EFS

Your Name

EM Motorsport

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Contents

Chapter 1

Installation

1.1 EFS Client

1.1.1 Minimum System Requirements

To ensure optimal performance, your system should meet the following requirements:

- **Operating System:** Windows 10 64-bit
- **Software:** Internet Explorer 9 or higher
- **CPU:** Intel Core 2 Quad Q6600 at 2.4 GHz or AMD Phenom 9850 at 2.5 GHz
- **Memory:** 4 GB RAM
- **Free Space:** 1 GB of free space
- **Graphics:** DirectX 10-compatible GPU, e.g., GeForce 9800GT 1GB or ATI Radeon HD 4870 1GB

EFS Client Installation and Configuration

1. Run the installation file `EFS.msi`. The Setup Wizard will open to guide you through the installation.
2. Click **Next** to begin. You can choose the default folder: `C:\Electronic Flag System\Electronic Flag System Client`.
3. Review the settings. Click **Next** to proceed or **Back** to make changes.
4. Once the installation is complete, click **Close** to exit the installer.
5. Copy patches, server scripts, and map files into the installed folder.
6. Navigate to the installation directory and double-click `EFS.GUI.Client.exe` to start the application.

Initial Configuration

On first launch, the interface will appear blank. Several configuration steps are required: Open the Settings menu: `Edit > Settings...` from the top menu bar. In the left sidebar, select **Connection** and configure network settings.

Connection

Notice: The EFS Client can connect to an EFS Server on a different machine, but the IP addresses must be set in the primary and backup server fields.

- **Primary Server:**
  - **Address** – IP of the machine running the primary EFS server. (127.0.0.1 means the same machine that you are working with)
  - **Port** – default is 6000.
- **Backup Server:**
  - **Address** – IP of the machine running the backup EFS server.
  - **Port** – default is 6001.

Reconnecting Settings

- Enables automatic connection to the EFS Server when the client starts.
- Connection retries and the delay between retries can be configured.

Then choose Circuit Map from the left sidebar.

Circuit Map Settings

- **Background** – Sets the background colour of the map.
- **Map refresh (ms)** – Defines the update frequency. Recommended: 100 ms.
- **Blinking latency** – Determines how often flashing map elements toggle their status. Recommended: 4.

Then it's needed to choose the map folder located in the installed software directory.

Expand the circuit map and choose **Map Elements**, then check for any missing unchecked **element** boxes, all must be checked.

Then choose **Circuit Cars**, check the position smoothing for both race cars and service vehicles. The rest can be modified later.

In **Display** option, choose "Large (Full HD)".

In **Logger** option, in current logfile folder, create a folder with name **Logs** in the software installed directory and choose it.

After this phase, in order to make all the functions and buttons to appear, at first it's needed to go to `File>Disconnect`, then go to `File>change role>Race control`. In this step you will need activation key. Then go to `File>connect`.

1.2 EFS Server

After passing EFS Server installation process, you will need to do following steps. First of all you will need to copy and paste the the desired map on the map folder in the software installation directory folder. Copy and paste the script file and patches in the software installed folder.

After the first launch of the software, in the above task bar, choose **connection** tab, in **VIC hex codes**, import hex file from the default opening folder.
In the **equipment connection**, check **Ethernet** and **Autoconnect at startup**.

In the top task bar, choose **circuits** tab, choose the country, add maps that are already copied in the map folder of this software. In the box "selected circuit info", based on the circuit that is chosen, corresponding panels are shown. By right click you can allow them to demonstrate which flags. So for the first time to allow all the pannels showing flags, you can select them all an by right click you can choose "flags allowed".
If there are backup servers, there is no need to do setups in the secondary backup, just would need to copy the maps in the same folder as the primary one. (path to the installed program)

In the top task bar, choose **Panels** tab, now you can add panels from 1 to 40, choosing their active status as yes, adding their IP address, choosing their model (T1 or T2), and putting the upload port 6001.

By choosing smart marshalling tab, you can add smart marshalling components in the "Smart marshalling servers" box. you can add cars by pressing **saved unit info** button, activate and deactivate cars in "car list" box.

In `Tools>XML permisions`, after inserting the password, you can set permissions to the users to send what info on the panels.

