SCX Digital
The REAL race experience

with

the RaceManagement Solution

from

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The REAL SlotRace Experience

Introduction
This Guide provides a detailed introduction of the NEW SCX Digital Race Management Software exclusively developed for the SCX Digital system.

Chapter 1 is providing a quick summary of the SCX manual end explains the basic functions of the SCX Digital System. The chapter is not having the intention to replace the original manual and should only be seen as an additional help and a summary of the manual.
Tip: Print the pages 4&5 and place it beside your track, which allows you quick access to the system functions.

After a while you will recognise that this help is not required anymore ;-) 

Chapter 2 describes the SCX Digital System with the usage of SCX D RMS from Guy and the SCX Digital Interface from Ole.
Note: the usage of the information in this summary is at one's own risk and I am not taking any responsibility for any damage or problems caused by the usage of the information provided.
The information in this document has been proven to be working and I am using this information for myself as well.

If there are any outstanding questions or problems, which the manual is not answering, don't hesitate to contact us.

Special thanks to Guy and Ole who made this SCX Digital <-> PC Interface working.

Any feedback is welcome to improve the information!

Have Fun!
Sven

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A SCX Digital Fan
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1. SCX Quick Guide

1.1. Race Type

a) Race with PitTerminal and increased lap counting
   - press for 2 sec MODE + 2 x SELECT
   - display shows (...), start race: press for 2 sec START/STOP
b) Race with PitTerminal and decreased lap counting
   - press for 2 sec MODE + SELECT + MODE + SELECT (Choose amount of laps) + MODE
   - display shows (...), start race: press for 2 sec START/STOP
c) Race without PitTerminal and increased lap counting
   - press for 2 sec MODE + MODE + 2 x SELECT
   - display shows (...), start race: press for 2 sec START/STOP
d) Race without PitTerminal and decreased lap counting
   - press for 2 sec MODE + MODE + SELECT + MODE + SELECT (Choose amount of laps) + MODE
   - display shows (...), start race: press for 2 sec START/STOP

1.2. Racing Car configuration (for each car)

(Note: only working with PitTerminal)

a) Fuel level
   - press for 2 sec MODE + 3 x MODE, 2 x SELECT (Fuel level) + MODE then display jumps automatically to brake intensity
b) Break intensity
   - press SELECT (brake intensity) + MODE
   - display shows (CAR)
put car into the Pitlane and press the L/C button on the throttle

1.3. Fuel tank size for all cars the same

- press for 2 sec MODE + 4 x MODE + 2 x SELECT (Fuel level) + MODE
- display shows (...), start race: press for 2 sec START/STOP

4 SCX Digital RMS - (c) SlotHobbySolutions 2008
1.4. Using of the Digital SCX Chronometer

1.4.1. Display Race Information after a race

- press for 2 sec **MODE**, 5 x **MODE**
- display is showing **RES**
- press **SELECT**, display shows fastest lap of each driver
- press **SELECT**, display shows average lap time of each driver
- press **SELECT**, display shows the duration of the whole race
- press **SELECT**, display shows the time, lap distance for each driver to the winner of the race

- press for 2 sec **MODE** to start the race with the same setting again
- on the display you will see (…)

1.4.2. Configuration of the qualifying mode

- press 2 sec **MODE**, 2 x **MODE**
- display is showing **QUA**
- press **SELECT**
- display is showing **LAP**
- press **SELECT**
- display is showing **001**, choose now the amount of qualifying laps
- press **SELECT**
- display is showing **PLA**
- press **SELECT**
- display is showing **001**, choose now the amount of driver
- press **MODE**
- display is showing (…) and the Chronometer is showing **M-1**
- press **START/STOP** to start the qualifying session

Note: further functional details can be found within the original manual
2. SCX Digital RMS and the mode 2 Interface from SEB

2.1. General Information of SCX D RMS
SCX D RMS has been developed exclusively for SCX Digital and the microprocessor controlled mode 2 Interface from SEB was developed to give the user more stable data from the track, and to provide an easy to use solution for users who are “just” looking for a race management to quickly setup and start racing.

