

Schmidt Digital Solutions

Manual : Chrono2 for Slot It oXigen

Rev. 1

Endurance 23:55:31									
Pos	Id	Team	Car	Lap	Gap	Last	Best	Time	Info
01	4	Worthing Digital	Audi	9	0 / 0	00:09:461	00:08:216	04:05:773	
02	18	Mission 8	BMW	9	0 / 0	00:11:937	00:08:001	04:25:651	
03	19	North Staffs	Viper	7	-2 / -2	00:11:322	00:08:208	04:25:955	
04	1	Low Lands Racing	Rebellion	7	-2 / 0	00:08:259	00:08:224	04:22:893	
05	6	Olifer Racing	Oreca	7	-2 / 0	00:09:149	00:08:516	03:22:644	
06	2	Demon Slot Racing	Nissan	6	-3 / -1	00:12:206	00:08:221	04:10:052	
07	9	BB Slot Vikings	Lola Nissan	5	-4 / -1	00:08:298	00:08:298	03:30:116	
08	3	Sportcarazing	Pescarolo	4	-5 / -1	00:11:627	00:08:532	04:22:285	
09	17	Rockingham	Porsche	3	-6 / -1	00:08:527	00:08:527	03:42:845	
10	14	Gas Monkeys	Corvette	3	-6 / 0	00:10:723	00:10:052	04:00:578	
11	16	Great Barr Slot Car	Alpine	3	-6 / 0	00:08:247	00:08:247	04:14:020	
	20	Safety Car	Mercedes	0	-9 / -3	xx:xx:xxx	xx:xx:xxx	xx:xx:xxx	PitL



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Introduction and Features

Welcome to ChronO2 oXigen (O2), a computer software Race Management System (RMS) designed as a successor to the original Chrono, which has been freely available from Slot It for many years. With the development of a new dongle and firmware (version 4.xx), ChronO2 has been created to support the enhancements in the firmware. The development of ChronO2 was a collaborative effort between the creators of RCS64 (Scalextric Digital) and RCSO2 (oXigen) in close partnership with the Slot It team. ChronO2 is a free RMS with fundamental features designed to facilitate practice, qualifying races, endurance events, and races involving up to 20 cars.

As an additional feature, an Android app is available for purchase on the Play Store, allowing you to display individual race data and the overall race status. To use this app, you need to connect your Android device to the same WiFi network as the PC or laptop running ChronO2.

CHRONO2 and LabVIEW

ChronO2, like the original Chrono and the Bootloader, has been developed using LabVIEW. LabVIEW (short for Laboratory Virtual Instrumentation Engineering Workbench) is a system design platform and development environment created by National Instruments. LabVIEW is commonly used for tasks such as data acquisition, instrument control, and industrial automation. The free RMS Chrono, provided by Slot It, is also developed using LabVIEW.

LabVIEW is known for its reliable communication with various types of equipment, although it does have limitations when it comes to the user interface.

System Requirements

To run ChronO2, you will need a Windows PC or laptop. Additionally, you must have a dongle with firmware version 4.xx or higher. The older dongles (the large yellow or black ones) will not work with ChronO2 unless they have been updated to firmware version 4.xx.

We recommend using the Bootloader tool to update your dongle, controllers, and chips to the latest firmware (version 4.xx). For type B2/C chips and SCP3 controllers, you should use the Slot It mobile application for firmware updates (or Nordic DFU)

Software Registration

There is no need for software registration in ChronO2. For inquiries or information, you can reach us through:

- email at rsc64rms@gmail.com
- Message via Facebook
- Slotforum

If you come across any errors or omissions in this manual or have any comments, please feel free to share your feedback with us.

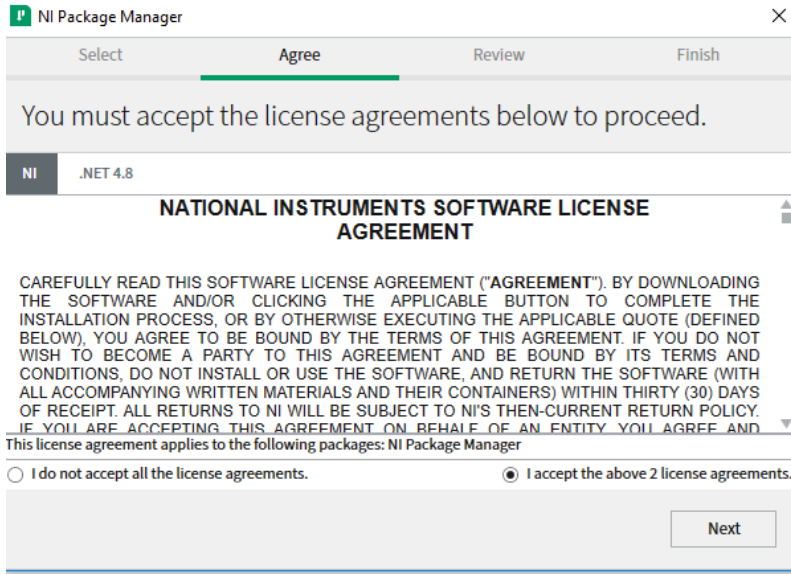
Features in Chrono2

Chrono2 offers the following features:

- Practice event
- Qualifying event
- Grand Prix Races (laps)
- Endurance Races (time)
- Dashboard for 20 teams
- Automatic and Manual Track Call (stop or yellow flag speed)
- Countdown after track call
- (Optional) Slow start after track call (gradual speed increase)
- Start sequence, track call and fastest lap sounds
- Result data viewer
- Resume race after a PC crash (or as continuation from previous race date)
- Individual or global settings for power, brake and pitlane speed
- Marshall window
- Delete/add/edit laps and lap times during session
- Live status information (on track, connection etc.)
- Log
- Android App support

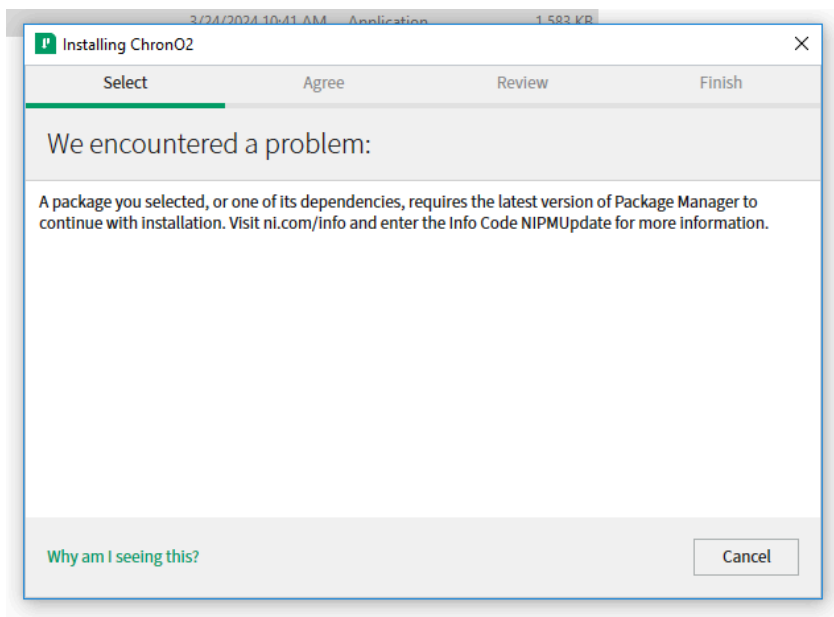
Getting Started – Establishing a Connection/Installation

To get started, download ChronO2 from the Slot It Website’s download page and follow the installation instructions. Unzip to a directory on your PC/Laptop and install. Accept the license agreement.



