Electronic Vehicle Registration (EVR)

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Automatic Vehicle Identification (AVI)

The AVI systems identify, control, monitor, track and collect data on vehicle movements on the roads, parkings, seaports, airports, government, corporate facilities, hospitals, borders, shopping and sport centres, universities, power/chemical plants, oil refineries, gates and police or military deployment points enabling better management and monitoring of vehicle activities.

The AVI provides Electronic Toll Collection (ETC) and Electronic Vehicle Registration (EVR).

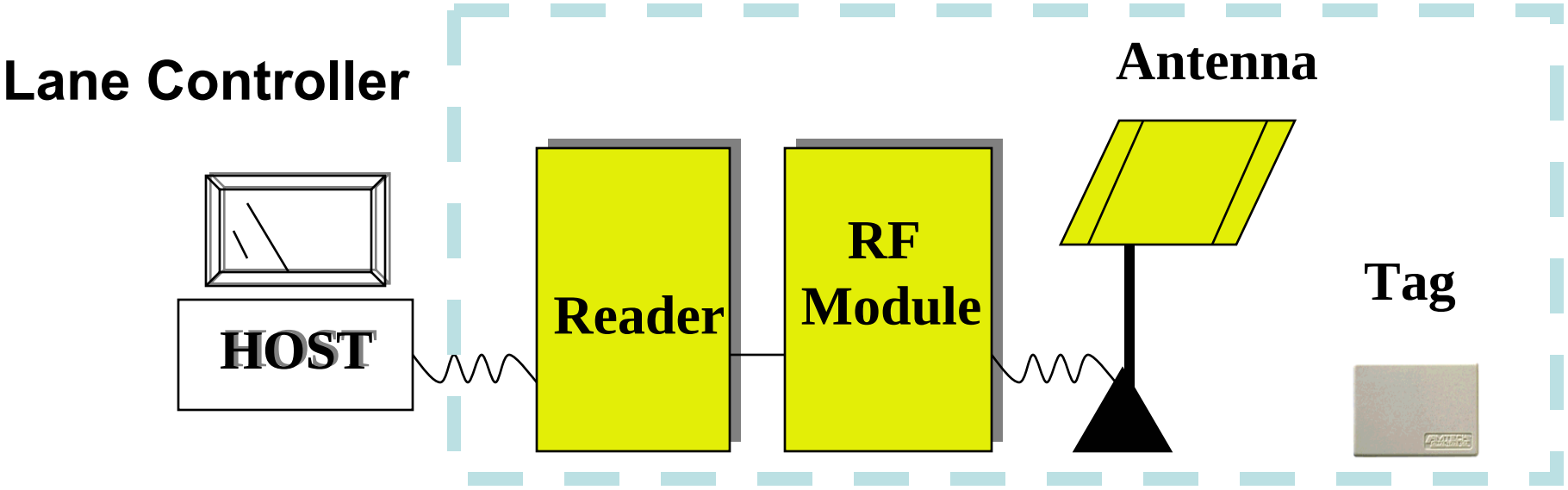
Electronic Vehicle Registration (EVR)

The EVR creates a secure and efficient access control system for traffic corridors, freight tracking and border crossings of public or private facilities. It can be adopted for military bases, state/local government complexes as well as for certain private entities that deal with sensitive materials. It also could be used by inspection/regulatory agencies as part of licensure, tracking, and monitoring requirements for commercial or private and military vehicles.

