RACE AMERICA

INNOVATION. TECHNOLOGY. RELIABILITY.

Track Safety Digital EX Software Owner's Manual

for use with

Digital Safety Flags, Track Safety Lights and Black Flag Displays

rev D.5.2

RaceAmerica Corp.
105 Bonaventura Drive
San Jose, CA 95134
(408) 988-6188
www.raceamerica.com
info@raceamerica.com

Table of Contents

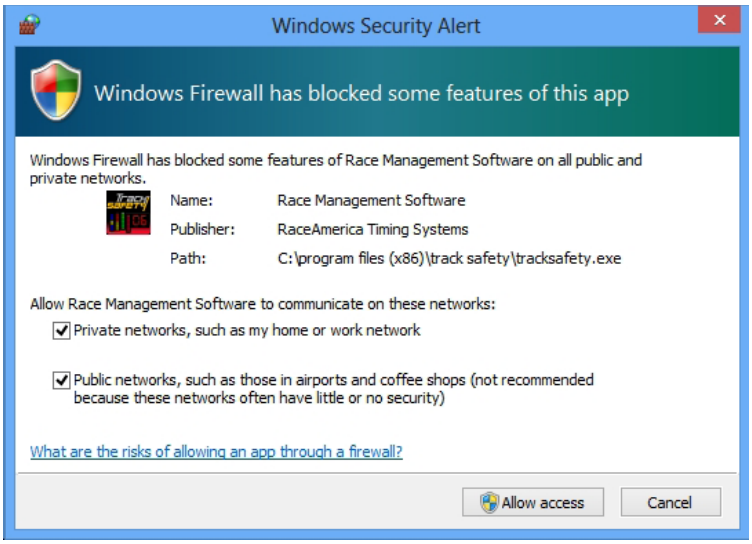
Figures and Illustrations

RACE AMERICA

INNOVATION. TECHNOLOGY. RELIABILITY.

PRODUCT INFORMATION LINKS

RaceAmerica Website	www.raceamerica.com
RaceAmerica Online Store	store.raceamerica.com
Raceamerica Online Forum	www.raceamerica.com/forum
Product Warranty	www.raceamerica.com/legal.html
Service & Repairs	www.raceamerica.com/service.html
Technical Assistance	www.raceamerica.com/techcall.html
Owner's Manuals	www.raceamerica.com/prodpdf.html
Mounting Diagrams	www.raceamerica.com/mountpdf.html
Product Catalog	www.raceamerica.com/catalog.html



NOTE: This software program utilizes an internal Server and/or Client to communicate with track safety devices and software programs.

Many of the Windows operating systems will detect this operation and alert the user with a choice to block this type of communications using the Windows Firewall. In order for this software to communicate properly with track safety devices and software, insure all network types (Private, Home, Public, etc) are selected (if applicable) and ALLOW ACCESS and/or UNBLOCK is selected. If the user's response to this prompt is to KEEP BLOCKING or CANCEL or ASK ME LATER, Windows will restrict the communications between this program and other devices and software and block the communications, limiting the effectiveness of this software program.

NOTE: These Windows Firewall prompts will occur only on the first time the Windows operating system encounters an attempt by this software to communicate. The user will not be prompted the next time this program runs making it invisible to the user of a blocked or unblocked communications path. The input at these prompts is stored by Windows Firewall and does not change after the computer is rebooted.

THEORY OF OPERATION

The Track Safety Software runs on a standard 64-bit PC using Windows Windows 7, 8, 10 and 11 operating systems. The software communicates with the Digital Safety Flags (DSF), Intelligent Track Safety Lights (TSL) and Black Flag Displays through USB connected wireless links or IP network connections. The software operates in two basic modes; SETUP and RUN.

Three setup modes: Track, Flag, & IDs configure all aspects of the software and hardware using drag and drop features.

Setup mode provides the ability to move and rotate safety lights on the PC screen to match their physical locations on the track using a user supplied track diagram image file to serve as the screen background. Brightness levels for the safety lights can be adjusted and safety lights can be grouped to illuminate the same flag by clicking on any one safety light in the group.

In Config Flag mode, Digital flag images are enabled for DSFs and 16 unique flags with 8 configurable segments each can be colored, animated, and interconnected to provide a series of flags for TSLs.

In Config ID mode, each DSF/TSL can be enabled or disabled, assigned an ID and Panic Flag, and spare DSF/TSLs can be swapped in and out of use.

Run Event mode is designed for live practice or race event operation. Data Comm Link and Battery levels for each ID can be monitored and displayed. If utilizing Black Flag Displays, numbers are entered through the number pad on the computer keyboard.

INSTALLING THE PC SOFTWARE

To install the Track Safety Digital software unzip the downloaded file. Drag the contents from the zip folder to the desktop.

To install the software, double click the setup icon and follow the program prompts to automatically install the software and all necessary files.

WIRELESS DSF/TSLs ONLY: The FTDI_ setup.exe file will follow to install all drivers for the USB Wireless Unit and wait until the install is complete. Connect the USB Wireless Unit to the PC and a COM port will be assigned to the device. A message will appear at te bottom of the PC screen identifying the COM port number (i.e. COM7, COM16, etc.)

NETWORK DSF/TSL ONLY: Connect the PC to the network to acquire an IP address. Connect each iTSL to power and to the network using the IP TrackNet network interface. The PC and iTSL's acquire their network IP Address through DHCP unless static addresses are requested by the customer. Network configuration will be transparent to the user.

The Track Safety software icon will be placed on the computer's desktop. Double click the Track Safety Digital icon to start the program.

STARTING THE SOFTWARE

To start, double click the Track Safety Digital icon. The program maintains an audit file date and time stamping actions by the operator as well as flags selected and displayed on each light on track. The audit file also logs issues when the program and each light is not commuicating or the light is not responding to cammands from the program. Each time the operator QUITs the program, the audit file is copied to the audit file folder and renamed with the date and a system generated number. In the event the program is started and ended multiple times, there will be several audit files with the same date stamp but different system generated number in chronological order.

In the event the program crashes or computer looses power, the audit file remains intact until the next time the program is QUIT retaining all logged entries since the previous QUIT, This insures no lost data in the log files.

The flagset.fsp file contains the 13 selected flags images and data and is loaded into the program each time the program starts, This is an essential file and a program error message will be displayed if this file is not present or is damaged.

After the initial startup screen, the SYSTEM SETTINGS screen is displayed as shown in Figure 1. The many features of the SYSTEM SETTINGS screen are discussed in detail later in this manual

Figure 2 will prompt to choose the Data Comm Link Type, Network or Wireless. When using the WIRELESS DATACOMM, click on the desired

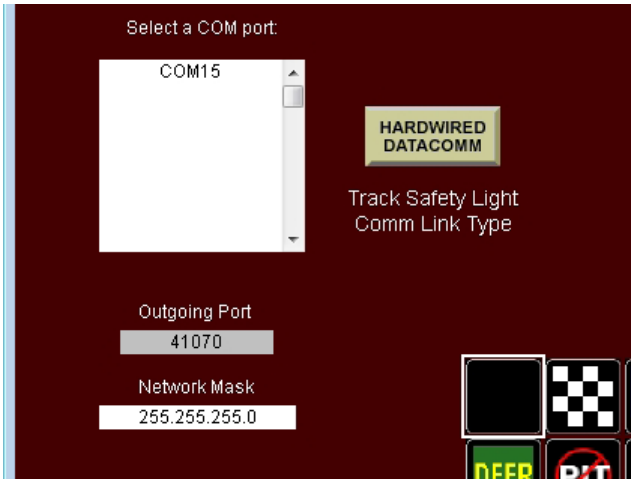


Figure 2 - Data Comm Selection

Figure 1 - System Settings screen

PC COM port to proceed. If the desired COM port is not listed, QUIT the program and check the USB cable connections and restart the program.