Note:

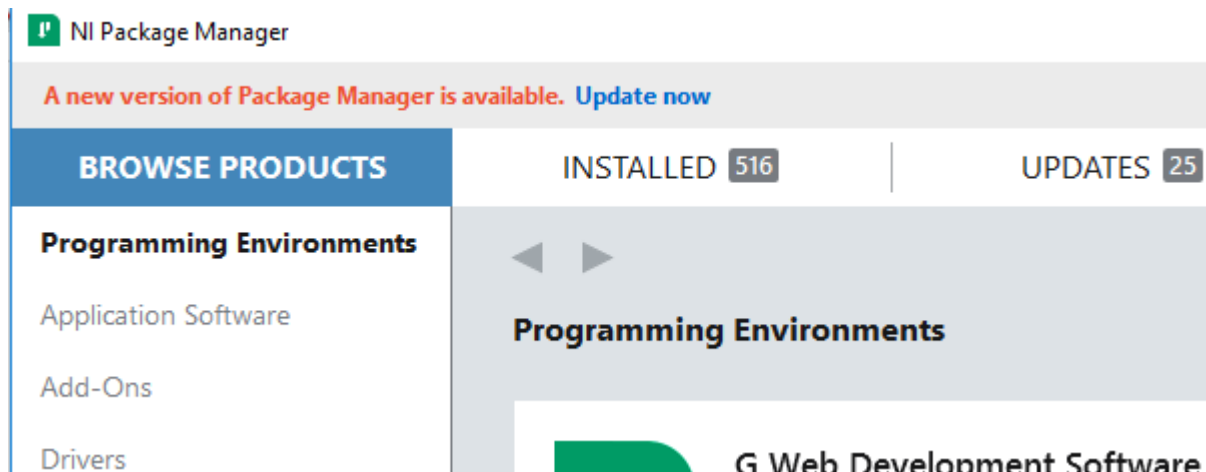
It might be that the installer will give a warning that your Package Manager is outdated.



There are 2 ways to solve it.

1: If you have a previous version of ChronO2 or the Bootloader installed, use the auto-update button and try again. When doing the auto-update, latest version of package manager will be installed.

2: Or, find the package manager in your Start Menu and update it. -> Click the UPDATE NOW link and install again.



Once the software is installed, you'll find the ChronO2 icon on your desktop and/or start menu.

If you have Chrono2 already installed, updates can be obtained via the "update" button within the RMS. This button is only visible if an update is available.



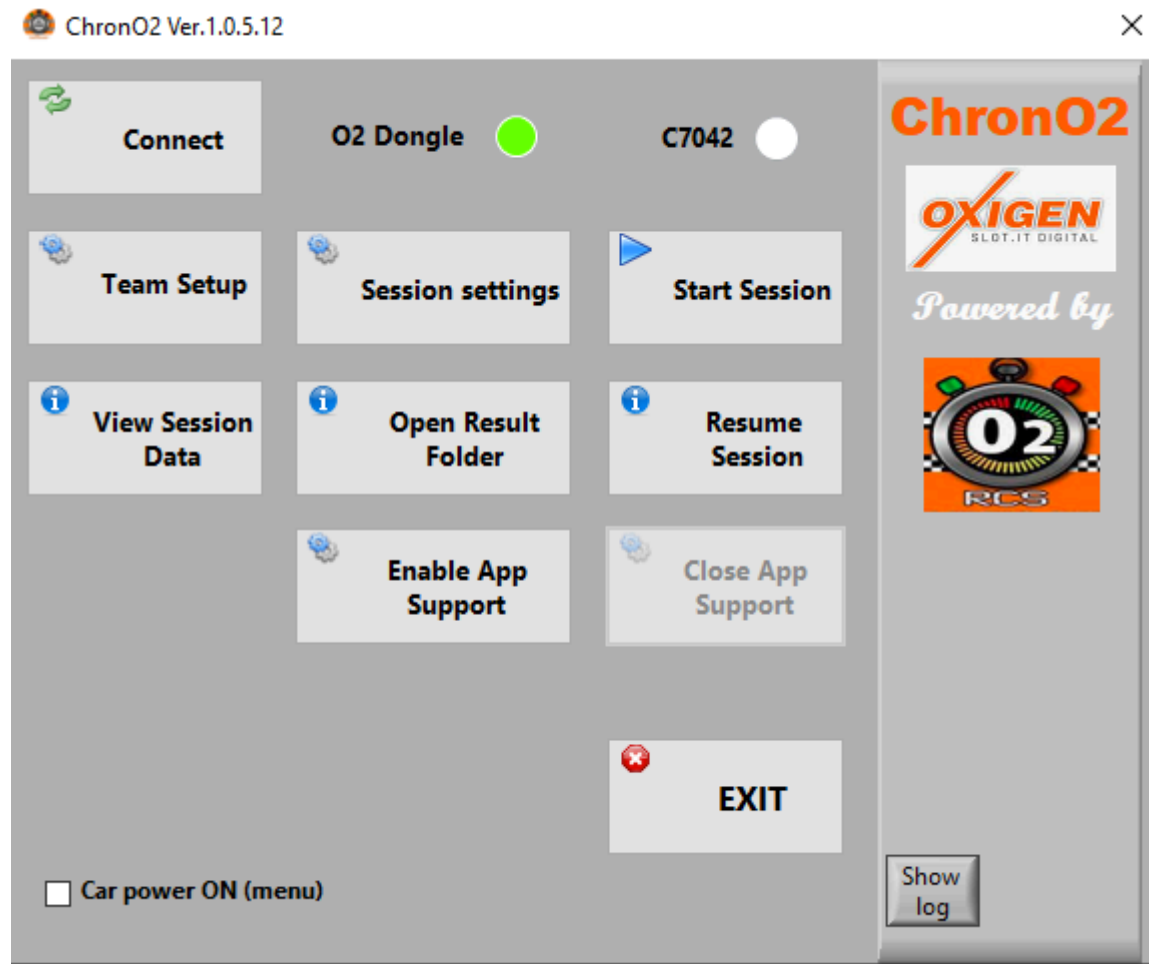
Before using ChronO2, make sure that the dongle, car(s), and controller(s) have been updated to firmware version 4, and that the cars are paired with controllers (SCP2 & 3). Launch ChronO2 and click 'CONNECT.'

The software will automatically detect the presence of the oXigen dongle (provided It has the correct firmware and is installed/connected according to the oXigen manual).

It can also detect a Scalextric Sport Digital C7042 Powerbase, though It hasn't been extensively tested, It should function for lap counting. It's even possible to detect both devices simultaneously if your track is powered by the C7042.

Main screen

MAIN SCREEN AND CONNECTION



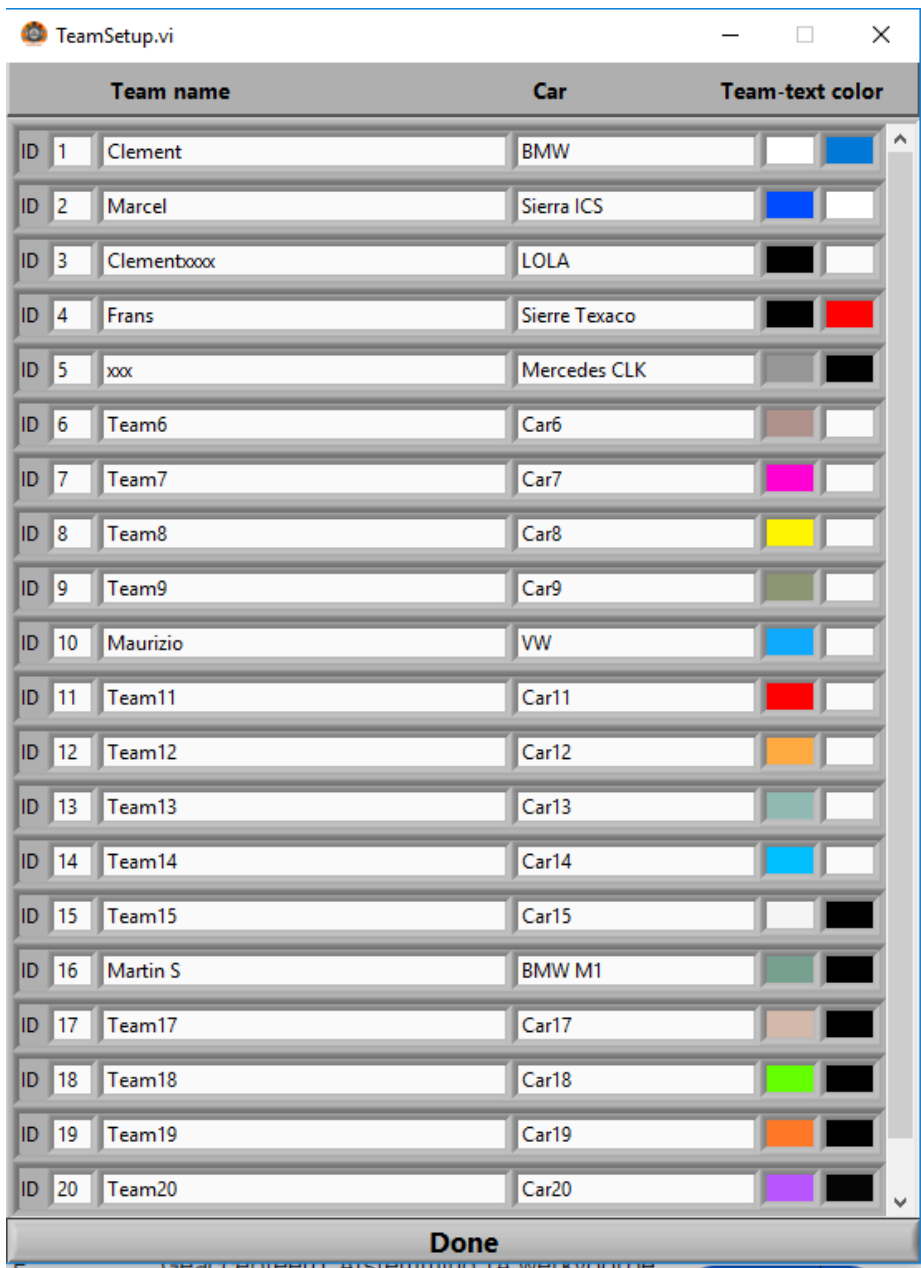
The primary screen serves as the hub for Initiating all actions. Begin by ensuring a connection with the dongle by clicking the 'connect' button located at the top left.

