

Regularity Master

Regularity Master 57

User's Manual



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Regularity Master 57

User's Manual

1. General characteristics:

Regularity Master 57 is a 3 in 1 instrument designed for use in Regularity rallies, combining a high accuracy multiple odometer with an electronic speed table and a real time clock.

All control parameters are displayed via a 5,7" touch screen, through which, the operator (co-driver), may also change the values of various parameters, without need of any additional keyboard.

However, some external buttons - switches are also available, through which certain basic parameters may be changed, such as:

- a) Prepare next average speed.
- b) Change average speed.
- c) Add - subtract meters to the odometers.
- d) Reverse Button.

Regularity Master 57 is offered as a ready to install device.

It requires a 12V DC power supply (1A min), but it is also available (upon request) for operation with 6 or 24V DC.

Output voltage to the pulse sensors, is 24V DC in any case, so adequate sensors must be used (most of the sensors found in the market function without problem).

Regularity Master 57 may be connected with two pulse sensors of various types (inductive, optical, magnetic), with either two or three wires, PNP or dry contact type. Each sensor can be calibrated separately.

If two sensors are connected, the odometer functions by calculating the mean value of the two signals. In any case, operator can also manually select which sensor to be used.

2. Wiring:

Power supply is done through the red (+) and black (-) wires.
A 1A safety fused is found on the red wire or on the top of the box.

Four additional wires are used for connecting the two sensors.

Brown (+24V DC)

White (0V DC)

Green (left sensor signal)

Yellow (right sensor signal)

For 2-wire sensors, we use the brown wire for supply and the green(left) or yellow(right) for the returned signal.

For 3-wire sensors, we use the brown and white wires for supply and the green(left) or yellow(right) for the returned signal.

3. Commissioning:

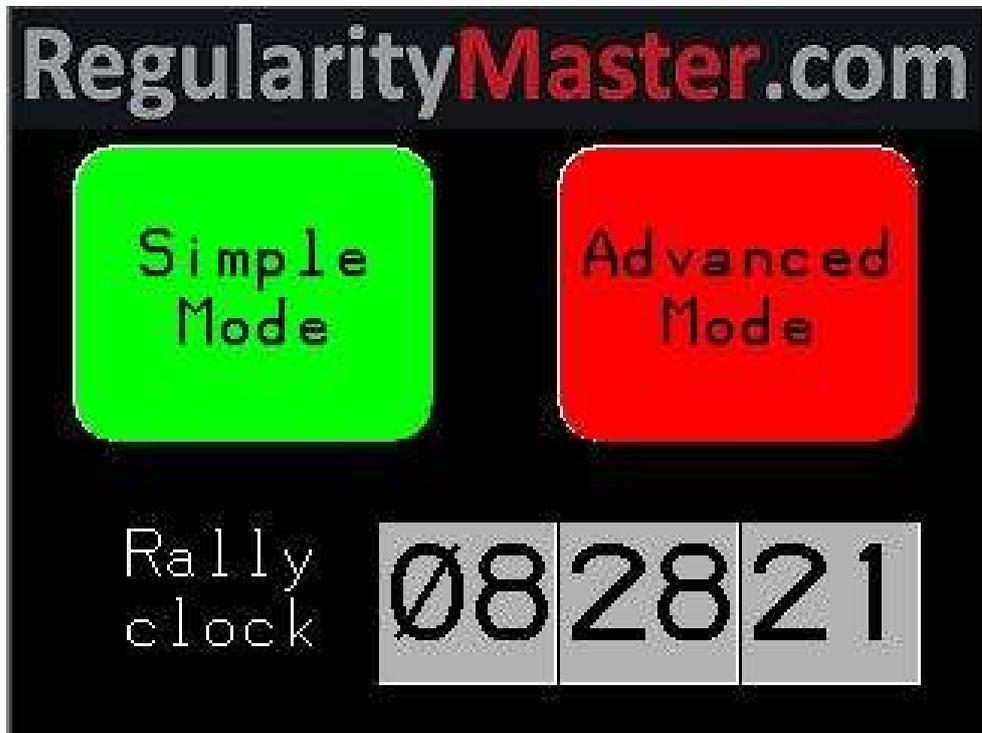
If power is connected to the device, we only need to push the On-Off switch, in order to operate.

In any case, if the sensor wires are not connected, protect them in order to avoid a short circuit that could damage device's power supply unit.

4. Functional description:

Home screen:

When we power on the instrument, after ~10 sec, the following screen appears:



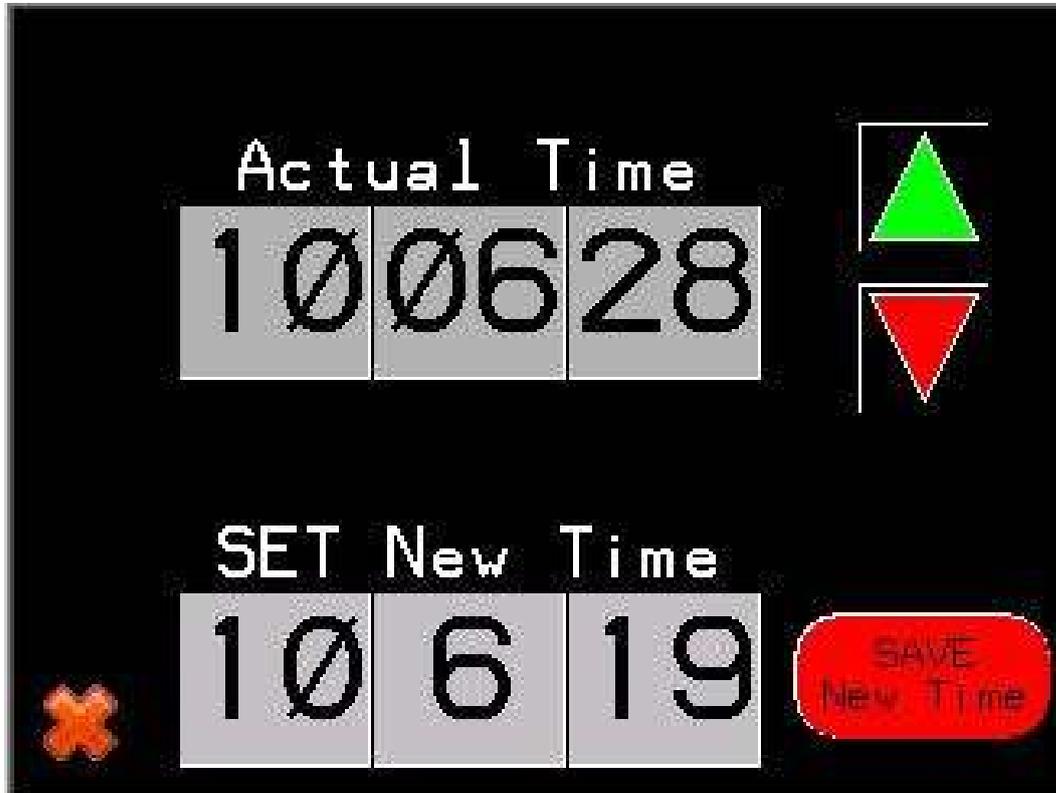
From this screen, we can select if we want to use the **Simple Mode** (suitable for most European regularity rallies), or the **Advanced Mode**, for special rallies.

By pressing on the **Rally clock**, a screen for setting up the time appears.

4.1 Time set-up

The instrument is equipped with a Real Time Clock, which can be synchronized with the rally's clock. This is particularly useful for special stages with self start.

Through the initial screen, by pressing on the time indication, next page appears:



For minor changes, we can just use the up and down arrows.

By pressing the ▲ button, time is increased by 1 second and by pressing the ▼ button, time is decreased by 1 second.

