Appendix A. Registers Documentation

SK9822 AXI4-lite IP Registers

Short Name	Long Name	Size in bytes	Notes
CSR	Control and Status Register	1	
TSR	Transmission Start Register	1	
GBCR	Global Brightness Control Register	1	
ICSR	Interrupt Control and Status Register	1	
LEDs	LED full-range colors	4 * LED_number	Each LEDs[i] corresponds to i-th LED of N. Start and end address are not constant
R	Red binary colors	((LED_number-1) / 8) + 1	Each i-th bit corresponds to i-th LED. Start and end address are not constant. Register size multiple of 8 bits.
G	Green binary colors	((LED_number-1) / 8) + 1	Each i-th bit corresponds to i-th LED. Start and end address are not constant. Register size multiple of 8 bits.
B	Blue binary colors	((LED_number-1) / 8) + 1	Each i-th bit corresponds to i-th LED. Start and end address are not constant. Register size multiple of 8 bits.

Explanation:

r – allowed to read

w – allowed to write

h – updated by hardware

“LED_number” is the number of elements in LEDs array.

“i” is variable from 0 to (LED_number – 1)

Control and Status Register **RESET_Value: 0b00000000**

Field	Bits	Type	Description
TI	0	rh	**Transmission indication.** 0b – no data transmission is happening 1b – transmission is going on
INSEL	1	rw	**Color source selection.** 0b – binary color data is selected as input source 1b – full-color data is selected as input source
LOOP	2	rw	**Continuous transmission option.** The start of the transmission takes place an infinite number of times for each ST command as long as LOOP is activated 0b – deactivates loop. Transmission starts happening only once for each ST command 1b – activates the loop.
RES	7:3	r	**Reserved**

Transmission Start Register **RESET_Value: 0b00000000**

Field	Bits	Type	Description
ST	0	wh	**Start transmission command.** This bit is set by software and automatically cleared by hardware 0b – takes no effect 1b – starts the transmission and resets to 0 value
RES	6:1	r	**Reserved**
SYNC_ST	7	wh	**Start synchronous transmission command.** This bit is set by software and automatically cleared by hardware 0b – takes no effect 1b – sets the EXT_ST transmission signal to 1

Global Brightness Control Register **RESET_Value: 0b10000000**

Field	Bits	Type	Description
INSEL	0	rw	**Global brightness input selection in full colored mode.** 0b – global brightness is used 1b – individual brightness of each LED is used
RES	2:1	r	**Reserved**
GB	7:3	rw	**Global brightness value.** Can be limited by hardware

Interrupt Control and Status Register **RESET_Value: 0b00000000**

Field	Bits	Type	Description
TIEN	0	rw	**Transmission interrupt enable.** 0b – interrupt disabled 1b – interrupt enabled
TI	1	rh	**Transmission interrupt status.** This bit is set by software and automatically cleared by hardware 0b – no interrupt occurred 1b – interrupt occurred
CTI	2	wh	**Clear transmission interrupt.** This bit is set by software and automatically cleared by hardware 0b – no effect 1b – TI will set to 0
STI	3	wh	**Set transmission interrupt.** This bit is set by software and automatically cleared by hardware 0b – no effect 1b – TI will set to 1
RES	7:4	r	**Reserved**

LEDs[i] Register **RESET_Value: 0x8**

Field	Bits	Type	Description
BS	4:0	rw	**Individual brightness** Optional brightness for all channels of LEDs[i]
RES	7:5	r	**Reserved**
R	15:8	rw	**Red** LEDs[i] red channel value
G	23:16	rw	**Green** LEDs[i] green channel value
B	31:24	rw	**Blue** LEDs[i] blue channel value

R Register **RESET_Value: 0x0**

Field	Bits	Type	Description
ON[i]	1 per i	rw	**Turns on/off the red channel of LEDs[i].** 0b – off 1b – on

G Register **RESET_Value: 0x0**

Field	Bits	Type	Description
ON[i]	1 per i	rw	**Turns on/off the green channel of LEDs[i].** 0b – off 1b – on

B Register **RESET_Value: 0x0**

Field	Bits	Type	Description
ON[i]	1 per i	rw	**Turns on/off the blue channel of LEDs[i].** 0b – off 1b – on