1.2.1 Software Update

To update the EFS software, you will need to run the updated installer, then copy patch and scripts in the installed folder. Pay attention if there is not a log folder for the server software, create a folder named "Logs" in the installed program folder and define the logs go there by: `Tools>log options>choose the folder`

To check if the patch is updated in the installed client software, press the question mark, if it shows zero, it means the patch needed to be copy and paste in the folder.

Chapter 2

Flags

The EFS Client is designed to communicate with panels, enabling full control as well as reception of feedback and diagnostic information. This allows the Race Control Operator to manage track status directly from Race Control and to inform drivers and marshals of any on-track incidents in real time.

2.1 Settings

In menu Edit → setting → sector flags,

Flag → Defines which sector flag is selected by default from the *Flags side bar*

Restore flag → Defines the time before restoring to the default selected flag, after selecting a different sector flag from the *Flags side bar*

2.2 Profile circuit flag

From the Top Menu, the preferred flag profile can be selected. The EFS Client provides two profiles: **FIA** and **FIM**. Enable a profile via: `Tools > Circuit Flag > Flag Set: FIA, FIM`.

2.3 Custom Flag Layouts

In addition to standard FIA and FIM layouts, users can create custom layouts, which define the group of flag buttons shown in the Flag Bar. When the client is **not connected** to the server (`File > Disconnect`) and no playback file is loaded, the editor can be opened via: `Edit > Flags Toolbar Editor`. There are five modes of operation:

- Create a new layout
- Edit an existing layout
- Delete an existing layout

- Import a layout from a file
- Export a layout to a file

2.3.1 Selecting a Layout

The available layout depends on the flag set of the selected circuit and the size of the current sidebar. To change it, use: `View > Flag Toolbar > Select Layout...`.

2.4 Set flags

The Flags Sidebar provides quick access to deploy various track information. The Flags Sidebar offers two views: Reduced and Extended. Switching between these views is done by clicking the arrow located in the Top Right Bar.

To display a sector flag on a light panel, first select the desired flag from the Flags Sidebar in the right (Yellow flag, Double Yellow flag, Green Flag, Slippery Flag, White Flag,). Then, using the mouse, hover over the target Circuit Track Marshalling Sector. The corresponding sector will be highlighted, if the option is enabled in the settings indicating the area selected for flag deployment.

2.4.1 Deploy Later

The EFS Client allows for the delayed deployment of various Circuit Flags through the **Deploy Later** function. This button is available by default in the flag toolbars.

2.4.2 Red Flag

Red flag button is located in the right side bar. By clicking on it you can set a red flag.

Changing the rules of the red flag

The **Red Flag** has the highest priority and, by default, overrides all other flag conditions. This behaviour can be customized in the menu:

- `Tools > Circuit Flags > Red Flag > Deployed > Keep Yellow/Double Yellow on Sector` Keeps Yellow/Double Yellow flags active even when the Red Flag is deployed.
- `Tools > Circuit Flags > Red Flag > On Track > Allow Yellow/Double Yellow on Sector` Allows Yellow/Double Yellow flags to be set after a Red Flag is deployed.

Big Red Button

The **Big Red Button** provides quick access to deploy the Red Flag in urgent situations.
To open this window, navigate to: `View > Red Flag Button`.
By default, a confirmation prompt appears before deployment. If disabled, the Red Flag is deployed immediately without confirmation.

2.4.3 Slippery Flag management

There are slippery flag buttons on the right sidebar, you can press the button and choose the sector on the map to deploy it. One is waved, one is static. For each circuit, it is possible to define the rendering mode of the **Slippery (yellow/red) flag**, selecting between a **3-stripe** or **4-stripe** version. This configuration can be set within the *EFS Client* by navigating to `Tools > Panels > Slippery Flag Rendering`. Then is just need to press the slippery flag button in the right side bar to set it on a sector.

Silent Flags Visualization on Client

Flags operating in silent mode remain visible within the EFS Client for information purposes. These are marked with a gray cross to indicate that they are not currently displayed on the physical panel.

2.4.4 WEC Safety Car flags

The FIA World Endurance Championship (WEC) has introduced a specific Safety Car procedure that includes multiple defined phases. Once the SC (Safety Car) flag is deployed, this procedure can be managed within the EFS Client by navigating to: `Tools > Circuit Flags > WEC SC Procedure Steps`.
From this menu, the appropriate procedural step can be selected depending on race conditions. The available steps are: **Merging**, **Prepare Pass Around**, and **Pass Around**.

