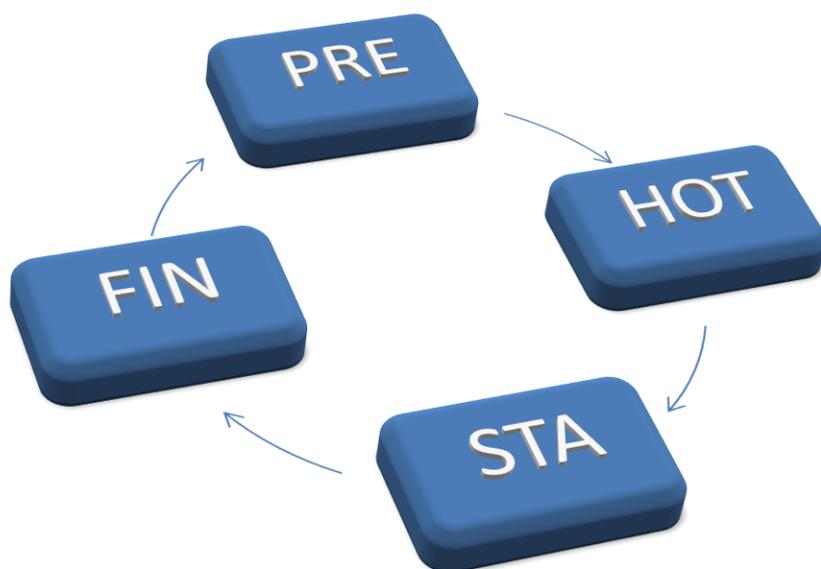# KORSMIT
Rally Electronics

Operating Manual
Alma 1 (GPS)

Version 3.0.0

Korsmit Rally Electronics

28-10-2017

Introduction and background

Thanks for having an interest in our Alma 1 range tripmaster. Currently this range exists of 2 models:

- Alma 1 XL
- Alma 1 GPS

 The 2 models have the same fundamentals (hardware and software) but are slightly different in operation and very different in installation. With these 2 models, the old original Alma 1 (Small screen) has been discontinued because the big majority of customers did already choose for the bigger screen of the XL version and secondly at the bottom side of our product range, some new models have been added (Alma Rally series).

Model recognition

On the outside, this models can be recognized on the fact that the turning knob to dim the screen backlight and the on/off toggle switch have been replaced by two push buttons.

On the inside the PCB has the code: A1XL2.1

Major changes

Next to the already mentioned push buttons to dim the lcd backlight and for the on/off functions, there are some other changes:

- Two sensor inputs (XL) or a GPS signal and a sensor (GPS). With the XL version, an average can be used of the two sensors combined or switched between the sensors. This can even be done on the fly.
- Additional features in the setup menu (correction factor etc)
- The stages menu has been upgraded with more stages and more information that can be saved and is more accurate.
- The extra buttons have made it easier and faster to adjust the average speed while driving on the Special Stage
- A list with 20 average speeds can be programmed
- Trip 2 (complete Stage) can be shown on external displays (is also available for previous version)
- 5 different named calibration values can be used per sensor.
- The backlight dim button can be set in switch mode or step mode.
- The on/off button has to be hold for a while to power down the device, so can never be operated accidentally ..
- A sprint can be timed for a certain programmable speed (For Example: your sprint for 0 to 100 km/h), but also for a certain distance. (how long it takes to drive a quarter mile).
- Switchable between kilometers and miles without re-calibrating.

Content

Legend:

BUTTON = A button that needs to be pressed.

PRE = Status

Summary: 1 page explanation

PRE: prior to the test

HOT: "ready to go"

STA: On the KP

FIN : FINished
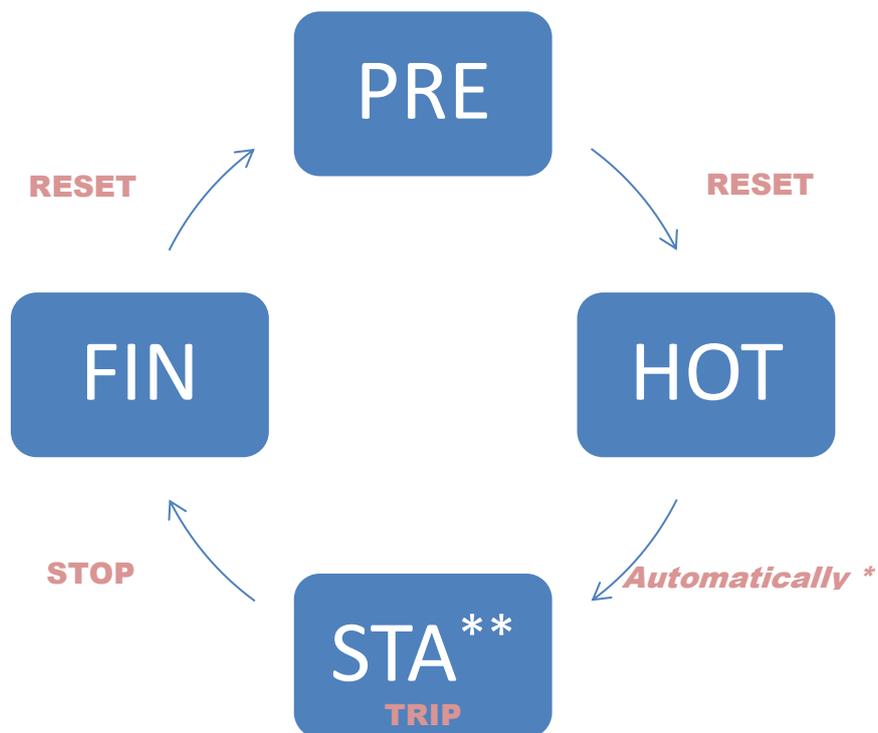
*   Manual start: **TRIP**
➢ Restore **HOT** status: **RESET (long)**

** Only   Regularity

1.Change Average Speed manually: **SETUP**	1.Change Average Speed from list: **STAGES**
2.Activate next character: **STAGES**	2.Select next Average Speed: **STAGES**
3.Activate Average Speed: **DIM**	3.Activate Average Speed: **DIM**

➢ Forward/stop/reverse: **RESET (short)**

1 Start

1.1 General

After installation of the device in the vehicle, it is time to start it up. Although it powers up as being switched off, it still starts itself in the background to be able to detect the on/off button. This can also take a couple of seconds.

When the power to the device is completely cut off, it does not lose its setup information or information in the stages menu.

Everytime the device is switched off, it takes about 4 seconds before it can be powered up again.