SCX D RMS has a limited number of functions of the full PCLC Lapcounter Version.

Following Functions are available with SCX D RMS:
- Driver Configuration with driver names
- Driver can easily be added in the “New Race Window”
- Car Configuration with Car Picture
- Statistic functions
- Quick Setup Solution for Interface and Racing definition
- Standard View defined for screen resolution 1024x768
- Multi Language support
- False Start and Penalty Function

SCX related Racing functions are the same as in the PC LapCounter Version, which can be bought separately.

Following Functions are additionally available in the PCLC Version:
- Dual Interface Support
- Zoom Display Function for Network Display Solution
- Championship Definition
- Race Track Configuration
- Team Race Setup
- Race Class and Series Definition
- Fuel Level Mgmnt performed by PCLC
- User can change Display of Race, ie changing colors, fonts, tables etc
- Support of external equipment
- mode 1 and mode 2 Interface support

The following chapters are explaining the first configuration steps to take and items which the user have to take care of to ensure that the interface and SCX D RMS are working without any problems.
2.2. SCX Digital Control Unit Compatibility

The SCX D RMS Version has been designed to work with the PitControl Unit, but it is possible to have the solution working with the Standard Control Unit as well.

But then you will have the limitation that you are not able to use the fuel level consumption.

If you are using the non Pit Control Unit you will not see the fuel level changing during the race, but you can use the standard unit for race control, lap time measuring etc.

If you need PCLC to perform the Fuel Level consumption then you need to have the full PCLC Version.

**Interface configuration examples**

**Standalone setup: 3 drivers**

- as standalone -> working
- as standalone -> working
- as standalone -> NOT working

**Possible 6 driver setup**

If the standard unit with the colored button is used as an extension to drive with 6 drivers, there is no problem to use the solution.
2.3. Start Window from SCX D RMS

If you have installed/connected the interface to the track and SCX D RMS is successfully installed, you will be asked to choose language and enter your registration code. Details about installation and registration can be found in the Quick Installation Guide.

**Note:** If you chose "CANCEL", then SCX D RMS runs in demo mode. It is fully functional but it will stop counting after 10 laps.

Now you should see this SCX D RMS Start Window

The configuration of the interface and the appropriate parameters will be described in the next few chapters to ensure that the solutions will work without any problems and allow the user to troubleshoot themselves to isolate possible problems.

**Note:** The view is made for a resolution of 1024x768 and you will recognise 6 pre-defined spaces for max 6 drivers. If you are driving with less then 6 drivers only the appropriate lines are used, but the view will not change.

The first step is to configure the SCX Interface
3. Initial Configuration of the Interface

SCX D RMS has been designed to minimise the manual configuration requirements to allow users to start racing very quickly. SCX D RMS supports only the “mode 2” Interface from Ole which eases the configuration requirements. However, some minor configuration steps are required, and can be performed within minutes.

3.1. Option Window

If you click in the Main SCX D RMS window on the Options button, you will see the following window being displayed.

**Note:** It is not possible to choose the Interface type as SCX D RMS has been designed to work with the Mode 2 Interface only.

The “Sound” Tab is explained in Chapter 3.2

![Option Window](image)

1. Definition of the language (if you have not done already on the first start ;‐)

   **Note:** You can change each word or translation by clicking on the "Translation" button.

2. By clicking on the Setup Button, the Interface Setup window will appear. Further details can be found in chapter 3.3

3. If you tick this box, your race data will be stored in a Microsoft Access database, which allows you a detailed race analysis. See Chapter 8

   Choose MpH if you want the speed in MpH later in the Statistics.