2.4.5 Slow Down Zone flags

In addition to standard sector flags, the EFS Client provides functionality for displaying Slow Down Zone (SDZ) flags. Operators may also choose to deploy the Slow Zone manually at a later point during the session by selecting the SZ Deploy Later button.

In order to be able to apply **SDZ** flag, some configurations on **EFS Server** is needed. Under **Circuit** tab, in the box **Selected circuit info**, by doing a right click in this box, and selecting the desired panel, we can enable this feature.

2.5 Standing Start & Rolling Start

The **Standing Start** and **Rolling Start** flags are available in the EFS system, introduced after their use in Formula 1 events. They can be added to custom flag layouts during the layout creation process (see Section 2.3 for more details).

2.6 Clear flags

Clearing a sector flag can be performed in two main ways: using Clear or Clear All.

When a flag is active on a sector, it can be cleared by first selecting the Clear button and then clicking on Sector.

The Clear All option enables removal of all active flags of a specific type. For instance,

if a flag is set on some Sectors, selecting Clear All will remove all flags of that type simultaneously.

2.7 Flag Silent Mode

Silent Flag Mode allows Race Control and Marshals to issue flag commands to panels without displaying them on the physical panels themselves.

Silent mode functionality must be enabled or disabled globally by checking or unchecking the **Use Flag Silent Mode** option in **Electronic Flag System Server**, in **Connection** tab under **Ethernet connection parameters** part.
Or individually, in **EFS Client** software in: `Tools > Panels > Flashing Rates and MC Buttons`.

2.8 Automatic flag set

Certain automatic functions can be enabled or disabled in the menu Tools → Automatic Flag/Lights settings.

In the opened window, by selecting the relevant "page" from the drop-down list at the top, then, by checking/unchecking the box beside each rule you will need to enable/disable it.

Chapter 3

Panels

3.1 Silent Mode for Single Panels

It is also possible to enable silent mode for individual panels. When activated, any flag sent to the panel will automatically operate in silent mode. On the client, silent mode for panels is managed through the Circuit Silent Panel window, accessible via the Silent command in: `Tools > Panels > Silent...`

3.2 Show Panels ID

In some cases (e.g., track inspections or configuration), it is useful to display panel IDs directly on the track. The *EFS Client* can show each panel's ID or number, which may vary with the track layout. Enable this via: `Tools > Panels > Track Panels`.

Chapter 4

Penalties and Warnings

In the left sidebar of the **EFS Client**, there is a **Penalty** button. It opens the *Penalties and Warnings* window, in this window the following options appear:

4.0.1 Black Flags

The EFS Client allows quick notification of drivers using dedicated black flag displays. These messages can appear on the Info Panel as well as T1, T2, and T3 trackside panels, using either the driver's car number (up to 3 digits) or TLA (Three-Letter Acronym).

To display a black flag, after pushing the **Penalty** button in the left sidebar, it is possible to:

1. Enter the car number or TLA in the input field.
2. Select the desired flag type: **Black Flag**, **Black and Orange Flag**, or **Black and White Flag**.
3. The EFS Client generates the message and displays it on the Info Panel and the relevant trackside panels.

Info Panel options:

- **Show on All Black Flag Track Panels** – Shows the same black flag on all enabled track panels.
- **Follow on All Black Flag Track Panels** – Shows the black flag of the car on the panel in the following sector based on the position of the car.
- If both options are disabled, a specific panel can be selected manually from a dropdown list of black-flag-enabled panels.

If a **SMART Marshalling System** is connected, the same information is transmitted to the targeted car unit and displayed on the vehicle's SMART LED interface.

4.0.2 Long Lap

The Info Panel can display **Long Lap** penalties for up to four drivers or riders. After pushing **Penalty** button in the left sidebar, in the appeared window the operator enters the car number or TLA (Three-Letter Acronym) and selects **Set Long Lap**. The chosen

identifiers then appear on the Info Panel.
It is not required to fill all four fields; one to four identifiers can be displayed depending on the situation.

4.0.3 Long Lap x2

After pushing the **Penalty** button in the left sidebar, the operator enters the car number or TLA (Three-Letter Acronym) and selects **Set Long Lap x2**. The chosen identifiers then appear on the Info Panel, with the heading shown as *Long Lap x2*. Up to four drivers or riders can be displayed simultaneously.