When NETWORK DATACOMM is selected, the pre-configured network port numbers are displayed. Enter the mask used by the network. The network port numbers cannot be changed and the software will auto configure the network connections

When using the 4525IP Network Antenna, select NETWORK ANTENNA.

Click SAVE SETTINGS to continue. Other software preferences and options are also displayed on this screen (SYSTEM SETTINGS) and discussed in depth later in this manual.

INITIAL CONFIGURATION

To configure the software to match track and safety light hardware, perform the following steps selected from the Main Menu:

1) Click on Track Setup to position each safety light on the track and assign turn numbers to each safety light.

2) Click on Configure IDs to enable each safety light and detect the ID.

3) Click on Configure Flags to enable digital flag images for DSFs and create custom and animated flags for TSLs to match your race event.

4) Click on System Settings to select the desired options when running an event.

5) Click on Remote Control to configure DSF Hand Controllers, iPad and iPhone Hand Control and third party software.

MAIN MENU

The Main Menu is the next screen displayed as shown in Figure 3. The Main Menu displays all the setup, run, and monitoring functions of the software.

LOAD - Use to load a previously saved Track Safety file with background image, safety light placement, size and transparency, configured flags, and DSF/TSL enabled IDs and Panic Flag. *(Note: the software comes pre-loaded with a few sample files).* LOAD will prompt with a list of previously saved files to select from. Click on the desired file to load and preview the image onscreen.

SAVE - Stores the current image, DSF/TSL placement, size & transparency, cofigured flags, and enabled IDs and Panic Flag. Enter the filename to save the current settings for recall using the LOAD function.

RESET - Clears all configured track, flag, and DSF/TSL settings and track image.

SYSTEM SETTINGS - Configure the software for type of communications and error reporting. The functions on this screen are discussed later in this manual.

RUN EVENT - Displays the screen used during a live practice or race event to control the flags displayed by each iTSL on track. The RUN EVENT screen is discussed in detail later in this manual.

TRACK SETUP - Use to select the background image, position the DSF/TSLs onscreen to correspond to their physical position on track. The TRACK SETUP screen is discussed in detail later in this manual.

CONFIG FLAGS - Use to design and configure each of the 16 flags displayed by the iTSLs to meet track and racing needs. The CONFIG FLAGS screen is discussed in detail later in this manual.

CONFIG IDS - Use to enable or disable each DSF/TSL by ID number. Also used to swap out DSF/TSL and reassign spare units. The default Panic Flag is configured on this screen. The CONFIG LIGHTS screen is discussed in detail later in this manual.

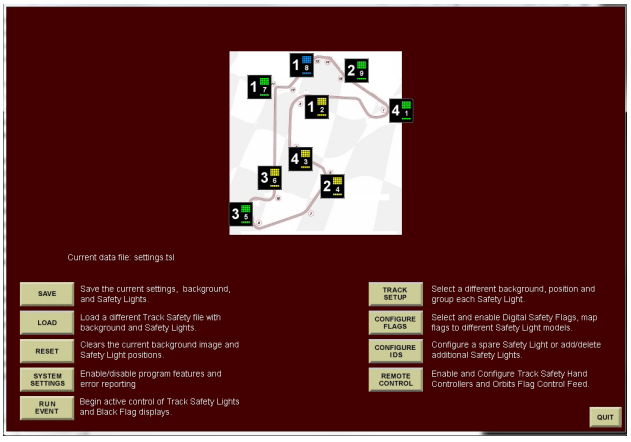


Figure 3 - Main Menu screen
(No image appears first time program is run)

TRACK SETUP SCREEN

This screen, displayed in Figure 4a for IP network and Figure 4b for wireless, is used to configure the onscreen overhead view of the track and position of each DSF/TSL.

Each DSF/TSL ID enabled on the Config IDs screen is displayed. IDs consist of a color (red, green, blue or yellow) and a number (1, 2, 3, etc.) combination. Position each DSF/TSL by clicking on an DSF/TSL ID and drag and drop in position on the track image. To rotate the TSL to a horizontal orientation, right click the TSL. Right click again on the TSL to change back to a vertical orientation onscreen. It is very important to insure the DSF/TSL ID screen location matches its physical location on track.

SELECT BACKGROUND - Click to select a file containing an overhead image of the track used by the software as the onscreen background track image. Compatible file formats are JPEG, JPG, BMP, GIF and PICT image files, either photos or drawings. The Track Safety program will prompt for the location of the track image file. After selecting the desired file, the software resizes the image to best fit the PC screen size. Higher resolution image files will result in clearer background images of the track.

RESET - Click to clear the track image file and reset the DSF/TSL position onscreen.

DSF/TSL TURNS - This function is used

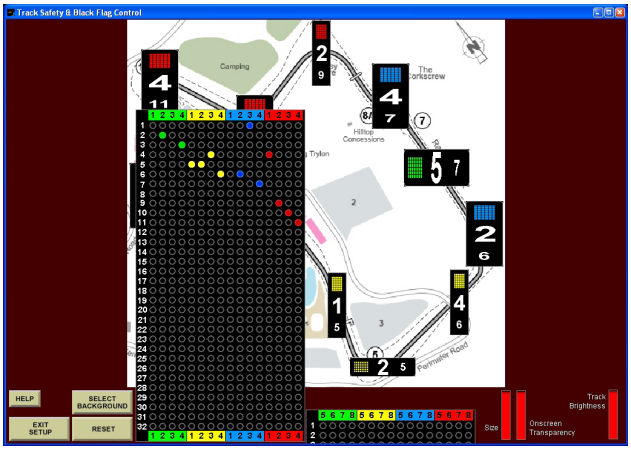


Figure 4a - Track Setup Screen (IP network)

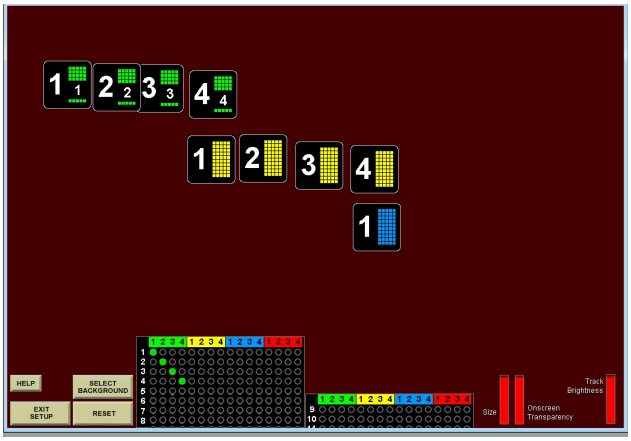


Figure 4b - Track Setup Screen (wireless)

to group safety lights together so all safety lights in a turn group will always display the same flag when one of the DSF/TSL are selected. For tracks with difficult corners requiring multiple lights to effectively alert drivers, multiple safety lights can be grouped together to function as a single safety light. For IP network configurations, 32 different turns are available designated as turn 1 through 32. For wireless configurations, 16 different turns are available designated as turn 1 through 16. Notice

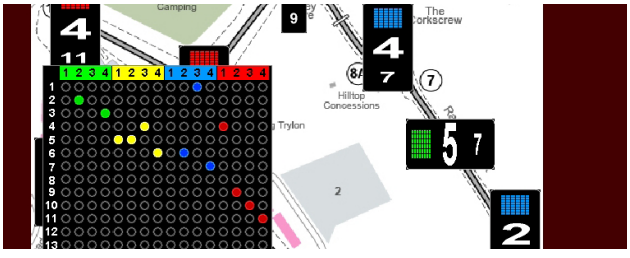


Figure 5 - Linked Turn Groups

in Figure 5, there are two turn group tables at the bottom of the screen containing IDs and turn number popups. To link IDs into a turn group for a specific turn, locate the ID color and number, then move down to the desired turn number and click in the circle. The circle will change color and the ID onscreen will display the turn number selected. To remove a ID from a turn group, click on the colored dot again. To change turn groups, click on the circle of a different letter and the ID will tranfer to that turn group.