To start the device, press shortly on the **ON/OFF** button. It will start up the device with a message of the model.

To power down the device, you have to press and hold the **ON/OFF** button until the arrows fill the complete screen. This can only be done in the **PRE** and **FIN** mode.

2 Setup

2.1 General

To open the Setup menu, press **SETUP** in the **PRE** or **FIN stage**. (For explanation about the stages, see Chapter 4 or 5)

The menu consists of the following components:
- Average target speed (only in regularity mode)
- Average target speed list (only in regularity mode)
- Trip Rounding Speed
- Driver Correction factor
- Signal Speed
- Light dim
- Sprint Value
- Sprint Type
- Software version
- * Simple * or * extended * View
- * Rally * or * Regularity * mode
- Distance Mls or Km
- Calibration run
- Calibration distance
- Sensor Mode
- GPS Correction Factor (Only for the gps version)
- GPS Clock Deviation (Only for the gps version)
- GPS Accuracy Range (Only for the gps version)
- GPS Information (Only for the gps version)
- Surface/calibration selection
- Pulses per wheel revolution Sensor 2 (Only for the non gps version)
- wheel circumference Sensor 2 (Only for the non gps version)
- Pulses per wheel revolution Sensor 1
- wheel circumference Sensor 1

The menu can be scrolled by the **TRIP** and **STOP** buttons.

With **RESET** you can leave the Setup menu.

2.2 Menu items

2.2.1 Average Target Speed (Regularity Mode)

In this menu item you can set the starting average target speed of the stage. This is the target average speed with which the tripmaster calculates and what should be your average speed that you want to drive. From this average speed, the average speed deviation in meters or miles will be calculated. During the Special Stage (STA) and the HOT Stage you can adjust the average speed in the main screen. (see 4.2.2.2 HOT and 4.2.2.3 STA)

To change the value you can use the following button combinations:

- o Up (1):   SETUP + STOP
- o Down (1):   SETUP + TRIP
- o Fast Up (50*):   STAGES + STOP
- o Fast Down (60*): STAGES + TRIP

*The difference in these values allow you to come close to a certain value faster before you need to use the fine adjustment.

2.2.2 Average Target Speed List (Regularity Mode)

In this menu item you can make a list of up to 20 different average target speeds which can be activated subsequently during the Special Stage (STA) and the HOT Stage. To active these values, please see 4.2.2.2 HOT and 4.2.2.3 STA. In this section we only explain how to enter and change the list of values.

In this screen you see the selected list item on the 3rd line:

```
1 5      0 2 0 . 4 5
```

This means that listitem number 15 is selected with the value for the target average speed of 20,45 km/h (or Mls/h). The listitem number that is selected here means that this Target average speed will appear when it is activated during operation. When it is activated, the next value will be selected so it can be activated subsequently.

From this menu item in the setup menu, you press SETUP once. "SCROLL" will appear in the top right corner to indicate that you are in the scroll status of the list. You can go throught the list to select the correct list item by scrolling with the STOP and TRIP button.

If your goal is only to select the correct list item, simply leave this mode by pressing RESET and "SCROLL" will disappear from the top right corner.

To adjust a certain Target average speed value, you press SETUP from the "SCROLL" mode when you have the desired list item selected. "ADJUST" will appear in the top right corner to indicate you are adjusting the Target speed value and the second digit of the value will start blinking. To change

this value, press the SETUP button until the correct number is selected. When you have the correct value, press the STAGES button to select the next digit. Keep repeating this until you have to correct value for the target average speed. When you made the desired value, press the DIM button to save the value and to go back to the "*SCROLL*" mode.

This actions you can keep repeating until you have made the desired list. All values that are 0 will not be used during the activation of the list.

Also now, to leave the "*SCROLL*" mode, press the RESET button.

2.2.3 Trip Rounding Speed

On the display, the trip distances can be displayed with a trailing 0 instead of the real number for readability. There are however cases that the accurate trip distance is required at the meter accurate. This is always on a low speed. For this reason, we have made it possible to round down the last digit of the distances. This can be done speed dependable. From a certain speed, the last digit of a distance (more then 10) will remain a 0. If the speed drops below the set speed, the trip will display the last digit again. To never display the last digit, set the speed at 0.
I the setup menu, this item is described as: *"Speed with '0'"*.
In this menu item you can set the speed at which the trip distances will generate display a "0" when exceeded. This value is set in km/h or in Mls/h.
To change the value you can use the following button combinations:

- o Up (1):   SETUP + STOP
- o Down (1):   SETUP + TRIP
- o Fast Up (20):   STAGES + STOP
- o Fast Down (20): STAGES + TRIP

2.2.4 Driver Correction Factor (DCF)

This option is seen as an advanced option. If you do not want to use it, just keep it at 0 and it will not do or interfere with anything.

The driver correction factor is a compensating factor for the driving style of the driver. When a driver cuts corners where the organization did not or drives with a lot of wheelspin, you can compensate for this with this option without changing the calibration values because the real calibration should not change while a distance that is nicely driven stays that difference.

The range of the DFC is from -5% to 5%.

To change the value you can use the following button combinations:

- o Up (0.1%):   SETUP + STOP
- o Down (0.1%):   SETUP + TRIP
- o Fast Up (1%):   STAGES + STOP
- o Fast Down (1%): STAGES + TRIP

When you as a driver cut corners (you have less distance in your screen than the value should be) you use a negative value.

When you as driver have a lot of wheelspin (you have more meters in your screen than the value should be) you use a positive value.

The easiest to explain this factor is by an example.

Example:

- Screen value: 1131 meters.
- Value from organization: 1160 meters

2 ways to calculate (is mathematically the same)

1131/1160 = 0,975 = 97,5%   Screendistance = 97,5% of the "real" distance
Or 1160-1131 = 29 →29/1160 = 0,025 = 2.5%   Screendistance deviation = 2,5% of real distance
(for Option 1 you now do: 100% - 97,5% = 2,5%)

From both values you can see you have to set the Driver Correction factor at **-2,5%** to have displayed 1160 in your screen instead of 1131.

For wheelspin you do exactly the same. The percentage will be over 100%. You keep the value positive.

Ofcourse, the same can be generated by compensating the calibration values but this way keeps your calibration values clean..(and offers some more possibilities for the future….)

