Hex Description

HEX0 (address 0x04): The HEX0 register is used to write values and settings to the right-side of the display. When the full display override is disables, this register controls digits 0-3 (rightmost four displays). However, if the override bit is enabled, writing to this register will update all six displays. The data written to HEX0 includes the mode bits (bits[15:14]), the full display override bit (bit[13]), and the value to be displayed ([12:0]).

In Full Control Mode, bits [13:11] indicate which digit (0-5) is to be controlled, and SEG_ENCODE[6:0] specifies which segments are active on that digit (a-g). This allows individual segment control. Only one digit can be written per instruction in this mode unless the full override is active.

HEX1 (address 0x05): The HEX1 register operates similarly to HEX0, but when full display override is disabled, it only affects digits 4-5 (leftmost two displays). This allows segmented control between the left and right display clusters. Like HEX0, it supports all four display modes. Writes to this register follow the same format: mode selection([15:14]), override bit ([13]), and either value or display/segment control information depending on the mode.

In Full Control Mode, writing to HEX1 with override disabled will only affect the leftmost two digits. If override is enabled, writing to HEX1 will also update all six digits, just like HEX0.

Mode: This bit controls with display mode we are in: “00” for Hexadecimal, “10” for Binary, “01” for Decimal, or “11” for Full Control.

full_disp_override_s: Whether to use all 6 segments, or 4/2 segment. If it is ever 1, regardless of whether it is in HEX0 or HEX1, it will write to all 6 displays. If it is HEX0 and this is 0, it will write to the right 4 displays, and if it is HEX1 and it is 0 it will write to the left 2 displays.

VALUE[12:0] : the numerical value of that will actually be displayed on the displays. Its interpretation depends on the selected mode. For hex, binary, decimal this field contains the full value to be decoded and displayed. In Full Control Mode, this field is broken down further to include display selection (DISP_SEG) and the segment encoding (SEG_ENCODE).

DISP_SEG[2:0] (for Full Control Mode): In Full Control Mode, this field specifies which individual display (digit 0 through 5) is to be controlled.

SEG_ENCODE[6:0] (for Full Control Mode): This field provides direct control over the segments of a selected 7-segment digit. Each bit corresponds to one of the segments.This field is 7 bits wide, each bit corresponds to one of the seven segments. Writing a 1 to a bit turns on the corresponding segment, while writing a 0 turns off the corresponding segment.

ADDRESS	REGISTER NAME	B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
0x04	HEX0	MODE[1:0]		full_disp_override_s	VALUE[12:0]												
				DISP_SEG[2:0]			-	-	-	-	SEG_ENCODE[6:0]						
0x05	HEX1	MODE[1:0]		full_disp_override_s	VALUE[12:0]												
				DISP_SEG[2:0]			-	-	-	-	SEG_ENCODE[6:0]						