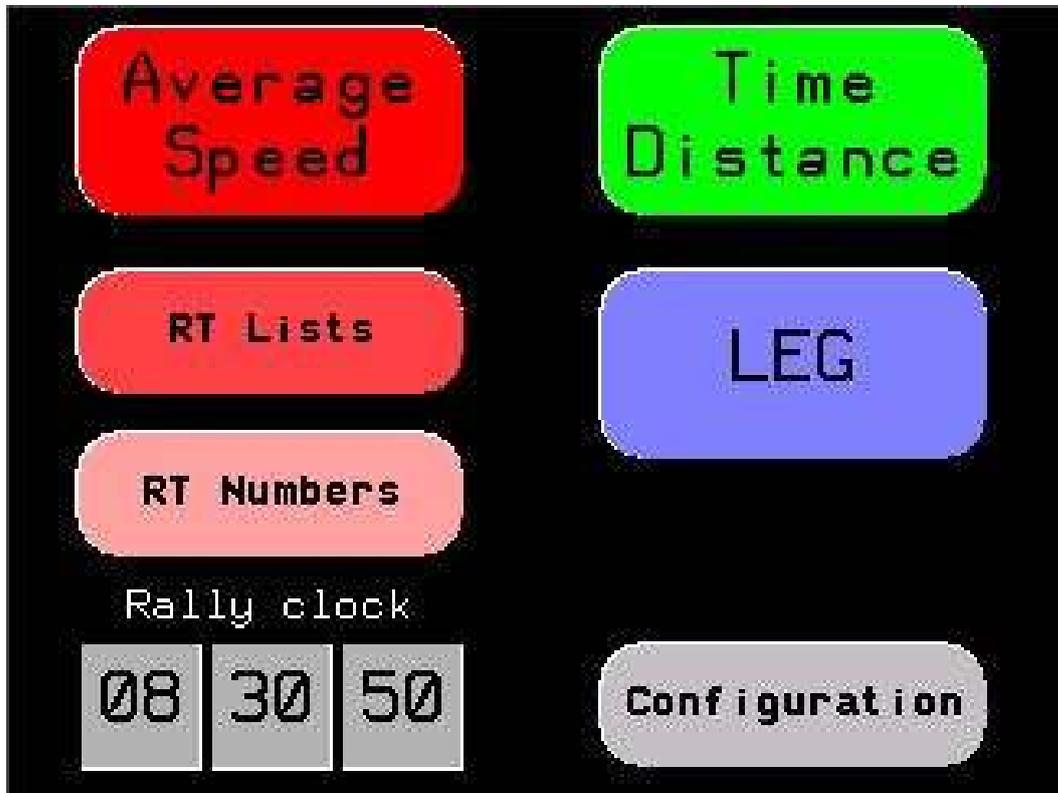
We must NOT press the SAVE New Time button

If we want to fully set up the clock, we set the new time one the bottom line, and then we save it by pressing the **SAVE New Time button**.

By pressing the X button, we return to previous screen.

4.2 Simple Mode Page

In case we select from initial screen the **Simple Mode**, then the following screen appears:



By pressing on any button, we can select one of the following screens - operations.

Average Speed: In order to run in a RT, by following given average speed(s)

RT Lists: Screen for setting average speeds (and distances) for all RT.

RT Nrs.: Screen for setting the number of each RT.

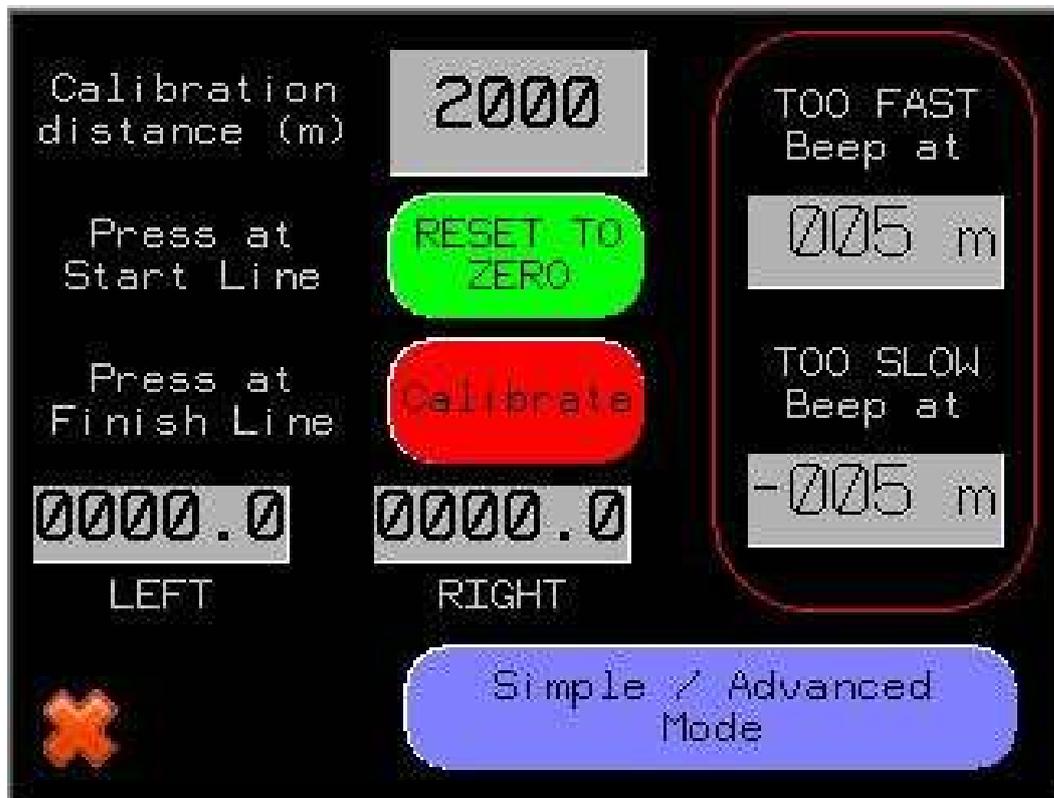
Time Distance: In order to run in a RT, by following given time-distance instructions.

LEG: Total leg overview screen.

Configuration: Basic configuration screen and calibration.

4.2.1 Calibration - basic settings

Through the Simple Mode screen, by pressing on Configuration button, next page appears:

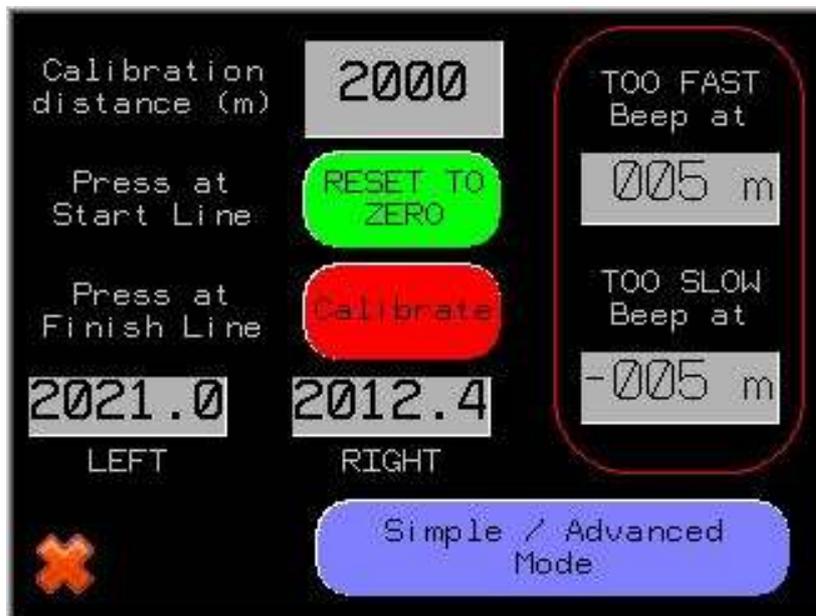


Sensors are called Left and Right, but they can be connected as we like (e.g. front and back, or in case of only one sensor this can be connected either as left or right).

In order to calibrate the instrument, we follow the following procedure:

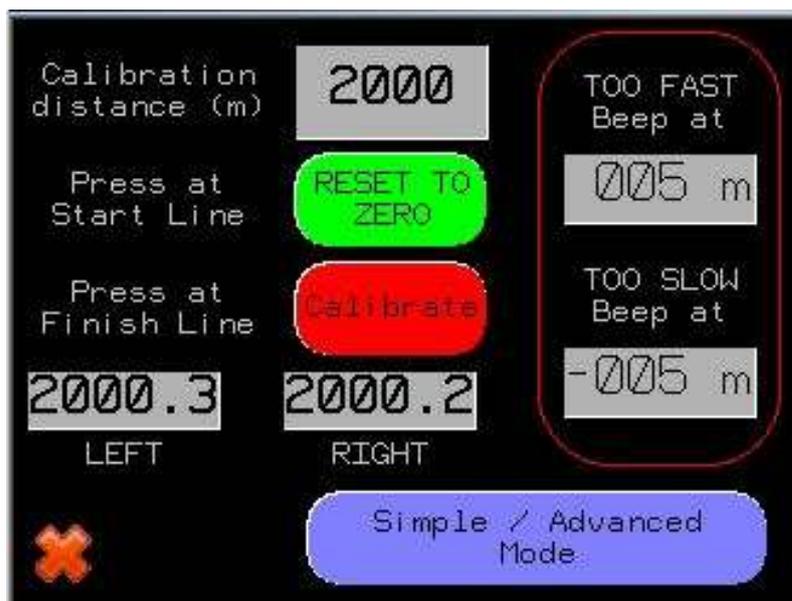
- a) We fill in, the Calibration distance in meters, in this example is 2000.
- b) Once on the start line of the calibration route, we press the **RESET TO ZERO** button, and then the LEFT and RIGHT distance indications become 0,0 as in the above picture.

c) We drive as close as possible to the ideal line, and by arriving on the end line we fully stop.

