

RedSpeed™



The eyes have it!

RedSpeed™
UK Type
Approved



MONITRON
INTERNATIONAL

Red Light Enforcement – RedGuard™ Speed Enforcement – SpeedCurb™ or combined Redlight and Speed Violation Enforcement System – RedSpeed™



RedGuard™

Redlight Violation Enforcement System

The state of traffic signals are continuously monitored by the system. If a vehicle is detected crossing the stop line when the signals are red, then two wide-angle images and one zoom image of the vehicle are recorded. The two wide-angle images can be used as evidence that the vehicle was moving at the time of recording. The zoom image gives a close up of the number plate. The system records all relevant information associated with the violation, including images, on removable hard disk or optical disk facility. All data is protected against tampering, through use of encryption and data-integrity codes embedded in the information. A built in flash module permits operation at night. Violations are retrieved via a central PC with a modem. Operational parameters such as time into red may be locally or remotely programmed into the unit.

SpeedCurb™

Speed Violation Enforcement System

The speed of vehicles passing through a monitored section of carriageway is measured by either piezo sensors buried in the road surface, laser or a built in radar module. All data is protected against tampering through use of encryption and data integrity codes embedded in the information. A built in flash module permits operation at night. Operational parameters including speed threshold and active time may be programmed into the unit.

RedSpeed™

This incorporates all the facilities of the separate RedGuard™ and SpeedCurb™ systems. The RedSpeed™ Outstation includes:

- Removable hard disc or Optical WORM disk (UK version) for on-site storage of violations (or)
- Automatic transfer of offence information to Instation for storage on WORM or removable medium
- Capable of monitoring offences from two separate camera heads into one Outstation
- Capable of capturing violations from the Front and/or Rear of vehicles
- Unique Flash facility that allows side by side capture of violations
- Violation Server that allows connection to ISDN, PSTN or ADSL connections for transfer of encrypted violation images and data

Instation Software

Combined Redlight and Speed Violation Enforcement System

RedSpeed™ software is designed to run on an IBM (or compatible) PC and runs under Microsoft Windows providing central control and management of the system. The intuitive graphical user interface means users can be up and running in minutes.

The Instation includes the following functions:

- Automatically retrieves and stores violation and image data from camera sites
- Allows remote communications with a site to modify operational parameters - for example, time into red



- Allows viewing and printout of captured violations
- Built-in image enhancement features such as brightness and contrast
- Removable hard disc or Optical disk
- Provides database searches - for example, all red light violations above 10 seconds into red for the previous week from all sites
- 'Contact Sheet' display, permits rapid visual overview of selected sections of database
- Produces print-out of Notice of Intention to Prosecute via 'hot-links' to standard word processing packages

Retrieves statistical information from the camera site including:

- Total vehicle count
- Number of violations
- Speed profiles (histogram of average vehicle over time period)
- Violation profiles (histogram of violations over a given time period)

Speed Violations

Each of the speed sensor interfaces is continuously monitored by the RedSpeed™ program. As soon as a timing reading is received from the timing processor, it is checked for accuracy, sequence number and validity and converted to a speed using the stored sensor spacing. If the measured speed exceeds the programmed speed threshold, then the vehicle presence loop is monitored until the vehicle clears the loop.

When a violation is detected, two images are captured from the frame grabber (the first is a zoom shot and the second, taken within 100ms, is a wide angle shot) and the following information stored:

- Site Name and Location
- Date and Time
- Offence and Frame Number
- Speed
- Lane Number

The system then delays (for a period related to the vehicle's speed) and captures a third frame (wide angle). The third frame is stored with the information as above plus the time delay between it and the previous frame.

Red Light Violations

For red-light only, the state of all aspects of the signal head is continuously monitored and their 'on' time recorded. When the red aspect is detected, a timer is started. When this timer exceeds the programmed 'time into red' the two road loops are monitored for detection of a moving vehicle. If a vehicle is detected the program proceeds to violation capture.

When a red light violation is detected, two images are captured from the frame grabber (the first is a wide shot and the second, taken when the detection loop is empty, is a zoom angle shot) and the following information stored:

- Site Name and Location
- Date and Time
- Offence and Frame Number
- Time Into Red
- Previous Amber Time
- Speed (optional)



The system then delays (for a period related to the vehicle's speed) and captures a third frame (wide angle). The third frame is stored with the information as above plus the time delay between it and the previous frame.

Data Protection

The following procedure is used to maintain the data integrity:

- A message authentication code (MAC) for the image is calculated
- The image is then encrypted using DES
- The MAC is appended to the encrypted image
- The image MAC is appended to the violation data
- A MAC is generated for the violation data and stored with the violation data
- The violation data is encrypted
- All the above is stored on the primary evidence store

Encryption

Encryption transforms an image into random data, ensuring the nature of the data is unrecognisable to an unauthorised observer and that it is not possible to selectively alter part of an image or even monitor it.

Currently, evidence which is recorded automatically at the roadside is manually retrieved for immediate viewing because photographic film is used.

Date collection must be done promptly to ensure notices of intended prosecution can be issued within the prescribed time.

Electronic imagery, conversely, allows data to be collected and transmitted automatically with minimal delay over a data network and by using a 56 bit encryption key for encryption, allows for maximum security.

Technical Specification

Controls

Multi-Frame Capture	Control 0-5 secs. in steps of 0.1 sec.
Time into red	0-5 secs. to within 0.1 sec
Green/Amber Speed Recording	13 mph - 138 mph +/- 1% (Plus Red if RedSpeed)
Threshold speed arming	Yes (optional) separate flash only & capture thresholds
Number of Frames/ Violations	3 to 4
Set-up speed units	km/h or mph
Speed detector spacing (Piezo)	500-1500 mm

Recorded Information

DD/MM/YY	Site No.
HH:MM:SS	Photo Interval
Det Channel(s)	Vehicle Speed
Duration of Last Amber	Frame storage Capacity: 30,000 frames
Time into Red	22,000 frames HDD 14,000 frames OPTICAL

Display

Time between frames	Total vehicles
Time into Red	Total Violations
Frames per Violation	Current signals state
Current set-up units	Site ID
Red threshold speed (optional)	Red and Green/Amber speed (optional)
Flash only threshold speed (optional)	

Mechanical/Environmental

Enclosure protection	IP65 Vandal Resistant
Operation/Access	One person from street level
Working Temperature	-20°C to +50°C 80% RH above 20°C
Temperature Sensor	Disables unit if outside working range
EMC	0V/m 27-500MHz, 3V/m 500-1000MHz 90% A.M. 11 Hz Square Wave
ESD	IEC801-2:1984 (B56667). 4KV Max

Power Supply

Voltage	100 VAC to 250 VAC
Mains Voltage Tolerance	-15% + 20%
Mains Frequency Tolerance	+/-2%
Mains Interruptions	0V for 10ms, 50% for 20ms, 80% for 50ms
Mains Transients	500V Transients, Reception <= 12Hz

Flash Unit

Flash Controls	Night / Day/Night / Off / Zoom Only
Flash Power	100W-5 to 200W-5
Flash Interval	0.1s min. Variable



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