111111111
11111111111111000000000000000000
00000000000000000000000000000000
000000000000000000000000000000*
L0960
01101001110101011010101111111111
01001001100110011101010110101011
111111100100100101100111010101
1010101111111101101101100101
1101010110101011111111100100100
100101011101010110101111111111
110110110101011101010110101011
11111111011011000000000000000000
00000000000000000000000000000000
000000000000000000000000000000*
L1280
01101010110101011010101111111111
110110111001101011010110101011
1111111011010101010101011010101
101010111111110010010001100110
1101010110101011111111100100100
100101011010101101011111111111
01001001010101101010110101011
11111111100110000000000000000000
00000000000000000000000000000000
000000000000000000000000000000*
L1600
11111110111111110100111111111111
0100100111111110111111101101011
11111110110101011111111111111111
11111111111111111111111111111111
011111110010111111111111011011
00000000000000000000000000000000
00000000000000000000000000000000
00000000000000000000000000000000
00000000000000000000000000000000
000000000000000000000000000000*
L1920
00000000*
C9834*
```

Reference MAME Dump of Zaccaria Cat'n Mouse IC 10M

JEDEC file generated by jedutil*

QF1928*

F1*

L00000 111111101111110101101111111111*
L00032 1101101011111110111111110010111*
L00064 111111110111011111111111111111*
L00096 10011011011111110010010011111111*
L00128 1111111011001111111111111110110*
L00160 111111101111111011010111111111*
L00192 011011011111111111111110100111*
L00224 111111110011110111111111111111*
L00256 101010111111111000000001111111*
L00288 1111111100110111011010110110100*
L00320 111111111111111001101110111001*
L00352 010010011111111111111110011011*
L00384 101101100010010111111111111111*
L00416 10011011101110100010010011111111*
L00448 1101111101010111111111101101101*
L00480 111111111110111010101111111111*
L00512 1111011011111111111111101010111*
L00544 111111111011011010111111101010*
L00576 0101011011111111011011010000000*
L00608 0000000000000000000000000000000*
L00640 111111111111111000000000000000*
L00672 000000000000000000000000000000*
L00704 000000000000000000000000000000*
L00736 000000000000000000000000000000*
L00768 10010110111101010010101111111111*
L00800 0100100101100110111010100101011*
L00832 11111111001001001010011011101010*
L00864 01010111111111110110110110011010*
L00896 1110101001010111111111100100100*
L00928 011010101110101001010111111111*
L00960 1101101110101010111010100101011*
L00992 111111110110110000000000000000*
L01024 111111110110110110000000000000*
L01056 01010111111111110110110110011010*
L01088 1110101001010111111111100100100*
L01120 011010101110101001010111111111*
L01152 1101101110101010111010100101011*
L01184 1111111110110110000000000000000*
L01216 000000000000000000000000000000*
L01248 000000000000000000000000000000*
L01280 100101011110101001010111111111*
L01312 1101101101100101111010100101011*
L01344 11111111011011011010010111101010*
L01376 0101011111111110010010010011001*
L01408 1110101001010111111111100100100*
L01440 011010011110101001010111111111*
L01472 0100100110101001111010100101011*
L01504 111111111001100000000000000000*
L01536 000000000000000000000000000000*
L01568 000000000000000000000000000000*
L01600 111111110111111010110111111111*
L01632 0100100111111111011111110010111*
L01664 111111101101101111111111111111*
L01728 1011111101101011111111111011011*
L01760 000000000000000000000000000000*
L01792 000000000000000000000000000000*
L01824 000000000000000000000000000000*
L01856 000000000000000000000000000000*
L01888 000000000000000000000000000000*
L01920 00000000*

C94EE*