```c
#include "range_finder.h"
#include "display.h"
#include "switch.h"
#include "to_7seg.h"
#include "control.h"

typedef enum {IDLE, COUNT, WAIT, MEAS} control_estado;
static control_estado estado;

bool volatile gb_control_can_sleep;

static bool volatile gb_control_initd;

uint8_t cnt;
uint16_t dist;
uint16_t luz;

static BusOut *g_leds;
static AnalogIn *g_lit;

static Timeout to;
static Ticker tick;

static bool volatile to_evnt;
static bool volatile tick_evnt;

static void to_isr (void){
  to_evnt = true;
}

static void tick_isr(void){
  tick_evnt = true;
}



void control_init(BusOut *leds, AnalogIn *lit){
  if(!gb_control_initd){
    gb_control_initd = true;

    estado = IDLE;

    cnt = 0;
    dist = 0;

    g_leds = leds;
    g_lit = lit;

    to_evnt = false;



  }
}

void control_fsm(void){
  if(gb_control_initd){

    switch(estado){

      case COUNT:

          to_evnt = false;

          if(gb_swm_long_msg){

            if(cnt == 0){
              gb_display_off_msg = true;
              g_display_segs = 0;
              tick.detach();
              estado = IDLE;

            }else{
              to.attach_us(to_isr,1000000);
              estado = WAIT;
            }

          }else if(gb_swm_msg){
            gb_swm_msg = false;
            cnt = (cnt < 5) ? (cnt+1) : 0;
           // gb_display_update_msg = true;
            g_display_segs = (0x54 << 8) | to_7seg(cnt);

          }else if(tick_evnt){
             tick_evnt = false;
             luz = g_lit -> read_u16()/656;
             g_display_brightness = 0.39*luz+1;

          }else{
            //nothing
          }

      break;

      case  WAIT:

          gb_swm_msg = false;
          gb_swm_long_msg = false;

          if(to_evnt){
            to_evnt = false;
            to.detach();

            if(cnt == 0){
              gb_display_update_msg = true;
              g_display_segs = 0x543F;
              *g_leds = 0;
              estado = COUNT;

            }else{
              gb_rf_start_msg = true;
              estado = MEAS;
            }

          }else if(tick_evnt){
             tick_evnt = false;
             luz = g_lit -> read_u16()/656;
             g_display_brightness = 0.39*luz+1;

          }else{
            //nothing
          }
      break;

      case MEAS:

           gb_swm_msg = false;
           gb_swm_long_msg = false;
           to_evnt = false;


          if(gb_rf_done_msg){

            to.attach_us(to_isr,1000000);

            if(-1 == g_rf_range_cm){
              dist = 0x7950;
               g_display_segs = dist;
              *g_leds = 7;

            }else if(g_rf_range_cm  > 99){

              dist = 0x4040;
              g_display_segs = dist;
              *g_leds = 5;

            }else if(g_rf_range_cm  <= 33){
              *g_leds = 4;
              dist = g_rf_range_cm;
               g_display_segs = (to_7seg(dist/10) << 8) | to_7seg(dist%10);

            }else if(g_rf_range_cm  <= 66 && g_rf_range_cm  >= 34 ){
              *g_leds = 2;
              dist = g_rf_range_cm;
               g_display_segs = (to_7seg(dist/10) << 8) | to_7seg(dist%10);

            }else if(g_rf_range_cm  <= 99 && g_rf_range_cm  >= 67 ){
              *g_leds = 1;
              dist = g_rf_range_cm;
               g_display_segs = (to_7seg(dist/10) << 8) | to_7seg(dist%10);
            }



            // gb_display_update_msg = true;

            cnt--;
            estado = WAIT;
```

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          }else if(tick_evnt){
             tick_evnt = false;
             luz = g_lit -> read_u16()/656;
             g_display_brightness = 0.39*luz+1;

          }else{
            //nothing
          }

        break;

        default:   //IDLE
            gb_swm_msg = false; //irrelevante
            to_evnt = false;

          if(gb_swm_long_msg){
            gb_swm_long_msg = false;
            gb_display_on_msg = true;
            //gb_display_update_msg = true;
            tick.attach_us(tick_isr,10000);
            gb_display_brightness_msg = 100;
            g_display_segs = 0x543F;
            g_display_brightness = 100;
            estado = COUNT;
          }

        break;

    }
    __disable_irq();
    if(!to_evnt && !gb_swm_long_msg && !gb_swm_msg && !gb_display_update_msg && !gb_rf_done_msg && !gb_rf_start_msg){
      gb_control_can_sleep = true;
    }
    __enable_irq();
  }
}



```