4.0.4 Drive Through

After pressing the **Penalty** button in the left sidebar, the operator enters the car number or TLA (Three-Letter Acronym) and selects **Set Drive Through**. The chosen identifiers then appear on the Info Panel with the heading **Drive Through**. In FIM mode, the heading is shown as **Ride Through**. Up to four drivers or riders can be displayed simultaneously.

4.0.5 Warning

After pressing the **Penalty** button in the left sidebar, the operator enters the car number or TLA (Three-Letter Acronym) and selects **Set Warning**. The chosen identifiers then appear on the Info Panel with the heading **Warning**. Up to four drivers or riders can be displayed simultaneously.

4.0.6 Equipment

After pressing the **Penalty** button in the left sidebar, the operator enters the car number or TLA (Three-Letter Acronym) and selects **Set Equipment**. The chosen identifiers then appear on the Info Panel with the heading **Equipment**. Up to four drivers or riders can be displayed simultaneously.

4.0.7 Change Position

Instructs a driver or rider to relinquish one or more positions. The message includes the participant's identifier and the number of positions. "Change position warning" can be set by pressing the **Penalty** button in the left sidebar.

4.0.8 Time Penalty

Displays a time penalty for a specific driver or rider. The Info Panel shows the identifier and the time in seconds. "Time Penalty" can be set by pressing the **Penalty** button in the left sidebar.

4.0.9 In Pit

Informs up to four drivers or riders that they must return to the pit area. Car numbers or TLAs can be entered as needed. "In Pit warning" can be set by pressing the **Penalty** button in the left sidebar.

4.0.10 Loudness

Warns up to four participants that their vehicles exceed noise limits. "Loudness warning" can be set by pressing the **Penalty** button in the left sidebar.

4.0.11 Stop & Go

Instructs a driver or rider to return to the pit lane, stop completely, and then rejoin the race. Shown in the Info panel with the participant's identifier. "Stop & Go penalty" can be set by pressing the **Penalty** button in the left sidebar.

4.1 Blue Flag

The blue flag button is on the left sidebar. The EFS Client manages two types of blue flags:

- **Standard Blue Flag** – A flashing signal, activated manually by a marshal or remotely by Race Control. It can be configured in stationary or flashing mode.
- **Dedicated Blue Flag** – Includes the number or TLA of the driver/vehicle. Managed only by Race Control and available on T1 and T2 flag panels.

How to Display a Dedicated Blue Flag

Once pressing the **Blue flag** button, a window will appear that provides two buttons: one **Panels** and one **Cars**.
If choosing **Panels**, enter the car number (up to three digits) or TLA, select **Blue Flag**, and choose the panel where it should be displayed.
Blue flags can be sent directly to drivers based on live vehicle data by choosing **Cars**. A list of all vehicles on track is shown in the *Cars on Track* box. Select a car ID and press **Send** to display a Blue Flag to that driver.

In the Blue Flag window, two options are available:

- **Follow on Panels** – Automatically shows the Blue Flag on the panel corresponding to the vehicle's position (requires SMART Marshalling).
  Notice: When **Follow on Panels** is active, manual sending of a Blue Flag + Number to any panel is disabled. A notification appears on the Panels page to inform the operator.
- **Show TLA** – Displays the driver's TLA instead of the car number.

Blue Flags are shown on panels only if all the following **conditions** are met:

1. No other flags are currently displayed on the panel.
2. The vehicle is a *race car* with high priority.
3. The vehicle has not lost communication (*packet lost*) longer than the server-defined limit.
4. The vehicle is moving.
5. The vehicle's equipment is on.
6. If multiple cars qualify, the first car entering the previous sector takes precedence, while still meeting conditions 3, 4, and 5.

4.1.1 Custom Blue Flag Display

Blue Flags may be shown using three styles:

1. Unframed Number/TLA + Off
2. Blue-Framed Number/TLA + Off
3. Blue-Framed Number/TLA + Blue

4.2 Penalty Display configuration

The EFS system allows penalties to be shown on Info Panels with customizable visual settings. Access these settings via: `Tools > Panels > Info Panel > Penalties > Rendering...`.

In the configuration window:

- Select one or more penalties from the list.
- Choose visual rendering options:
  - **White/Black** – White text on a black background.
  - **Black/White** – Black text on a white background.
  - **Flashing Mode** (only if flashing is enabled):
    - **Text** – Flashes the text.
    - **Background** – Flashes the background.
- Press **Update** to apply changes and transmit them to the server.