4. If you want to activate the false start function (see Chapter 7.1), you need to activate it here. You can use the false start function when you have to restart a race, ie after an interruption caused by an accident in the track.
5. Definition of the Stop & Go Penalty for "False Start" recognition
   - Penalty: time, the driver have to wait in the pit
   - Must be made within: numbers of laps where the drive has to get into the pit to have his penalty. If laps are decreased to "0", the driver will be disqualified
   **Note:** special information for users of the standard control unit can be found in the chapter 3.3., point 5

3.2. Option Sound Window
In the Option Sound Window you can configure Sound (Wave-Files) to different Race situations or you can disable the Sound function if you wish to do so.
3.3. Option Interface Setup Window

Via this Drop Down Menu, you can choose the appropriate serial port, where the Interface is connected to. If SCX D RMS is recognising the interface, the control button number 2 is changing to green.

It is VERY important that there are NO errors on the interface (observe messages in the message window number 3 ) to support all functions which are delivered by SCX D RMS.
If it is not possible to make it run without any errors, you might need a Serial to USB Interface and connect to a USB port on your PC.

Note: I am using the USB/Serial Adapter from Vivanco (www.vivanco.de, Product ID 10752 as I wasn’t able to get a stable connection with my PC.

If you click this option, the SCX Digital time will be decoded and taken from SCX Digital System, otherwise the times are measured the SCX D RMS itself.
This is a very good option if you own the Chronometer, as the Time on Chronometer will be the same as displayed by SCX D RMS.
This Option is mainly used for users with the Standard Control Unit to allow the usage of the false start functionality. Meaning you can build pit box where a driver has to drive into and stop for the penalty stop. By pressing the LC Button for longer period then the time defined in this option you can activate Penalty Stop

**Note:** This function is used in the PCLC Version for Pit Entry and fuel level usage as well.

**Generate PIT OUT :** this value defines which level of the throttle value needs to be reached that SCX D RMS is recognising that a car wants to leave the Pit after refuelling. Values between 3-5 has been recognised to be good values.

**Note:** if the values are to small, SCX D RMS generates directly after the car drives over the Pit In Track piece a PitOut Signal and the Pitstop is not recognised correctly.

**Non Zero Throttle** should be always "0" and is used for the false start recognition function. Meaning as soon as somebody is touching the throttle during the traffic light phase even very carefully, it will be recognised as an "false start"

If you choose this Option, you are able to pause and resume the race by pressing the LIGHT button on the MCU. This function is especially for interest to combine it with the false start function by activating the “False Start during Restart” function as it supports a controlled restart when the race was paused.

The Debug Window provides you the opportunity to perform some further checks but it is especially design to allow the programmer to investigate problems if you have identified one. More Details in Chapter 3.4

Last but not lease, to minimise the window you use this button and it will disappear in the Status Line of window on the bottom of the screen.

If you click this box, the throttle control monitor window will appear. More information, see chapter 3.5
3.4. Debug Window
The debug window makes it possible to identify possible setup errors, or to isolate and debug a fault. It is meant as a tool to observe whether the interface is working correctly, and if an error occurs, to save a logfile for the programmer to reproduce the fault.

If you click on the "Start" button, you will recognise a data stream even if no car is running on the track.

3.4.1. The SCX Digital Data Stream
As the data stream is complex to read and analyse. Special software is required to analyse the data. This software is a programmers tool, and not available to the user.

In the example of the window above you can see a correct working interface with the appropriate data stream.
Every data word has the same length and should look similar to the pattern above.
If you receive error messages in the status window of the SCX Digital (see page 11) or a strange format of the datastream above, you have an error on the interface and SCX D RMS would not work correctly.

Note: An interface problem might be only solved by using a serial/USB interface adapter.
3.4.2. Saving a Logfile

If you do recognise a reproducible error, you can help the developer to improve the interface. A feature has been implemented to save the data stream and allows you to capture the problem. In case you are able to reproduce a fault, the best solution would be to tick the "Automatic Clear after" 60 sec (default value). By doing this, a running log file is created continuously and the buffer is cleared every 60 sec. That means you can have your race and as soon as the fault occurs, you quickly access this window, click the "Stop" button and save the log file. This information can now be send with an explanation to us, and we will have a look into the data and your description to identify the problem.