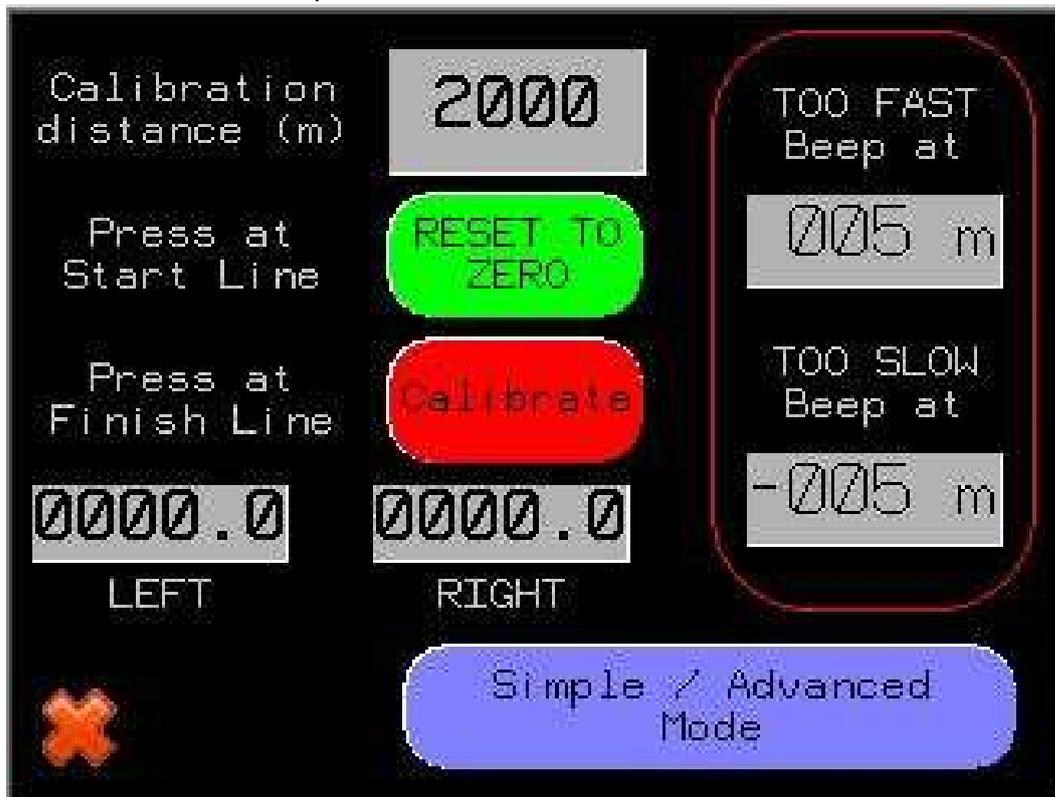


The measured distances at this moment can be different than the calibration distance, since calibration is not yet done.

d) We press then the **Calibrate** button. Automatically then the instrument will calculate the ideal coefficient for each sensor, and the actually measured corrected distances will appear on each sensor's display. (Probably slightly different from the calibration distance as displayed with higher accuracy).



On the right side of this screen, we can also set-up the limits (in meters) for TOO FAST or TOO SLOW beep.



In the above example, both limits are set to 5 meters, which means that the instrument will start beeping when the difference between real and ideal distance becomes >5 m (TOO FAST), or <-5 m (TOO SLOW)

!! For TOO FAST beep distance, a positive value must be used and for TOO SLOW beep distance a negative value must be used !!

From this page, we can also return to the Mode selection page (Simple or Advanced), by pressing on the relative blue button.

4.2.2 Average Speed rallies mode

Through the Simple Mode screen, by pressing on **Average Speed** button, next page appears:



In this screen we can find the following buttons and indications:

Sensors selection buttons, are found on the top left corner of the screen. The green one shows the actually selected, and by pressing on any of them we can switch between LEFT, RIGHT, or BOTH (mean value) sensors.

RT odometer is the measured distance we have run, since the start of the RT.

By pressing on **RESET RT ODO**, we reset the RT odometer to 0 (**Attention, there is no delay, reset occurs immediately**).

The RT odometer is automatically reset to 0, when START RT is pressed or when an automatic Self Start occurs.

By pressing on the odometer indication, a popup window appears, where we can manually set and save a new value for the partial odometer:



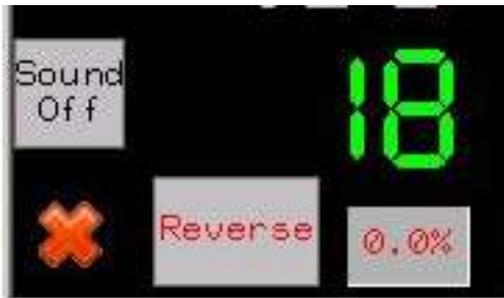
By touching on the grey area a numeric pad appears in order to set the new value to the partial odometer.



Once we set the new value, we press enter and then the **Save** button.

With the external **+ / -** switch, we can add or subtract 10 or 1 meters to the RT odometer as well.

Advance / Retard difference: This indication, found just under the RT Odometer, shows the difference between the real distance (partial odometer), and the target (ideal distance). This value is expressed in meters.



A negative value means that we miss some meters, so we are slow and we have to accelerate, when positive value means we are fast and we have to decelerate. Ideally we have to see continuously 0.

The color of this indication changes, from GREEN, to ORANGE and to RED, depending on its value and on the relative settings on the configuration menu.

Sound button, is used to activate or deactivate the beep signal. Sound goes automatically ON when a RT starts.

Reverse button, is used to make the odometers count down, in case we have to make reverse, or we took a wrong direction, and have to return back.



When Reverse is pressed, it becomes fully RED
When we are back to the right point, we press again the Reverse, to deactivate it.

When an a RT starts, the Reverse option is deactivated automatically.

In some models, an external RED push button exists, for Reverse mode. As far as this button is pressed the Reverse mode is active.

The **correction factor (0,0%)** is used in case that we realize that we have a systematic error on our measured distances, during a stage. If e.g. we realize that every 2 km we have to add 10 m, in order to match the odometer indication with the roadbook marks, we can set a correction coefficient of 0,5%, which acts like a multiplier (1,05) over our calibration coefficients. In that way, we can easily make a provisional correction, without changing our calibration coefficients.

Typical example of using the correction factor are cases of very "tight" roads, where we can not drive on the ideal line, and though our odometer "writes" systematically less meters. Other case is when we have loss of pressure on a tire, and then the relative sensor "writes" more meters (in this case a negative correction factor has to be used).



The red **START SS** button is used for manual start of a RT, and it is mostly used for stages where a marshal gives the GO signal . By pressing it, the RT odometer is reset to 0 and the ideal distance (Target) as well. At the same time, the value of NEXT average is moved to actual NOW, and based on it the computer starts calculating the ideal distance. **Attention, this button acts immediately, (without any delay), as this is useful in case of "Flying Start". So special care should be taken to not be pressed by mistake, during a RT, as indications will be reset to 0!!!!**

The **SELF START**, button, is mostly used in case that we have to make a self start (without a marshal) at a certain known time. In this case, at max 59 seconds before the start time, we press the SELF START button, which becomes green and then, once the rally clock seconds indication, matches with the relative setting of seconds (figure on the bottom right corner), the stage is starting, exactly the same way as described above. The SELF START option is deactivated then automatically, and the relative button becomes gray again.

In the above example, time is 08:45:02, and the seconds settings for self start is set to 00, which means that if we press the SELF START button, the stage will automatically start once the clock shows 08:46:00.

!! In case we forget to press the SELF START button, and the start time has already passed, we can still start the RT within the next one minute, by pressing the SELF START button continuously, for ~3 seconds. Then the RT will start, by calculating the start time, at the previous minute (08:45:00) in our example, and by adjusting then the ideal meters.

Of course in this case, as RT odometer will be set to 0, if we have already left the start line, a manual correction to odometer has to be executed. !!

At this part of the screen, an extra (partial) odometer appears (0,48 in this example), which resets to 0, every time we press on the freeze odometer button.



On the top right corner of the screen, we have the following indications:

AVG NOW Speed, which is the speed at which we have to drive.

NEXT Speed. In this tab, appears the next average speed, in order to be ready for change, at the right moment. The next average, moves to the actual average, just by pressing the external green button.

