Parameter configuration guide of the config.h file

TSDZ2 open source firmware mb.20beta1.A
modified version of 20 beta 1 (C)
adapted to the original VLCD5 - VLCD6 - XH18 displays

I recommend reading the 20 beta 1 instruction manual (wiki).
It was a source of useful information for the preparation of this guide.

Before using the software, modify the parameters according to your needs.
Check the correctness of the type of motor, battery and display.

Caution. Changing only the numeric values after the definitions, consistent with the definitions themselves and in the expected range, incorrect values can cause unpredictable operations.

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```
/*
 * config.h
 * parameters configuration file
 * for TongSheng TSDZ2 motor controller firmware
 * by (C)Casainho and EndlessCadence and Leon, 20 beta 1 version
 * adapted to stock displays VLCD5 VLCD6 XH18
 * from an idea of marcoq (Jobike forum)
 * Author: mbrusa
 * Version mb.20beta1.A
 */

#ifndef CONFIG_H_
#define CONFIG_H_

#define DEBUG_MODE                              0
#define DEBUG_DATA                              1
```

```
// ------------------------------------------------------------------
// MOTOR
// ------------------------------------------------------------------

// motor type (0=48V 1=36V)
// DO NOT ENTER OTHER VALUES!
#define MOTOR_TYPE                                      1
```

Choice of motor type 0 = 48V 1 = 36V. DO NOT ENTER OTHER VALUES!

```
// experimental high cadence mode (1=ENABLED)
#define EXPERIMENTAL_HIGH_CADENCE_MODE                  0
```

If enabled, it allows assistance from the engine at a higher cadence.
It is possible that the experimental mode is not suitable for the engine, use at your own risk.
Probably only suitable for 36 V motors.

```
// motor acceleration adjustment
#define MOTOR_ACCELERATION                              25
/* VALUES NEED VALIDATION FROM USER FEEDBACK
      Default value = 0 %
      36 volt motor, 36 volt battery = 35 %
      36 volt motor, 48 volt battery = 5 %
      36 volt motor, 52 volt battery = 0 %
      48 volt motor, 36 volt battery = 45 %
      48 volt motor, 48 volt battery = 35 %
      48 volt motor, 52 volt battery = 30 % */
```

Acceleration of the engine.
As a first setting, use low values, then gradually increase if necessary.
Consider the values in the table as maximum values.
Set carefully, aware that setting a higher value than necessary can cause greater stress on the transmission.

```
// assist without pedal rotation (1=ENABLED)
#define MOTOR_ASSISTANCE_WITHOUT_PEDAL_ROTATION     0
```

At the start, enable assistance only with the push on the pedals without rotation.
It is recommended to use this function with the brake sensors installed and enabled.
The minimum thrust needed to start the assistance is adjusted with the next parameter.

```
// assist without pedal rotation threshold
// max value 100, recommended range between 10-20
#define ASSISTANCE_WITHOUT_PEDAL_ROTATION_THRESHOLD 20
```

Sensitivity to start assistance without pedal rotation
As a first setting, use low values, then gradually increase if necessary.
Set to 100% just apply a minimum torque to the pedals. Recommended values 10-20.

```
// pedal torque conversion (optional calibration)
#define PEDAL_TORQUE_PER_10_BIT_ADC_STEP_X100       67
```

It is used for a correct calculation of human power.
With higher values there is a greater reactivity. Gradually change by a few units.
Calibration recommended (not yet implemented).
It does not replace the hardware calibration, necessary to improve the resolution of the torque sensor.

```
// cadence sensor high percentage (calibration required)
```

```
#define CADENCE_SENSOR_PULSE_HIGH_PERCENTAGE_X10    500
```

Parameter for cadence sensor in advanced mode. Default value.
The actual value can only be obtained with a correct calibration (not yet implemented).
See the procedure on the dedicated wiki page (20 beta 1).
After calibration, enter the actual value.

```
#define CADENCE_SENSOR_PULSE_HIGH_PERCENTAGE_X10    500
```

Parameter for cadence sensor in advanced mode. Default value.
The actual value can only be obtained with a correct calibration (not yet implemented).
See the procedure on the dedicated wiki page (20 beta 1).
After calibration, enter the actual value.

```
// ----------------------------------------------------------------
// BATTERY
// ----------------------------------------------------------------

// maximum battery current (Amp)
#define BATTERY_CURRENT_MAX                          17
```

Maximum battery current in amperes.
Set the maximum current that the battery can supply.
The maximum value is internally limited by the software to the value of 18 A.