SIZE - To change the displayed size of the IDs, click and hold down while dragging the red bar up or down within the Size bar. Note the size of the IDs onscreen will change as the red bar expands and shrinks in size.

TRANSPARENCY - To change the displayed transparency level of the IDs onscreen, click and hold down while dragging the red bar up or down within the Transparency bar. Note the onscreen ID will become more transparent as the red bar shrinks in size. Compare size and transparency settings and ID in Figure 4a and Figure 6.

BRIGHTNESS - To change the brightness level of the physical DSF/TSL on track, click and hold down while dragging the red bar up or down within the Brightness bar. Note the brightness levels of the flags displayed on TSL on track will dim as the red bar shrinks in size. DSFs on track will dim after the brightness level is selected..

HELP - To view a 'cheat sheet' explanation

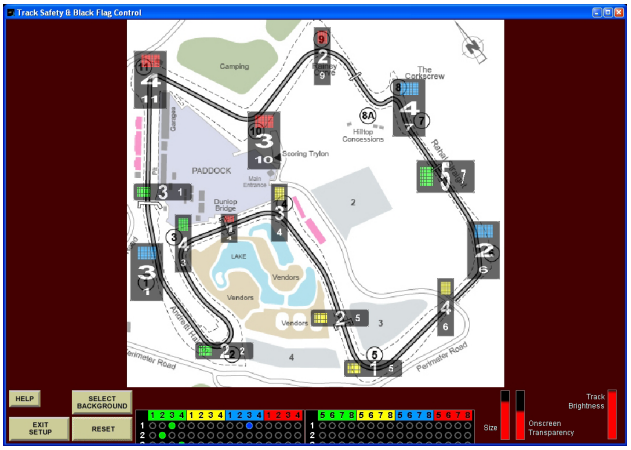


Figure 6 - Size and Transparency example (compare to Figure 4)

of the functions on this screen.

EXIT SETUP - Returns to the MAIN MENU screen.

NOTE: to expand the software screen to the maximum size, click on the maximize button located in the upper right corner of the window containing the program. The image will be expanded to best fit the new screen size.

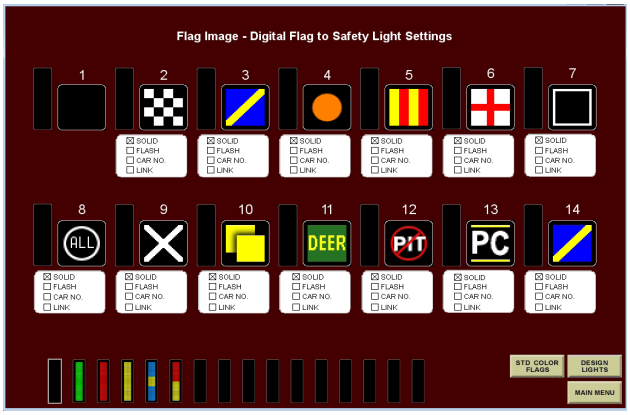


Figure 7a - Config Flags- Image Flags

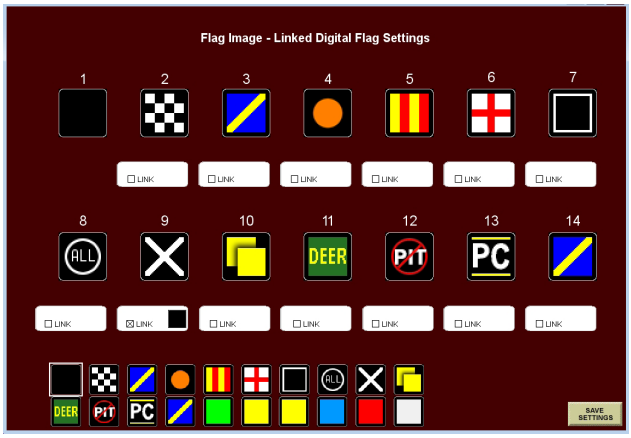


Figure 7b- Linked Flags Example

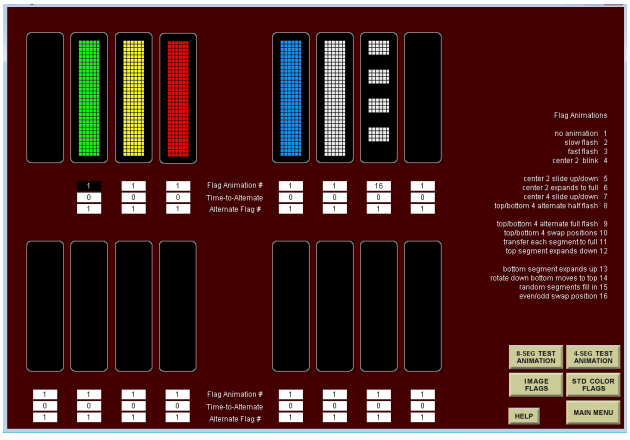


Figure 7c - Config Flags- Design Lights

CONFIG FLAGS
IMAGE FLAGS

Figure 7a illustrates the Config Flag screen layout for DSF flag images. Each DSF contains 13 flag images preselected by the customer and installed in each DSF at the factory Included with the software is a flag image file flagSet.fsp matching the installed flag images. The DSF can display the flag image as a solid image, a flashing image, alternate with a car number or alternate with a second flag. Click the check box next to the desired method to be displayed. If no display method is selected, the flag image will be disabled and not available for use. To unclick all display methods, click on the X displayed. The onscreen flag image will illustrate what will be displayed on the DSF. When the CAR NO is selected, the onscreen illustration will substitute NUM in place of the car number when no number is in the Black Flag field on the Run Event screen, To alternate the flag with a second flag, select LINK for the first flag as shown in Figure 7b for flag #9, then select the second flag at the bottom, then click the box next to LINK. The second flag will appear in this box for the first flag.

A maximum of 20 DSF flags can be available. This limit is the total of the number of enabled image flags plus the number of enabled std color flags.

If the safety lights contain a combination of DSFs and TSLs, each DSF flags can be mapped to a TSL flag. This is convenient when the entire track needs to display the same flag on the DSFs and the mapped TSL flag will be sent to all TSLs on track. To select the mapped TSL flag, click on the desired TSL flag at the bottom of the screen (will highlight will a white frame), then click on the TSL box next to the desired DSF image flag. Additional TSL flags can be designed as described in the next section.

CONFIG FLAGS
DESIGN LIGHTS

Figure 7c illustrates the Config Flag screen layout for TSLs. Each TSL has a full size LED

display panel designed with eight individually configurable segments of LEDs. Six segment colors are available, red, green, blue, yellow, white and, of course, black or no color. The Config Flags Screen contains 16 configurable flags to meet the needs of the race event and safety flag requirements. When the software is first run, there are six flags preconfigured as examples. To change a segment on a flag, click the segment. Rotate through each available color by repeated clicking. To duplicate a flag, right click an existing flag, then drag and drop onto a second flag. The segment colors will be duplicated on the second flag.

