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/*
N_routes1_0.ino

Created from several examples

Menu to control routes on N module and switch them

Switch relay ON = straight route

 The circuit:
 * RX is digital pin 13 (connect to TX of RLY08)
 * TX is digital pin 12 (connect to RX of RLY08)

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 */

#include <LiquidCrystal.h>
#include <SoftwareSerial.h>

#define uint8 unsigned char

#define NUM_KEYS  5   // pushbutton number
#define BACKL_PIN 10   // select the pin for the LCD Backlight

#define IMPULSE 11 // relay to pulse signal command

//Pushbutton names
#define NEXT 2
#define PREV 1
#define INCR 0
#define DECR 3
#define ACTI 4

// State names
#define GARE 0
#define ENTRETIEN 1
#define ZI 2

// Variant names
#define QUAI1 0
#define QUAI2 1
#define HANGAR 0
#define FOSSE 1
#define USINE 0
#define DEPOT 1

// routes configuration
#define GARE_QUAI1       0b01000110
#define GARE_QUAI2       0b10000101
#define ENTRETIEN_HANGAR 0b00100001
#define ENTRETIEN_FOSSE  0b00000001
#define ZI_USINE         0b00001001
#define ZI_DEPOT         0b00011001
```

```
//Function prototypes
int get_key(void);
int conv_key(int);
void activate(uint8, uint8);
void pulse(void);


// Global variables and objects
LiquidCrystal lcd(8, 9, 4, 5, 6, 7);
SoftwareSerial mySerial(13, 12); // RX, TX

uint8 state;
uint8 var1;
uint8 var2;
uint8 var3;
int oldkey=-1;

uint8 back_index; // to manage backligth with humans'eye response
uint8 back_val[9] = {0, 4, 16, 36, 64, 100, 144, 196, 255};
uint8 routes[6]= {GARE_QUAI1, GARE_QUAI2, ENTRETIEN_HANGAR, ENTRETIEN_FOSSE,
ZI_USINE, ZI_DEPOT};


//*****************************************************************
// check if new key is pressed return key number, -1 if none
int get_key(void)
  {
  int adc_key_in;
  int key;

   adc_key_in = analogRead(0);    // read the value from the push button divider
   key = conv_key(adc_key_in);  // convert into key press
   if (key != oldkey)   // if keypress is detected
     {
     oldkey = key;
     delay(50);  // wait for debounce time
     return key;
     }
    else
     return -1;
  }


//*****************************************************************
// Convert ADC value to key number
int conv_key(int input)
  {
  int adc_key_val[5] ={50, 200, 400, 600, 800 };
  int k;

  for (k = 0; k < NUM_KEYS; k++)
    {
    if (input < adc_key_val[k])
      return k;
    }

  // if here, no valid key pressed
  return -1;
  }
```

```
//*********************************************************************
// Activate switches
void activate(uint8 st, uint8 v)
{
mySerial.write(0x01);  mySerial.write(0x5C);  mySerial.write(routes[(st<<1)+v]);//
set relays  for route
delay(2000);// wait 2s for switch motion
pulse(); // pulse power to switch signals
}




//*********************************************************************
// Pulse signal command to protect solenoids (500 ms pulse)
void pulse()
  {
  digitalWrite(IMPULSE, HIGH);
  delay(500);
  digitalWrite(IMPULSE, LOW);
  }



//*********************************************************************
// general Arduino setup section.
void setup()
  {
  pinMode(IMPULSE, OUTPUT); // 10A relay
  digitalWrite(IMPULSE, LOW);

  pinMode(BACKL_PIN, OUTPUT);
  back_index=5;
  analogWrite(BACKL_PIN, back_val[back_index]);

  state = GARE;
  var1 = QUAI1;
  var2 = HANGAR;
  var3 = USINE;

  // set the data rate for the SoftwareSerial port
  mySerial.begin(9600);
  delay(2000); // After power up, LCD and soft serial port need time to be able to
receive commands...

  lcd.begin(16, 2);
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print(" Itineraires 1.0");
  activate(GARE, QUAI1);
  lcd.clear();
  }
```

```
//*********************************************************************
// Infinite loop, choice the group of routes with up down button
// then select route with left right button
// and finally activate it with select button.

void loop()
  {
  int key;

  switch (state)
    {

//---------------------------------------------------------------------
     case GARE :
       lcd.setCursor(0,0);
       lcd.print( "      Gare     ");
       lcd.setCursor(0,1);
       if (var1 == QUAI1)
           lcd.print("     Quai 1   ");
         else
           lcd.print("     Quai 2   ");

       key=get_key();
       //*****************************************************
       if (key == ACTI)
         {
         activate(state, var1);
         }
       //*****************************************************
       if (key == INCR)
         {
         var1=(var1+1)%2;
         }
       //*****************************************************
       if (key == DECR)
         {
         if (var1==0)
            var1=1;
           else
             var1=0;
         }
       //*****************************************************
       if (key == NEXT)
         {
         state = ENTRETIEN;
         }
       //*****************************************************
       if (key == PREV)
         {
         state = ZI;
         }
       break;

//---------------------------------------------------------------------
       case ENTRETIEN :
       lcd.setCursor(0,0);
       lcd.print( "   Entretien  ");
       lcd.setCursor(0,1);
       if (var2 == HANGAR)
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          lcd.print("     Hangar    ");
        else
          lcd.print("     Fosse     ");

      key=get_key();
      //*********************************************************
      if (key == ACTI)
        {
        activate(state, var2);
        }
      //*********************************************************
      if (key == INCR)
        {
        var2=(var2+1)%2;
        }
      //*********************************************************
      if (key == DECR)
        {
        if (var2==0)
           var2=1;
          else
            var2=0;
        }
      //*********************************************************
      if (key == NEXT)
        {
        state = ZI;
        }
      //*********************************************************
      if (key == PREV)
        {
        state = GARE;
        }
      break;

//-----------------------------------------------------------------------
      case ZI :
      lcd.setCursor(0,0);
      lcd.print( "      Z.I.      ");
      lcd.setCursor(0,1);
      if (var3 == USINE)
          lcd.print("     Usine     ");
        else
          lcd.print("     Depot     ");

      key=get_key();
      //*********************************************************
      if (key == ACTI)
        {
        activate(state, var3);
        }
      //*********************************************************
      if (key == INCR)
        {
        var3=(var3+1)%2;
        }
      //*********************************************************
      if (key == DECR)
        {
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```
        if (var3==0)
           var3=1;
          else
            var3=0;
        }
      //*********************************************************
      if (key == NEXT)
        {
        state = GARE;
        }
      //*********************************************************
      if (key == PREV)
        {
        state = ENTRETIEN;
        }
      break;

    }
 delay(200);

}
```