```
// battery capacity (Watt/h)
#define TARGET_MAX_BATTERY_POWER                     630
```

Total battery capacity in Watt hours.
Calculate the capacity by multiplying the rated voltage by Ah.
Example: a 36 Volt, 17.5 Ah battery has a nominal capacity of 630 Wh

```
// number of cells in series (7=24V 10=36V 13=48V 14=52V)
#define BATTERY_CELLS_NUMBER                          10
```

Number of battery cells in series.
This value can be an integer from 7 to 14.
7 for 24 V battery; 10 36 V; 13 48 V; 14 of 52 V.

```
// battery internal resistance (milliohms)
#define BATTERY_PACK_RESISTANCE                      196
```

Internal resistance of the battery in milliohms.
It is used to eliminate the oscillation of the notches indicating the state of charge of the battery, between no-load voltage and voltage under load.
How to calculate the battery resistance:
Measure the difference between the no-load voltage and under load, with a constant current.
Example for 10 A current, R = difference of 1.96 Volts / 10 Amp, R = 0.196 = 196 milliohm.

```
// battery low-cut-off voltage (Volt)
#define BATTERY_LOW_VOLTAGE_CUT_OFF                   29
```

Cut-off voltage for low battery.
If the voltage drops below this value, the controller will automatically lower the current so as not to drop below the minimum voltage limit.
Set this value by checking the characteristics of the cells from the battery.

```
// battery voltage calibration (95% to 105%)
#define ACTUAL_BATTERY_VOLTAGE_PERCENT               100
```

Parameter to correct the voltage value shown on the display.
Example, with a fully charged battery of nominal 36V, the voltage should be close to 42V, if
it is lower try to increase the parameter one unit at a time until reading 42V, vice versa if the voltage is higher, the parameter must be decreased.

```
// battery capacity calibration (max 100%)
#define ACTUAL_BATTERY_CAPACITY_PERCENT                    100
```

Parameter for setting the actual battery capacity. Calibration procedure:
With the battery fully charged, check the percentage on the display, it must be 99.9%.
At this point, use the bike until the battery is completely exhausted.
Check the residual percentage and calculate the effective percentage value (100 - residual value).
Set the parameter with this value.
Example, final residual percentage 8%, effective capacity 92% (100 - 8).

```
// li-ion cell
#define LI_ION_CELL_OVERVOLT                               4.30
```

Value beyond which the error E08-ERROR_OVERVOLTAGE is displayed.
Possible if you set the wrong number of cells in series.
The unit of measurement of this and subsequent parameters is in Volts (of each single cell).

```
#define LI_ION_CELL_RESET_SOC_PERCENT                     4.10
```

Value for automatic reset to 99.9% of the percentage of residual capacity, with battery fully charged.
Recommended values from 4.10 to 4.15, otherwise with lower values, after a short turn, if the voltage does not fall below this value, when it is switched on again it resets to 99.9 again.
If the battery is not fully charged and the voltage is lower than this value, the reset is not automatically activated.
If desired, it can be done manually by activating the procedure provided.

```
// full
#define LI_ION_CELL_VOLTS_FULL                            3.95
```

Minimum voltage value to display the complete battery charge status, 4 notches with VLCD6 and XH18 display, 6 notches with VLCD5.

```
// 4 bars
#define LI_ION_CELL_VOLTS_3_OF_4                          3.85
#define LI_ION_CELL_VOLTS_2_OF_4                          3.55
#define LI_ION_CELL_VOLTS_1_OF_4                          3.25
```

Voltage value to display intermediate charge states.
From 1 to 3 notches, for VLCD6 and XH18 displays.

```
// 6 bars
#define LI_ION_CELL_VOLTS_5_OF_6                          3.80
#define LI_ION_CELL_VOLTS_4_OF_6                          3.65
#define LI_ION_CELL_VOLTS_3_OF_6                          3.50
#define LI_ION_CELL_VOLTS_2_OF_6                          3.25
#define LI_ION_CELL_VOLTS_1_OF_6                          3.10
```

Voltage value to display intermediate charge states.
From 1 to 5 notches, for VLCD5 display.

```
// empty
#define LI_ION_CELL_VOLTS_EMPTY                           2.90
```

Voltage value to display the state of the completely discharged battery, 0 notches.
For all these parameters, check the technical characteristics of the cells used.