FLAG ANIMATION - Each flag can be animated using one of the 16 pre-configured animation patterns listed on the right side of the PC screen. To select an animatiion, click on the Animation box directly below the flag to be animated. To view the flag animation with the color segments selected, click the TEST ANIMATION button. All 16 flags will display their selected animation pattern using the color segments of each flag. Click EXIT ANIMATION to return to the Config Flags screen.

TIME TO ALTERNATE and ALTERNATE FLAG - A sequence of flags can be interconnected to provide a more noticeable flag pattern to the drivers. An example would be to click on a flashing green flag that would change automatically to a solid green flag after 5 seconds and turn off the green after 10 more seconds. The flag to be displayed first would be configured for the number of seconds before the next flag is displayed. Enter the number of seconds (up to 999 seconds) into the Time To Alternate field directly below the first flag. Enter the next flag number in the Alternate Flag field below the number of seconds entered.

For example, enter 10 in the Time To Alternate field of flag #2 and a 6 in the Alternate Flag field of flag #2. When flag #2 is selected on the Run Event screen, it will display for 10 seconds then change to flag #6. Furthermore, also entering a 5 in the Time To Alternate field in flag #6 and a 10 in the Alternate Flag field of flag #6 will further extend the flag changing. Now selecting flag #2 on the Run Event screen will cause flag #2 to display for 10 seconds, then change to flag #6 which will display for 5 seconds before chaging to flag #10. This function allows multiple color patterns and multiple animations to be used to more effectively get the driver's attention separating the safety lights from other lighting on the track. When a flag is confgured to change to an alternate flag, an arrow will appear in the upper right corner of the flag. Zero seconds disables the alternate flag function for a given flag.

NOTE: When multiple flags are interconnected, there are times one of the alternate flags will never be used by itself. Removing intermediate flags from the Run Event screen is helpful to reduce flag selection error. To remove the flag from the Run Event screen, click on the flag number above a flag and a red X will appear to confirm.

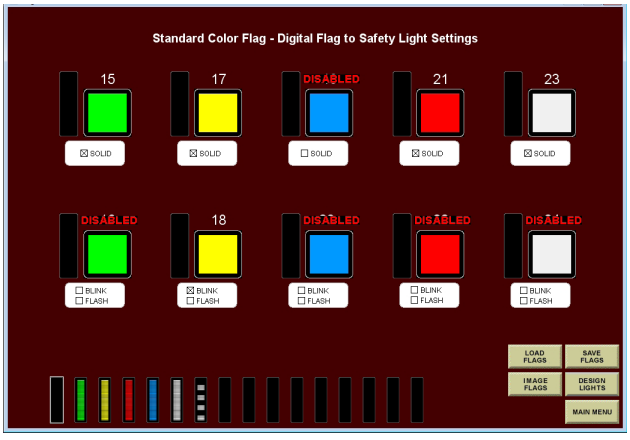


Figure 7d- Config Flags - Std Color Flags

IMAGE FLAGS - Click here to configure the DSF flag images..

STD COLOR FLAGS - Click here to configure the DSF standard colors..

HELP - To view a 'cheat sheet' explanation of the functions on this screen.

MAIN MENU - When finished configuring flags, click to return to the Main Menu. If a flag was altered or a flag set loaded, the software will prompt to keep the changes, discard the changes, or return to the Config Flags screen.

CONFIG FLAGS
STD COLOR FLAGS

Figure 7d illustrates the Config Flag screen layout for DSF standard color flags. Each DSF can display solid, blinking (slow flash) and flashing solid colors. A solid color can be enabled and a blinking or flashing color can be enabled. Each of these selections counts as part of the maximum of 20 flags enabled for DSFs. To disabled a flag, click on the displayed X and the flag will be removed from use.

CONFIG IDS SCREEN

Up to 32 safety lights can be enabled for IP network configurations and up to 16 safety lights can be enabled for wireless configurations and up to 3 spares safety lights can be made available to be swapped into service or added to the already enabled safety lights as shown in Figures 8 and 9. When this screen is displayed, the program polls the track for all active IDs and spare IDs. All active IDs on track display their ID code as one of four colors (red, green, blue, or yellow) and a number of illuminated segments (1, 2, 3, etc).

ENABLE/DISABLE ALL - To enable all IDs for use by the software, click the ENABLE ALL button. All onscreen IDs will be illuminated. To disable all IDs, click the DISABLE ALL button and all onscreen IDs will be grayed out. To enable a single ID, click on the onscreen ID and the ID will illuminate. To disable a single ID, click on an illuminated onscreen ID. All enabled IDs will be available for use on the Track Setup and Run Event screens.

NOTE: It is important to insure only active IDs are enabled on this screen to maximize the efficiency of the communications between the tower and the on track DSF/TSLs. IDs enabled onscreen but do not exist on the track will cause the software to repeatedly poll attempting to establish communications with the missing safety light.

TIMEOUTS and PANIC FLAGS - When an DSF/TSL responds, its on-track ID is loaded below the corresponding onscreen ID as well as its Revision level, configured Timeout parameter and configured Panic Flag as shown in Figures 8 and 9. A Panic Flag will be displayed on DSF/TSL if there is a complete breakdown in communiations with the tower. This is a safety backup function to continue to insure the correct flag is displayed by each safety light on the track.

To change the Panic Flag and/or Timeout, select a Default Panic Flag at the bottom of the screen and enter the number of seconds in the Timeout field, then click ASSIGN PANIC FLAG. A value of 0 seconds disables this function. If a flag is already configured into a DSF/TSL that is not enabled, a red question mark will appear in the panic flag field for that ID.

REASSIGN IDs and SPARES - To change the assigned ID of an iTSL on track, click on an existing ID. Note the flag sticks to the cursor until

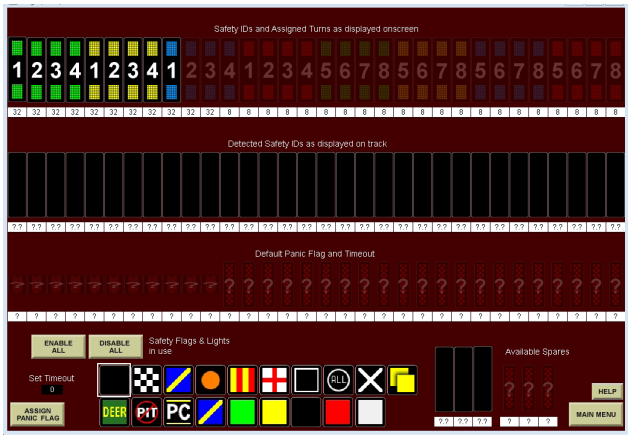


Figure 8 - Config IDs for IP network

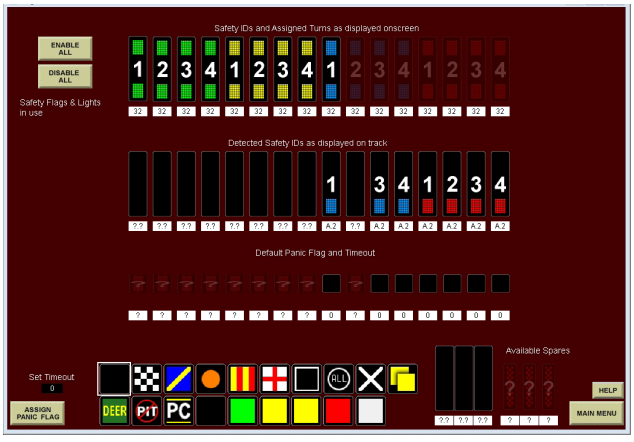


Figure 9 - Config IDs for wireless

it is placed over a different ID and clicked again to reassign. The next software polling of the track will display the ID change and the DSF/TSL will display the newly assigned ID.