Chapter 5

Customized Features

5.1 Country Flag

The country flag button is located on the left sidebar. The country flag can be displayed by Race Control on the Info panel. This flag must be defined on the Server software prior to being shown on the panel and is configured during the commissioning process. This feature is typically used by the circuit for parade displays or during the national anthem.

5.2 Custom Logo

From the menu `Tools > Custom Logo > Add...`, it is possible to add a custom logo for both the Info Panel and the Flag panels. Custom logo can be removed following this direction `Tools > Custom Logo > Remove`.
There is button in the left sidebar that allows you to display the custom logo on info panels and flag panels. The Custom Logo window lists all custom logos previously defined via the `Tools > Custom Logo > Add...` menu. To display a custom logo, select the desired logo and click the "Select" button. The logo will then appear automatically on the Info panel and on the Flag panels, if configured in the Server. To clear a displayed logo, simply click the "Clear" button.

Notice: Custom logos have the lowest display priority. Therefore, if a Sector flag is shown on the Flag panels, it will override the custom logo.

Chapter 6

Messages

There is a dedicated button in the left sidbaar named **Messages**. Using this button, the EFS Client can display different messages in the Info panel. EFS is capable of showing three types of messages: predefined messages, saved messages, and User saved messages. To view them simply select the message in the list and press "Show Message".
To create a new predefined message, simply press **edit message** on the appeared window after pressing **Messages** button, create the desired message and press "Save".

6.1 Import/Export custom messages

Local machine messages can also be imported/exported using the commands in `Edit>User messages>Import../Expoert`. When exporting/importing the messages, it is possible to choose whether to export/import them all or only some selectable through a list.

Chapter 7

Pit Lane

EFS includes a dedicated section for managing pit lane status. This functionality provides full control over the EM Motorsport Pit Entry, Pit Lane panels (where installed), and the EM Motorsport pit exit lights. There is a dedicated button in the left sidebar to **Pitlane**. After pressin "Pitlane" button, a window will popup that through it, you can control Pit Entry panel, Pit Lane, and Pit Exit.
You can define that how you want the Pit Exit light be controlled, by "Race control and pitlane, or "Race control". This can be done by going through this path: `Tools>Pit Excit Lights Control>RC or RC & pitlane`.

Chapter 8

Start Light

To manage starting light by EFS client, there is a a number of automatic functions that can be controlled from `Tools>Automatic Flag/lights`, then from the combo box in the window, choose **SCU Starting Lights**. There you can check and uncheck your desired sets of rules.

Before the start of a race, a pre-start procedure can be configured to inform all personnel on the grid of the remaining time before the formation lap. In the EFS Client, the Race Start Time can be scheduled, to do that you need to press the **Pre start** button in the left sidebar. This timing follows the standard FIA start procedure but can be customized to accommodate different requirements.

Start procedure of the race can be controlled by the **Race Strart** button in the left sidebar. Four starting procedures are integrated into the EM Motorsport Starting Light System and EFS Client Software: FIM, Standing Start, Rolling Start, and Manual Start. If a problem occurs just before the race starts, the start procedure can be stopped by pressing the **Abort** button.

8.1 More Information on Starting light

Four starting procedures for controlling the starting lights are:

- **FIM Start:** All red lights turn on simultaneously. Race begins when the lights are switched off.
- **Standing Start (Formula 1):** Five red lights illuminate sequentially at 1-second intervals. After a delay (0.2–3.0 s), all red lights are extinguished to start the race.
- **Rolling Start:** All red lights turn on, then all green lights illuminate to signal the start.
- **Manual Start:** Race Control manually controls each phase, including red light delays and switching off red or turning on green lights, for maximum flexibility.

Chapter 9

Session management

Session management in the EFS Client helps organize events and improve operational control. It can be accessed through the **Session** button in the left sidebar, which opens the Session Management window.

Session Configuration

From the Session Management interface, all session parameters can be configured. Selecting **Manual mode** delegates control to the Race Control operator.

Session Types

- **Track Activity:** For non-racing use (e.g., demo laps, filming, test drives).
- **Free Practice:** Testing sessions without direct competition.
- **Qualifying:** Determines grid positions against the clock.
- **Warmup:** Short pre-race session for final checks.
- **Race:** Competitive session under official rules.

