

RACE CONTROL SYSTEM ENSURES SAFETY AT TRACKS WORLDWIDE

Corner workers use handheld controllers to command local operation of digital safety flags, with remote control and supervision provided from the control tower via PC-based software.

By Dennis Laczny, President and CEO of RaceAmerica

Innovation. Technology. Reliability. These three words comprise the slogan of RaceAmerica, and since 1991 have been the foundation of the company's efforts to support race activities for their clients around the world. What started as the first Apple 2 computer-based timing system nearly 30 years ago has evolved into a one-stop-shop for race timing devices, LED scoreboards, race management software and more.

One of the main areas of interest for racetracks is safety, and this focus has led to the development of digital safety flags installed throughout many racetracks (Figure 1). Corner workers—the individuals known for holding up the traditional racing flags—are a vital part of ensuring races run safely.



Figure 1. Digital flags are used at racetracks worldwide as an upgrade to handheld flags, improving safety for both drivers and track personnel.

These corner workers need to be equipped with instant, two-way electronic communications between them and race control to ensure the correct information is displayed on the digital safety flags at all times. The controllers enabling these communications need to be intuitive to use, with minimal training required for successful operation.

To address this need, RaceAmerica chose IDEC's LB Series flush mount pushbutton switches as an integral part of their handheld controller.

Controller Design Dilemma

When design of the handheld controllers first began, RaceAmerica decided to incorporate a pushbutton switch with customized imagery familiar to the corner operators. The objective was to provide flexibility and extensive functionality while maintaining simplicity, but attaining these goals was a significant challenge. Designing a controller enclosure with a sealed environment yet fitting the hand introduced dimensional limitations and manufacturing assembly issues.

In addition, all functionality and customization options had to fit inside the controller enclosure, with no complex assembly procedures or equipment required. In their product investigation, RaceAmerica researched more than 20 types of pushbutton switches. However, none of them met their needs, with each proving incompatible in terms of size, required manufacturing assembly processes and other factors.

Fortunately, a client who had used an IDEC pushbutton switch on his company's products suggested the IDEC LB Series flush mount switch as a possibility. One examination of the switch is all it took to provide eye-opening potential to this partnership. Not only would the IDEC pushbutton switches pave the way for the handheld controllers to work in the way RaceAmerica envisioned, but they also expanded the flexibility and functionality beyond the original designs.

Design Details

The handheld controller is part of a system providing operators with the ability to enter information and control the display of this information on the digital safety flags. As shown in Figure 2, the flags depict different race conditions such as pit closed (left), debris on track (center) or checkered flag (right). Control of the digital safety flags can be directed from the race management software, or from wired or wireless handheld controllers.

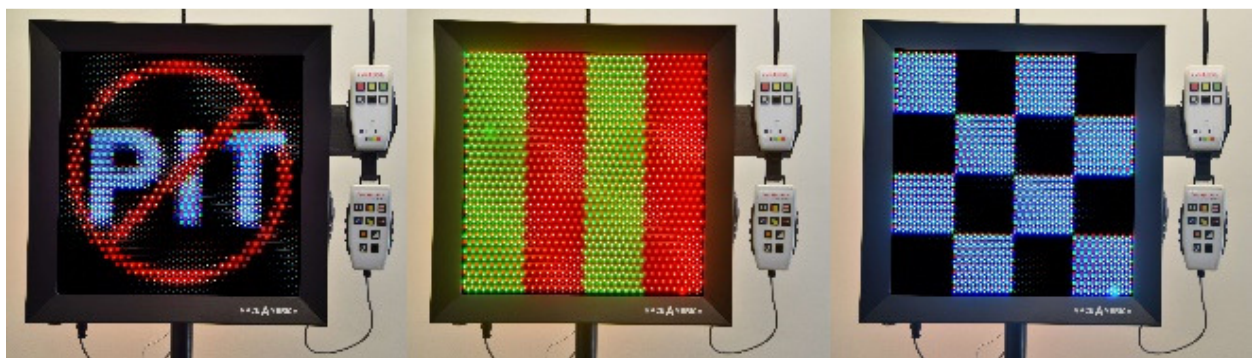


Figure 2. Digital safety flags are placed throughout a racetrack to indicate status such as pit closed (left), debris on track (center) or checkered flag (right).