HELP - To view a 'cheat sheet' explanation of the functions on this screen.

MAIN MENU - When finished configuring lights, click to return to the Main Menu.

RUN EVENT SCREEN

Figure 10 illustrates the main screen used when running a live practice session or race event. The track image, enabled ID placement, turn group assignments, and configured animated flags all appear on this screen. To assign a flag to a DSF/TSL, first, click the desired flag and a white frame appears to confirm. Second, click the safety light onscreen to assign and a blue frame will flash to confirm (if enabled in System Settings). The onscreen DSF/TSL will display the assigned flag and animation while the program sends the new flag information to the DSF/TSL on track. If other DSF/TSLs are turn grouped with the selected DSF/TSL, they will also be updated with the new flag and animation. If the desired flag is already highlighted with the white frame, click additional safety lights on screen to assign.

UPDATE ALL - After selecting a flag to be displayed, click on this button to assign the flag to all enabled IDs. This is convenient when red flagging the entire track in one click.

LINK AND BATTERY - The program monitors the Data Comm Link Integrity level established with each DSF/TSL on track as well as measuring the reserve Battery level connected to each DSF/TSL. To display these montiors, click the LINK AND POWER button and Figure 11 appears. Click on the LINK or POWER table and drag and drop it on the screen in an open area. Do not cover a safety flag or the flag will not be visible on the Run Event screen. Once placed, click the EXIT LINK BATT button to return to the Run Event screen. Click this bitton again to remove the tables from the Run Event screen.

SHOW ID NUMBERS - Click and hold this button to show onscreen DSF/TSL ID color/numbers and Group Letter (if assigned) on the PC screen. Release the button to hide and return to live control.

BLACK FLAG UPDATE - This display is operated by using the numbered keypad on the your PC keyboard. Enter the number to display and click the UPDATE button to transmit to the Black Flag Displays. If the UPDATE button is not pressed within 5 seconds, the displayed number will revert back to the previous entry or go blank if no number was previously entered.

CLEAR BLACK FLAG - Click to immedaitely clear all Black Flag Displays.

HELP - To view a 'cheat sheet' explanation of the functions on this screen.

MAIN MENU - Click to return to the Main Menu. Safety Lights will not be updated after leaving the Run Event screena nd the Panic Flags may be displayed by default.

NOTE: to expand the software screen to the maximum size, click on the maximize button located in the upper right corner of the window containing the program. The image will be expanded to best fit the new screen size.

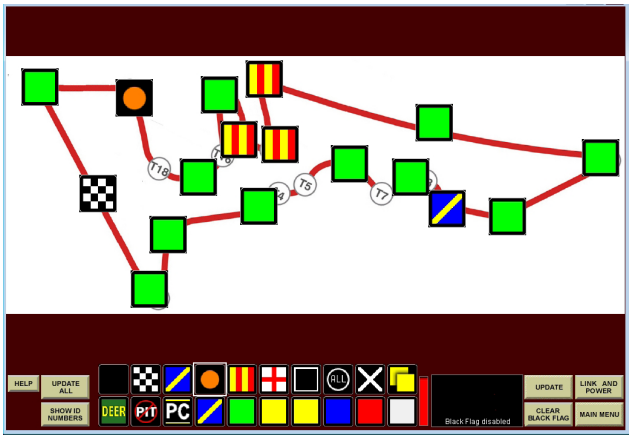


Figure 10 - Run Event Screen

SYSTEM SETTINGS

This section will select the type of data communications between the PC and the ontrack DSF/TSL as shown in Figure 12. Click on the button to toggle between Hardwired RS485 communications and IP Network communications.

Select the real time errors to be displayed onscreen by clicking a button to enable or disable visual reporting of errors.

ERROR CONDITIONS

The software polls the DSF/TSLs on track on a regular interval and confirms the correct flag is being displayed, data communications link integrity levels, and reserve battery levels for each DSF/TSL. Each time a response is received, the displayed flag for that DSF/TSL is confirmed to be correct. If a response is not received by every enabled DSF/TSL on track (flag not confirmed), the software will poll again attempting to confirm the current flag with each DSF/TSL. If an error condition is detected by the software, a visual indicator will appear onscreen framing the onscreen DSF/TSL where the failure has been detected.

If a response is not received from a safety light, the safety light onscreen is highlighted with a rapidly flashing red frame as shown in Figure 13a.

If a response was received from a DSF/TSL but the Data Comm Link level or reserve Battery level is below minimum levels, the detected ID will display a slowly flashing yellow frame as shown in Figure 13b.

If a DSF hardwired hand controller, remote TSL hand controller (iPad/iPhone) or Third Party software has overriden the last flag sent by the tower, the ID will display the new flag and frame the ID effected with a rapidly flashing white frame as shown in Figure 13c. Until the tower has sent a new flag to the iTSL or cleared it, the white frame will continue to flash.

If a DSF/TSL on track has been configured with a Default Panic Flag and Timeout, AND, has not received a poll from the tower for more than the Timeout, the Default Panic Flag will be displayed until the DSF/TSL receives a poll from the tower. Before this happens, the PC screen will frame the suspect ID with the red frame as shown in Figure 13a to alert the operator of a communication error and possible Panic Flag to be displayed. This is a safeguard against power loss, an accident with a safety light on track, a breakdown in communications, etc. to insure the DSF/TSL will be displaying a predictable flag controlled by the tower and the DSF/TSL configuration selected by the user.

RUN EVENT OPTIONS

Additional features can be enabled and disabled to further customize the automatic operation of the software and safety lights during the race event (see Figure 12).

PAGE FLASH ALERT - If any of the onscreen status indicators are enabled and an error condition occurs, a visual flashing alert can be enabled as an attention getter. The background behind the track image on the RUN EVENT screen will flash red if an error condition is triggered,

BLACK FLAG DISPLAYS - Click to enable or disable the Black Flag displays on track and remove the onscreen references. When

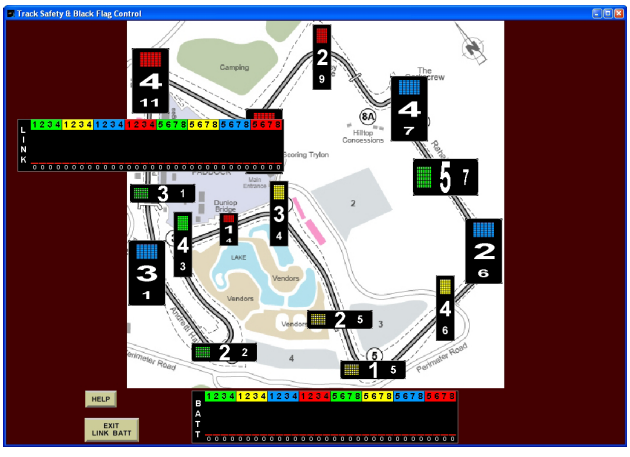


Figure 11 - Link/Battery Monitoring

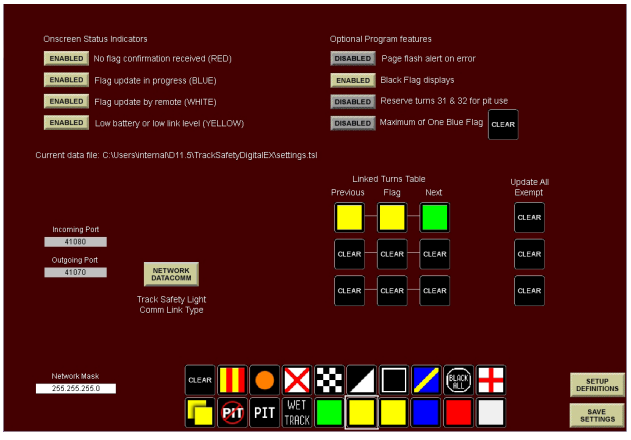


Figure 12 - System Settings Screen

enabled, the Black Flags positioned around the track are included in the DSF/TSL polling.