The next average can be adjusted, either by pressing on it and setting a new value, either via the external switches (+- 1km/h και +- 0,1km/h).

In case we have set up a list with distances for automatic change of average speeds, then on the indication under the Next Average, we can see the distance at which the next average change will occur.

In the above example, we can see that the actual average speed to follow is 45, the next one (2), is 49,9 and we do not see any distance, as this is not filled in. In this case we can only change manually the average speed.

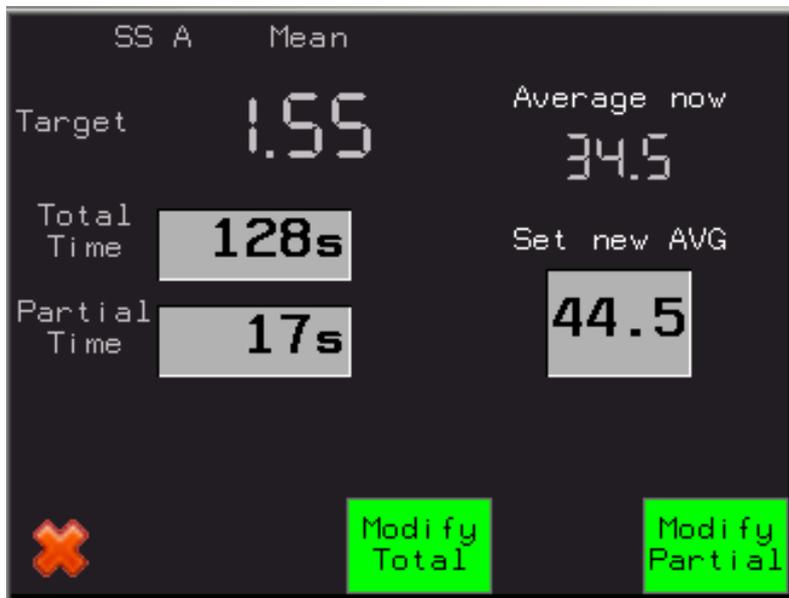
(See later how to fill in the RT lists)

By pressing on the **RT** indication, the following pop-up window appears, where by the use of arrows, we can select the RT list that we want to use. This popup closes by pressing on the X.

!! This selection has always to be done, before the start of the RT !!



In case that during a change of an average, we make a mistake, (either changing earlier, either setting wrong new average), this can be corrected, by pressing on the tab of the actual average, when next page appears:



In this example, we see that the current average is 34,5 km/h and that this has been set 17 seconds before (Partial Time). Just under it, we can set the new, right, average, 44,5 km/h.

By pressing the **Modify partial** button, the computer recalculates the ideal distance, considering that during the 17 last seconds, we should have driven with 44,5 instead of 34,5 km/h and of course saves that new average to the actual average. In this example, the Target distance will then change from 1,55 to 2,04~2,05.

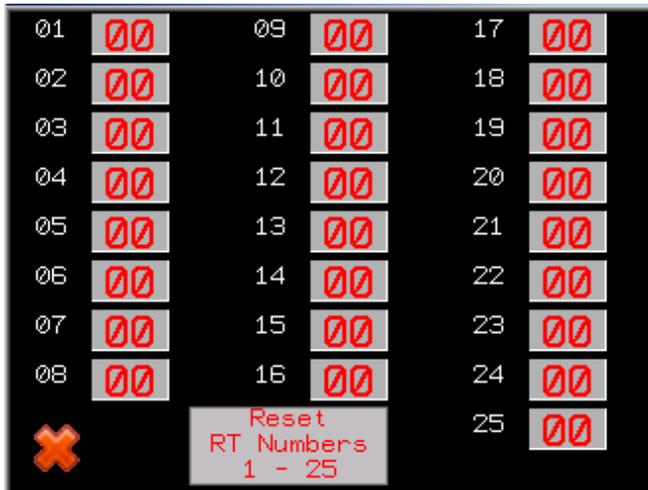
By pressing the **Modify Total** button, the computer recalculates the ideal distance, considering that we should have driven with the new average, during all the stage (means all the 128 seconds since the start of the stage). In this example, the Target distance will then change from 1,55 to 1,58.

This option (MODIFY TOTAL), can also be used in case of simultaneous start of two stages with different average speeds, if the second stage has no average speed changes, till the point that the first stage ends.

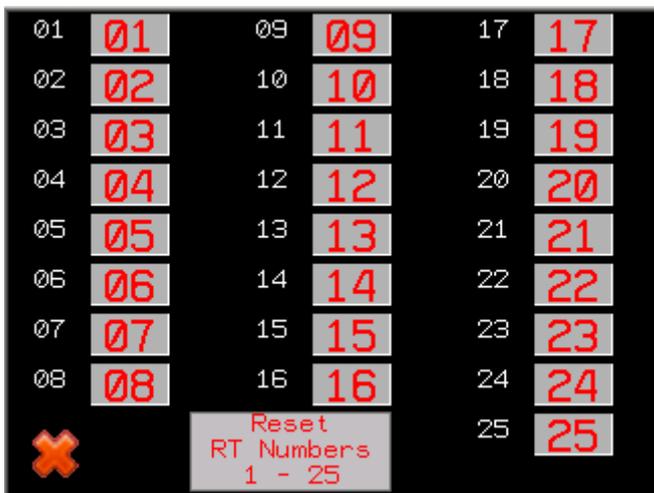
4.2.3 Preparing the RT lists

RM57 offers up to 25 RT lists, with max up to 20 average speed changes.

We can set the numbering of the RT lists in order to accord the rally numbering. From the initial screen, by pressing the **RT Nrs.** button, the following screen appears.



In this screen we can set the numbers we want manually, one by one, or press the **Reset RT Numbers 1-25** button, which automatically gives those numbers to the RT lists.



By pressing the X button we return to initial screen.

From the initial screen, by pressing the **RT Lists** button, the following screen appears.

RT	START	45.0	000.000	00.0
01	004.820	48.6	000.000	00.0
	007.856	49.9	000.000	00.0
←	012.450	35.0	000.000	00.0
	015.245	49.9	000.000	00.0
→	000.000	00.0	000.000	00.0
	000.000	00.0	000.000	00.0
Reset RT	000.000	00.0	000.000	00.0
	000.000	00.0	000.000	00.0
✖	000.000	00.0	000.000	00.0
	000.000	00.0	000.000	00.0

In this page we can prepare the average speeds for all 25 RTs. We can preset maximum 20 consecutives average speeds.

By pressing the left <- or right -> arrows, we can select the RT list we want to prepare. If we want to reset all values of a specific RT to 0, we press for a while the **Reset RT** button.

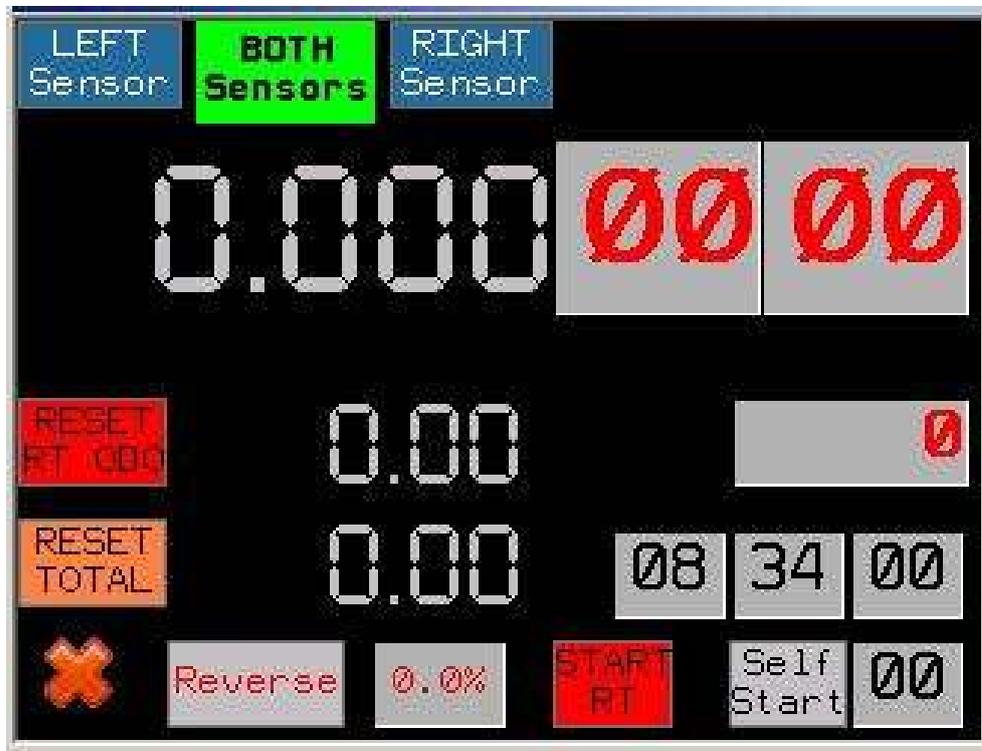
Once we select the right RT list, we can change all the values we want, one by one, and set the right average speeds.

