

```

1
2 #define TM1637_I2C_COMM1      0x40
3 #define TM1637_I2C_COMM2      0xC0
4 #define TM1637_I2C_COMM3      0x80
5
6 void TM1637Display::setBrightness(uint8_t brightness, bool on)
7 {
8     m_brightness = (brightness & 0x7) | (on? 0x08 : 0x00);
9 }
10
11 void TM1637Display::setSegments(const uint8_t segments[], uint8_t length, uint8_t pos)
12 {
13     // Write COMM1
14     start();
15     writeByte(TM1637_I2C_COMM1);
16     stop();
17
18     // Write COMM2 + first digit address
19     start();
20     writeByte(TM1637_I2C_COMM2 + (pos & 0x03));
21
22     // Write the data bytes
23     for (uint8_t k=0; k < length; k++)
24         writeByte(segments[k]);
25
26     stop();
27
28     // Write COMM3 + brightness
29     start();
30     writeByte(TM1637_I2C_COMM3 + (m_brightness & 0x0f));
31     stop();
32 }
33
34 bool TM1637Display::writeByte(uint8_t b)
35 {
36     uint8_t data = b;
37
38     // 8 Data Bits
39     for(uint8_t i = 0; i < 8; i++) {
40         // CLK low
41         pinMode(m_pinClk, OUTPUT);
42         bitDelay();
43
44         // Set data bit
45         if (data & 0x01)
46             pinMode(m_pinDIO, INPUT);
47         else
48             pinMode(m_pinDIO, OUTPUT);
49
50         bitDelay();
51
52         // CLK high
53         pinMode(m_pinClk, INPUT);
54         bitDelay();
55         data = data >> 1;
56     }
57
58     // Wait for acknowledge
59     // CLK to zero
60     pinMode(m_pinClk, OUTPUT);
61     pinMode(m_pinDIO, INPUT);
62     bitDelay();
63
64     // CLK to high
65     pinMode(m_pinClk, INPUT);
66     bitDelay();
67     uint8_t ack = digitalRead(m_pinDIO);
68     if (ack == 0)
69         pinMode(m_pinDIO, OUTPUT);

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70
71
72     bitDelay();
73     pinMode(m_pinClk, OUTPUT);
74     bitDelay();
75
76     return ack;
77 }
78
79 void TM1637Display::start()
80 {
81     pinMode(m_pinDIO, OUTPUT);
82     bitDelay();
83 }
84
85 void TM1637Display::stop()
86 {
87     pinMode(m_pinDIO, OUTPUT);
88     bitDelay();
89     pinMode(m_pinClk, INPUT);
90     bitDelay();
91     pinMode(m_pinDIO, INPUT);
92     bitDelay();
93 }
```