If you wish to power your cars without initiating a formal session, you can activate power to the cars by using the option at the bottom left. This feature proves highly useful for guiding your cars back to the Pit or within reach after a session.

Let's take a closer look at the buttons, proceeding from left to right:

Team setup

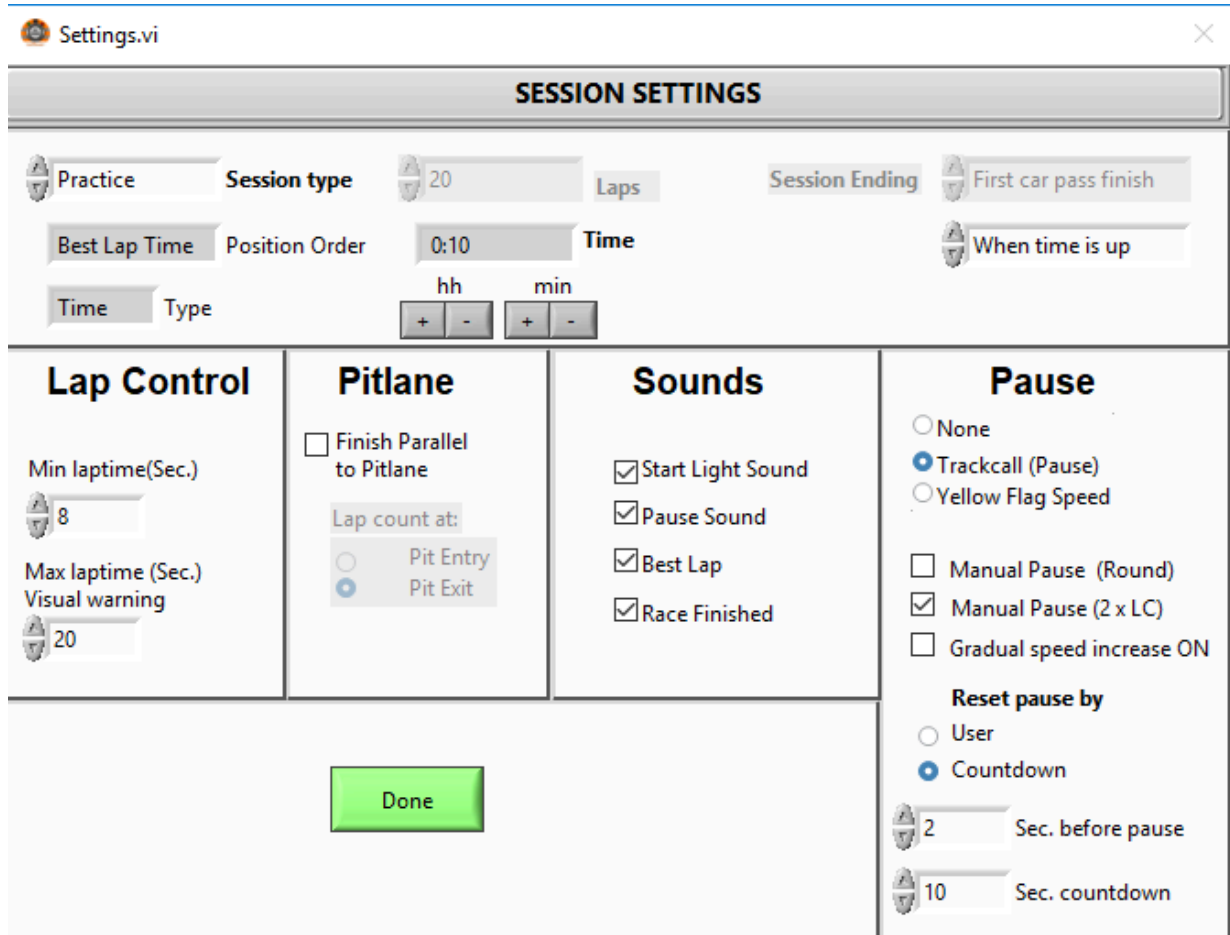
ChronO2's dashboard displays the team name and car name, linked to the controller's ID. You have the Flexibility to configure the team and text colours on the right side. These selected colours will be reflected in the dashboard and the mobile app.



With your teams and cars configured and prepared for action on the track, ChronO2 will remember these settings for future sessions. Simply click 'DONE' to return to the main screen.

Session Settings

Now that you've set up your teams and cars, It's time to delve into session settings to tailor your racing experience to your preferences. Here's an overview of the options:



Top Row: Choose the type of session, whether It's practice, qualification, endurance (time-based), or a Grand Prix (laps). Adjust the values using the '+' and '-' buttons. Determine the session end criteria, such as when the first car crosses the finish line, when all cars complete the same lap, or when the allotted time expires.

Lap Control: Specify the minimum lap time; laps with a shorter lap time won't be registered. Laps exceeding the maximum lap time will be highlighted in orange on the dashboard as a visual warning.

Pit Lane: Configure your Pit lane settings. ChronO2 can be instructed to add a lap (or not) when the pit lane aligns with the Start/Finish straight. If the Pit lane is parallel, ChronO2 should add a lap when cars enter the Pit. This feature requires the magnets to be correctly positioned in the Pit lane, as per the oXigen manual.

Sound: Select the desired sounds using checkboxes to enable or disable them.

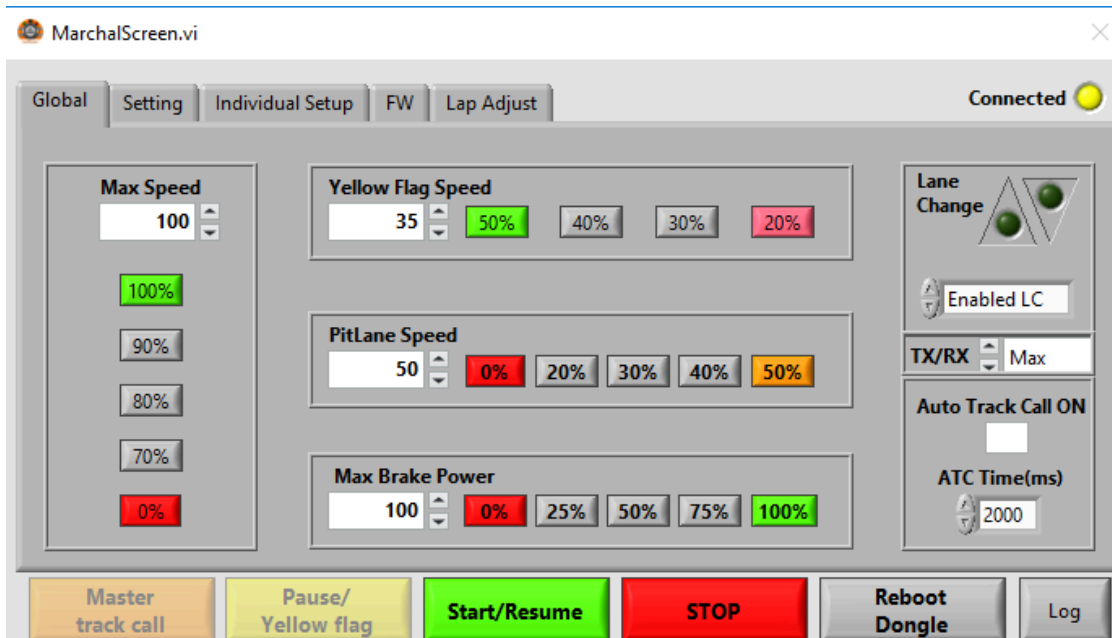
Pause: There are multiple ways to pause a race, either with a full stop (track call) or through a yellow flag speed. To allow pausing from the controller, use the checkboxes to activate the round button or the two LC (Lane Change) buttons to Initiate the call. Note that with these options enabled, a track call from the mobile app is also possible. Enabling "Gradual speed increase" will provide a slow speed build-up for cars rather than full power instantly. For resuming the race after a pause, you can choose to have a countdown, Initiating a timer after each call, with full power returning after a set time. Alternatively, you can use the buttons on the controller when set to 'user' to resume racing. It's important to note that a track call can be initiated or cancelled at any time through the marshal screen, and all settings are automatically saved. Click 'Done' to return to the main screen.