```
// -------------------------------------------------------------------
// BIKE
// -------------------------------------------------------------------

// wheel perimeter(mm)
#define WHEEL_PERIMETER                                2280
```

This parameter is used to calculate the speed and kilometers traveled.
Enter the wheel perimeter in millimeters.
Indicative values:

26-inch wheel   =   2050 mm
27-inch wheel   =   2150 mm
27.5 inch wheel   =   2215 mm
28-inch wheel   =   2250 mm
29-inch wheel   =   2300 mm
It is recommended to measure the actual perimeter and check the distance traveled with GPS.

```
// wheel max speed (km/h)
#define WHEEL_MAX_SPEED                                45
```

Maximum speed limit.
Beyond this value the engine stops.
Attention, if the ENABLE_WHEEL_MAX_SPEED_FROM_DISPLAY function is enabled, this limit is ignored and replaced by the one set on the display.

```
// ------------------------------------------------------------------
// FUNCTION
// ------------------------------------------------------------------

// enable functions (1=ENABLED)
#define ENABLE_LIGHTS                               0
```

Enable the use of lights, on and off, via the lights button.

```
#define ENABLE_WALK_ASSIST                          1
```

Enables the use of the walk assist, walking the bike up to 6 km / h.

```
#define ENABLE_BRAKE_SENSOR                         0
```

Enable the use of brake sensors when installed.
It also enables the functions where the use of sensors is required:
-   walk assist debounce delay
-   cruise mode without pedal movement
-   accelerator
For safety with the sensors installed, even with the function disabled, the engine stop is always active when braking.

```
#define ENABLE_THROTTLE                             0
```

Enable the accelerator only if it has been installed.
Available only with brake sensors installed and enabled.
Inquire about legislative restrictions regarding use.
Attention, the accelerator is an alternative to the temperature sensor.
Both cannot be enabled!

```
#define ENABLE_TEMPERATURE_LIMIT                    0
```

Enable only if the temperature sensor has been installed.
Warning, the temperature sensor is an alternative to the accelerator.
Both cannot be enabled!

```
// FUNCTIONS ENABLED ON STARTUP
// street mode (0=OFFROAD 1=STREET)
#define ENABLE_STREET_MODE_ON_STARTUP               1
```

Enable STREET mode at startup.
The STREET mode is a function that can be configured as a legal driving mode, it is possible to limit the speed and power of the engine. The throttle and cruise mode are disabled. Inquire about legislative restrictions regarding engine speed and power limits.

```
// display mode (0=DISPLAY DATA 1=SET PARAMETER)
#define ENABLE_SET_PARAMETER_ON_STARTUP             0
```

Choice of how to use the display.
If enabled, parameter modification is active at startup.
If left at 0, the data display is active at startup.

```
// odometer compensation (1=ENABLED)
#define ENABLE_ODOMETER_COMPENSATION                1
```
Enable the compensation of the kilometers added when viewing the data.
Even when the bike is stationary, all data sent to the display increase the odometer.
By enabling this function, the distance added and not traveled is recovered, during this operation the speed
displayed while driving remains at zero until the kilometers have been balanced.

```
// cadence sensor mode (0=STANDARD 1=ADVANCED)
#define CADENCE_SENSOR_MODE_ON_STARTUP              0
```
Cadence sensor mode at startup.
0 = standard mode,
1 = advanced mode (double the pulses).
Choosing advanced mode requires a calibration (not yet implemented).

```
// lights configuration (0 to 8)
#define LIGHTS_CONFIGURATION_ON_STARTUP             0
```
Mode of operation of the lights at startup.
See below the various modes and their codes.
This value can be different from the 3 selectable in the display menu.

```
// ridind mode (1=POWER 2=TORQUE 3=CADENCE 4=EMTB)
#define RIDING_MODE_ON_STARTUP                      1
```
Start-up assistance mode.
Choose the preferred one from the available assistance modes.
      1 - POWER   **assistance proportional to the power on the pedals**
      2 - TORQUE   **assistance proportional to the torque on the pedals**
      3 - CADENCE   **assistance subordinated to the movement of the pedals**
      4 - EMTB   **assistance with progressive percentage of the torque on the pedals**