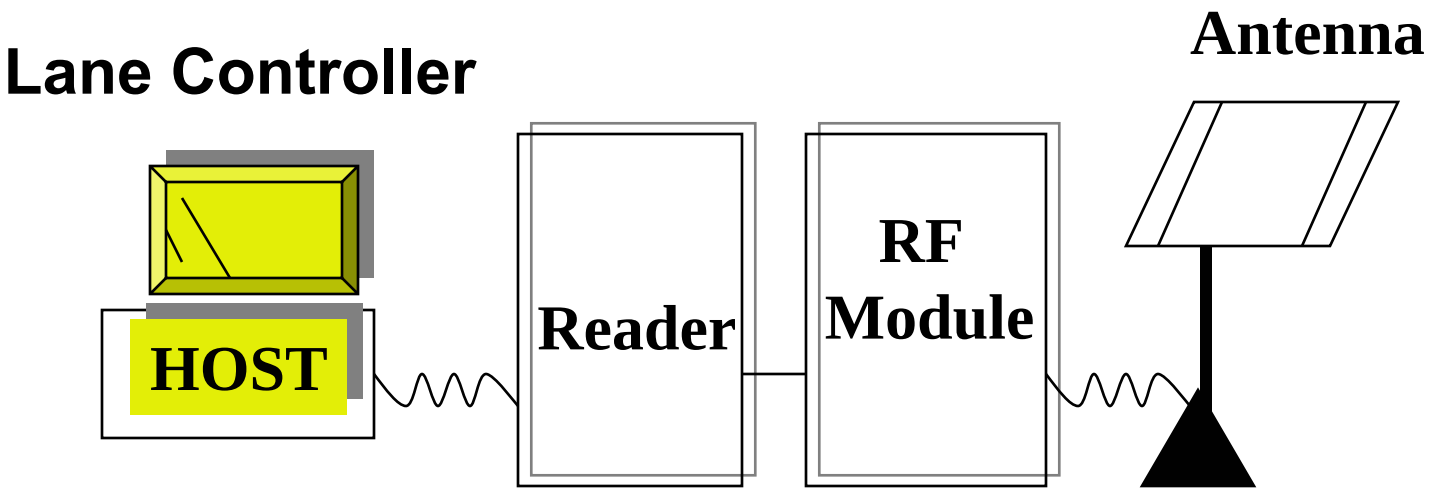
RFID Network

- A basic RFID Network consists of Tags, RF Module, Antennas, Readers and a Host system. The Host is composed of a Database and Specific Software. A unique electronic identification code is established for each vehicle via a tamper-resistant windshield sticker tag, and each unique code are linked to a record in the centralized owner/vehicle-based database.
- In operation, the Reader's Antenna broadcasts RF energy over an adjustable area called the read zone or reader footprint. The Tag on the vehicle reflects a small part of this RF energy back to the Antenna, and the reflected radio waves denote the Tag's unique ID code and other stored data. The Reader then transmits this code to the responsible government agency's Host system to determine the vehicle's compliance. The Tag-to-Reader identification process takes only milliseconds.