Other Parameters

- **Championship:** Assigns a championship for correct vehicle identification when SMART Marshalling is used.
- **Mode:** Time-based, lap-based, or combined. In combined mode, the race ends when laps are completed unless maximum time is reached.
- **Time Duration:** Define hours, minutes, and seconds. For lap-based sessions, enter total laps as well.
- **Stop time when suspended:** Pauses the countdown if a Red Flag is deployed.
- **Finish when countdown ends:** Automatically ends the session and shows the Chequered Flag when time runs out. If disabled, session must be ended manually.

- **Use Timing Server:** Delegates session management to the timing server. A stopwatch icon will appear in the top bar.

Within the Session Management window, it is possible to save session configurations for future use. The system includes functionality to schedule a session in advance. To close an active session, the "Close Session" command must be selected from the session management window.

Notice: The *Finish session when countdown ends* option is not available for **Race** sessions. In this case, the session ends only when triggered manually or by the timing server. Once the session parameters (Type, Mode, Duration, etc.) are set, press the **Open Session** button to start the session. When the session is open, session-related controls appear in the lower section of the Flag Side Bar.

9.1 Session Recording and Playback

1. To enable session recording, select **Enable session recording** in the Session Management window before opening the session using the **Session** button in the left sidebar.

2. When recording is active, an indicator appears in the session status bar at the top of the screen.

3. To access playback, first disconnect the EFS Client from the server via `File > Disconnect`.

4. After disconnecting, load a recorded session by selecting `Open...` and browsing to the desired `.sdf` file. Recorded sessions are stored in a tree structure organized by Championship and Session.

5. Once loaded, the playback control interface appears along with all session data.

9.2 Retrieve Session from Server

EFS Client can download closed sessions directly from the server via `Tools > Download Session file...`. Select a date range, filter by championship or circuit, and click **Download** to save the session to a chosen folder. A progress bar shows the download status, which can be canceled at any time. The client must be connected to the server to perform this action.

Chapter 10

Signs

There is a sign button in the left side bar. That opens a window that using that you can set signs on panels.

Sign Panels Group

Signs, both custom and predefined, can be assigned to specific panel groups, similar to custom logos. To configure panel groups, go to `Tools > Circuit Panel Groups`.

- Click **New** to create a group and enter its name. The group will appear in the list, initially empty.
- Add or remove panels using the "$>$" and "$<$" buttons to transfer panels between the available list and the group.

To display a sign, select it and click the target panel. To apply a sign to all panels, use the **Set all panels** button. To apply a sign to a group of panels, use the **Set panel group** button.

Custom Sign

Custom signs can be created, edited, or removed in the EFS Client. To manage signs, go to `Tools > Custom Sign` and select:

- **Add** – Opens the custom sign creation window.
- **Edit** – Modify an existing sign.
- **Remove** – Delete a sign from the system.

Chapter 11

Timing

Access the Timing Window via the **Timing** button in the left sidebar. It allows the Info Panel to display session time, remaining laps, and predefined messages.

Countdown

Set the total session duration in Countdown mode. Start manually with the **Start** command or automatically with **Autostart** when the race lights go off. Pause, Stop, and Reset commands control the countdown.

Grid Countdown

Grid Countdown automates message display at predefined intervals before session start. Configure:

- Duration and message timing
- Type of message
- Activation time (optional)

Enable intervals individually and select messages from the predefined list or use defaults. Start with **Set** and **Start**. Sequences can be saved and loaded for reuse.

Info Panel and Starting Light Synchronization

The Timing Window can synchronize the Grid Countdown with the Starting Light Pre-Start sequence. Updates to the sequence are reflected automatically on the Pre-Start display. The Starting Light mode (e.g., FIA, FIM) must be set to define behavior during synchronization.

Chapter 12

Journal

The Journal, accessible via the **Journal** button in the left sidebar, lists all events from a session, showing the last two hours by default along with real-time updates. The window can be resized by dragging its borders.

Event Filtering

Events can be filtered by category using the drop-down menu at the top right.

Event Export

The event list can be exported in `.CSV` or `.PDF` format.

Chapter 13

Vehicles

Access the Vehicles Window via the **Vehicles** button in the left sidebar. It shows all active SMART Marshalling units on track in a table with diagnostic data.