3.5. Throttle Data Monitor

If you click point 11, page 12 in the SCX Digital Interface config window, a throttle data window is being displayed. It is showing the throttle values of each throttle in real time. You can use this function to check the functionality of each throttle to see whether a throttle is broken or needs cleaning. If now throttle is pressed, all values HAVE to be "0".

If the guide has been followed and the interface has been configured as described, the interface should work now without any problems :-)  

**Note:** Normally these configuration steps need to be performed only one time. Every new version or update of PCLC can be "just" reinstalled over the existing PCLC version. All configuration parameters will not be overwritten.

In the next chapters I will explain the driver and car definition and finally we will be able to start our 1st race.
4. Driver Definition

You have 2 Options to add a new drive:
- you can add and configure drivers settings in the Driver Option Menu
- you can add a new driver in the new race definition to quickly add a driver and use the Driver Menu to personalise the driver setting.

This chapter explains the Driver definition via the Driver Menu Option.

If you click on the Driver Button in the Main Window you will get this initial view.

By clicking on the 'New' Button a new line will be added in the Driver Name table. You can add as many drivers as you like. These drivers can be choosen later in the race setting window.

On the right side you can see 2 tabs:
**Sound:** you can define for the different race situations a special sound. This can be done for every driver
**General:** you can define when the driver will be treated by SCX D RMS as a Pace or Safety Car. This function is required to be ticked using the SCX Digital Safety car to avoid false start recognition.
5. Car Definition

The Car Setting window is available via the Main SCX D RMS Window and clicking the "Car" button.

The only activity which is required to define is the Car Name and the Car Picture.

The Car Picture will be displayed later in the Race View.

By clicking on the 'New' Button a new line will be added in the car table where you can enter the name of the car.

The General View on the right side will allow you to choose a car picture.

Note: the maximum size of a picture should not exceed 56 kByte.

Now you are ready to start the race!
6. Race definition

So, now you are ready to start your first race :-) but before we can start, you need to define the race type, i.e. lap limited or time limited, choose the drivers and define the track size (just first time !!!)

In the driver fields you can choose the drivers which you have defined previously in the Driver Menu. However if you forgot to define a drivers name, there is no need to leave the Race setting window. You can enter the names of the drivers in these fields and the driver names are automatically stored in your driver database.
Then choose the car which you want to assign to the driver.

In the Track Information fields you enter your track details. This information remains stored until you change it. Enter the minimum lap time. Via this time, you define the time where the RMS accepts a valid lap. Why is this important? It has been experienced that incorrect very small lap times can occur for different reasons. i.e. the driver is cheating :-) and after the driver left the track, the driver puts the car back close to the S/F line, creates a very small lap time and suddenly has an unrealistic lap record. Or a defective reed under the Start Finish line can cause an incorrect, unrealistic time. Although this is very, very rare

Note: I have defined the time 1 sec below the lap record.
3. You can define for every race a separate name which allows you to find the different races in your statistics basis.

4. Here you can choose whether you want a lap limited or time limited race. In the time limited race, the driver with the most amount of laps will win the race.

5. If you have ticked this box, all drivers have to finish their current lap to completely finish the race.

6. You can run a qualifying session where at the end of the race the order of the drivers is done based on the lap time. It allows you to run a “real” qualifying session before starting the main race.

   If you tick the practice box, you can run a race as usual but the race results are not stored in the race database.

If you click now the OK button, you will see the main racing screen with car pictures and the driver names.
7. Starting the race
You can start the race by either clicking the “Start” Button with your mouse on the main screen or the more convenient solution just press the START button on your control unit.

The traffic light will appear and if the 5 lights are disappearing the race start.

In the bottom of the window, you will see the laps or time remaining. The fuel display is in synch with the fuel level function and LED display of SCX Digital. There is not difference in the function as it is just displaying on the window what you will see on the Pit Display.
What will happen if you press the throttle BEFORE the traffic lights disappears when you activated the false start function, you will get to know in the next chapter 😊

7.1. False Start function of SCX D RMS

As soon as a throttle is pressed during the traffic light phase and the value is above the defined “Non zero throttle” in point 7, page 11, the appropriate driver is penalised.