RFID System Diagram

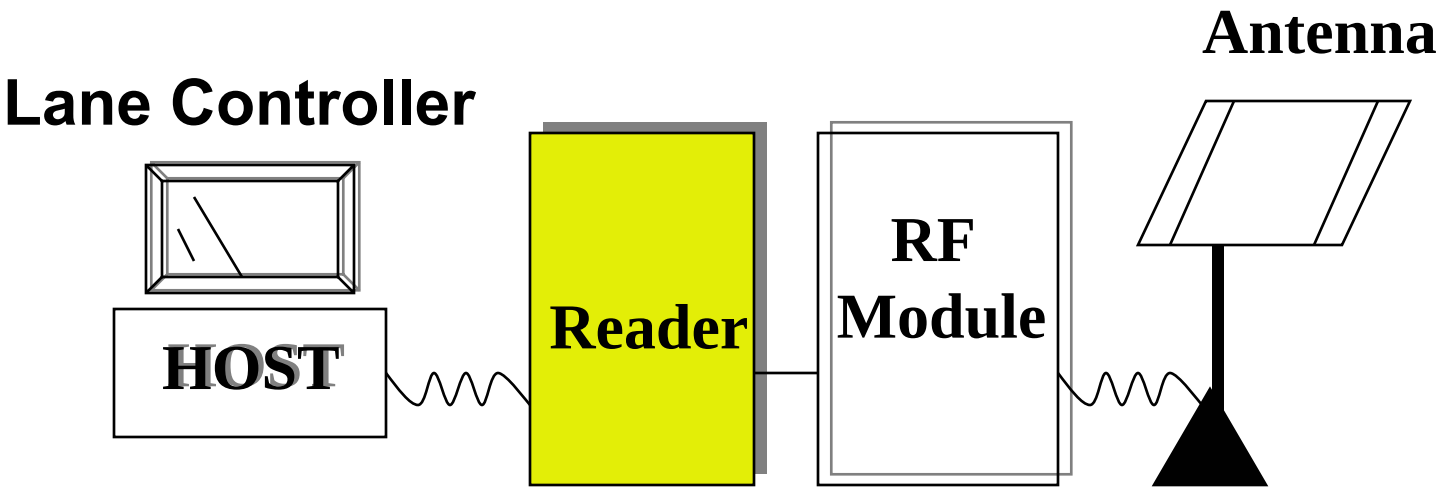


RFID Back End Host



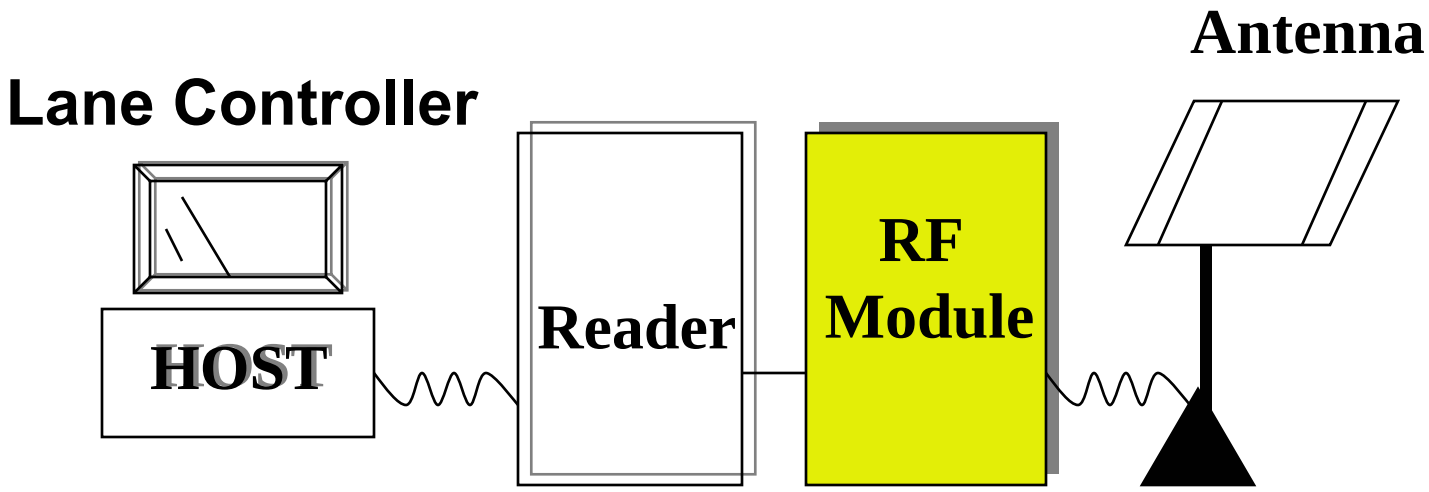
The Host is the Software Database or Lane Controller. Links to the back end computer system. It may be at the site or far a way. The Reader can connect to the Host via Serial Cable, Fiber, Ethernet, Radio or Satellite networks.

RFID Reader Receiver Section



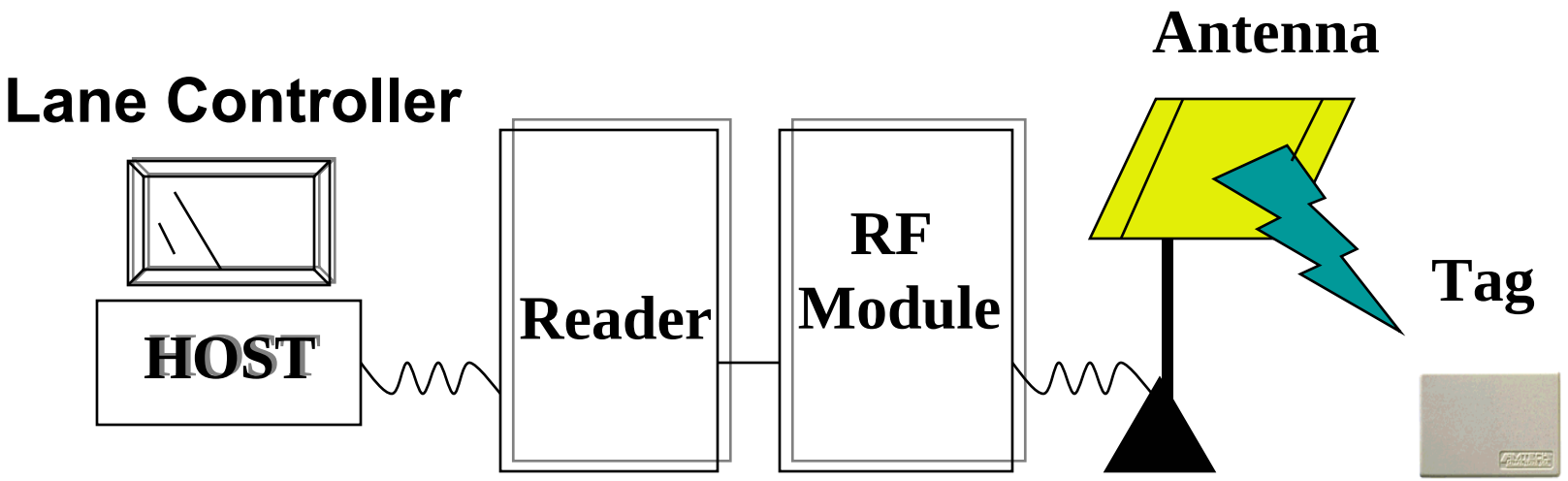
The Reader is at lane with the Antenna. It provides the operational link between tagged objects and information management systems (computer room). It receives a demodulated signal from the RF module, decodes and validates the ID from the Tag, and transmits the ID along with any appended information to the Host computer. It acts as the Tag decoder (logic) of the system and can also control external hardware, such as traffic signals or gates. Normally the Reader and the RF Module are in the same box and reside together.