Note: Changes made in the settings screen will persist until the next session, even if you close Chrono2. If you don't want the mobile app to initiate a call, select Pause option : none

Start session

Initiating a session will display the race dashboard featuring the connected teams and the marshal screen, which will be explained in detail later.

For your first race, It's helpful to know that in the top left corner of the dashboard, you can adjust the font size using the '+' and '-' buttons. If the marshal screen is hidden behind the dashboard, you can bring It to the forefront by clicking the marshal button.

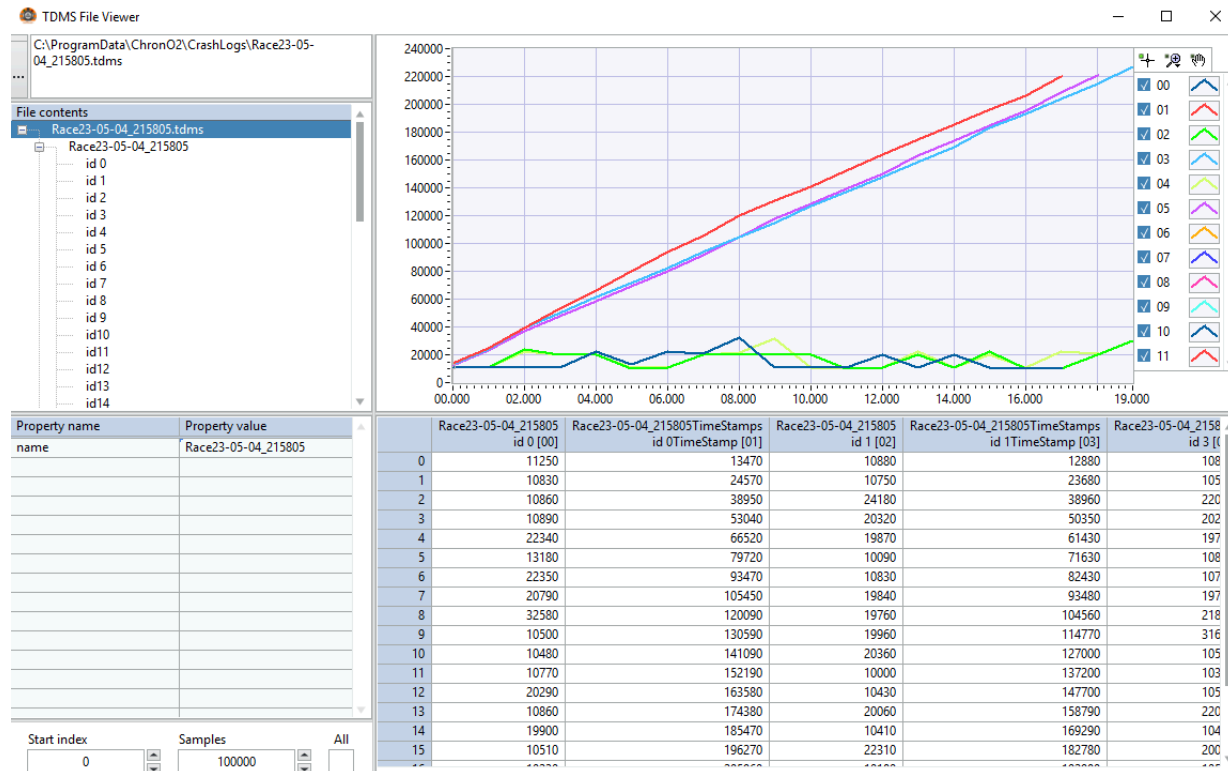
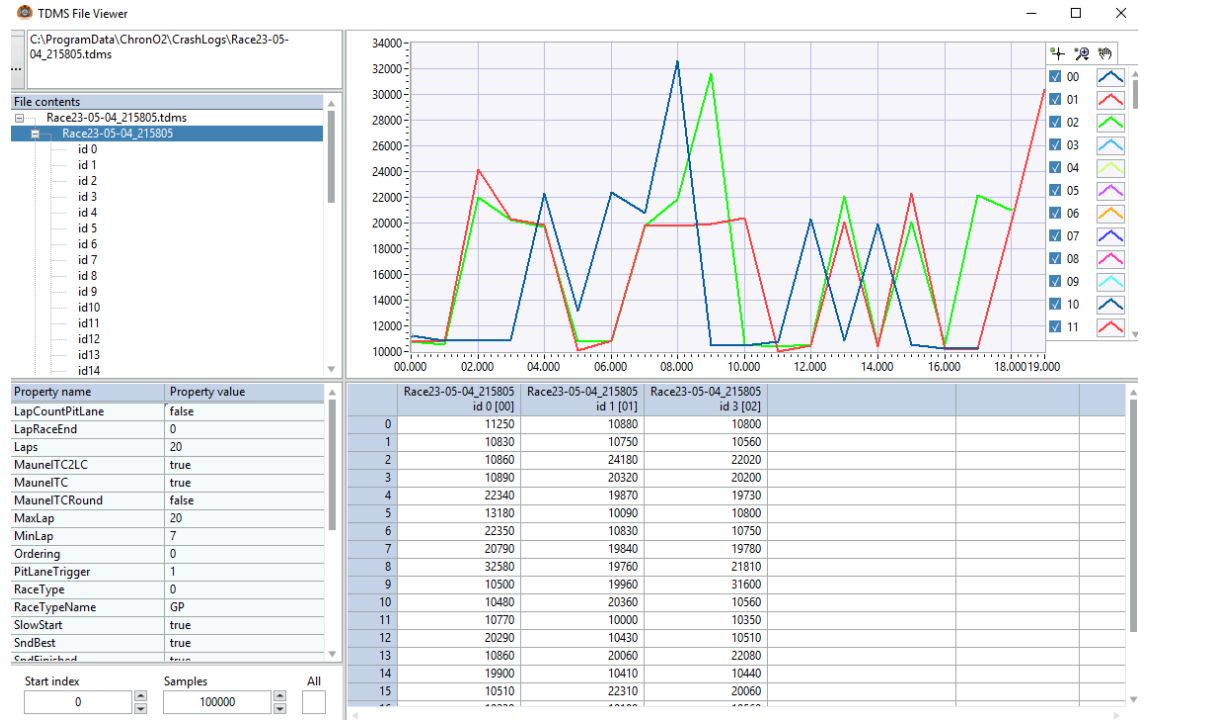


To commence the race, click 'start/resume' in the marshal window. A countdown will begin, accompanied by a start light displayed on the screen (and a countdown in the mobile app).

Once the lights are off, the cars will receive power.

View session data

Using this button, you can access data for each team from a previous session, either by ID or for all IDs. Please note that the ID shown in the graph is one less than the actual ID (ID1 is displayed as id0). However, team information remains visible. Data is stored for each lap, and you can select or deselect teams and zoom in on the data. Please be aware that you cannot edit the data; It's for viewing purposes only. The tool is a default LABVIEW tool.