In case that we also know the exact point where an average has to change, we can also fill in the relative tab in the distance column (Distance in km, with reference point the start of the stage). If we do so, then once the cadencer (ideal distance), reaches that value, then the average will automatically change, by this filled in the right tab. If we prefer to change averages manually, then we have to set the distance tabs to 0.

Attention: Once we prepare the list with average speeds, then we have to load it to the relative special stage, by selecting the RT number to use.

4.2.4 Time Distance rallies mode

Through the Simple Mode screen, by pressing on **Time Distance** button, next page appears:



This mode is used in case of rallies where the organization does not give us an average speed to follow, but a table with distances and ideal times.

e.g. a table like the following one:

RT 1

100m at 8 sec

200m at 16 sec

300m at 24 sec

400m at 31 sec

500m at 38 sec... etc.

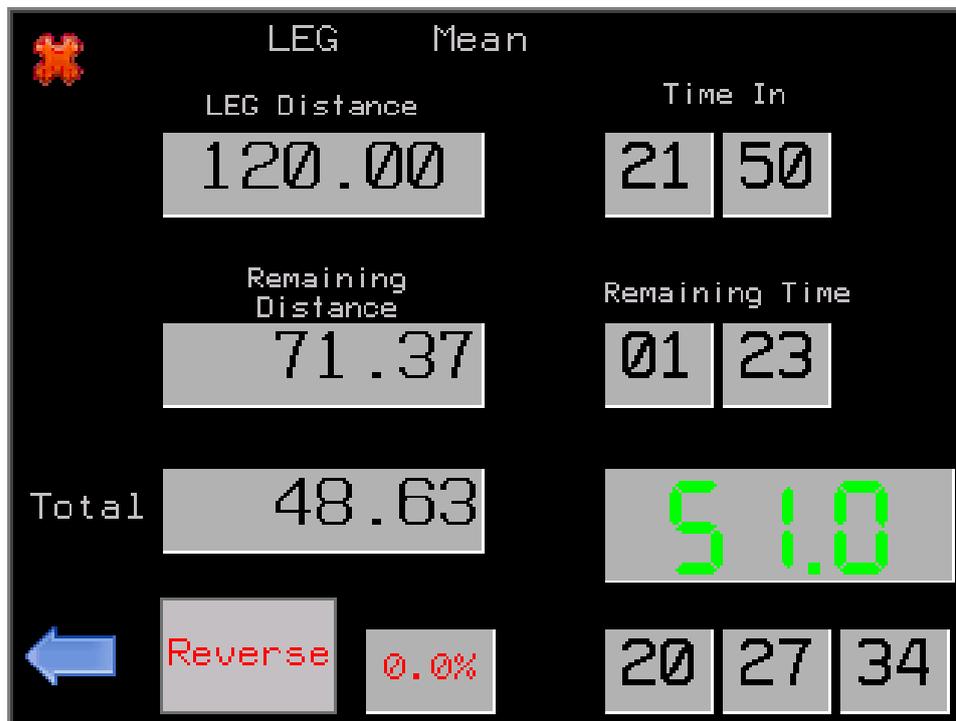
Once we start the RT (Auto SelfStart or Manual Start), then the instrument at every 100m show us on the two top indications the relative distance and the relative time that we passed (min : sec).

On the following screens we see that we passed the 100m checkpoint at 12 seconds, which means we are 4 seconds too slow compared to the given table, and we passed the 200m checkpoint at 19 seconds, which means 3 seconds later than the ideal time. In that way, at every checkpoint, we can compare our time with the ideal time, and decide if we have to accelerate or break.



4.2.5 LEG Operation

By pressing the **LEG** button, next page appears:



In this page we can set the total LEG distance (TC to TC) and the requested Time in.

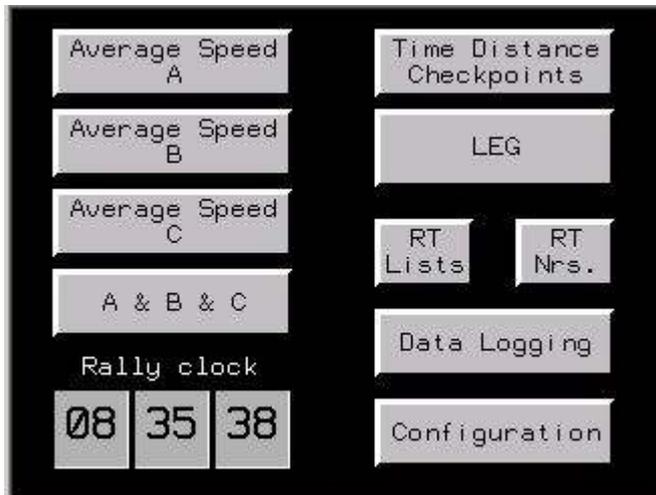
RM57, calculates then - based on the total odometer - the remaining distance and remaining time, (based on the real time clock with minute accuracy).

It calculates also and proposes the average speed to follow, in order to be on time on the next TC, giving us an idea of the rhythm we have to keep.

!! The relative calculation of minimum required speed, occurs every full minute !!

4.3 Advanced Mode Page

In case we select from initial screen the **Advanced Mode**, then the following screen appears:



In this mode, we have 3 in 1 individual instruments, giving us the possibility to run simultaneous RT, with common start, or RT in a RT etc.

By pressing on any button (grey areas), we can select one of the following screens - operations.

Average Speed A: Instrument A overview screen.

Average Speed B: Instrument B overview screen.

Average Speed C: Instrument V overview screen.

A & B & C: Simultaneous overview screen of all 3 instruments.

RT Lists: Screen for setting average speeds (and meters) for all RT.

RT Nrs.: Screen for setting the number of each RT.

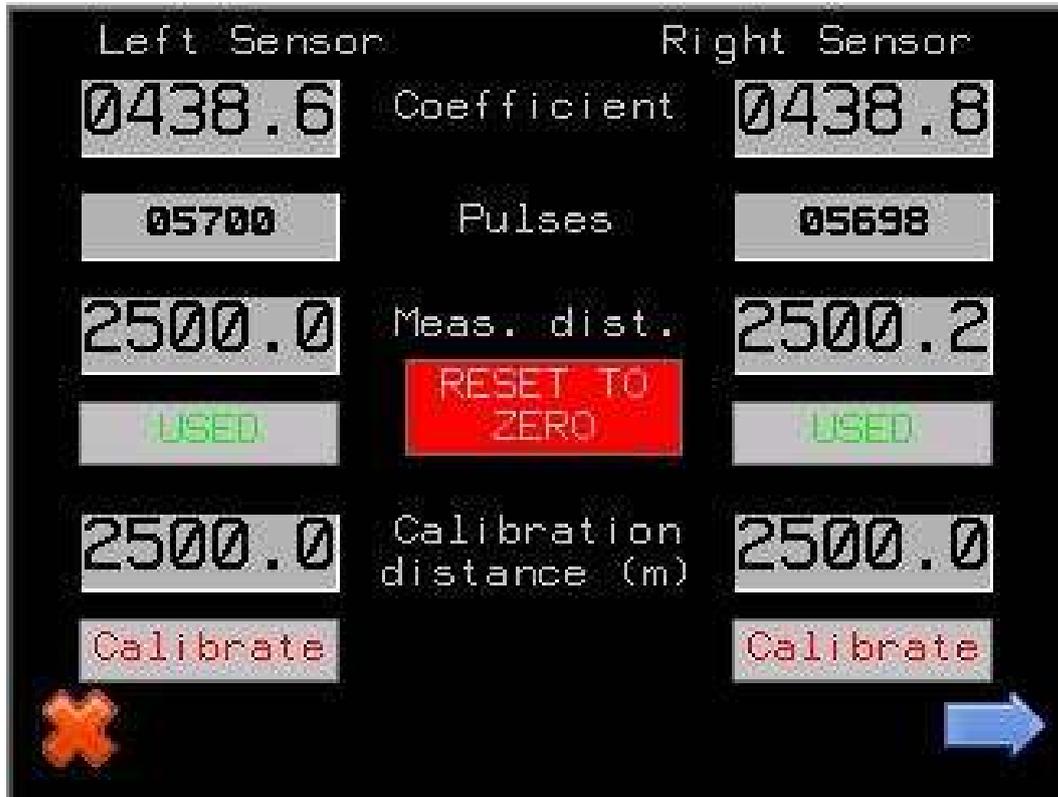
LEG: Total leg overview screen.