RFID Reader RF Section



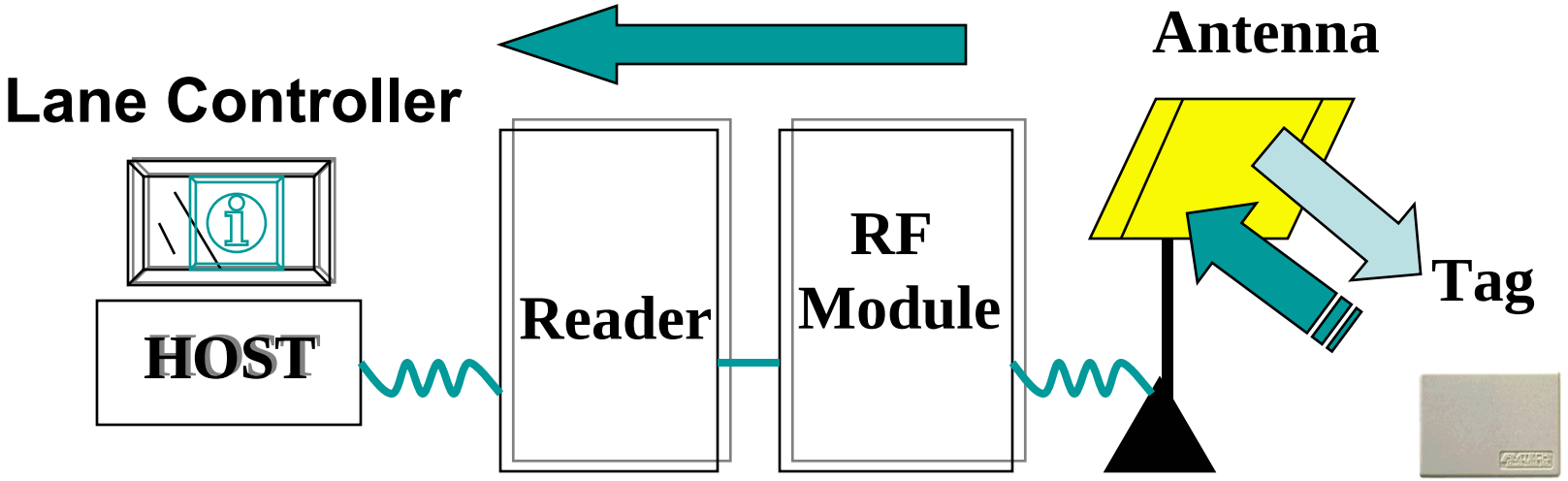
The RF Module is a radio Tx/Rx controlled by the reader. Upon command from the reader, the RF Module generates and delivers an RF signal to one or two Antennas for broadcast. The RF module then receives and demodulates the reflected Tag signal returned through the Antenna and Pre-amplifies and conditions the signal before sending it to the Reader. Controlled by the Reader, the RF module can operate continuously or can be activated in response to a sensor input signal indicating the detected presence of an object.

RFID Antenna



The Antenna is used to broadcast and receive RF signals in the 915-MHz band. Here the Tag is **interrogated** by the Antenna and turns it on. Upon receiving the RF from the Antenna, the Tag then sends its ID back to the Reader through the Antenna.