RESERVE TURNS - Safety lghts can be used to control Pit In and Pit Out for the drivers controlled from a hand control or tower. Normally when a full track yellow of green occurs, all safety lights display the same flag. To reserve safety lights for pit use, enable this function and configure the Pit In safety lights on turn 15 (wireless) or turn 31 (IP network) and Pit Out safety lights on turn 16 (wireless) on turn 32 (IP network). When enabled, turns IDs assigned to Pit In and Pit Out will not display full track flags and can be controlled separately by the tower or a hand control.

LINKED TURN TABLE - When a flag is assigned to a turn, another flag can automatically be assigned to the previous turn and the next turn using this table. To link previous turn and next turn flags, click on a flag at the bottom of the screen and then click the box under the PREVIOUS column for the previous turn, FLAG column for the offending turn, or the NEXT column for the next turn on the track. Up to three relationships between flags and turns can be configured. Figure 12 illustrates a yellow flag send to a turn will cause the previous turn to be a double yellow and the next turn to be a green.

UPDATE ALL EXEMPT - When a flag is assigned to a single turn, then a full track flag is selected, there are times when it is desired to keep the single turn assignment during the full track flag. Selecting the desired flag and placing it in this table makes that flag exempt from UPDATE ALL full track assignments.

NOTE: The linked turn table requires turns assigned to IDs are contiguous without numeric gaps. This may require IDs be assigned to incremental turns even though the number may not be the actual track turn number.

MAX OF ONE BLUE - Enabling this features will allow only one turn to display a flag at a time. Start by clicking on a flag at the bottom of the screen designated as a blue flag, then click on the Blue Flag Box. When a turn is set to this flag, all other turns containing the same flag will be turned off. This feature allows to fllow a driver

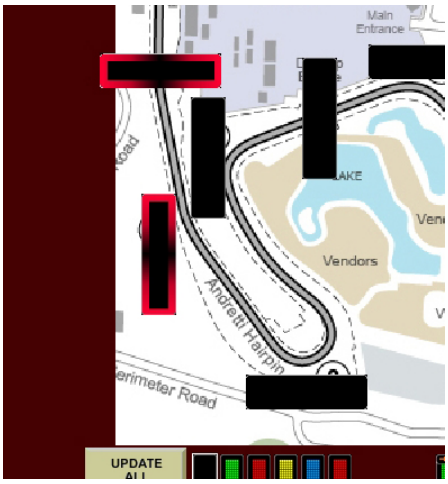


Figure 13a - No response from iTSL

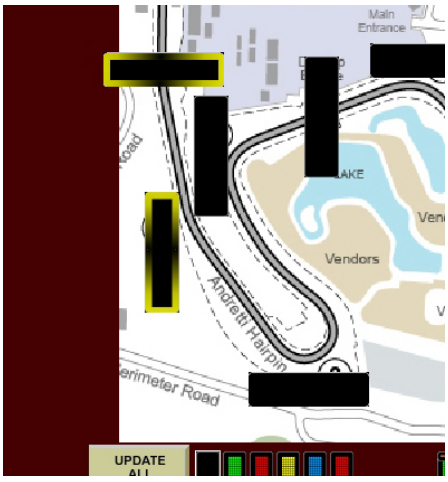


Figure 13b - Low Comm Link or Battery

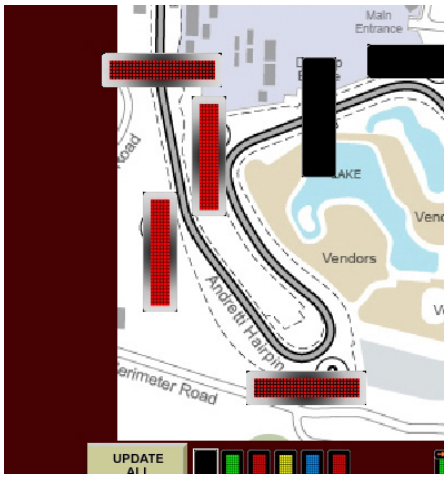


Figure 13c - Remote Override

around the track clicking the next turn with ther designatd blue flag and the previous turn blue goes out.

REMOTE CONTROL

Control of the DSF/TSL can be direct from the screen or from remote sources. DSFs can be controlled by hardwired hand controller and third party software packages like Mylaps Orbits software using their Rmonitor Feed. TSLs can be controlled by the same thrid party software and RaceAmerica's Hand Control using our Track Safety App and an iPad, iPhone ot iTouch.

DSF (or TSL) HAND CONTROL - Use this screen to configure the buttons on a hardwired hand controller connected to a DSF. Start by clicking on a flag at the bottom of the screen, then click on one of the S1 through S9 buttons on the hand controller. Once all buttons are assigned, click ASSIGN FLAGS to send this configuration to all DSFs. The flags will be sent to the DSF and confirmed by updating the assigned flags for each button S1 through S9 by ID on the right side.

Use the READ HAND CONTROLS if a DSF was powered on after the hand control flags were sent. To display additional DSF hand control assignments, click the NEXT ID SET to advance to the next eight IDs. The DSF Hand control table stored in the DSF is sent and display onscreen. Figure 14 displays the hand control at ID 1 BLUE and the nine flags assigned to each button on the hand controller image. When using a combination of DSFs and TSLs with hardwired hand controllers, click SHOW TSL FLAGS to display the TSL assigned to the DSF flag.

NOTE: If an assigned flag on the hand controller is changed, the physical flag image on each hand controller unit must be changed to reflect the current flag. A complete set of flag images is included with each hand controller.

TSL HAND CONTROL APP - To enable the Hand Control Server, enter a SERVER PORT number under the Hand Control Server, then click the ENABLE SERVER box to enable. When the server is enabled, a confirming message will be displayed. Up to 8 hand controls can be enabled for wireless configurations and up to 16 hand controls can be enabled for IP network configurations. Up to five flags can be assigned to each hand control.

To 'pair' a Hand Control with the Track Safety software, start by clicking REMOVE in one of the rows to reset the current entry, then enter a DEVICE NAME to be assigned to the Hand Control. The software will edit out unusable characters as you type.

Next, click on the TURNS CONTROLLED column and select a specific turn number or ALL. ALL provides full control of all turns as well as individual control of each turn. Up to five flags can be assigned to each Hand Control by clicking on a flag at the bottom of the screen, then clicking in one of the 5 slots under HAND CONTROL FLAG ASSIGNMENTS.