The graph displayed above represents the final race results for a race featuring four cars. At the bottom of the graph, you can observe the lap times for each team per lap. The cumulative result, achieved by adding up each lap time, is represented by the lines. In this case, since it was a 20-lap race, the first line (light blue) that reaches the total lap count indicates the winner, and you can easily discern the gap between the winning team and the others.

On the top right of the graph, you'll find various tools, including options for zooming in on specific details. On the left side, you can select individual IDs and access data from previous races for detailed analysis.

Open result folder

Name	Date modified	Type	Size
CrashLogs	5/4/2023 10:18 PM	File folder	
LapLog	5/4/2023 10:18 PM	File folder	
RaceLogs	5/13/2022 8:19 PM	File folder	
Result	5/4/2023 10:33 PM	File folder	
SoundFiles	12/31/2022 4:48 PM	File folder	
ChronO2	5/4/2023 10:34 PM	Configuration sett...	3 KB

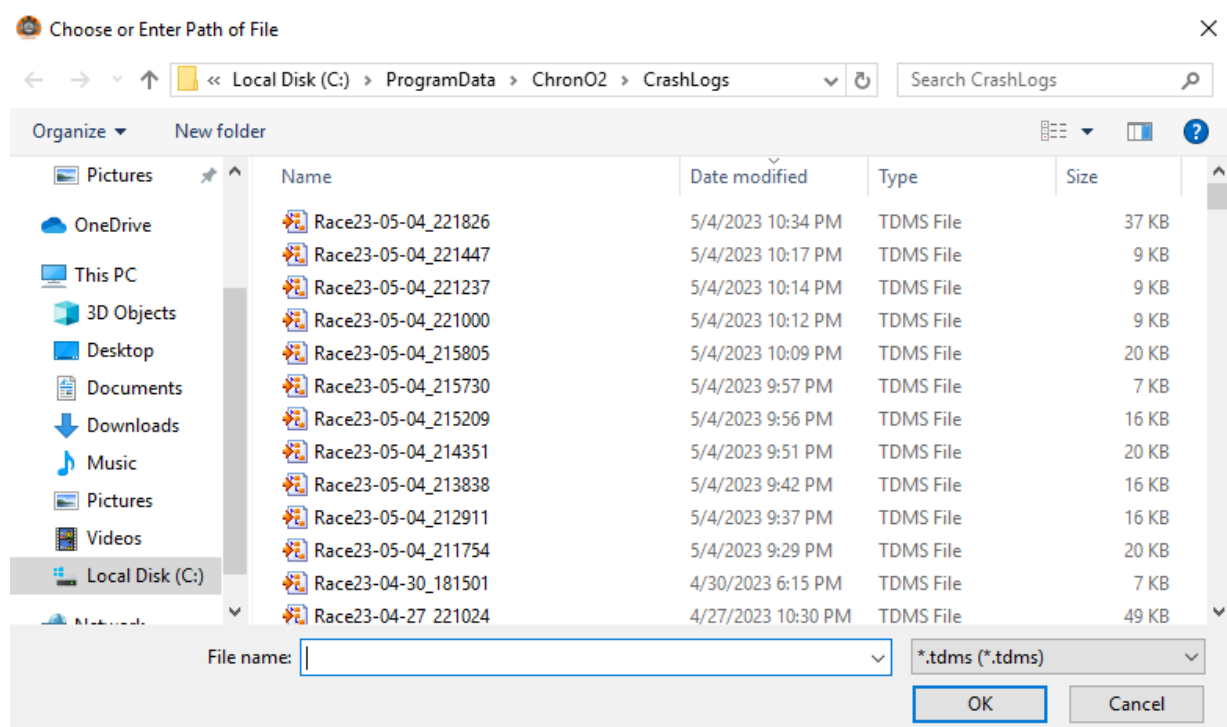
This button will direct you to the result folder where you can locate a straightforward text file containing the final results of each session.

Pos	Id	Team	Car	Lap	Gap	Last	Best	Time	Info
01	2	Marcel	Sierra ICS	20	0 / 0	30:380	10:000	03:47:120	OnTrack
02	4	Frans	Sierre Texaco	19	-1 / -1	21:030	10:350	03:40:850	OnTrack
03	1	Clement	BMW	18	-2 / -1	10:260	10:230	03:40:220	OnTrack

Resume session

In cases where the software or your PC experiences a crash or if you need to halt a session for any other reason, the "Resume Session" option comes to your rescue. This feature allows you to pick up right where you left off, and it can also be used if you wish to continue a race at a later time.

Pressing the "Resume Session" button will open the folder containing crash logs. You can select the one you want to try. All team data, settings, laps, and other relevant information will be preserved. It's important to ensure that cars and controllers remain paired as they were during the initial session. Normally, the race should seamlessly continue from the point where you left off.



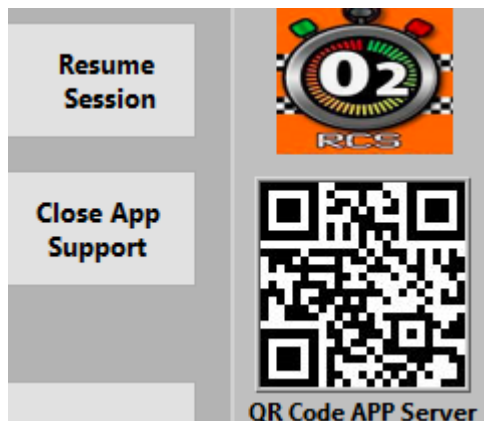
Check for updates

You can use this button to verify if there's an update available for Chrono2. Please note that an active internet connection is required to use this feature. If an update is indeed available, Chrono2 will guide you through the installation process. (This button is only visible when an update is available).

Enable App Support

By pressing this button, you enable Chrono2 to establish communication with Android devices on the same WiFi network as your PC.

An Android app named **DashRCS** is available on the Google Play Store. This app can display individual race data or provide an overview of the overall race status. To establish a connection, download and install the app on your phone. Then, simply start the app and scan the QR code displayed on the screen (both on the main screen and marshal screen) to link your devices.



After selecting "Start Session" on the main screen in Chrono2, you have the option to choose your team. Connected teams will be highlighted.

Once the race is initiated, a countdown will appear, and depending on your selected view (individual or live), you will have access to race data. For more details about the app, please refer to the later sections of this manual. Clicking "Close App Support" will terminate the communication with the app.

Exit

Selecting "Exit" will close Chrono2, and It will retain your settings and teams from the previous session for your convenience.

Marshall screen

The marshall screen is a separate window that you can move to a second screen if available or hide and call upon when necessary. The marshall screen is a powerful tool for controlling the race, and It becomes visible when you start a session. It consists of various tabs for different functionalities.

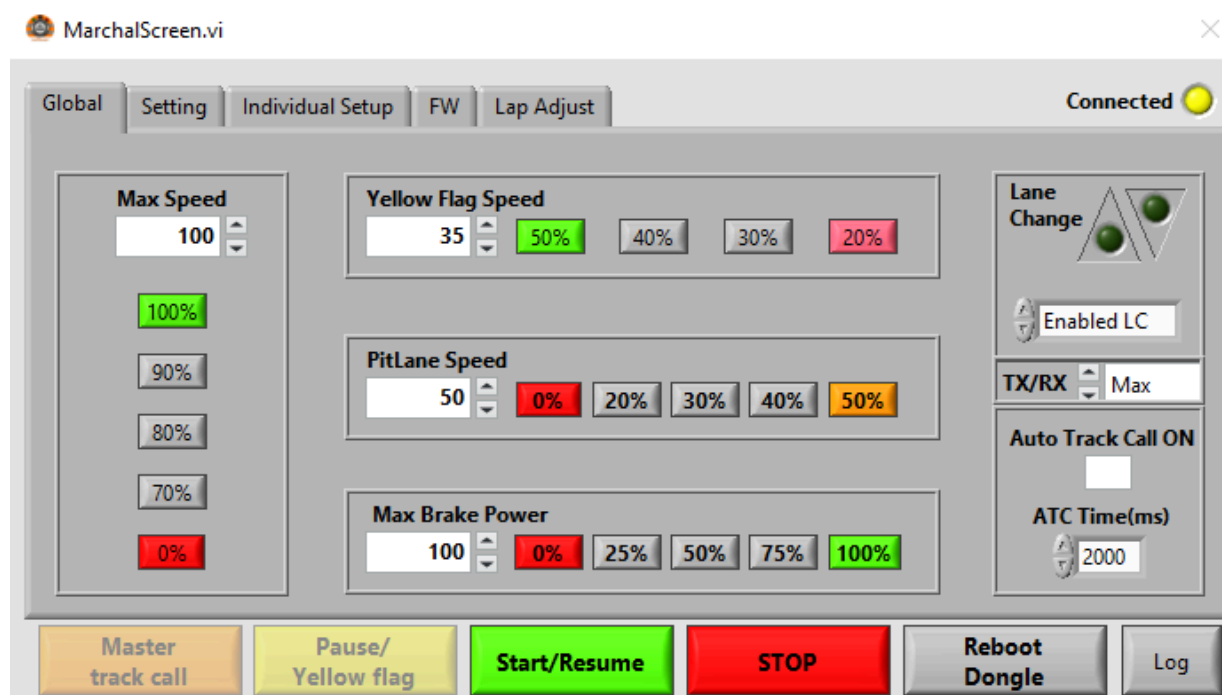
Note: Any changes you make in the Marshall screen will persist as long as you don't close Chrono2. If you restart Chrono2, the values will return to their default settings.