Data Logging: Page where we can see all logged data of the last RT (Distance, time, etc)

Configuration: Basic configuration screen and calibration.

4.3.1 Calibration - basic settings

Through the Advanced Mode screen, by pressing on Configuration button, next page appears:



On this page, we can calibrate the instrument for each sensor independently.

Sensors are called Left and Right, but they can be connected as we like (e.g. front and back, or in case of only one sensor this can be connected either as left or right).

The instrument in fact operates like two separate instruments, keeping separate odometers for left and right sensors for all measured distances (total, partial). Under normal conditions we always use the Mean Values (A Mean, B Mean, C Mean).

At any moment, by switching between L & R, we can compare the two odometers, and if we notice significant differences, decide then which one to keep watching.

In order to calibrate the instrument, we follow the following procedure:
 We fill in to both left and right sensors, the Calibration distance in meters, in the a.m. example is 2500.

Once on the start line of the calibration route, we press the RESET TO ZERO button, and then the pulses and measured distance indications become 0 for both sensors.

We drive as close as possible to the ideal line, and by arriving on the end line and once we fully stop, we press the red Calibrate button for each sensor we want to calibrate.

Automatically then the instrument will calculate the ideal coefficient for each sensor, and this will appear on the relative indication. In fact this coefficient express the distance between two pulses, and it is calculated with 0,1 mm accuracy. (In the a.m. example, the coefficient for the left sensor is 438,6 mm and for the right sensor 438,8 mm).

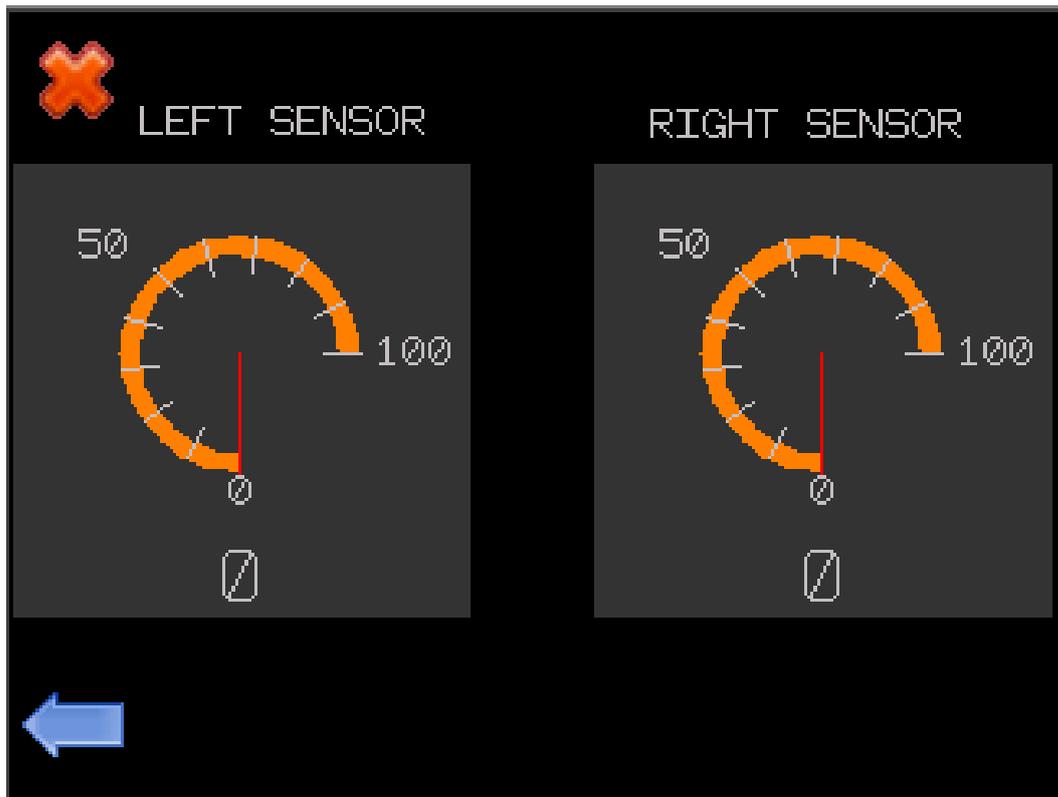
In case that the measured distance is not exactly the same as the given one (as it happens in the a.m. example for the right sensor), we can also set manually the relative coefficient, by pressing on it, and slightly increase or decrease it.

By pressing the right arrow -> we move to the next page of the configuration menu.



In this page, we can set the distance limits for the Too Fast / Too Slow difference indication. According to this settings, the relative indication will change color on the screen. The lower values (Yellow settings), correspond also to the limits for the sound signal.

By pressing the left arrow <- we return to the previous page, and with the right arrow -> we move to the 3rd page of the configuration menu.



In this page we can see two speedometers, one for the left and one for the right sensor, giving us the possibility to easily compare their operation, during driving.

(The figured actual speed, is the average speed of the last 2 seconds)

4.3.2 Average Speed rallies mode

RM57 can be used in several types of regularity rallies. It is ideal for rallies with frequent changes of average speed during a regularity test, for rallies where we have simultaneous start of more than one regularity test, with different average speed each and also for "stage in the stage" cases.

From the main page, we can select which RT we want to overview, as up to 3 RT can run simultaneously.

Hereafter we present the RT A, but RT B and RT C have the same functionality.

By pressing **Average Speed A** button, the next page appears:



Target indication, is the ideal distance, based on the selected average.

RT ODO is the real distance we have run, since the start of the special stage.

By comparing those 2 figures, we realize if we are too fast or too slow.

By pressing on **RESET RT ODO**, we reset the partial odometer to 0 (**Attention, there is no delay, reset happens immediately**).

The RT ODO is automatically reset to 0, when START SS is pressed or when an automatic Self Start occurs.

By pressing on the odometer indication, a popup window appears, where we can manually set and save a new value for the partial odometer:



By touching on the grey area a numeric pad appears in order to set the new value to the partial odometer.



Once we set the new value, we press enter and then the **Save** button.

Total indication is the total odometer and this is common for both A, B and C instruments. By pressing on Total for ~3 seconds, we reset the total odometer to 0.

By pressing on the odometer indication, a new page appears, where we can manually set and save a new value for the total odometer:



We change and save the new Total distance, the same way we do for the Leg distance.

With the external + / - switch, we can add or subtract 10 meters to the total and partial odometer as well.

Advance / Retard difference: This indication, found just under the Total Odometer, shows the difference between the real distance (partial odometer), and the target (ideal distance). This value is expressed in meters.



A negative value means that we miss some meters, so we are slow and we have to accelerate, when positive value means we are fast and we have to decelerate. Ideally we have to see continuously 0.

The color of this indication changes, from GREEN, to ORANGE and to RED, depending on its value and on the relative settings on the configuration menu.

Sound button, is used to activate or deactivate the beep signal. Sound goes automatically ON when a RT starts.

Reverse button, is used to make the odometers count down, in case we have to make reverse, or we took a wrong direction, and have to return back.



When Reverse is pressed, it becomes fully RED. When we are back to the right point, we press again the Reverse, to deactivate it.

When an a RT starts, the Reverse option is deactivated automatically.

In some models, an external RED push button exists, for Reverse mode. As far as this button is pressed the Reverse mode is active.

The **correction factor (0,0%)** is used in case that we realize that we have a systematic error on our measured distances, during a stage. If e.g. we realize that every 2 km we have to add 10 m, in order to match the odometer indication with the roadbook marks, we can set a correction coefficient of 0,5%, which acts like a multiplier (1,05) over our calibration coefficients. In that way, we can easily make a provisional correction, without changing our calibration coefficients.

Typical example of using the correction factor are cases of very "tight" roads, where we can not drive on the ideal line, and though our odometer "writes" systematically less meters. Other case is when we have loss of pressure on a tire, and then the relative sensor "writes" more meters (in this case a negative correction factor has to be used).



The red **START SS** button is used for manual start of a regularity stage, and it is mostly used for stages where a marshal gives the GO signal . By pressing it, the partial odometer (LEG) is reset to 0 and the ideal distance (Target) as well. At the same time, the value of NEXT average is moved to actual NOW, and based on it the computer starts calculating the ideal distance. **Attention, this button acts immediately, (without any delay), as this is useful in case of "Flying Start" . So special care should be taken to not be pressed by mistake, during a stage, as indications will be reset to 0!!!!**

The **SELF START**, button, is mostly used in case that we have to make a self start (without a marshal) at a certain known time. In this case, at max 59 seconds before the start time, we press the SELF START button, which becomes green and then, once the race clock seconds indication, matches with the relative setting of seconds (figure on the bottom right corner), the stage is starting, exactly the same way as described above. The SELF START option is deactivated then automatically, and the relative button becomes gray again.