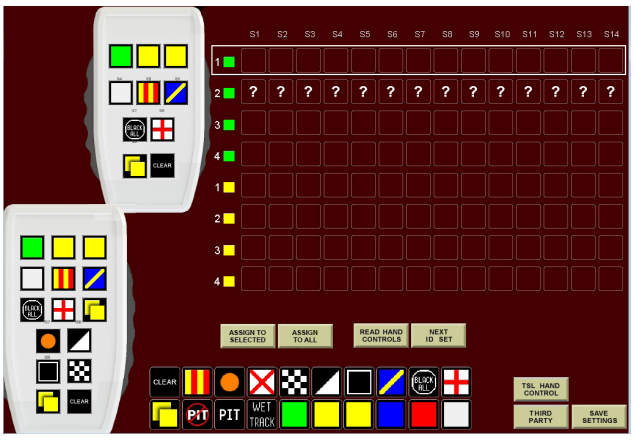


Figure 14 - DSF Hand Control

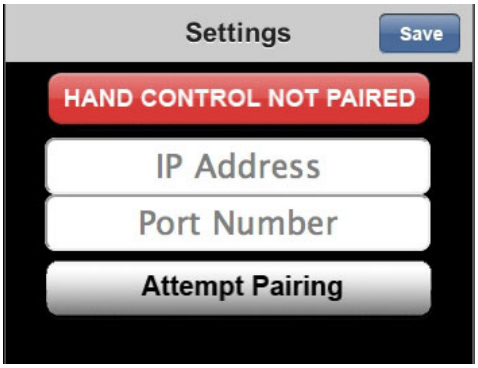


Figure 15 - Hand Control App Setup Screen

Next, click the box in the SELECT TO PAIR column.

On the iPad/iPhone/iTouch, insure a 3G or WIFI connection is available and start the Track Safety App. Enter the server IP address and server port number into the Hand Control setup screen as shown in Figure 16a for IP network and Figure 16b for wireless. Click ATTEMPT PAIRING on the Hand Control to begin the pairing process. Once paired, the IP address of the Hand Control will appear in the IP ADDRESS column of the Track Safety software and the Hand Control will confirm with HAND CONTROL IS PAIRED, then press SAVE on the Hand Control to finalize the pairing and flag assignments. The iPad/iPhone/iTouch will display the turns enabled and the five flags assigned on the iPad/iPhone/iTouch. At any time, the Track Safety App can be terminated and the turns and flags are stored. When the App is restarted, and the server is enabled in the Track Safety software, the pairing will be reconfirmed automatically. If any of the assigned flags have changed, a message will be displayed on the Hand Control and the new flags assigned and displayed on the iPad/iPhone/iTouch.

To enable Turn Status (flag at each turn) to be displayed on the iPad app, click the ENABLE TURN STATUS. On the iPad app, each turn assigned to a safety light will be updated with the current flag and indicate if the safety lights has confirmed if the flag is being displayed on track.

THIRD PARTY - Click on the THIRD PARTY button to enable control of the DSF/TSL direct from the MyLaps Orbits software. Go to the Scoreboard Settings screen in Orbits and copy the IP ADDRESS and PORT numbers displayed and enable the Scoreboard Feed. In the Track Safety software, enter the SERVER IP and SERVER PORT under the Orbits Rmonitor Feed. Click the ENABLE MONITOR in the Track Safety software to link with the Orbits software. When the monitor is enabled and linked, a confirming message will be displayed. Orbits offers five different flag conditions all displayed on the Remote Control screen in the Track Safety software. Click a flag at the bottom of the screen to highlight, then click the iTSL flag below the appropriate Orbits flag to assign. When a flag is selected in Orbits, the Track Safety sofware will assign the selected flag to all iTSL's ontrack and frame the onscreen ITSL's in

Figure 16a - TSL Hand Control (wireless)

Figure 16b - TSL Hand Control (IP network)

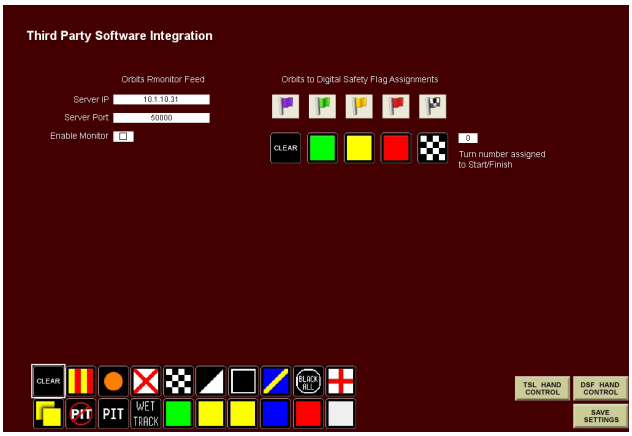


Figure 17 - Third Party Screenrty Screen

white, if enabled.

When the checked flag is selected in Orbits to end a race, all safety lights will display the checkered flag. Entering a the turn number assigned to the start/finish line will restrict the checked flag sent from Orbits to only the start/finish line. To return to all safety lights displaying the checkered flag from Orbits, enter 0. Regardless of what turn number is selected, the UPDATE ALL button with the checkered flag selected will override the Orbits setting.

SETUP DEFINITIONS

The program logs activities in the audit file with references to the configured values which can require some familiarization to convert to common track level information. Common track names for each flag and location of each light can be entered into the definitions screen shown in Figure 18. The information entered here is added to the audit files to customized the logging to the specific track. This adds clarity to each entry relative to the specific track.

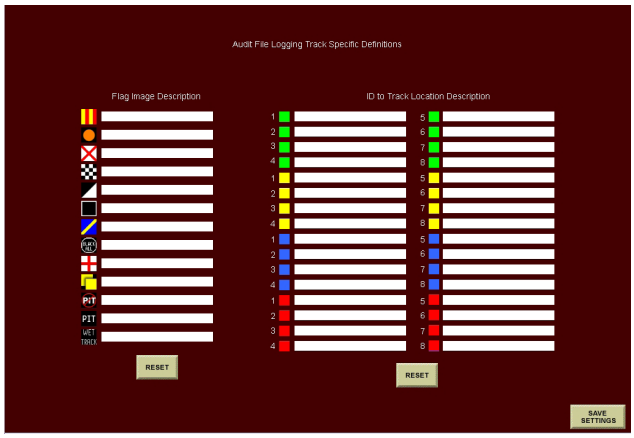


Figure 18 - Definitions screen

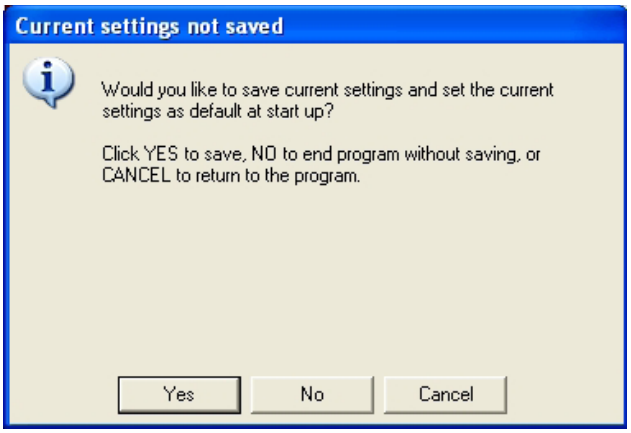


Figure 19 - End program prompt

END PROGRAM

To exit the program, click on the QUIT button on the Main Menu screen. The software prompts to determine what to do with all the setup and configuration contained in the program as shown in Figure 19.

To restart the program and continue with all setting as they are, click YES to save settings to a file and have that file loaded automatically when the program is run again. The user is prompted for a filename to be used to save all settings and accessible in the future using the LOAD button on the Main Menu screen.