2.2.5 Signal Speed

This menu item requires the External Display with Speed indication. In this menu item you can set the speed at which the display will generate a signal that a certain speed is exceeded. This value is set in km/h or in Mls/h.
To change the value you can use the following button combinations:

- o   Up (1):   SETUP   + STOP
- o   Down (1):   SETUP   + TRIP
- o   Fast Up (20):   STAGES + STOP
- o   Fast Down (20): STAGES + TRIP

2.2.6 Light Dim

This menu item can be used to set the dimmable screen backlight mode and value. It can be set in two modes:

- Manual
- Automatic (a number in the settings)

Manual:

When the DIM button is pressed to change the backlight, it goes from fully bright to each step darker until the darkest setting is reached (7 steps). In this case, it becomes the fully bright again.

Automatic:

In the light settings menu you choose one of the numbers from 1 to 7.
To change the value you can use the following button combinations:

- o Up (1):   SETUP   + STOP
- o Down (1):   SETUP   + TRIP
- o Up (1):   STAGES + STOP
- o Down (1):   STAGES + TRIP

This value as seen as the dark value. If the DIM button is used during operation, it will toggle between the selected dark value and the fully bright screen.

2.2.7 Sprint value

In this menu item you can set the value that is used for the sprint. The sprint is fully explained in the next chapter.

To change the value you can use the following button combinations:

- o Up (1):   SETUP   + STOP
- o Down (1):   SETUP   + TRIP
- o Fast Up (50*):   STAGES + STOP
- o Fast Down (60*):   STAGES + TRIP

*The difference in these values allow you to come close to a certain value faster before you need to use the fine adjustment.

2.2.8 Sprint type

The Sprint type can be set to two values:
- - Speed Sprint
- - Distance sprint

To change the value you can use the following button combinations:

- o Toggle: SETUP   + STOP
- o Toggle: SETUP   + TRIP
- o Toggle: STAGES + STOP
- o Toggle: STAGES + TRIP

With a *Speed Sprint*, a stopwatch will record the time until this speed is reached. (in km/h or Mls/h)
With a *Distance Sprint*, a stopwatch will record the time until this distance is reached. (in metres or Mls/1000).

In Rally and Dakar mode, this value is in the screen. In Regularity mode, this value is not in the screen but still can be found in the Stages menu. It counts together with the normal stopwatch. For the operation see, 4.2.2.2 HOT and 4.2.2.3 STA.

2.2.9 Software Version

The Software version is read only. This is used to see which software is in the device and can be checked with Korsmit Rally Electronics if an upgrade can be performed.

2.2.10   View

There is the choice between a complete (extended) view with a lot of information or a simple view with focus on only the necessary information. You can choose the best view for the circumstances and your own preferences. Changing the view does not affect any of the data that is stored.

To change the view you can use the following button combinations:

- o   Toggle: SETUP   +   STOP
- o   Toggle: SETUP   +   TRIP
- o   Toggle: STAGES +   STOP
- o   Toggle: STAGES +   TRIP

2.2.11   Rally, Regularity or Dakar mode

For optimal use of the layout of the screen, there are 3 different modes. If the mode is changed all the data in the Stages menu will be lost.
The Calibration information will **not** be lost so you do not have to re-calibrate the tripmaster.

To change the value you can use the following button combinations:

- o   Change: SETUP   +   STOP
- o   Change: SETUP   +   TRIP
- o   Change: STAGES +   STOP
- o   Change: STAGES +   TRIP

After this change you will be asked if you are sure because the information in the Stages menu is lost. You can choose "Yes" or "No"

No =   TRIP

Yes =   STOP

2.2.12   Distance Measurement

With this menu item you can choose between distance measurement in Miles or Kilometers. The speeds will be changed and the calibration numbers change automatically..
To change the value you can use the following button combinations:

- o   Toggle: SETUP   +   STOP
- o   Toggle: SETUP   +   TRIP
- o   Toggle: STAGES +   STOP
- o   Toggle: STAGES +   TRIP

2.2.13   Calibration Run

In this menu item we can chose to do a Calibration Run to perform an automatic calibration. (the official term is adjustment but everybody knows this as "Calibrating"). The Calibration Run will adjust **the circumference of the wheel (calibration value)** and **not** the amount of pulses per revolution.

The GPS Version has 1 pulse sensor connection while the non-GPS version has two. In this explanation we will describe the non-GPS version (2 sensors) but it will be clear for the single sensor of the GPS version as well.

2.2.13.1 How it works

First of all you have to define a certain calibration distance (menu item: Calibration Distance). This distance is standard defined as 1000 meters but can be adjusted for a given calibration section. You drive up to the start of this section and activate the calibration Run (see next paragraph). After this, you drive this exact section and stop at the finish to deactivate the calibration run. At this moment he calculates the measured wheel circumference(s) and shows this in the display. After this, you have the possibility to accept this new wheel circumference(s) or to stay with your old value. At this moment it can be that the measured number is deviating from the real expected wheel circumference. This can have several reasons:

- The number of pulses per wheel rotation is not correct. If the wheel circumference is not extremely big or small, you can accept the value.
- You did not drive the correct calibration distance. Do **not** accept the value.

Note: The measured value will not be the same as when you measure with a tape around your wheel. The tire has a flat bottom surface from the indentation of your wheel. It will measure the wheel circumference that belongs to the radius of the indented wheel. So, it will be always less than when you measure it.

2.2.13.2 Perform the Calibration Run

The GPS Version has 1 pulse sensor connection while the non-GPS version has two. In this explanation we will describe the non-GPS version (2 sensors) but it will be clear for the single sensor of the GPS version as well.

The Calibration run is performed for the Surface/Calibration Selection that is active. This is also displayed in the final screen when the new values have to be confirmed.

After setting the calibration distance you go in the setup menu to "Calibration Run".

```
S e t u p   M e n u

C a l i b r a t i o n .
```

To activate the Calibration Run you can use any of the following button combinations:

- o Activate: **SETUP** + **STOP**
- o Activate: **SETUP** + **TRIP**
- o Activate: **STAGES** + **STOP**
- o Activate: **STAGES** + **TRIP**

```
Start Calibration?
Press YES if you are
at starting point
Trip=NO    Stop=YES
```

First drive to the beginning of the Calibration section (and Stop).

Then press **STOP** To start the calibration run. (**TRIP** to exit)

```
Drive 1000
meter and press
RESET
Pulses:000000 000000
```

Now you can start to drive and you will see the amount of pulses that is measured during this run. This are not meters but incoming pulses of your sensors. Left is sensor 1 and right is sensor 2. This can also be used during the installation of the tripmaster to see if you get pulses from your sensor.

At the end of the section when you have exactly driven the section distance (in this example 1000 meter), it is easiest to stop and you have to press the **RESET** button. He will give the following screen:

```
wheel1 cir: 1930 mm?
wheel2 cir: 1930 mm?
Normal
Trip=No        Stop=YES
```

If you want to accept the given values for the wheel circumferences you press **STOP**. To decline this as a new value you press **TRIP**.

