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1  /*
2  * This is the .cpp file for the MH-Z19 CO2 Sensor
3  * This code was exclusively written by MECH 45X Team 26
4  */
5
6  #ifndef MHZ19_H
7  #define MHZ19_H
8  #define MHZ19_ZEROTH_BYTE 0xFF
9  #define MHZ19_FIRST_BYTE 0x86
10 #define MAX_FRAME_LEN 9
11 #define NUMBER_OF_VALUES 5
12 #define CO2_START_UP_TIME 210
13 #define MAX_FRAME_READ_COUNT 40
14 #define MAX_FUNCTION_CALL_COUNT 1
15 #include "WProgram.h"
16 #include "Time.h"
17
18
19 class MHZ19 {
20 public:
21     MHZ19();
22     virtual ~MHZ19();
23     int get_co2_reading(void);
24     int get_co2_ave(void);
25     void set_transistor(int pin);
26     bool make_sensor_read(void);
27     void calibrate_sensor(void);
28     void reset_co2_ave(void);
29
30 private:
31     char frame_buffer[MAX_FRAME_LEN];
32     const uint8_t mhz19_read_command[MAX_FRAME_LEN] = {0xFF, 0x01, 0x86, 0x00, 0x00, 0x00,
33     , 0x00, 0x00, 0x79};
34
35     bool debug = false;
36
37     bool sync_state;
38     bool does_sensor_work;
39     bool is_average_taken;
40     bool first_time;
41     int co2_transistor_control;
42
43     int frame_sync_count;
44     int frame_read_count;
45     int byte_sum;
46     int current_byte;
47     int drain;
48     int co2_ppm;
49     int co2_ppm_average;
50     int reading_count;
51     int function_call_count;
52     int mhz19_buffer[NUMBER_OF_VALUES];
53
54     bool run_sensor(void);
55     void frame_sync(void);
56     void read_sensor(void);
57     void serial_drain(void);
58     void fill_frame_buffer(void);
59     void add_to_ave_buf(void);
60     void print_current_reading(void);
61     void calculate_average_reading(void);
62     void print_average_reading(void);
63     void take_average(void);
64
65     //Timer
66     time_t start_time;
67     time_t current_time;
68     time_t duration;

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```
69         void begin_timer(void);
70         bool check_begin_reading(void);
71     };
72
73 #endif /* MHZ19_H_ */
```