**Interfacing without an Arduino**

It is possible to interface with the nixie driver without using our Arduino library, by simply treating the Nixie driver as a 65-bit shift register. The shift register's 65 bits are made up by the two 32-bit shift registers, and the data output of the 2nd shift register providing an extra bit.

In the nixie driver, there is a single bit allocated to each number: shifting a '1' into this bit will cause the number to be displayed, and shifting a '0' will cause it to be blanked. The order of the numbers is 1->9 followed by 0, from the left to the right, with the leftmost '1' occupying the MSB. The final 5 bits are the 5 decimal points, from left to right.

So for example, the following binary sequence will output '5.4.3.2.1.0':

1st Digit: '5'| 2nd Digit: '4' | 3rd Digit: '3' | 4th Digit: '2' | 5th Digit: '1' | 6th Digit: '0' | Decimal Points

0000100000 0001000000 0010000000 0100000000 1000000000 0000000001 11111

Once the correct binary sequence is generated, it will need to be shifted out, with the LSB first. This is done by padding the sequence with 7 '0's and then shifting out in bytes, so the above becomes:

00001000 00000100 00000010 00000001 00000000 10000000 00000000 00011111 10000000

This becomes (in hexadecimal):

0x08 0x04 0x02 0x01 0x00 0x80 0x00 0x1F 0x80

This can then be shifted out to the Nixie Driver using standard commands.

Example 02 – '-3.1416':

'-' is the 9th Digit of an IN15A, therefore will be replaced with '9'. The decimal point is before the number, so will be needed on digit 3.

1st Digit: '-'| 2nd Digit: '3' | 3rd Digit: '1' | 4th Digit: '4' | 5th Digit: '1' | 6th Digit: '6' | Decimal Points

0000000010 0010000000 1000000000 0001000000 1000000000 0000010000 00100

In binary:

00000000 10001000 00001000 00000000 01000000 10000000 00000001 00000010 00000000

In Hex:

0x00 0x88 0x08 0x00 0x40 0x80 0x01 0x02 0x00