2.2.14   Calibration Distance

Because it is not always possible to use the same distance for the calibration, the distance can be adjusted for the calibration. In general, the longer the distance, the more accurate the calibration (if

your calibration section is accurate) This can come in handy if the Organization of a regularity event gives a stage/section as a calibration section . This distance can then be entered and driven and you calibrate your tripmaster to the one that is used by the organization (if they did everything with 1 device, with 1 setting in 1 car!!). In this case, it does not even matter if your device deviates from the truth (if 1 meter is really 1 meter) because it is the same as the one that the organization does all the (distance) measurements with.

To change the value you can use the following button combinations:

- o Up (1): **SETUP** + **STOP**
- o Down (1): **SETUP** + **TRIP**
- o Fast Up (50*): **STAGES** + **STOP**
- o Fast Down (60*): **STAGES** + **TRIP**

*The difference in these values allow you to come close to a certain value faster before you need to use the fine adjustment.

2.2.15   Sensor Mode

The Sensor mode is which sensor(s) you want to use. There are 2 (GPS) or 3 possibilities.
Non-GPS:

- - Use sensor 1
- - Use Sensor 2
- - Use Average of Sensor 1 and 2

GPS:

- - Use sensor 1
- - Use GPS signal

During the **HOT** stage and the Special Stage (**STA**) this can also be changed. see, 4.2.2.2 HOT and 4.2.2.3 STA.

To change the value you can use the following button combinations:

- o Change: **SETUP** + **STOP**
- o Change: **SETUP** + **TRIP**
- o Change: **STAGES** + **STOP**
- o Change: **STAGES** + **TRIP**

When the **average of sensor 1 and 2** is chosen, the average of the sensors is taken. The sensors do only use the calibration information (wheel circumference and pulses) of sensor 1. The calibration values of sensor 2 are completely ignored. **Therefore, this mode can only be used if the calibration information of both sensors is the same.** This mode will make a higher accuracy because it measures the virtual middle of the car if the sensors are placed in a left and right wheel.
The remaining options are self-explanatory.

2.2.16   GPS Correction Factor (Only for the gps version)

This factor allows for a small correction of the measured distances of the GPS measurement. If there is always the same deviation, it can be corrected between -5% and 5%.

To change the value you can use the following button combinations:

- o   Up (0.1%):   **SETUP   +   STOP**
- o   Down (0.1%):   **SETUP   +   TRIP**
- o   Fast Up (1%):   **STAGES +   STOP**
- o   Fast Down (1%): **STAGES +   TRIP**

Example:
If the real distance is 1000 meter and the screen displays 950, you enter as GPS correction factor (+) 5%.
(Be aware that the screen value of 950 is in reality 950 up and until 959 meter. The last digit is made 0 for readability)

2.2.17   GPS Clock Deviation (Only for the gps version)

The GPS clock is transferring the time in normal greenwhich (winter) time. In this menu you can correct the time to match your timezone and winter or summertime. The value is in hours.

To change the value you can use the following button combinations:

- o   Up (1):   **SETUP   +   STOP**
- o   Down (1):   **SETUP   +   TRIP**
- o   Up (1):   **STAGES +   STOP**
- o   Down (1):   **STAGES +   TRIP**

2.2.18   GPS Accuracy Range (Only for the gps version)

To compensate for the deviation of the GPS signal, a minimum distance (in meters) is necessary to overcome that the distance is counted of the deviation of the GPS signal. The smaller this value, the better it is for the reading but too small is bad while you are counting deviation in the measurement. It has already a pre-set value that we see as optimum. If you want or need to change it, the best is to stop the car for a while with the tripmeter activated. When it stand still and has a good receipt of signal and is still counting distance, than you should increase this value.

To change the value you can use the following button combinations:

- o   Up (1):   **SETUP   +   STOP**
- o   Down (1):   **SETUP   +   TRIP**
- o   Up (1):   **STAGES +   STOP**
- o   Down (1):   **STAGES +   TRIP**

2.2.19   GPS Information (Only for the gps version)

This is a read-only item. It displays GPS information for analysis purpose and to check if a correct GPS signal arrives.

2.2.20   Surface/calibration selection

With this menu item you can select and use different calibration values. You can use this for an event or for different sets of wheels. Instead of numbering these values, we have used names to make it more easy to handle. Which name you use, has no extra effects.
The next names are used:

- Normal   For your normal set of tyres
- Event   If you do a calibration run for a certain event and you want to keep your normal calibration value
- Wet   For your wet tyres
- Gravel   If you have a special surface (a lot of wheelspin) or different tyre pressure
- Dunes   If you have a special surface (a lot of wheelspin) or different tyre pressure

While there are no extra effects, the Dunes mode will work exactly the same as the Event mode. It will just save your calibration value (only the wheel circumference) for each sensor. So, in total, you have 5 calibration values for sensor 1 and 5 for sensor 2.

If you want to use a mode, you have to make sure you set the wheel circumference for this sensor after changing the mode in this menu item (Perform a Calibration run). If you ever did it, it is already saved of course. Changing this mode will of course **not** delete your saved values!

2.2.21   Pulses per wheel rotation Sensor 2 (non GPS version)

The setup of wheel sensor 2 works exactly the same as wheel sensor 1.
Please see 2.2.23 Pulses per wheel rotation Sensor 1 for complete explanation.

2.2.22   Wheel circumference Sensor 2 (non GPS version)

The setup of wheel sensor 2 works exactly the same as wheel sensor 1.
Please see 2.2.24 Wheel circumference Sensor 1 (Calibration Value) for complete explanation.

2.2.23   Pulses per wheel rotation Sensor 1

In this menu item you can set the amount of pulses you receive per rotation of the wheel of sensor. If you know this exact number, you can set it here. If you do not know this exactly, you can put in your best guess. If it is not an exact whole value, just put the closest number you think. If we do a calibration run (see Menu Item: Calibration Run) and we get an extremely small wheel circumference, we should decrease this number of pulses per rotation. If we get with a calibration run an extremely high wheel circumference, we should increase the amount of pulses per rotation. Any deviation from the exact real truth will automatically be compensated in the wheel circumference when an Automatic Calibration Run is performed. Being at approximately the correct

wheel circumference gives as benefit that the size of the wheel circumference is normal and that there will not be big deviations of internal rounding of values.

