**Designations:**

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)

**SK9822 module 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 | Each: 4<br>Total: 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 div 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 div 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 div 8) + 1 | Each i-th bit corresponds to i-th LED. Start and end address are not constant. Register size multiple of 8 bits. |

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

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

**Transmission Start Register** **RESET_Value: 0b00000000**

| Field | Bits | Type | Description |
|---|---|---|---|
| ST | 0 | wh | Starts the transmission.<br>0b – takes no effect<br>1b – starts the transmission and resets to 0 value |
| RES | 7:1 | r | Reserved |

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

| Field | Bits | Type | Description |
|---|---|---|---|
| INSEL | 0 | rw | Global brightness input selection in full colored mode.<br>0b – global brightness is used<br>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.<br>0b – interrupt disabled<br>1b – interrupt enabled |
| TI | 1 | rh | Transmission interrupt status.<br>0b – no interrupt occurred<br>1b – interrupt occurred |
| CTI | 2 | w | Clear Transmission interrupt<br>0b – no effect<br>1b – TI will set to 0 |
| STI | 3 | w | Set Transmission interrupt<br>0b – no effect<br>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 | Optional individual brightness for all channels of LEDs[i] |
| RES | 7:5 | r | Reserved |
| R | 15:8 | rw | LEDs[i] red channel value |
| G | 23:16 | rw | LEDs[i] green channel value |
| B | 31:24 | rw | 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].<br>0b – off<br>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].<br>0b – off<br>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].<br>0b – off<br>1b – on |