Good to Know: All the values that you can modify in the marshal screen can be adjusted in real time both before and during a session. For instance, you can enable or disable auto track call during a session or set the maximum global power.

Now, let's describe the buttons located at the bottom of the marshal screen:

- **Master Track Call:** This button is used to pause the race, cutting power to all cars. Even if the track call setting is yellow flag speed, all cars will come to a halt.
- **Pause / Yellow Flag:** Use this button to pause the race. Depending on the session settings, either all cars will stop, or yellow flag speed will be applied.
- **Start/Resume:** This button is for Initiating a session or resuming It after a track call.
- **Stop:** Press this button to conclude a session when It's finished (e.g., when the allotted time or laps are completed) or to Quit a current session and return to the main screen.
- **Reboot Dongle:** If you encounter unusual behaviour or unexpected values, rebooting the dongle during a session can help resolve issues.
- **Log:** Clicking this button will open a window that displays live communication. This feature can be useful for troubleshooting and analysis, helping you understand what's happening during the race.

Marshall screen - Global



In the "Global" tab, you will find the following settings from left to right:

- **Global Maximum Power:** On the left, you can set the maximum power available to all cars. You can use quick buttons for easy adjustments or manually input the desired value.
- **Global Power Settings:** In the middle, you have control over global power settings for specific scenarios. This includes the Yellow flag maximum speed during a track call, the pit lane speed between the pit in and out sensors, and the maximum brake power. These settings apply universally to all cars, and you can utilize quick buttons or make manual adjustments.
- **Lane Change Button:** On the right, you can enable or disable the use of the lane change button for all cars. Additionally, you can send a lane change command, either up or down, to all cars by clicking on the LED.
- **TX/RX Setting:** This setting is primarily useful if you have more than one dongle in the same room, each serving different tracks. By default, you can leave it at the maximum setting, and it's only relevant in such multi-dongle scenarios.

A noteworthy feature is the "AUTO TRACK CALL." When you check the box, it will activate auto track call after a set number of milliseconds (default value is 2000 ms or 2 seconds). oXigen will detect if a car goes off track, and after the specified time, it will automatically initiate a track call or apply yellow flag speed, depending on your chosen setting. This feature enhances race management and ensures fair play during the race.

Marshall screen - Setting

The "Settings" tab is essentially a visualization of the settings, along with a QR code to facilitate connecting to the correct WiFi network for the mobile app.

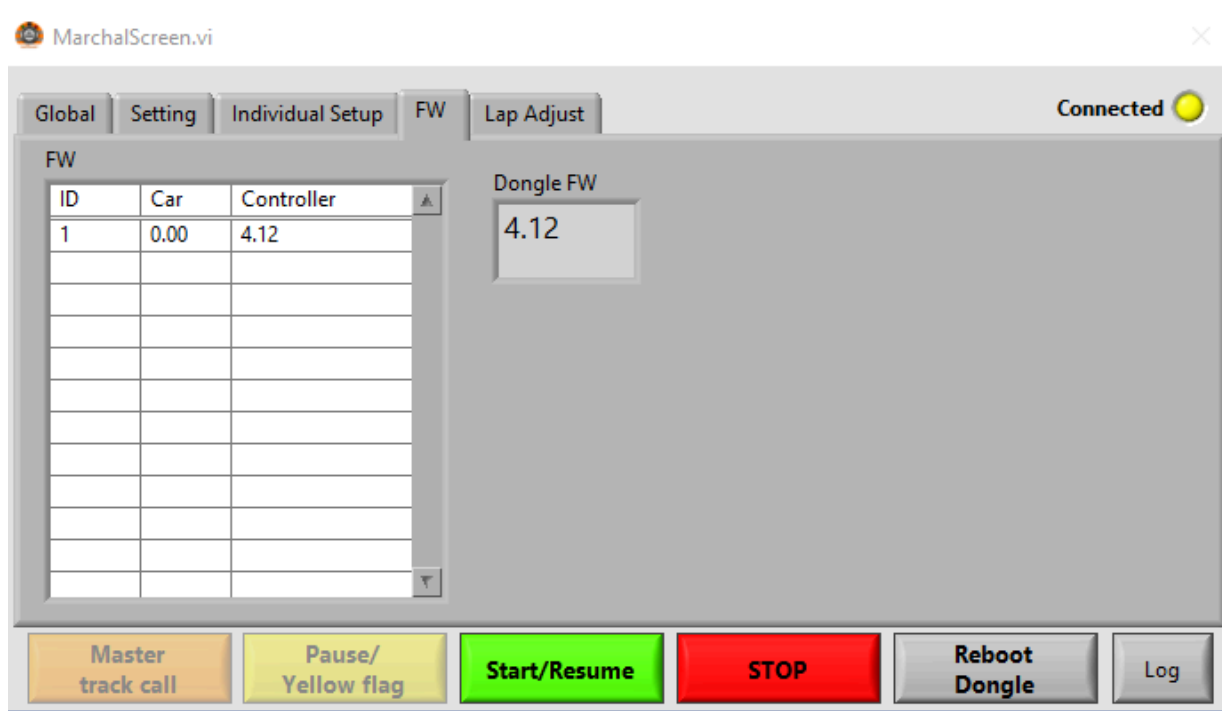
Marshall screen - Individual Set up



This tab allows you to select the CAR ID for which you want to modify individual settings. For example, you can Limit the maximum power for a car driven by a novice driver. Select the ID and adjust the maximum value accordingly.

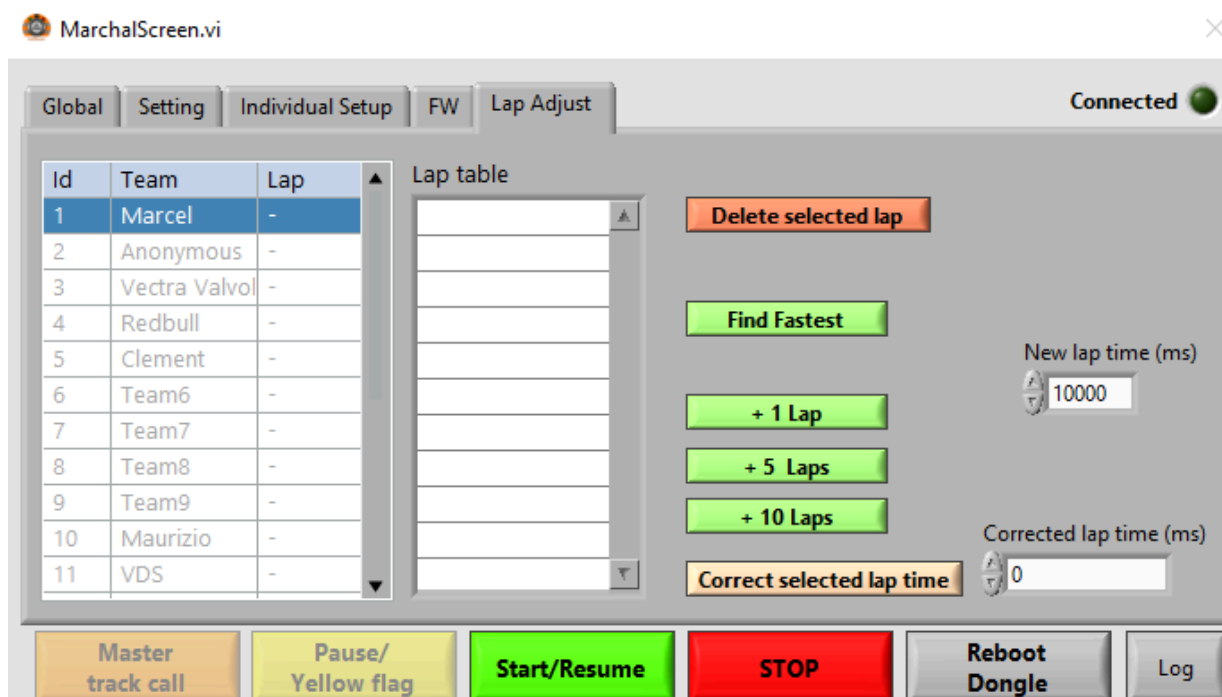
When you increase the minimum power, you can set a car to move with a fixed speed and act as traffic.