To change the value you can use the following button combinations:

- o Up (1):   **SETUP** + **STOP**
- o Down (1):   **SETUP** + **TRIP**
- o Up (1):   **STAGES** + **STOP**
- o Down (1):   **STAGES** + **TRIP**

2.2.24   Wheel circumference Sensor 1 (Calibration Value)

Adjust here the circumference of your wheel of sensor 1. If *the pulses per wheel circumference* is/can not be set exactly, this will behave as a calibration value but not the wheel circumference. This has no influence on the correct operation. This value is often significantly smaller than the actual circumference because of the indentation off your wheel. The wheel circumference can be automatically measured and set by the means of the Calibration run (see 2.2.13 Calibration Run). If you use multiple sets of wheels, you can perform an automatic calibration run for every set at different Surface modes. (see 2.2.20 Surface/calibration selection). Also this value can be increased or decreased if you want to do small changes or set your wheel circumference manually.

To change the value you can use the following button combinations:
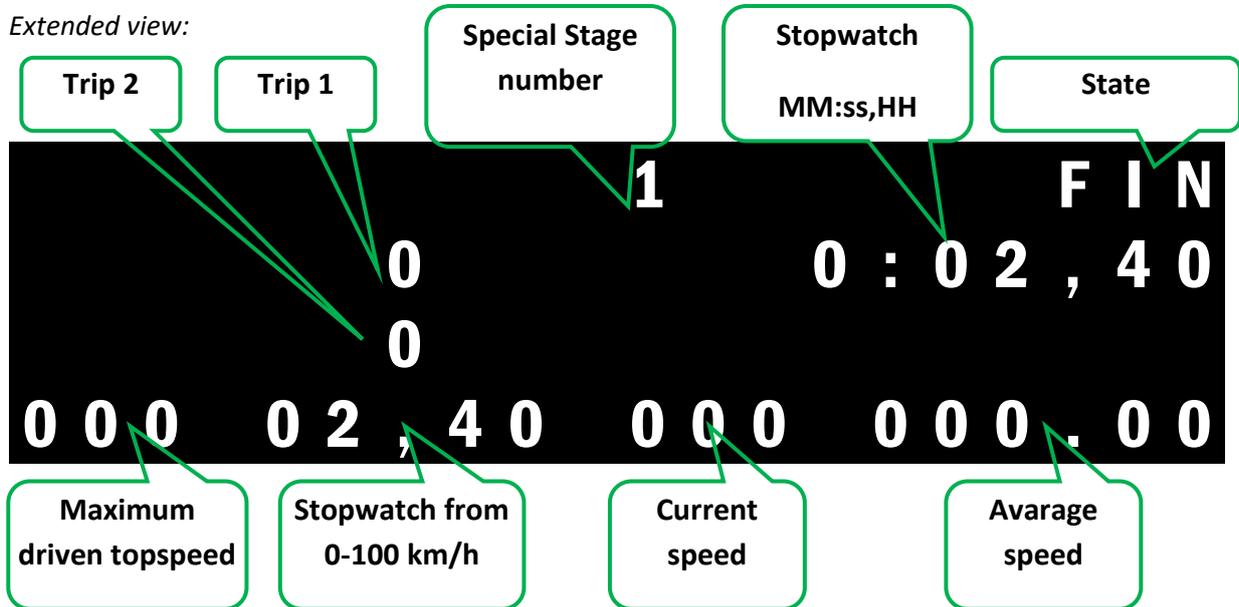
- o Up (1):   **SETUP** + **STOP**
- o Down (1):   **SETUP** + **TRIP**
- o Fast Up (50*):   **STAGES** + **STOP**
- o Fast Down (60*): **STAGES** + **TRIP**

*The difference in these values allow you to come close to a certain value faster before you need to use the fine adjustment.

3 Operation Rally mode

3.1 Screen Explanation

Extended view:

Trip 2 | Trip 1 | Special Stage number | Stopwatch MM:ss,HH | State

```
                    1                F I N
      0                       0 : 0 2 , 4 0
      0
0 0 0    0 2 , 4 0    0 0 0    0 0 0 . 0 0
```

Maximum driven topspeed | Stopwatch from 0-100 km/h | Current speed | Avarage speed

Simple view:

Trip 2 | Trip 1 | Special Stage number | Status

```
                    1                F I N
      0                       0 : 0 2 , 4 0

      0         0 0 0
```

Only in PRE and FIN status (for the connection stages):

Current speed

ITEM	DESCRIPTION
TRIP 1	The trip distance in meters. This can be resetted by the **TRIP** button. Above 10 meters, the value will be rounded down to every 10 meters for readability
TRIP2	Total Special Stage distance.
SPECIAL STAGE NUMBER	Special Stage number. This is also the Special Stage number that can be found in the Stage storage section, the Stages menu.
STATE	The State where you are. There are 4 states: PRE, HOT, STA, FIN
STOPWATCH	Stopwatch: Minutes, seconds, and hundredths in steps of 0.04 s
MAXIMUM DRIVEN TOPSPEED	The maximum driven topspeed on the Special Stage in Km/h
3.1.1.1 STOPWATCH FROM 0 TO 100 KM/H	A stopwatch in seconds and hundreths which stops automatically at 100 km/h.
CURRENT SPEED	Current speed in Km/h
AVARAGE SPEED	The average speed on the Special Stage.

3.2 Functionality: State Explanation

The trip meter goes through 4 States every time when driving and capturing a Special Stage:
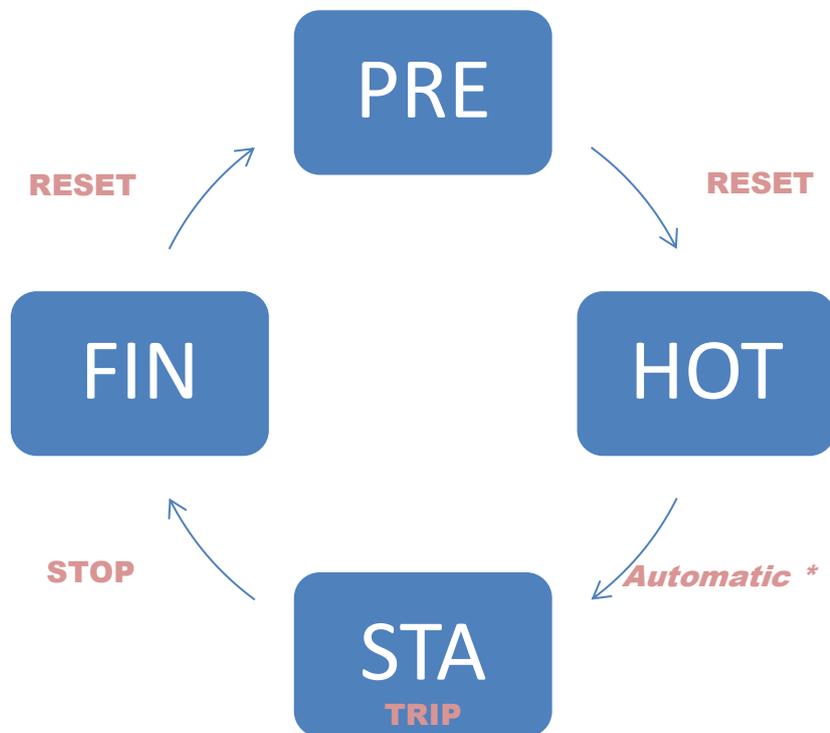
PRE: Before the Special Stage