```
// lights configuration
#define LIGHTS_CONFIGURATION_1                    1
#define LIGHTS_CONFIGURATION_2                    6
#define LIGHTS_CONFIGURATION_3                    7
/*  NOTE: regarding the various light modes
      (0) lights ON when enabled
    (1) lights FLASHING when enabled
    (2) lights ON when enabled and BRAKE-FLASHING when braking
    (3) lights FLASHING when enabled and ON when braking
    (4) lights FLASHING when enabled and BRAKE-FLASHING when braking
    (5) lights ON when enabled, but ON when braking regardless if lights are
enabled
    (6) lights ON when enabled, but BRAKE-FLASHING when braking regardless if
lights are enabled
    (7) lights FLASHING when enabled, but ON when braking regardless if lights
are enabled
    (8) lights FLASHING when enabled, but BRAKE-FLASHING when braking
regardless if lights are enabled
*/
```

Configuration of the light modes, selectable from the menu on the display.
Find out about compliance with current regulations.
Choose the 3 preferred modes among the 9 available.
With light control ON:

> **0 - on**
> **1 - flashing**
> **2 - on and fast flashing when braking**
> **3 - flashing and on when braking**
> **4 - flashing and fast flashing when braking**
> **5 - on and on during braking also with light control OFF**
> **6 - on and fast flashing when braking even with the light control OFF**
> **7 - flashing and switched on when braking even with the light control OFF**
> **8 - flashing and fast flashing when braking even with the light control OFF**

The braking modes are only available with the brake sensors installed.

```
// STREET MODE FUNCTION

// street mode power limit (1=ENABLED)
#define STREET_MODE_POWER_LIMIT_ENABLED          1
```

Enable the power limit in STREET mode.

```
// street mode power limit value (Watt)
#define STREET_MODE_POWER_LIMIT                   250
```

Power limit in watts when STREET mode is enabled.

```
// street mode speed limit (km/h)
#define STREET_MODE_SPEED_LIMIT                   25
```

Speed limit in km / h when STREET mode is enabled.
Beyond this value the engine stops.
This speed limit can be replaced by the one set on the display when the
ENABLE_WHEEL_MAX_SPEED_FROM_DISPLAY function is enabled.

```
// street mode enable other functions
#define STREET_MODE_THROTTLE_ENABLED                  0
```

Enable the accelerator, if installed, in STREET mode.
Available only with mounted and enabled brake sensors.

```
#define STREET_MODE_CRUISE_ENABLED                    0
```

Enable cruise mode in STREET mode.
Available in mode with active pedal movement, otherwise only with brake sensors installed and enabled.

```
// throttle ADC values (optional)
#define ADC_THROTTLE_MIN_VALUE                        47
#define ADC_THROTTLE_MAX_VALUE                        176
```

Throttle adjustment range, relative minimum and maximum values.

```
// motor temperature limit (sensor required)
#define MOTOR_TEMPERATURE_MIN_VALUE_LIMIT             65
```

Set the temperature from which the motor protection will start, limiting the power.
The power gradually decreases up to the maximum temperature limit, then the engine stops.

```
#define MOTOR_TEMPERATURE_MAX_VALUE_LIMIT             80
```

Set the maximum engine temperature. At this temperature the engine will be turned off.
Values in degrees Celcius.

```
// enable temperature error at min limit value
#define ENABLE_TEMPERATURE_ERROR_MIN_LIMIT            1
```

If enabled, the error code E06 - ERROR_OVERTEMPERATURE is displayed when the minimum temperature limit is exceeded. If disabled when the maximum limit is exceeded.

```
// ----------------------------------------------------------------
// DISPLAY
// ----------------------------------------------------------------

// display type
#define ENABLE_VLCD6                                  0
#define ENABLE_VLCD5                                  0
#define ENABLE_XH18                                   1
```

Choose the type of display used. Enable only one.

```
// display parameters
#define ENABLE_DISPLAY_WORKING_FLAG                   1
```

Enables the display to turn off after 5 minutes of inactivity.

```
#define ENABLE_DISPLAY_ALWAYS_ON                      0
```

The display is always on.
This parameter is alternative to the previous one, enable only one of the two.

```
#define ENABLE_WHEEL_MAX_SPEED_FROM_DISPLAY           0
```

Enable the speed limit set on the display.
The upper limit of the WHEEL_MAX_SPEED parameter is ignored.
The speed limit always remains active in STREET mode.
Attention, when the speed limit on the display is lower than that in STREET mode, the one on the display has priority.
Example:
>   **- display limit 30 km / h, STREET limit 25 km / h, limit used 25 km / h**
>   **- display limit 20 km / h, STREET limit 25 km / h, limit used 20 km / h**
For setting the limit, consult the manual of your display.