Wired controllers are typically used at larger tracks where a hardwired connection is required. For smaller tracks where all displays change at the same time to all the flags, a wireless handheld controller is generally used.

Each digital safety flag is typically controlled either remotely from a PC running the race management software in the racetrack command tower, or locally from a handheld controller. Up to nine customer-selected flags can be chosen from the controller (Figure 2). Pressing any button, each equipped with a clicking sound and tactile feel to provide positive feedback, displays the associated selection on the digital safety flag and sends notification to the tower. In addition, Race Control can also send signals to any of the digital display flags via the race management software.



Figure 3. Handheld controllers wired to each digital safety flag allow corner operators to locally control the information displayed on the flag.

The IDEC switches used in both the wired and wireless controllers allow for an image to be placed under the switch's clear cover, clearly defining its assignment and action when pushed. RaceAmerica has also provided custom handheld controllers with corporate logos as part of the pushbutton switch assignment, with this information also displayed on the digital flags. The handheld controllers integrate with the race management software, allowing control tower and other track personnel to make changes to the system.

The capability of assigning functions and labels to each button so an operator can intuitively understand its action is a key element to the controller's ease of use and flexibility. Reliability is also critical for this safety-related application, and the pushbutton switches meet this need with an IP65 rating, allowing the controller to operate in harsh racetrack environments. In fact, the controllers have maintained a higher level of performance in operation than anticipated.

Switch Customization

The handheld controllers present a streamlined design because the switches only extend 2mm in front of the face panel, preventing dust and other particles from accumulating. This low profile also makes regular cleaning and maintenance easy.

This 2mm extension distance is the shortest in the industry, and when combined with the switch's short body allowed reduction of the controller size to fit the hand. Removable contact blocks facilitated easy wiring, and single-board mounting reduced installation time and prevented incorrect wiring.

Multiple switch contact blocks can be pre-soldered onto a single printed circuit board, with the board easily installed behind the controller's face cover, saving cost in design and assembly. The artwork for each pushbutton switch is specified by the track, and the controllers are designed accordingly. The design of the switch allows for changes to the picture image under

the clear cover, making button reassignment an easy task. The image under the cover is protected from the elements, making it ideal for a race track environment.

The race management software controls the entire track safety system and interfaces to the controllers. Track personnel can change button assignments via the software to match the button images. The ability to change button assignments on the controller and within the software allows for customization when built and in use.

RaceAmerica can connect to a client's PC running the race management software and demonstrate how to use it to reconfigure the handheld controller to meet each track's needs. When track personnel change the function of a button on the controllers, they can concurrently change the image in the software and on the safety flag, providing flexibility to accommodate changes.

One of the screens in the software is used to define the unique function for each button on each handheld controller (Figure 4).