Vehicle Filters

Filter vehicles by type using the drop-down menu:

- Race Cars/Bikes – assigned to a circuit
- Championship Race Cars/Bikes – part of the session's championship
- Safety/Medical Cars
- Service Vehicles
- Track Activity Cars

Blue-flagged vehicles are always shown in the Flagged Cars list regardless of filters.

Table Information

Columns include:

- Driver Number / TLA
- Flag – current flag on the SMART Marshalling unit
- Speed – in km/h or mph
- Overspeed – red highlight if exceeding configured thresholds and time delay
- ASI (Accident Severity Index) – numerical G-force of impacts

Overspeed Settings

Configure thresholds via `Tools > Vehicles > Speed Limits`. You can enable/disable monitoring, set max speed per flag type, and define the overspeed delay.

ASI Values

- 8–9: Light impact
- 10–11: Medium impact
- 12–13: Moderate impact
- 14–16: Heavy impact

Coverage Monitoring

Enable live coverage via `View > Show Vehicle Coverage`. Coverage Reports can be downloaded using `Tools > Download Coverage Report`, filtered by Championship and Circuit.

Chapter 14

Smart Marshalling Race

Hardware Connections

- Connect the Smart Marshalling (SM) device to the antenna (black and magnetic GPS antenna).
- Connect the red (+) and black (-) cables to a DC power supply with 12V, 1.5A power.
- Attach the LTE antenna.
- From the power supply, another branch cable goes to the channel1 connector of the Kvaser USB CAN. Ensure a CAN terminal connector adapter is in place (direct connection is not possible).
- From Kvaser a USB cable comes out and connects to the pc.

Software Requirements

- Install the Kvaser driver
- BUSMASTER software
- In the EFS Client, use the **Custom Command** button in the left side bar to open the window to monitor SM communication.
- In the EFS Server, once is disconnected, the **Smart Marshalling** tab allows adding a device. (**High Priority** is only relevant when the car is in a Championship.)

Device Registration in EFS Server

- EFS server software, under the **Smart Marshalling** tab, in **Car list** select **Saved Unit Infos** → **Edit**.
- Enter the device Serial ID and number, then **Save**, **Apply**, and **OK**.
- In the **Connections** tab, press **Connect**.

Message Transmission

From BUSMASTER to EFS Client

- In BUSMASTER, open the **Transmit Window**.
- Define a message with ID `6AE`.
- Enter the value in front of `00` (e.g., `01`, `02`, etc.).
- The chosen value corresponds to a color displayed in the EFS Client **Custom Command**..

From EFS Client to BUSMASTER

- After pressing custom button in the left side bar of EFS Client, configure button names and colors in the settings for easier monitoring. To do that you will need to press setting icon on the **custom commands** window.
- Each button (1–5) sends messages from EFS Client to the BUSMASTER.
- BUSMASTER will read these commands in Hex format.

Chapter 15

Smart Marshalling Track

Modifying List of Vehicles

The list of vehicles in the Car Window can be updated at any time, even during an open session. All changes are synchronized live with the EFS and Smart Marshalling servers. To modify the list, go to `Tools > SM Units Management` from the top menu bar in EFS client software.

Chapter 16

Track Panel Hardware

16.1 T2

The Track Panel has three input cables: Power (110–240 V AC), Console connection, and Ethernet connection.

1. Power Supplies

- 12 V → Our Plate, Aesys CPU
- 5 V → MVT board, LED boards (×2), LED power (×4), repeater LED (back)
- 48 V → Console

2. Ethernet Cable

Ethernet cable (4 wires: White/Orange, Orange, White/Green, Green) ans supporting 100 MHz.

- Ethernet enters switch (2 inputs, 1 output that goes to Aesys CPU).
- Console connects directly to MVT board (serial connection).

3. Communication Flow

- MVT board → Aesys CPU.
- Aesys CPU → LED boards via flat cable.
- One LED board drives rear LED; another drives front LED modules.

4. BS Antenna

- Mounted on top of panel.

- Two connections to MVT board: Radio and GPS of Smart Marshalling (synchronization).
- Radio frequencies: 800–900 MHz.

5. Console

On the small screen of the console, we can see the status of the connections of the console to the panel and the software to the panel.