RFID Tag Data Flow (Tag ID Communication)

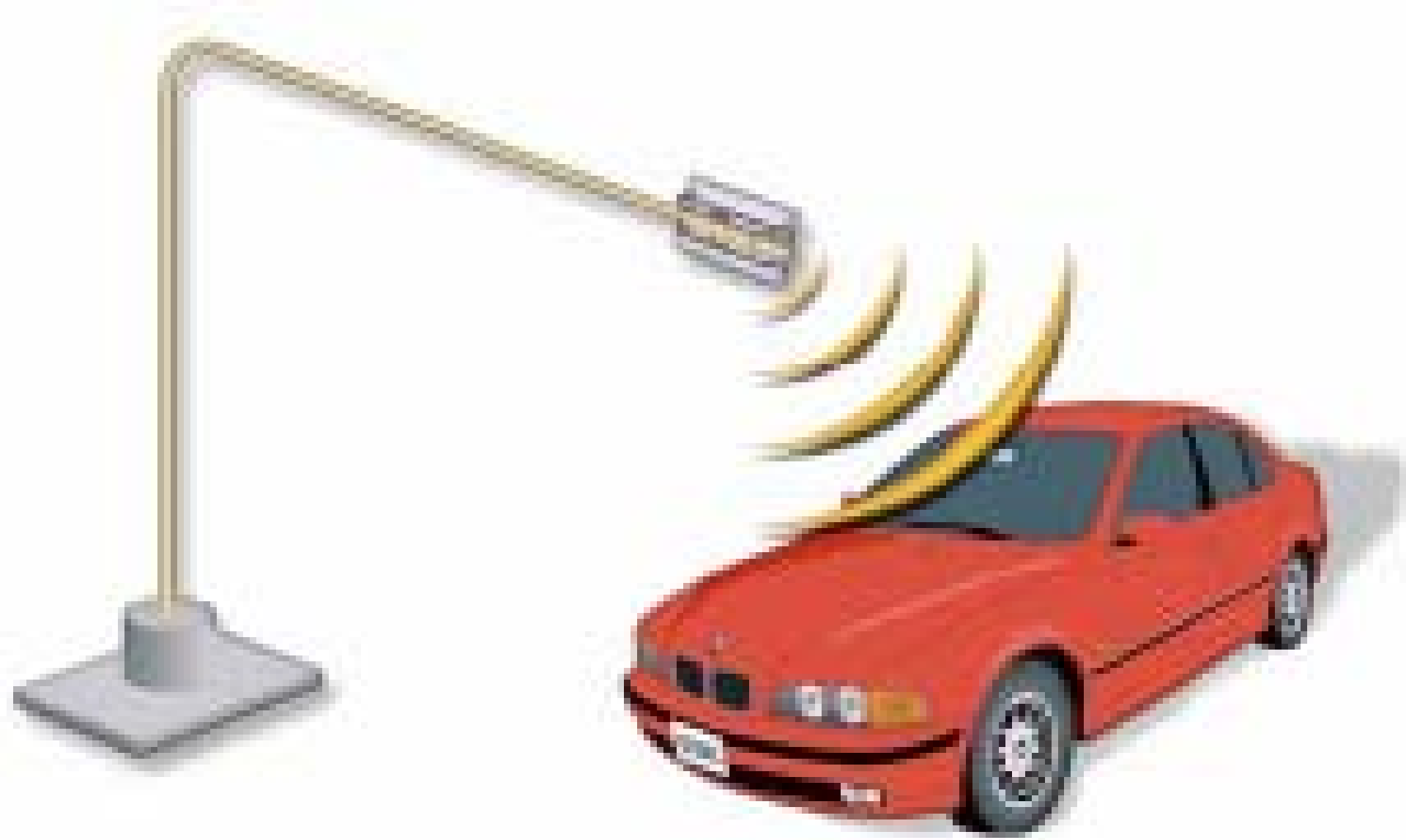


The Antenna captures the T**ag ID** number, at first as analog RF waves, then it is converted to digital information and send via any mentioned network to the Host computer. Every item may be on site but the Host computer may be remote.

Configuration of Fixed Tag Reader (FTR)

- The EVR fixed network is automated compliance screening for vehicle registration requirements. The System uses wireless RFID technology to automatically identify road vehicle compliance status using Readers and Tags to reflect vehicle information.
- The FTR is composed by Antenna, RF Module, Tag decoder, and Power Supply in one integrated package.