HOT: "Ready to Start"

STA: Driving the Special Stage

FIN :   FINished

3.2.1 Explained graphically:

*Remarks:

1. Manual Start, suppressing the automatic: **TRIP** (Release)
2. Recover to **HOT** state: **RESET**

3.2.2 Explanation

3.2.2.1 PRE

In this state you can drive towards your Special Stage. You can use the TRIP button to reset your **trip 1** to follow your roadbook to the start of your Special Stage. In this state you can open the Setup and Stages Menu by pressing the SETUP and STAGES buttons.

When you are completely stopped at the Start Line of the Special Stages, you press the RESET button to go the HOT Stage.

If you want to suppress the Automatic Start function, you can already push your TRIP button while pressing the RESET button to go to the HOT Stage.

3.2.2.2 HOT

The tripmaster is resetten. All Values go to 0 and the Stages number will start blinking, indicating that the Tripmaster is ready. You are ready to start. If you are surpressing the Automatic Start function by pressing the TRIP button, the Stage number will not be blinking.

Automatic Start: When the vehicle starts moving the Tripmaster goes to the STA stage and starts.

Manual Start: When you release the TRIP button the Tripmaster goes to the STA stage and starts.

If, for any reason, you want to go back to the PRE stage, you can press the STOP button.

3.2.2.3 STA

You drive on your Special Stage and the Stopwatch is running and the distance is counting.

You can press TRIP to reset your **Trip 1** value to zero to measure the distance from corner to corner.

By pressing RESET you can return to the HOT state. Use this button if, by accident, the autostart function is triggered while you are not started yet. You will get a Yes/No menu:

Stop = YES = Reset all and back to HOT

Trip = NO = back to STA. The information is not lost and everything continued counting in the background.

With the SETUP button you can freeze all screen information temporarily. All information will continue counting in the background and is displayed again when releasing the SETUP button.

Finally you stop the Stopwatch with the **STOP** button. This you have to do when crossing the Finishline. At this moment, the State will go to **FIN** and all Special Stage information is written to the **Stage Menu**.

3.2.2.4 FIN

This is the State after you have driven the Special Stage. All information is written to the **Stage Menu** and you can read your Information on the screen. Your **Trip** distances continue on measuring while this complies with your roadbook for the **Liason** stages.

You can still use the **TRIP** button to reset your **Trip 1**.

In this stage you can go to the **Setup Menu** by pressing the **SETUP** button and you can go to the **Stage Menu** by pressing the **STAGES** button.

To Continue on to the next state, **PRE**, you have to press the **RESET** Button and you continue with your next Special Stage. (see top of this section)

3.3 Additional Information:

1. When you put the car in reverse, "**REVERSE**" will appear in the top right corner of your screen and the trip distances will count backwards.
2. During these stages you can use the Simple or Extended view. See **Setup menu**.

4 Operation Regularity mode

4.1 Screen Explanation

Extended view:

Trip 3	Trip 2	Trip 1	Stage number	Stopwatch MM:ss,HH	State

```
          0         1              F I N
          0                  0 : 0 2 , 4 0
          0                    0 2 9 . 8 6
0 0 0   0 4 6       - 1 0   0 3 0 . 0 0
```

Maximum driven topspeed	Current Speed	Deviation in meters on position of Target Average Speed	Target Average Speed	Average Speed

Simple view:

Trip 3	Trip 2	Trip 1	Stage number	Stopwatch MM:ss,HH	Status

```
          0         1              F I N
          0                  0 : 0 2 , 4 0
          0
```

ITEM	DESCRIPTION
TRIP 1	The trip distance in meters. This can be resetted by the **TRIP** button. Above 10 meters, the value will be rounded down to every 10 meters for readability
TRIP 2	Total Special Stage distance.
TRIP 3	Total Event Distance
STAGE NUMBER	Stage number. This is also the Special Stage number that can be found in the Stage storage section; the Stages menu.
STATE	The State where you are. There are 4 states: **PRE**, **HOT**, **STA**, **FIN**
STOPWATCH	Stopwatch: Minutes, seconds, and hundredths in steps of 0.04 s
MAXIMUM DRIVEN TOPSPEED	The maximum driven topspeed on the Special Stage in Km/h
DEVIATION IN METERS ON POSITION OF TARGET AVERAGE SPEED	This is the deviation in meters from where you should be when you would have driven always exactly on your ideal average speed. If there is on the display "-100", that means, that you are hundred meters behind. You should have been 100 meters further now. While, if you change your average speed while driving (while being in the **STA** state), this value will keep your deviation. Therefore it can be that your current average speed measurement is higher than the target and There is still "-100"in the display. This is correct, while in the complete stage, you are still behind from where you should be if you were already behind while switching the average speed. The deviation is kept but the average speed is restarted when a new target average speed is activated. So; if the value is negative you should increase your speed. If the value is positive you should decrease your speed.
CURRENT SPEED	Current speed in Km/h or mls/h
TARGET AVERAGE SPEED	The average speed which you should drive. This can be changed and activated during driving of the stage (**STA** state). When activated, the Average speed starts counting again from 0 but the "Deviation on position of the target average speed" keeps its deviation so you can still compensate for that.
AVERAGE SPEED	The average speed on the Special Stage. If you change the target average speed and activate this, the average speed calculation is also restarted.

4.2 Functionality: State Explanation

A stage is a "travel" between two TC's. While in Regularity, the stages can follow each other (you drive from TC to TC) you have to go through different stages(*) in the TC zone.