Marshall screen - Firmware



In the "Firmware" tab, you can get an overview of the firmware versions currently in use during the ongoing session.

Marshall screen - Lap adjust



In the "Lap Adjust" tab, you have the ability to correct the number of laps and lap times, but only during an active session. Make sure to select the correct ID before making any changes. If you wish to edit or delete a specific lap, ensure you select it in the lap table. The 'Find Fastest' button will assist you in identifying the fastest lap in the lap table, and this is visually indicated as well.

When adding laps, it will take the new lap time (in milliseconds) that you can adjust according to your preferences.

Dashboard

Pos	Id	Team	Car	Lap	Gap	Last	Best	Time	Info
01	1	Marcel	Honda	19	00:000	33:120	09:790	13:37:310	OnTrack
02	3	Clement	BMW 21	0	-	XX:XXX	XX:XXX	XX:XX:XXX	DeSlot
03	4	Edwing	BMW eBay	0	-	XX:XXX	XX:XXX	XX:XX:XXX	DeSlot
04	5	John	Honda	0	-	XX:XXX	XX:XXX	XX:XX:XXX	DeSlot

Id	Team	Lap	Lap time (ms)
1	Marcel	19	03:48:800
2	Frans	-	00:11:930
3	Clement	-	00:10:950
4	Edwing	-	00:10:530
5	John	-	00:11:100
6	Team6	-	00:10:540
7	Team7	-	00:10:350
8	Team8	-	00:09:940
9	Team9	-	00:09:790
10	Maurizio	-	01:07:710
11	Team11	-	00:09:910

The dashboard is where all the action is shown. Important to know that on the top left, you will find a 'Marshall button' to call the marshall screen when it is hidden, and a '+' and '-' sign to increase or decrease the font size.

Pos	Id	Team	Car	Lap	Gap	Last	Best	Time	Info
01	3	Gilles	BMW	5	00:000	24:640	09:250	02:00:920	OnTrack
02	5	Marcel	ASTRA	2	01:490	10:850	10:740	00:38:440	OnTrack

The middle section on top shows the type of session - Practice, Qualify, GP or Endurance and the remaining time or laps done/to do for a GP. When you use a countdown after track call, it will be shown here too.

At the top right you will see different pictures depending on the status of the race, GO = drive, a finish flag and the end of the session, a track call flag (red) or a yellow flag.

The dashboard can show 20 ID's and the first 3 columns use the colors as set in the TEAMS. (background and text color)

POS : Position in session, depending on lap time for qualify or practice, or amount of laps in Endurance and GP

ID : the car/controller ID

Team : Team name

Car : Car name

Lap : Amount of laps done -> IMPORTANT => ChronO2 only adds a lap after you finished It (unlike in F1), so the first lap will be shown after passing START/FINISH for the second time.

GAP: Gap in time to the BEST time (qualify/Practice) or Gap in laps to car in leader/car in front (GP/Endurance)

LAST : your last lap time (ORANGE when higher than lap time set in settings)

BEST : your best lap time (Purple when It is the overall best lap time)

TIME : The time since first pass of START /FINISH until last pass of START/FINISH

INFO : this will give you real time information about your car (On track, deslot, in plt) and controller (controller off, reconnect)

Endurance 23:55:31									
Pos	Id	Team	Car	Lap	Gap	Last	Best	Time	Info
01	4	Worthing Digital	Audi	9	0 / 0	00:09:461	00:08:216	04:05:773	
02	18	Mission 8	BMW	9	0 / 0	00:11:937	00:08:001	04:25:651	
03	19	North Staffs	Viper	7	-2 / -2	00:11:322	00:08:208	04:25:955	
04	1	Low Lands Racing	Rebellion	7	-2 / 0	00:08:259	00:08:224	04:22:893	
05	6	Olifer Racing	Oreca	7	-2 / 0	00:09:149	00:08:516	03:22:644	
06	2	Demon Slot Racing	Nissan	6	-3 / -1	00:12:206	00:08:221	04:10:052	
07	9	BB Slot Vikings	Lola Nissan	5	-4 / -1	00:08:298	00:08:298	03:30:116	
08	3	Sportcarazing	Pescarolo	4	-5 / -1	00:11:627	00:08:532	04:22:285	
09	17	Rockingham	Porsche	3	-6 / -1	00:08:527	00:08:527	03:42:845	
10	14	Gas Monkeys	Corvette	3	-6 / 0	00:10:723	00:10:052	04:00:578	
11	16	Great Barr Slot Car	Alpine	3	-6 / 0	00:08:247	00:08:247	04:14:020	
20		Safety Car	Mercedes	0	-9 / -3	xx:xx:xxx	xx:xx:xxx	xx:xx:xxx	PitL

At the end of a session this screen will remain until you press STOP in marshall and Exit to main menu, where you can see more in detail in the SESSION DATA, which is automatically saved after each session.

DashRCS

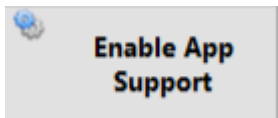
DashRCS is a mobile Android app under development by the creators of ChronO2. Although It's not their primary business, they have designed an app they believe is useful and plan to upgrade It in the future.

DashRCS is available for purchase on the Google Play Store, and It provides access to individual race data and an overall race status. To use DashRCS, your Android device must be connected to the same WiFi network as the PC or laptop running Chrono2.

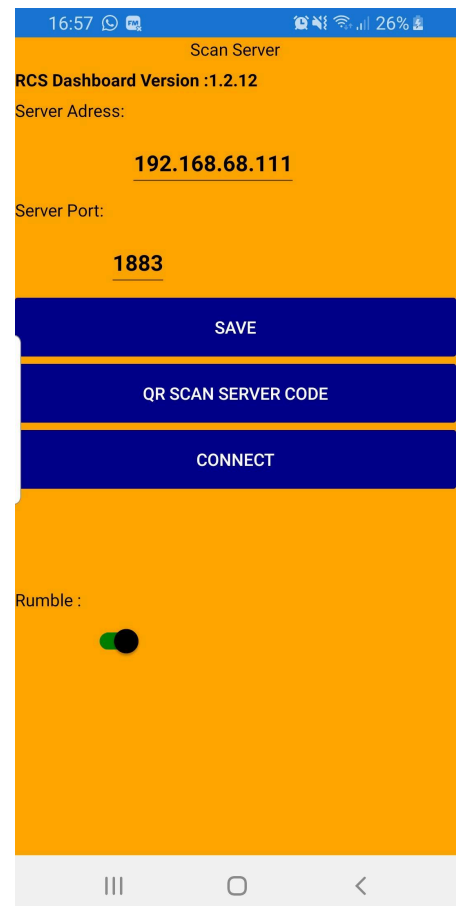
Download DashRCS: On the main screen of Chrono2, you can find a link to download DashRCS. Press "App Info" to access the download link.

Install the App: Download and install the DashRCS app on your Android device.

Connect to Chrono2: Start the DashRCS app. Use the "QR SCAN SERVER CODE" feature within the app to scan the QR code displayed in Chrono2. You'll find this QR code when you select "ENABLE APP SUPPORT" in Chrono2.



The mobile app will automatically open the scanner, and under normal circumstances, when your device is connected to the same WiFi network as the PC or laptop running Chrono2, the connection will be established. The app will then display the IP address and server port details. You won't need to manually input this information, as the app will handle the connection details seamlessly for you.