In the above example, time is 08:37:38, and the seconds settings for self start is set to 00, which means that if we press the SELF START button, the stage will automatically start once the clock shows 08:38:00.

Just above the rally clock, we have a **partial odometer**, which resets to 0, every time we press the Freeze button. This odometer can be used for navigation purpose, and is very useful in case of tight navigation.

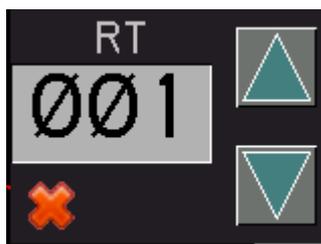
Finally, the **SEC** indication, can be used in order to modify the ideal meters, in case that we get instructions to stop in a point for a certain time.

In some rallies we can get instructions that at every STOP sign, we have to stop for 5 seconds. In this case, at the first STOP sign we will fill in SEC, 5, and then the instrument will modify the ideal meters accordingly. At the second STOP we will fill in SEC, 10, and so on.



On the top right corner of the screen, we have the following indications:

With the **RT button**, we can select, by pressing on the relative indication, the RT list that we want to use.



Now Average Speed, which is the speed at which we have to drive.

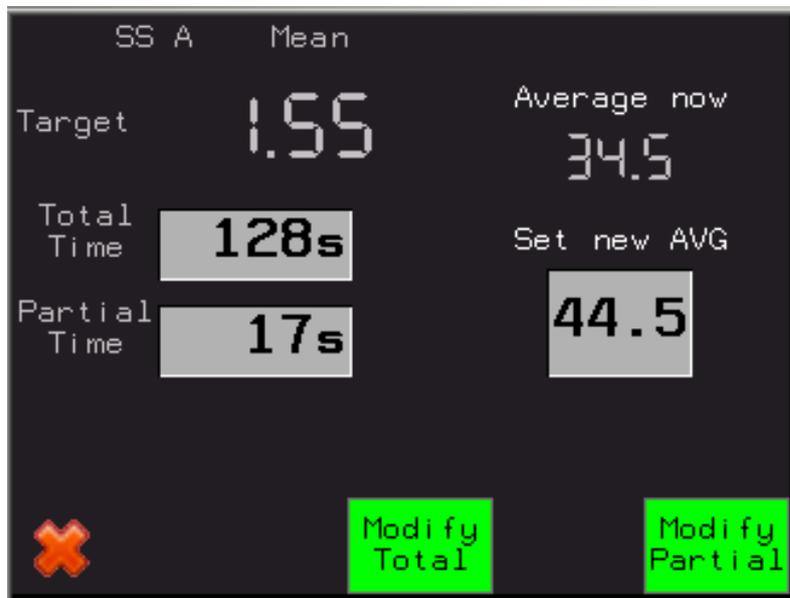
Next Average Speed. In this tab, appears the next average speed, in order to be ready for change, at the right moment. The next average, moves to the actual average, just by pressing the **Change button**, or the external green button. The next average can be adjusted, either by pressing on it and setting a new value, either via the external switches (+- 1km/h και +- 0,1km/h).

On the indications under the Next Average, we can see the averages that will follow, and their position in the list.

In the above example, we can see that the actual average speed to follow is 50, the next one (2), is 45 and the next ones are 48 - 35. (See later how to fill in the RT lists)

On every average change, all next average speeds, move one position up.

In case that during a change of an average, we make a mistake, (either changing earlier, either setting wrong new average), this can be corrected, by pressing on the tab of the actual average, when next page appears:



In this example, we see that the current average is 34,5 km/h and that this has been set 17 seconds before. Just under it, we can set the new, right, average, 44,5 km/h.

By pressing the **Modify partial** button, the computer recalculates the ideal distance, considering that during the 17 last seconds, we should have driven with 44,5 instead of 34,5 km/h and of course saves that new average to the actual average. In this example, the Target distance will then change from 1,55 to 2,04~2,05.

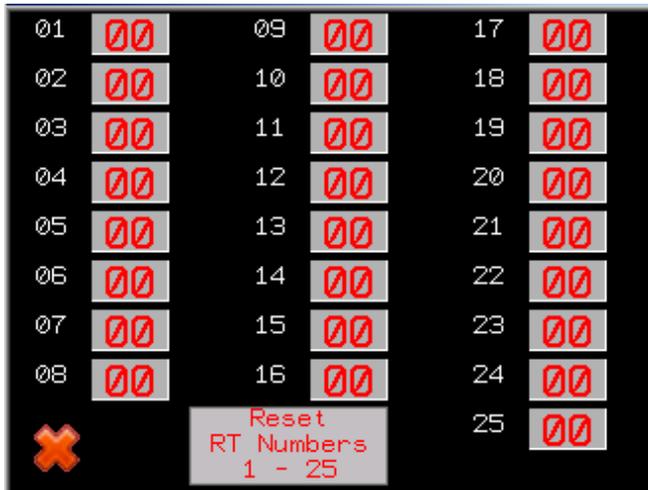
By pressing the **Modify Total** button, the computer recalculates the ideal distance, considering that we should have driven with the new average, during all the stage (means all the 128 seconds since the start of the stage). In this example, the Target distance will then change from 1,55 to 1,58.

This option (MODIFY TOTAL), can also be used in case of simultaneous start of two stages with different average speeds, if the second stage has no average speed changes, till the point that the first stage ends.

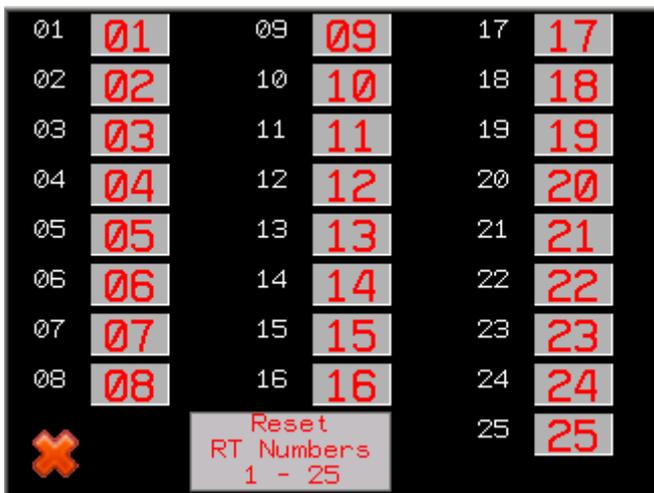
4.3.3 Preparing the RT lists

RM57 offers up to 25 RT lists, with max up to 20 average speed changes.

We can set the numbering of the RT lists in order to accord the rally numbering. From the initial screen, by pressing the **RT Nrs.** button, the following screen appears.



In this screen we can set the numbers we want manually, one by one, or press the **Reset RT Numbers 1-25** button, which automatically gives those numbers to the RT lists.



By pressing the X button we return to initial screen.

From the initial screen, by pressing the **RT Lists** button, the following screen appears.

RT	START	45.0	000.000	00.0
01	004.820	48.6	000.000	00.0
	007.856	49.9	000.000	00.0
←	012.450	35.0	000.000	00.0
	015.245	49.9	000.000	00.0
→	000.000	00.0	000.000	00.0
	000.000	00.0	000.000	00.0
Reset RT	000.000	00.0	000.000	00.0
	000.000	00.0	000.000	00.0
✘	000.000	00.0	000.000	00.0
	000.000	00.0	000.000	00.0

In this page we can prepare the average speeds for all 25 RTs. We can preset maximum 20 consecutives average speeds.

By pressing the left <- or right -> arrows, we can select the RT list we want to prepare. If we want to reset all values of a specific RT to 0, we press for a while the **Reset RT** button.

Once we select the right RT list, we can change all the values we want, one by one, and set the right average speeds.

In case that we also know the exact point where an average has to change, we can also fill in the relative tab in the distance column (Distance in km, with reference point the start of the stage). If we do so, then once the cadencer (ideal distance), reaches that value, then the average will automatically change, by this filled in the right tab. If we prefer to change averages manually, then we have to set the distance tabs to 0.

Attention: Once we prepare the list with average speeds, then we have to load it to the relative special stage, by selecting the RT number to use.

4.3.4 Multiple instruments operation

In order to better understand the Multi Instrument option, we will first describe an example of simultaneous start stages.

In some rallies, it is asked to start 2 or more special stages at the same moment, but with different average speed and different finish line each.