Clicking NO will end the program and not save any settings or configurations of lights or flags that may have changed since the program was started.

Clicking CANCEL will return to the Main Menu screen with nothing changed.

NETWORK ANTENNA

Wireless safety lights can add an EFS System to a track with minimal wiring and power installation. The wireless EFS is limited to 16 lights on track. With the addition of the model 4525 Network Antenna, wireless EFS is extended to 32 lights on track.

The 4525 is an interface between the 16 lights on track and the track's IP network. Two 4525's are utilized each managing a separate set of 16 lights as shown in Figure 20. The result is an IP network link between the PC software and the 32 wireless lights on track.

Start by selecting the NETWORK ANTENNA data comm type on the SYSTEMS SETTINGS page shown in Figure 21. Normally, when enabling a maximum of 32 lights, the software refers to an individual light with IDs 1 through 4 of each color (i.e. 1Green, 4Blue, etc) then 5 through 8 of each color (i.e 5Green, 8Blue, etc) for a total of 32 unique IDs. With the 4525, each set of 16 are referred to as IDs 1 through 4 of each color. Lights are designated in the Lower 16 or Upper 16 set of lights determined by the wireless Optimizer Code on the 4525 and on each light. For more information about the 4525 product line, download the 4525 Owner's Manual from the RaceAmerica website DownLoad Page under Support.

When the NETWORK ANTENNA is selected, several screens change to match the Lower 16 and Upper 16 terminology in the software. The IDs onscreen better match the IDs seen on each light. Figures 22 through 25 illustrate the screen changes in the software.

The added designation of 'L' for Lower 16 and 'U' for Upper 16 is added to many screens containing a refernce to the ID of each light.

With Network Antenna selected, note the repeated 1Green through 4Red twice in place of the 1Green through 4RED then 5Green through 8Red when using network communications without the Network Antenna selected.

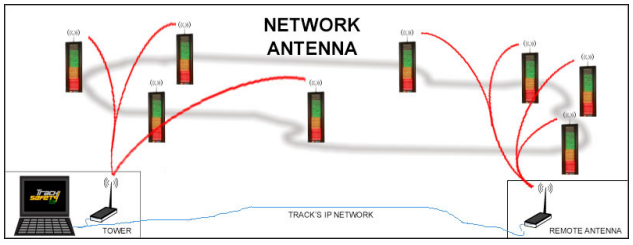


Figure 20 - 4525 Network Antenna

Figure 21 - Communication selection

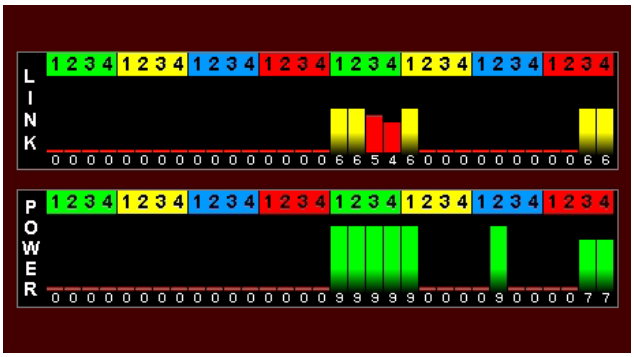


Figure 22 - Link & Power on Run Event Screen

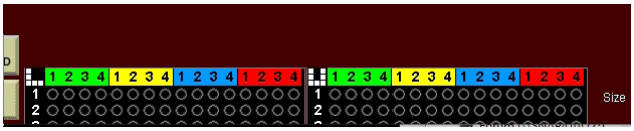


Figure 23 - Zone/Group assignment on Track Setup screen

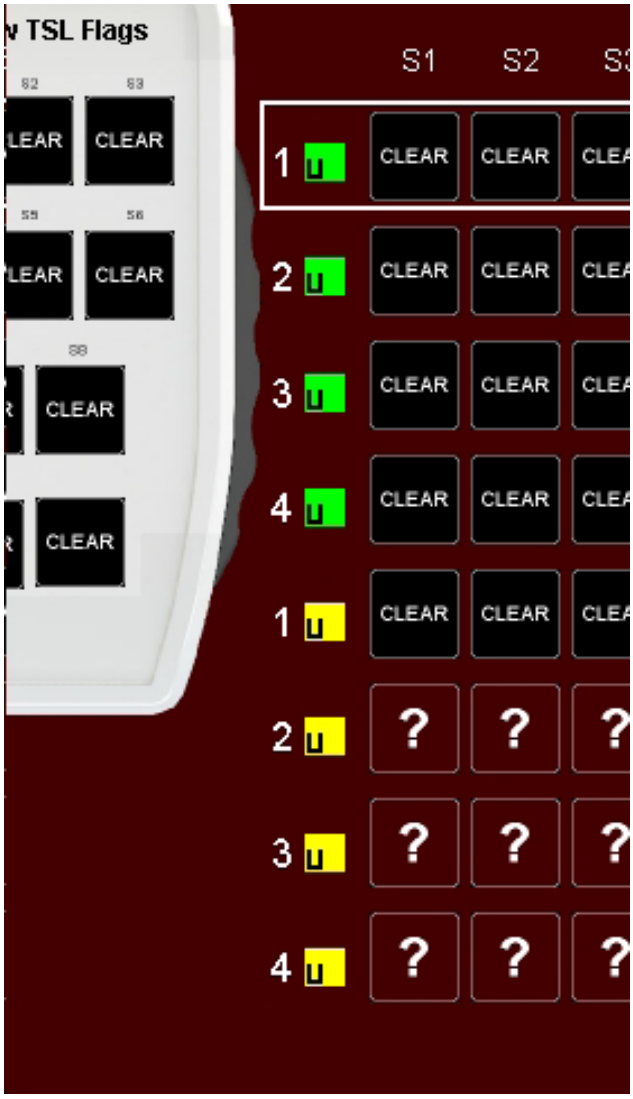


Figure 24 - Flag button assignment

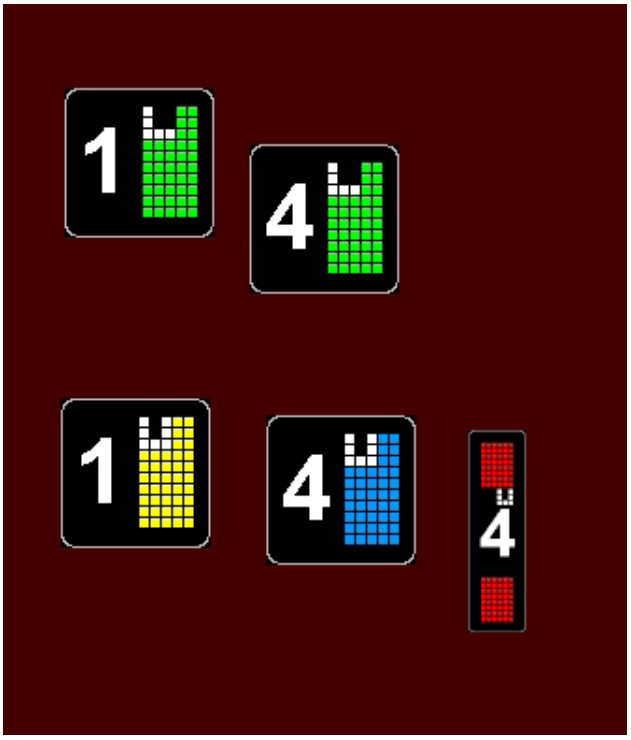


Figure 25 - Onscreen IDs