The trip meter goes through 4 States every time when driving and capturing a Stage:
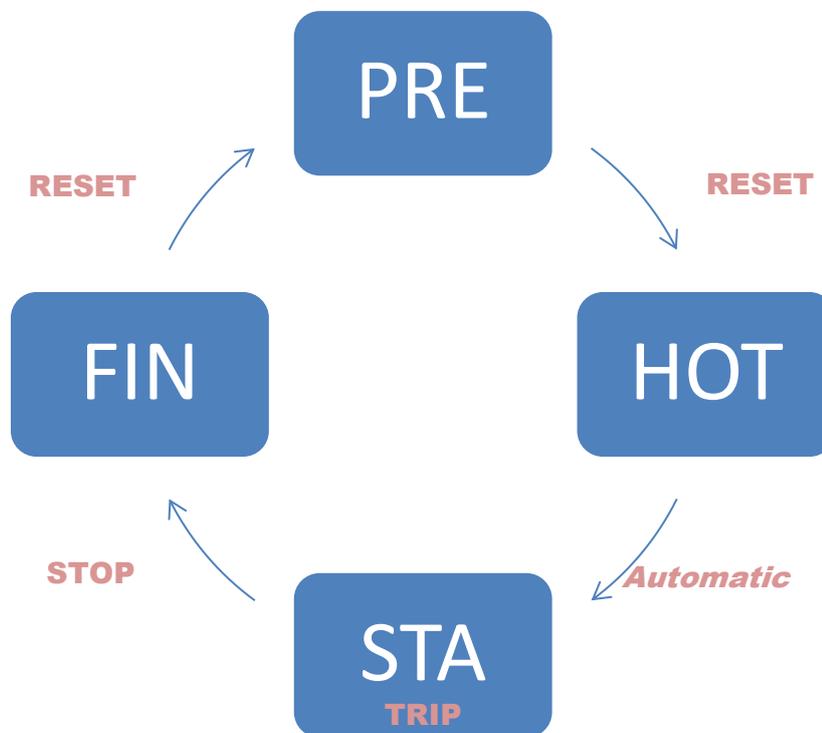
PRE(*):   Before the Stage

HOT :   "Ready to Start"

STA :   Driving the Stage

FIN (*):   FINished

(*) The States **FIN** and **PRE** Should be activated sequentially within the TC zone when TC's are following each other directly. (driving from TC to TC to TC) (**RESET**).

4.2.1 Explained graphically:

PRE

RESET

RESET

FIN

HOT

STOP

Automatic

STA

TRIP

Remarks:

1. Manual Start in **HOT** State, suppressing the automatic start: **TRIP** (Release)

2. Recover to **HOT** state: **RESET (Long)**

3. Counting backwards or stop counting: **RESET (short)**

3. Changing Target Average speed on **STA** State:

- **SETUP** to start and change digit

- **STAGES** to change next character

- **DIM** to Activate

4.2.2 Explanation

4.2.2.1   PRE

In this state you can drive towards your Stage. You can use the TRIP button to reset your **trip 1** to follow your roadbook to the start of your Stage. In this state you can open the Setup and Stages Menu by pressing the SETUP and STAGES buttons.

When you are completely stopped at the Start Line of the Stages, you press the RESET button to go the HOT Stage.

If you want to suppress the Automatic Start function, you can already push your TRIP button while pressing the RESET button to go to the HOT Stage.

If you are driving to a self start and you are too late, please see section *"Too late at self start"* at 4.3 Practical Cases.

4.2.2.2   HOT

All Values go to 0 and the Stages number will start blinking, indicating that the Tripmaster is ready. You are ready to start. If you are surpressing the Automatic Start function by pressing the TRIP button, the Stage number will not be blinking.

***Automatic Start*:** When the vehicle starts moving the Tripmaster goes to the STA stage and starts.

Manual Start: When you release the TRIP button the Tripmaster goes to the STA stage and starts.

If, for any reason, you want to go back to the PRE stage, you can press the STOP button.

During this HOT Stage, you can change and activate a new average speed. You can also only change it to activate it at the first necessary moment which can be after the start.

Changing average speed:
This is done with the *white buttons* of the Tripmeter.
Normal use:

1. To change to value, press the SETUP button. The second digit of the average speed start blinking to indicate that this digit can be changed. With pressing the SETUP button, the value of this digit can be changed.
2. To select the next digit, press the STAGES button. You can keep repeating this until the complete value is correct.
3. As long as a digit or the complete value is blinking, **the new value has not been activated and all calculations are based on the previous Target average speed.** To activate the New Target Avarage speed, you press the DIM button at any time a digit or the complete value is blinking. The new Target Average speed is used and the average speed measurement is resetted to 0**.** The Deviation of the Average Speed (in meters) will keep its deviation in meters so you can still compensate for that (which is of course still 0 in the HOT state).

Changing the average speed from the preprogrammed list:

1. To change to value, press the **STAGES** button. The selected average list speed will be displayed and blinking. When the **STAGES** button is pressed again, the next value in the list is selected and displayed. This can be done repeatedly. When the list reaches its end, it will start at the beginning again. All values that are 0 in the list will be skipped. If you want to change over to the normal way of changing the target average speed, press the **SETUP** button and see the previous paragraph *"Normal Use"*.

2. As long as the complete value is blinking, **the new value has not been activated**. This can be done by pressing the **DIM** button at any time a digit or the complete value is blinking.

In short:
- o   changing   **SETUP** and/or **STAGES**
- o   Activation   **DIM**

4.2.2.3   STA

You drive on your Special Stage and the Stopwatch is running and the distance is counting.

You can press **TRIP** to reset your **Trip 1** value to zero to measure the distance from corner to corner.

By pressing **RESET(long)** you can return to the **HOT** state. Use this button if, by accident, the autostart function is triggered while you are not started yet. You will get a Yes/No menu:

Stop = YES = Reset all and back to **HOT**

Trip = NO = Stay at **STA**. The information is not lost and everything continued counting in the background.

By pressing **RESET(short)** you can change manually from backwards to not counting and reverse counting. If the pulscounting is stopped, no meters are measured. When reverse is selected, all meters that are measured are deducted from all trips. When the car is put in reverse, the reverse will go to normal or normal will go to reverse. To go back to normal counting, press **RESET** until the state (**STA**) is displayed again in the top right corner of the display.

During the **STA** state, the Target Avarage Speed can be changed and activated. This is done exactly the same as during the **HOT** state. Therefore see the previous paragraph for the explanation (*"Changing average speed"*).

Finally you stop the Stopwatch with the **STOP** button. This you have to do when crossing the Finish line. At this moment, the State will go to **FIN** and all Special Stage information is written to the **Stage Menu**.

4.2.2.4   FIN

This is the State after you have driven the Stage. All information is written to the **Stage Menu** and you can read your Information on the screen. Your **Trip** distances continue on measuring while this complies with your roadbook for the **Liason** stages.

You can still use the TRIP button to reset your **Trip 1**.

In this stage you can go to the **Setup Menu** by pressing the SETUP button and you can go to the **Stage Menu** by pressing the STAGES button.