That means, that till the finish line of the first stage (shorter one), we have to drive by following the averages given for it, and once we finish the first stage, we have to adapt our speed, in order to bring our partial odometer in accordance with the ideal distance that occurs by following the average speeds of the second (longer one) special stage.

Let's consider an example, where we have to start simultaneously RT A and RT B as following:

	Avg. Speeds Of RT A	Avg. Speeds Of RT B	Distance	
START	45,5	42,7	0,00	
First change	47,2	44,8	2,50	
Second change	49,9	---	4,50	
Finish SS A		49,0	6,00	
Finish SS B			8,00	

According to the above table, we have to drive till km 6,00, where RT A finishes, by following the averages given for RT A, which means that if we follow the instructions, we will drive as following:

Time	Average speed	Distance
197,80 sec	45,5 km/h	2.500 m
152,55 sec	47,2 km/h	2.000 m
108,22 sec	49,9 km/h	1.500 m
458,57 sec		6.000 m

which means that we will drive the 6,00 km in 458,57 seconds.

Let's imagine a second "theoretical" car, which follows the averages of RT B and making the relative changes at the same time with us. At the moment we finish RT A, it should have run the following:

Time	Average speed	Distance
197,80 sec	42,7 km/h	2.346,1 m
152,55 sec	44,8 km/h	1.898,4 m
108,22 sec	44,8 km/h	1.346,7 m
458,57 sec		5.591,2 m

which means that at the moment that we finish RT A, it should have done 5.591,2 m, makes ~409 m less than us.

So, once we finish RT A, our ideal distance is then the one calculated before, which means that we have an advance of 409 m.

We have then to adapt our speed, in order to bring our odometer in accordance with the new ideal distance, and of course then to continue driving with the right given average till km 8,00, where RT B finishes.

That means, that at the moment we pass at km 6,00, we have to change the average on our electronic speed table to 49,0 and brake till our partial odometer shows ~0,41 km less than our electronic speed table indication and then continue driving at 49,0km/h, in order to keep this 0,41 difference, till km 8,00, where RT B finishes.

We realize that these calculations are very difficult to be executed during a rally, and besides that, some times it is just impossible, as we miss some information (e.g. we do not know at which exact distance we have to change our average, as this is given as a mark on the road)

For these cases, RM57 offers the Multi instrument function, which is nothing more than the simultaneous use of instrument A, B and C in one page.

By pressing on **A & B & C** button, the next page appears:



Most of the buttons and indications, are the same as seen on page A. The main difference is that now instrument B and C averages appear as well,

The tab in green SS A, shows that we actually watch the A stage. By pressing on SS B or SS C buttons, we can switch to other stages.

If we have set automatic speed changes, by setting the relative distances on the RT lists, these will happen for every stage at the right moment.

If we have to make manually simultaneous changes of average speeds, on two or three stages, we have to press on the actual average indication of each stage and then we see that the relative SS A, SS B, or SS C tab is flashing. Then when we press the **Change** button, or the external green button, the average of the selected SS will change to the next ones.

Attention, the average of the actually watched SS will change anyway, even if the relative tab is not flashing!!

Once we cross the finish line of SS A, we press then the SS B tab, in order to follow the second SS, and so on.

When we are in ALL SS page, and Self Start is used, the 3 SS get initialized and start at the same time.

If we want to **manually start all three SS** (or two of them), we have to activate the relative option **by pressing on the average Now indication** of each of them, as described above for the average changes.

4.3.5 Time Distance with known checkpoints

By pressing the **Time Distance Checkpoints** button, next page appears:



This mode is used in case of rallies of Time-Distance type, with known checkpoints. In the above example, a Target distance of 2.350 m is set and a target time of 200 sec.

As we can see, the RT has just started (1 sec before) so the remaining time is 199 and the remaining distance is 2350

Driver's display at the same time shows:



95 seconds after the start, and after having run 1 km, the display shows:



The two bar-graphs give us an idea of our rhythm. In the above example, we see that we are a little bit on delay, as the distance bar is less filled than the time bar.

Driver's display at the same time shows:



181 seconds after the start, and after having run 2.2 km, the display shows:



In the above example, we see that we are a little bit on advance, as the distance bar is more filled than the time bar. As we are reaching the checkpoint, we have to adjust our speed, in order to pass at the checkpoint, exactly when the remaining time is 0. At the last 10 seconds, a beep signal is produced every second.

Driver's display at the same time shows:



Once we pass the checkpoint, if a second checkpoint exists, the navigator has then just to change the Target Distance and the Target Time, without restarting the RT.

In the following example, we have a second checkpoint at 5.000 m with a target time of 400 seconds (all counting form the Start of RT)

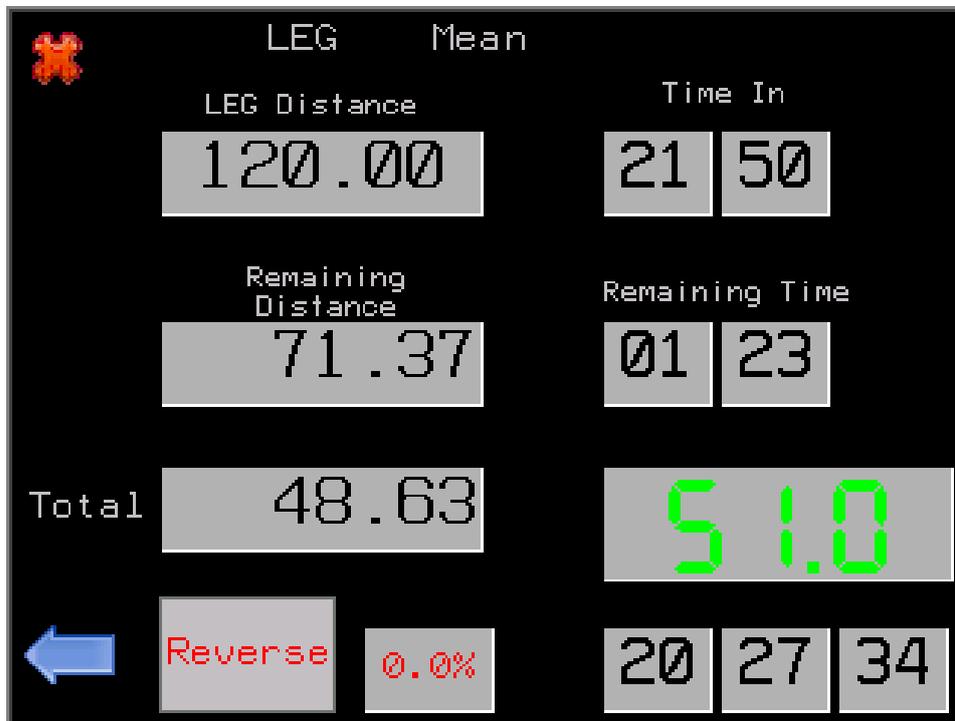


Note:

The Target Distance & Target Time, can be adjusted either through the touchscreen, either through the two external toggle switches.

4.3.6 LEG Operation

By pressing the **LEG** button, next page appears:



In this page we can set the total LEG distance (TC to TC) and the requested Time in.

RM57, calculates then - based on the total odometer - the remaining distance and remaining time, (based on the real time clock with minute accuracy).

It calculates also and proposes the average speed to follow, in order to be on time on the next TC, giving us an idea of the rhythm we have to keep.

!! The relative calculation of minimum required speed, occurs every full minute !

1. Driver's Display:

Regularity Master 57 is also equipped with a driver's display, which shows only the basic information that driver needs.

At power-up, the following screen appears:



By pressing on the Green or Orange button, the backlight color of the screen can change.



We propose the use of green backlight for day use and the orange backlight for the night use.

5.1 Average Speed Mode

By pressing on the **Average Speed** button, the following screen appears:



The data transferred to driver's screen, depend on what the navigator has selected to watch on his screen.

On the above example, we can see that navigator has started the RT 6, which has a requested average of 45.2 km/h, our actual speed is 54 km/h and we have an advance of 39 meters.

By pressing the left arrow button, we return to initial page.

By pressing at any other point on the screen, we can switch among the following displays, depending on what information driver needs to get.



5.2 Leg Mode

By pressing on the **LEG** button, the following screen appears:



Driver can select to watch the Leg Mode at any moment, even if navigator follows any other screen.

On the above example, we see that driver gets the following information:

Remaining distance till next TC, 143.26 km

Min required average speed based on the remaining time, 31 km/h

Our actual speed, 54 km/h

5.3 Time Distance Mode

By pressing on the **Time Dist/ce** button, the following screen appears:



More info about this screen can be found on chapter 4.3.5 page 36.



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