Note: in current version (may 2024) a speech button is available, this feature is under construction.

Once you're connected, the screen will change to display the teams in ChronO2, and they will appear as "greyed out." However, It's important to note that you can only select your desired team in ChronO2 after clicking "START SESSION." ChronO2 will then guide you to the dashboard and marshal screen, ensuring that the session doesn't commence until you press "START/RESUME" in the marshal screen. This provides ample time for you to make your team selection. In the app, the available and connected teams will be highlighted in the team overview screen. The app must be used in VERTICAL mode for optimal functionality.

Given that the screen is constantly on during the race, It's advisable to ensure that your device has enough battery power. Alternatively, you can connect It to a power source or a power bank for uninterrupted usage.

Once you've selected your team in the app, the team name and ID will be displayed as the "SELECTED TEAM," as illustrated in the example.

Selected Team id : 1 : Franck

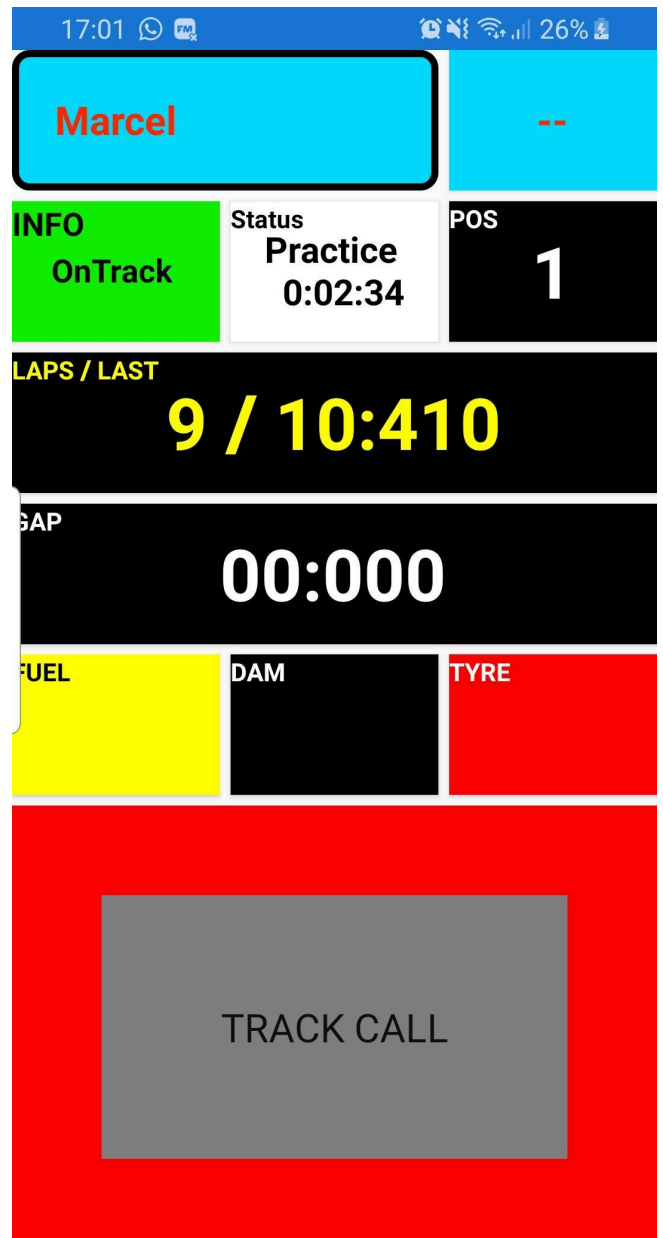
Once the race director or marshal triggers the session in ChronO2, DashRCS synchronises with a countdown, paralleling ChronO2's start lights. As the race officially kicks off, the app seamlessly transitions to the individual dashboard.

In case you mistakenly select the wrong team, simply tap your team name, and the app will smoothly guide you back to the team selection screen.

The information displayed in the individual dashboard mirrors ChronO2's data, providing real-time updates on the race's progress.

At the dashboard's bottom, you'll find a prominent "TRACK CALL" button. If you've configured ChronO2 with manual track call settings, this button is active and allows you to pause the race with a simple touch. If you prefer not to use manual track call, you can leave It deactivated in ChronO2 settings.

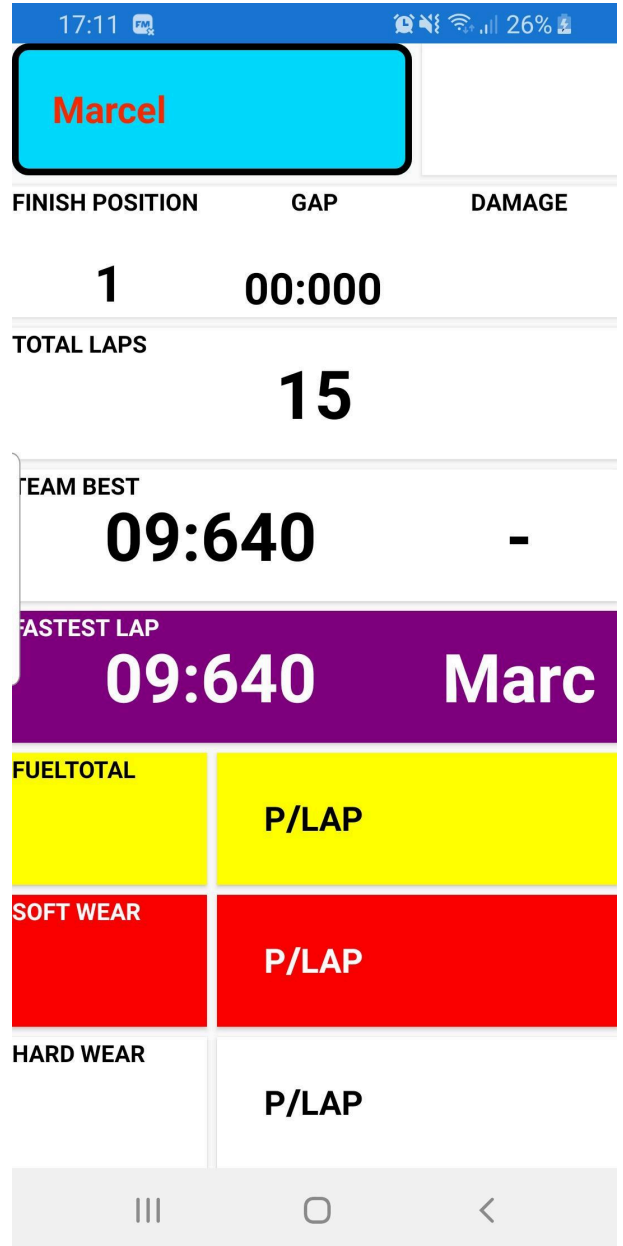
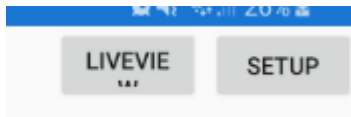
Additionally, you'll notice sections for fuel, damage, and tires, set up for future use. It's important to note that the "TRACK CALL" button conceals the Pit stop menu, although this feature is not active in ChronO2.



At the session's conclusion, a result page emerges, presenting your individual data alongside the overall winner and best time. DashRCS is future-ready, with capabilities to display fuel and tire usage, aiding in your strategic decisions.

When you return to Chrono2's main menu, the app seamlessly transitions to the Team selection screen.

Furthermore, at the top right of the Team selection screen, you'll find the option to choose "LIVE VIEW," enhancing your race management experience.



The Live View feature displays all connected IDs along with their positions and best lap times, offering a comprehensive overview of the race.

You can easily Switch between screens during a session. To do so, select your team name in the individual race dashboard, then choose "Live View." To return to the Team selection screen and select your team, simply click "BACK" from the Live View.

An overview of the LIVE VIEW: The LIVE VIEW is particularly valuable for spectators and teams to track the best lap times of all participating teams, enhancing the overall race experience.

We sincerely hope you enjoy using ChronO2. We've put in our best efforts to ensure its stability. The journey has been long, but we've learned and achieved a lot throughout it, and we can be proud of our accomplishment.

Now, we genuinely hope you have a fantastic time and enjoy every moment of it.

Have fun, happy racing!