```
// delay menu function (0.1 sec)
#define DELAY_MENU_ON                                 50
```

Maximum delay between the first press of the light button and the second confirmation, in the parameter setting procedure.
It is also the time within which, after confirmation and with a flashing code, you can move on to the next parameter.

```
// enable delay return to default display mode
#define ENABLE_RETURN_DEFAULT_DISPLAY_MODE            1
```

Enables automatic return to the display's default use mode.
If disabled, the return to the previous mode must be done manually.

```
// delay return to default display mode (seconds)
#define DELAY_DISPLAY_MODE_DEFAULT                    30
```

Delay after changing the use mode of the display for automatic return to the default mode.
>   **- ENABLE_SET_PARAMETER_ON_STARTUP = 0 it returns to the data display.**
>   **- ENABLE_SET_PARAMETER_ON_STARTUP = 1 it returns to the modification of the parameters.**

```
// displays double data (0=3 VALUES 1=6 VALUES)
#define ENABLE_DISPLAY_DOUBLE_DATA                    0
```

Enables the display of two data series (3 + 3 values)

```
// delay display data (0.1 sec, max 255)
// first series
#define DELAY_DISPLAY_DATA_1                      50
#define DELAY_DISPLAY_DATA_2                      50
#define DELAY_DISPLAY_DATA_3                      250
// second series
#define DELAY_DISPLAY_DATA_4                      250
#define DELAY_DISPLAY_DATA_5                      50
#define DELAY_DISPLAY_DATA_6                      50
```

After the first press of the lights button and the second confirmation, it is the display time of the chosen data, within this time, you can press the lights button again to go to the next data. The maximum value is 255 = 25.5 seconds and can be different for each individual data.
To stop displaying the data before the end of the time, change the level.

```
// display data configuration
// first series
#define DISPLAY_DATA_1                           1
#define DISPLAY_DATA_2                           2
#define DISPLAY_DATA_3                           5
// second series
#define DISPLAY_DATA_4                           4
#define DISPLAY_DATA_5                           7
#define DISPLAY_DATA_6                           0
/*  display data code configuration
     0 - motor temperature (°C)
     1 - battery SOC remaining (%)
     2 - battery voltage (Volt)
     3 - battery current (Amp)
     4 - absorbed motor power (Watt/10)
     5 - adc torque sensor (8 bit)
     6 - adc torque sensor (10 bit)
     7 - pedal cadence (rpm)
*/
```

Configuration of the data shown on the display.
Choose the data to be displayed, in the type and in the preferred order among those available.

> **0 - engine temperature, only with sensor installed (° C)**
> **1 - remaining battery charge (%)**
> **2 - battery voltage (Volt)**
> **3 - battery current (Amp)**
> **4 - power absorbed by the motor (Watt / 10)**
> **5 - torque sensor adc value (8 bit)**
> **6 - torque sensor adc value (10 bit)**
> **7 - pedal cadence (rpm)**

```
// -------------------------------------------------------------------
// ASSIST
// -------------------------------------------------------------------
// CAUTION: all assist values _LEVEL_0 for safety must be set to zero
```

CAUTION. For safety, all assistance values at level 0-OFF must be set to zero.

4 gear levels are available for each assistance mode:

1-ECO,

2-TOUR,

3-SPORT,

4-TURBO.

```
// power assist (% max 500)
#define POWER_ASSIST_LEVEL_0                        0
#define POWER_ASSIST_LEVEL_1                        70
#define POWER_ASSIST_LEVEL_2                        120
#define POWER_ASSIST_LEVEL_3                        210
#define POWER_ASSIST_LEVEL_4                        300
```

POWER ASSIST. Assistance mode proportional to the power on the pedals.

Values in percentage, maximum 500%.

Example, applying 100 watts to the pedals, with 300% assistance, the motor delivers 300 watts.

```
// torque assist (max 254)
#define TORQUE_ASSIST_LEVEL_0                       0
#define TORQUE_ASSIST_LEVEL_1                       70
#define TORQUE_ASSIST_LEVEL_2                       100
#define TORQUE_ASSIST_LEVEL_3                       130
#define TORQUE_ASSIST_LEVEL_4                       160
```

TORQUE ASSIST. Assistance mode proportional to the torque on the pedals.

The power supplied by the motor is proportional to the applied torque and the set assistance values.

Relative values, maximum 254.