- If the console connects correctly to the panel–> it will show "Link OK", otherwise "Link off".
- If server fails to connect: on the console screen will show "RC OFF", otherwise "RC OK".
- Connection steps: Connect → Equipment → Panel IP → Activate.

6. Gui

Upon opening the app **Gui** a window will pop up in whic you can modify things. If an IP address is specified in unit IP address of the window, and if **(common gateway)** is checked, we can connect to the panel. In the same way, set an IP address, connect unit (**AMUT radio**) we can connect to our smart marshalling.

To update software: CommGW → bottom right → **Update**.

16.2 T1

Panel T1 is twice the size of Panel T2. Both panels use multiple power supplies: **12 V, 5 V, 3.3 V, 48 V**.

1. Power Supply Usage

- 48 V → Console (extra output source).
- 12 V → Our Plate (MVT), Fans, Aesys CPU.
- 5 V → Aesys CPU, Green and Blue LED.
- 3.3 V → Red LEDs.

2. Cooling System

- 6 fans in the lower part of the panel, controlled by a sensor.
- 2 fans on both sides (always running).

3. LED Boards

- 4 LED boards on the front side.
- Each board powered by a dedicated supply.
- Boards connected in daisy-chain (output → input).

4. Luminous Intensity

- T1: **60,000–70,000 cd**
- T2: **32,000–40,000 cd**

Chapter 17

Programming of Smart Marshalling Track Board

For programming the **SOM** board, we mount it on the MVT board and connect the antenna. Using the **Gui Banco Test**, We choose the serial number of the **Track board** in **Test plan** tab, then in **Setup** tab check these options: "Enable configuration sequence", "Stop running sequence at first failure", by pressing **Start** button you will program the SOM board.

After installation was successful, you need to mount SOM board on the Smart marshalling track board, and connect GPS antenna, radio antenna, Jlink, battery, and the USB-C cable and check "ESkip configuration SOM flashing steps", "Enable configuration sequence", "Stop running sequence at first failure" in the **Gui** and press start to program the **Track board** as well.

After installation, just check "Enable test sequence" and control if all parts are successfully programmed.

Chapter 18

Gui of Smart Marshalling

By entering IP address of the Smart marshalling and choosing common gateway, you can connect to the device and update the firmware. By entering IP address of the MVT board of the base stations and choosing MVT application, you can connect to the Base station and update the firmware.

Chapter 19

EFS Server Software

In this chapter, I will add information for myself in order to know what configurations are needed for any option in client part.

19.1 Connecting the sectors behavior

In EFS server software, in **Circuit** tab, by right clicking on the panels in the "selected circuit info" box, `sector propagation>prev/next`, we can set a flag on a panel in EFS client software and automatically it will show the exact flag on previous/next panel.

19.2 Updatimg the software

To update the software, we run the installer and again just copy and paste the patch and script file in the in installation folder. We check if in the logs are going to be saved in a correct path, we go in this path: `Tools>Log options` and define a folder with name "Logs" in the installation folder path and choose it.

Chapter 20

EFS Client

In this chapter, I will add information on the EFS client software that I learn by time.

20.1 Flag significance

Flag	Meaning
Green	Track is clear. Normal racing conditions apply.
Yellow (single waved)	Danger ahead. Reduce speed, overtaking prohibited. Marshals may be on track.
Yellow (double waved)	Serious hazard ahead. Be prepared to stop. Overtaking prohibited.
Red	Session stopped. Drivers must reduce speed and return to the pit lane.
Blue	A faster car is approaching to lap you. Let it pass at the earliest safe opportunity. Ignoring may result in penalties.
White	Slow-moving vehicle ahead (e.g., recovery car or very slow competitor).
Black	Driver must return to the pits immediately, usually due to disqualification or a serious rule infringement.
Black with Orange Circle ("Meatball")	Car has mechanical problems that risk safety. Driver must pit for repairs.
Black and White Diagonal	Unsportsmanlike behavior warning (equivalent to a "yellow card" in football). Further infringement may lead to penalties.
Chequered	End of the session or race. Drivers must slow down after crossing the line.

20.2 Panel appearance

- A **red dot** on the panel in the map means the panel is connected and on, but the Smart Marshalling Console is not connected to it.

- When the panels are clear and the line on the lower side of the panel is **green** (not red), it means a console is connected as well and the panel is on.
- A **green dot** on the panel means the console is successfully sending information to it.

Chapter 21

Server Administration Client