To Continue on to the next state, PRE, you have to press the RESET Button and you continue with your next Special Stage. (see top of this section)

If there is no Liason stage but the TC are following directly after each other, you have to go to the PRE stage within the TC zone by pressing RESET

4.3 Practical Cases

4.3.1 Explanation Too late selfstart (extended distance start)

When you are arriving too late at your self start, you can still use the correct values with the following method. First you start the stopwatch in the normal way. While you are probably driving towards the selfstart, you have to surpress the auto-start function to accurately start the stopwatch. Therefore, You press from the PRE state the TRIP button and hold this. While holding the TRIP button, you press the RESET button to set the Tripmeter in HOT state. At the correct time, you release the TRIP button (often a foot pedal or switch) and the STA state will be started. Now your stopwatch is running correctly.

Now you prepare to start the distance measurement on the correct moment (starting line). You repeat the previous actions. You press from the STA state the TRIP button and hold this. While holding the TRIP button, you press the RESET button. The text appears: *"Are you sure you want to reset the distances? Setup = No RESET = YES."* While still holding the TRIP button, you press the RESET button. (or the SETUP button if you want to cancel). The next text will appear: "Keep TRIP pressed until you reach the starting line to start your distance." You keep your TRIP button pressed until you cross the starting line and release it at the right moment. Now your distance is also running correctly.

In short:
- o   To activate Stopwatch: Hold TRIP. Press RESET. Release TRIP
- o   To activate Distance: Hold TRIP. Press 2x RESET. Release TRIP

4.4 Additional Information:

1. When you put the car in reverse, "**REVERSE**" will appear in the top right corner of your screen and the trip distances will count backwards. (this can also be manually activated).
2. During these stages you can use the Simple or Extended view. See **Setup menu**.

5   Stages Menu

5.1 Description

In the Stages menu you can find all saved information about your stages.

To go to the Stages menu you press the **STAGES** button in the **PRE** or **FIN** state.

The Stages menu has the following menu items:
- The different Stages
- Total event time
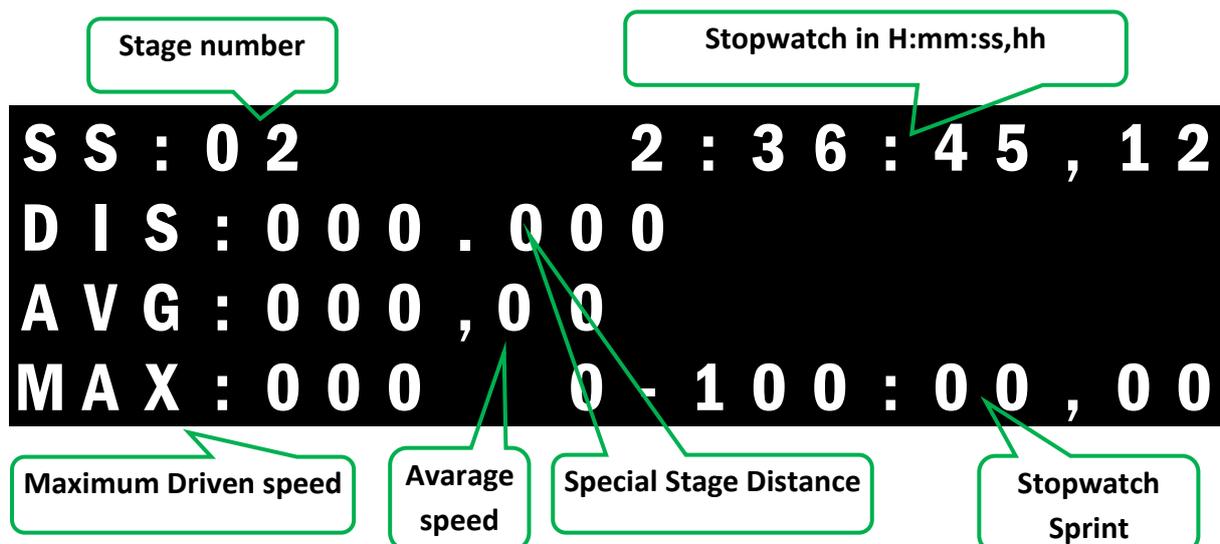- Entry to reset all stages (to be done before each event)

Next to the possibility to reset the complete event, you can also reset 1 individual stage so you can re-use that stage.

To scroll through the menu, you have to use **TRIP** to go down and **STOP** to go up.

You can leave the menu in 2 ways:
- **STAGES** button: You return where you were. (like a CANCEL or ESCAPE button)
- **RESET** button: You return and the selected stage will be activated. When the stage is already filled with information, you will not be able to activate this stage. If you want to overwrite the stage, you first have to remove all data from this individual stage (see reset an individual stage).

5.2 Screen Layout

Stage number

Stopwatch in H:mm:ss,hh

```
S S : 0 2              2 : 3 6 : 4 5 , 1 2
D I S : 0 0 0 . 0 0 0
A V G : 0 0 0 , 0 0
M A X : 0 0 0   0 - 1 0 0 : 0 0 , 0 0
```

Maximum Driven speed

Avarage speed

Special Stage Distance

Stopwatch Sprint

Be Aware: The sprint value that is currently active, will be displayed at the sprint. If you change the sprint value (see setup menu), it will be changed here also, even if there is still data in the setup menu.

5.3 Total Time

This menu item shows you the total time of all your stages. This is easy to compare with the time of the organization. To come there you do:

Select the 1 before last menu item (by selecting it with **TRIP** or **STOP**).
(The last menu item is to reset all stages)
This item will show you your total time.

Tip: From Special Stage 1 you can go down instead of up…

From this menu item, you can't leave with the **RESET** button.

5.4 Reset all Stages

The last menu item is to reset all Stages. All information of all stages will be lost. (ofcourse no setup information will be lost).

Select the last menu item (by selecting it with **TRIP** or **STOP**).

```
STages:

REset  all  stages?
(Press  RESET)
```

If you press the **RESET** button you get:

```
RESET  ALL  STAGES?
TRip  =NO
STop  =YES
```

Then press the **STOP** button the reset all stages. The total time (1 before last menu item) will also be resetted to 0.

5.5 Reset an individual stage

You can reset 1 individual stage. All information in this stage will be lost.

5.5.1 How to..

Activate the stage you want to reset (by selecting it with **TRIP** or **STOP**).

Press the **SETUP** button.

You get:

```
Reset   Stage:4
Trip   =NO
Stop   =YES
```

If you press the **STOP** button you will reset the Stage.

6 Technical information and limits

Maximum stored stages: 75 Stages

Maximum Stopwatch time   10 hours