```
// cadence assist (max 254)
#define CADENCE_ASSIST_LEVEL_0                      0
#define CADENCE_ASSIST_LEVEL_1                      70
#define CADENCE_ASSIST_LEVEL_2                      100
#define CADENCE_ASSIST_LEVEL_3                      130
#define CADENCE_ASSIST_LEVEL_4                      160
```

CADENCE ASSIST. Assistance mode subject to pedal movement.

The power supplied by the motor depends partly on the assistance values set and partly on the cadence of the pedals.

Relative values, maximum 254.

```
// eMTB assist (sensitivity 0 to 20)
#define EMTB_ASSIST_LEVEL_0                         0
#define EMTB_ASSIST_LEVEL_1                         6
#define EMTB_ASSIST_LEVEL_2                         9
#define EMTB_ASSIST_LEVEL_3                         12
#define EMTB_ASSIST_LEVEL_4                         15
```

EMTB ASSIST. Assistance mode with progressive percentage of the torque on the pedals.

The power supplied by the motor is progressively proportional to the applied torque.

20 predefined sensitivities are available.

Higher values correspond to a more reactive assistance, faster to reach the maximum engine power.

Choose your preferred sensitivity values from those available, from 1 to 20.

```
// walk assist (max 100)
#define WALK_ASSIST_LEVEL_0                        0
#define WALK_ASSIST_LEVEL_1                        30
#define WALK_ASSIST_LEVEL_2                        40
#define WALK_ASSIST_LEVEL_3                        50
#define WALK_ASSIST_LEVEL_4                        60
```

WALK ASSIST. Assistance mode when you want to accompany the bike on foot up to 6 km / h.
Activated with the dedicated button, consult the manual of your display.
Maximum value 100. Try low values and gradually increase.
Using low gears, high gears stress the transmission.

```
// walk assist threshold (speed limit max km/h)
#define WALK_ASSIST_THRESHOLD_SPEED                6
```

Maximum speed limit in walk assist mode, in km / h.
Inquire about legislative restrictions regarding the limit.

```
// walk assist debounce (brake sensor required)
#define WALK_ASSIST_DEBOUNCE_ENABLED               0
```

Enable the debounce time on the walk assist button.
Useful on rough terrain, when a rebound can cause the button to be released unwanted.
Available only with brake sensors installed and enabled.

```
// walk assist debounce time (0.1 sec, max 255)
#define WALK_ASSIST_DEBOUNCE_TIME                  50
```

Debounce time value on the walk assist button.
It is recommended to set this time as low as possible, slightly higher than that necessary for the activation of the walk assist.
Attention, the assistance remains active after releasing the button for the set time.
To stop assistance during this time, change the level.
With display XH18 it stops only when moving to the upper level.

```
// cruise level (target km/h, brake sensor required)
#define CRUISE_TARGET_SPEED_LEVEL_0                0
#define CRUISE_TARGET_SPEED_LEVEL_1                15
#define CRUISE_TARGET_SPEED_LEVEL_2                18
#define CRUISE_TARGET_SPEED_LEVEL_3                21
#define CRUISE_TARGET_SPEED_LEVEL_4                24
```

CRUISE ASSIST. Assistance mode with speed control.
The value set in the levels is the target speed to be maintained in km / h.
The power supplied by the motor adjusts itself to maintain the chosen speed.
speed may not be reached due to limited engine power.
The speed limits seen above have priority.
Carefully read the function of the next parameter.

```
// cruise function with pedal rotation
#define CRUISE_MODE_CADENCE_ENABLED                    1
```

Enables the cruise assistance mode subordinated to the movement of the pedals.
Speed is maintained only with minimal pedal movement.
By stopping pedaling the motor stops.
It can be compared to the CADENCE ASSIST mode, the difference is that changing the level does not change the power supplied by the motor but the speed to be achieved.
If disabled, pedal rotation is not required to maintain speed.
It can be compared to an accelerator with speed variation in steps. Increasing the level increases the speed, decreasing it decreases, at 0-OFF the motor stops. This mode is only available with the brake sensors installed and enabled.
Inquire about legislative restrictions regarding use.
If cruise mode is disabled in STREET mode, assistance with CADENCE ASSIST mode is activated.

```
// cruise threshold (speed limit min km/h)
#define CRUISE_THRESHOLD_SPEED                    10
```

Minimum speed limit for activating cruise mode, in km / h.
Below this value, assistance in CADENCE ASSIST mode is active.

```
#endif // CONFIG_H_
```