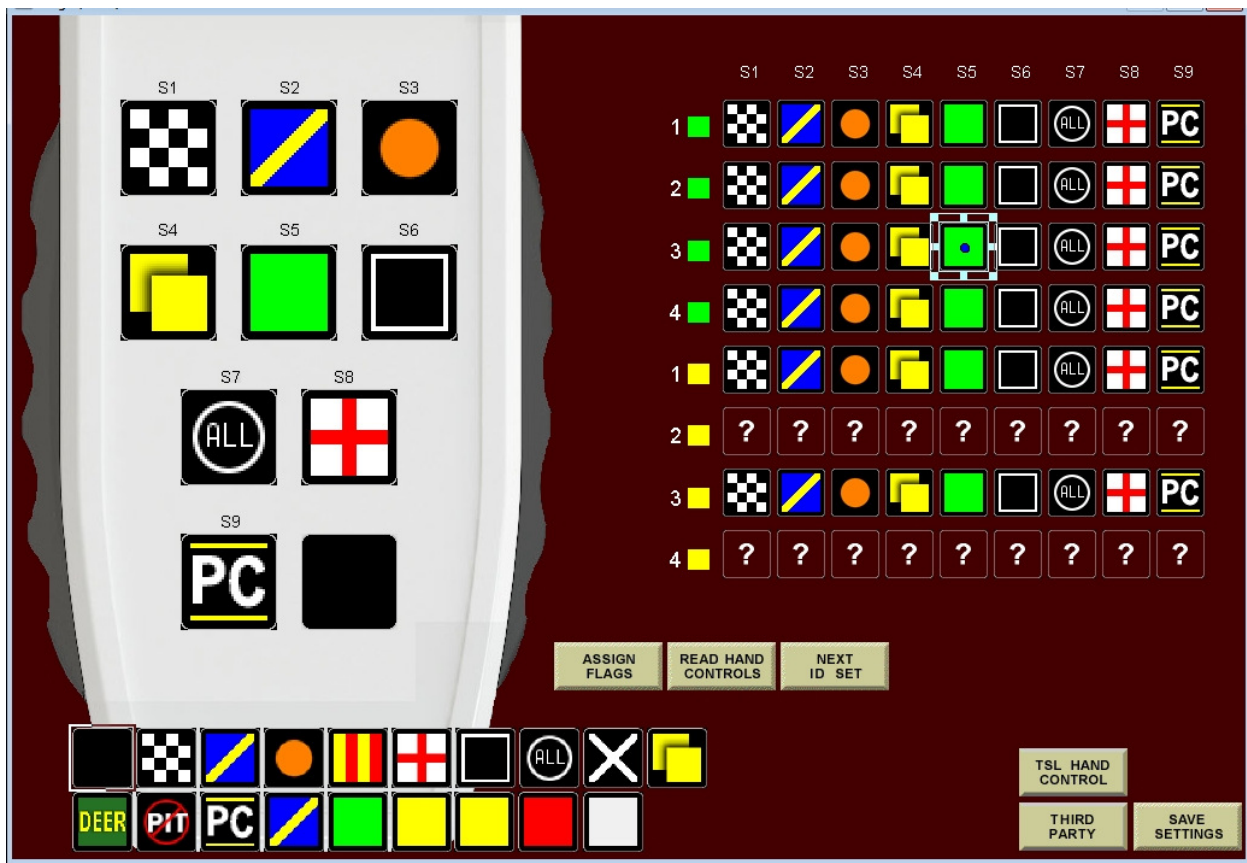


Figure 4. RaceAmerica's race management software can be configured to match the display on each of the IDEC pushbutton switches on the handheld controllers, with this display information sent to each corner flag when the corresponding switch is pushed.

The screen shows a full-size front view of the handheld controller with the switch images. Users can drag and drop a new flag image on the screen to reprogram the physical button on the controller, allowing for a high level of customization. Minimal training is required to configure the buttons and use the software due to the intuitive nature of the design.

Racing Ahead

"We selected RaceAmerica because their technology is state of the art and easy to use," says Kevin Rodgers, General Manager at the Autobahn Country Club racetrack. "It enhances the effectiveness of the corner workers and provides another layer of safety for our members out on track."

The versatility, flexibility and compactness of the pushbutton switch made it the right solution for the handheld controllers. "The system works great and has been a huge asset to racing safety for the events where we've had it installed," comments Tim Packman, Track President, Lancaster Speedway and Dragway. "I highly recommend this system to every track operator in both asphalt and dirt across the country. There is no price on safety, and we feel much safer with this system now installed."

About the Author

Dennis Laczny is the president and CEO of RaceAmerica, providing leadership on product direction and design, along with a focus on modernizing the racing industry. Prior to joining RaceAmerica, Dennis built a strong management foundation at Hewlett Packard. Leadership roles at several smaller companies gave him numerous opportunities to develop creative solutions by using his strong technical background.

About IDEC

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