This can happen to EVERY driver who is recognised and not limited to only one driver.
It is activated by default!

If recognised, the appropriate driver is marked with this sign and you will hear an alarm tone.
In the example above, you can recognise that 2 drivers caused a false start.

Note: if more then 1 driver pressed the throttle, ALL drivers who are recognised will be marked.

The driver(s) has/have now a few laps time to drive into the pit for the “Stop&Go” penalty. The amount of allowed laps before the driver has to get into the pit can set in the Option window on page 11.
By default there are 3 laps defined and you have the option to choose more. After you have reached 3 remaining laps, the remaining laps will be shown in the sign, as indicated on the next page.

Here you see that the driver has 2 laps left to enter the pit !!!!
If the number is decreased to “0” and you see an empty black circle, the driver is having just one lap left. If he still misses to get into the pit, a black flag will appear and the driver is disqualified.
Tough luck 😊

7.2. Stop & Go Penalty process description

If a driving drives into the pit to start his “Stop & Go” Penalty, you will recognise that the sign changes into a “Wait” sign.

Now the defined Timer starts counting down and is changing to the Go-Sign when the driver is allowed to leave the pit.

2 important notes which you need to know:
- If the driver is leaving the pit BEFORE the Go-Sign showed up, SCX D RMS is recognising it and changing the sign to the previous figure. So, be careful that you don’t leave the pit too early !!
- During a Penalty Stop Phase you are NOT allowed to refuel. Every try to refuel, will result in a disqualification.

7.3. Disqualification

If a driver is not following the rules as described above, a driver will be disqualified which is shown with a black flag.

7.4. Race Control

If you click the Update button on the Main window, you are able to control the race. That function is particular for interest if you have a Race Manager who controls the race, ie you can remove a lap from driver or give a stop & go penalty.
8. Race Statistic

SCX D RMS provides the possibility to save the race in a data base which is saving details about lap time, average lap time, fuel usage etc. This allows a detailed analysis of the race later.

A driver is able now to understand his driving style and can optimise his own driving performance. Furthermore this function provides a great feature for car tuning as you can compare race results of different cars in a very comfortable way.

Or you can use it to identify your best car etc.
You have so many different opportunities and it is like Telemetriefunction 😊

In order to have the statistic function working, you have to activate the function (see page 9, item 3)

You can call the statistic function by clicking on the “Stat...” Button on the main menu and the following window will appear.

The following 3 chapters will explain each menu option which are:

- Race Summary .....  
- Race detail by Lap  
- Statistics Board
8.1. Race Summary

The Race Summary window summary window provides you the summary of the last race with the most important information. You can save the data as an EXCEL File or Print the results on a printer.

8.2. Race detail by Lap

The “Race detail by Lap” option provides you detailed lap information of each driver and each lap. You can save the data as an EXCEL file or Print the results on a printer.
8.3. Statistics Board

Under the item Race History you can choose the race which you want to analyse in more details.

Tip: Just play with the function to learn about all possibilities. There are so many different option that I could spend my time to write a whole book on this topic 😊

There are 3 additional tabs which provide you additional statistics and graphical views which are Track-Statistics, Driver-Statistics and Car-Statistics.

In the top screen you can see the result of the driver Sven (myself ;-) and the fuel usage and pitstops during the race.

In the bottom screen lap times of 2 different drivers are presented to compare the results.

Tip: If you want to compare different results of different race, you have the opportunity to open a separate window for each race. If you have one graph open, keep the window open and choose the one which you want to compare with. A new window will be opened and you can compare it.
Now the race can start! Have fun!

I am closing my introduction and description now and I hope you have as much fun as I have with SCX Digital.

I hope I was able to provide you with the information you required to enjoy your SCX Interface – SCX D RMS solution and experience real race events.

If you have any feedback, improvement proposals etc, you can contact me via quickguide@slothobbysolutions.de

Regards!
Sven

Document History
Version 1 14.06.2008