

# Rally monitoring equipment for timing, route and safety tracking

Information from Instrotech

*Most of you have seen rally cars racing at high speed on country roads with clouds of dust, through forests, rivers and across deserts. Ever wonder how the timing, route monitoring and safety tracking are done?*

As one of their niche market products, instrumentation specialist, Instrotech, designs and manufactures rally timing equipment, and has done so for 27 years. All the South African Rally Championship events, the African Rally Championship and most SA Regional Championship events are timed with Rallytime. The timing systems have been sold to Australia and Jamaica and are used for air racing in South Africa.

The new Rallytime GPS TR is based on its predecessor which successfully introduced the satellite-based Global Positioning System (GPS) time signals to synchronise all clocks to the same timebase. The TR (transmit/receive) is now included to eliminate cables between the Flying Finish and the End Control and can communicate data between controls and the competing cars.

The product is universal in its operation. Each unit can be set up as a Start Control (with ultrasonic beam for jumped start), Flying Finish (with microwave timing beams), End Control (with large display of finish time), Open Control, Service Park or Parc Ferme. It can also be selected to drive a large master clock for documentation.

Additional advances to the system include optional microwave barriers that can trigger at high speed in rain and dusty conditions. The inputs allow for two pairs of barriers which can be set at a meter apart to avoid response from unwanted pedestrians. These industrial quality barriers are easy to set up, have a range exceeding 20 m, a response time of less than 10 ms (0,01 s) and have been proved reliable in rally conditions. For simpler, lower cost



*Fig. 1: Advances to the system include optional microwave barriers that can trigger at high speed in rain and dusty conditions.*



*Fig. 2: When in a timing control zone the SafeTrack is connected via the TR radio system to the Rallytime GPS TR in order to identify the car number to the control and receive time information back.*



Fig. 3: Most SA Regional championship events are timed with Rallytime.

applications the inputs can accept hand-held pushbuttons, infrared, laser or ultrasonic beams.

### Rallytime SafeTrack

#### *Safety system and data transmission*

Safety is a priority in any sport and rallying is no exception. The Rallytime SafeTrack is a compact dashboard-mounted unit with GPS for location, GPRS for real-time connection to the internet, TR for local coms and a display. Its keypad is fitted with four pushbuttons, two of which are used for the safety response. One is a green OK and the other a red cross. In an emergency the occupants press the cross and an emergency signal with time and location is sent out via GPRS and the internet to rally officials. The emergency signal is also transmitted through the TR radio link to nearby competitors as the following car is normally first on the scene. The incorporated GPS monitors the car's progress and, should it stop for longer than 30 seconds on a racing stage without the green OK being pressed it will sound an audible alarm (car's hooter) and, if OK is still not pressed, react as an emergency.

While the car is in a racing stage its location is continuously monitored and the position can be shown in near real time over the internet. This is useful to

organisers for location of competitors and for checking that the vehicle is following the correct route. When in a timing control zone the SafeTrack is connected via the TR radio system to the Rallytime GPS TR in order to identify the car number to the control and receive time information back. The SafeTrack, with its GPRS connection, is then used to relay this information to the rally headquarters for scoring and route location in real time.

### Documentation and printout

All data stored in the Rallytime GPS TR and the SafeTrack during an event is available via Rs232 to a printer or in a csv format using the USB connection or by means of a removable SD card. To ensure transmission and data reliability every vehicle carries its own times plus those of five other competitors. If no GPRS connection is available, the data is stored until the car is in an area where the signal strength is sufficient. Cars are fitted alternatively with MTN and Vodacom SIM cards as a further enhancement of data transmission to the rally headquarters.

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