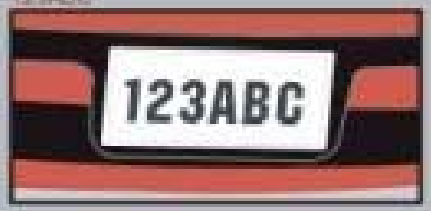
FTR Network



EVR Configuration

VEHICLE REGISTRATION

123ABC

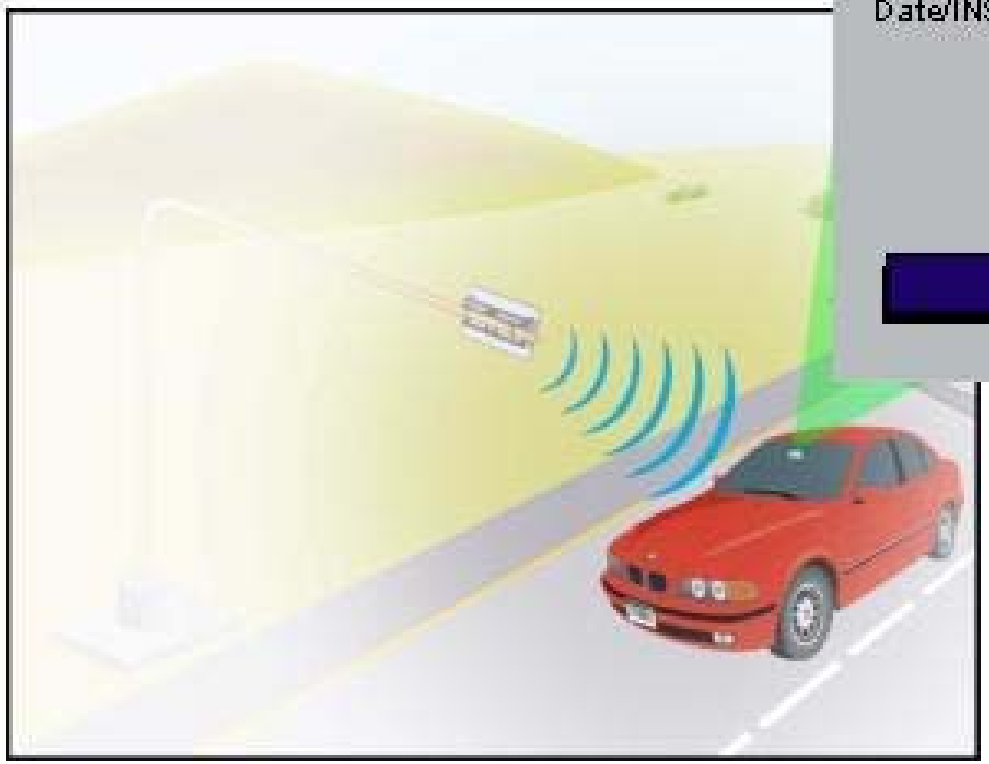


OWNER: Cook, Sam X
VEHICLE: BMW 535
LICENSE: 123ABC
COLOR: Red
YEAR: 1998
VIN: 154637267AWR92

Vehicle Emissions: CURRENT
Insurance: CURRENT
Date/INS: 08/01 -08/02

VALID

INVALID



Example of the type of information that can be read off the tag and into the database.

Fixed Tag Reader (Decoder)

Configuration of Handheld Tag Reader (HTR)

- **The HTR is ideal for RFID requiring an extended read range, multitag sort, read/write capability, and memory capacity not provided by proximity technology. It is suitable for EVR and compliance, rail, fleet, electronic toll collection, HSS, airports, and parking applications.**
- **It offers users the flexibility of writing to eGo tags and verifying tag read exceptions at fixed-reader RFID sites, such as airport and other sites parking facilities. The handheld reader can read from and write to eGo-type RFID tags 1 up to 0.9 meters away, whether programmed as full frame or half frame, up to 1.2 meters away.**
- **It can identify up to 6 eGo tags p/s and can retain up to 100 tag IDs in volatile memory. It allows users to read and store tag information eliminating time-consuming Tag data entry tasks.**

Handheld Tag Reader

Configuration of Roadside Transportable Reader (RTR)

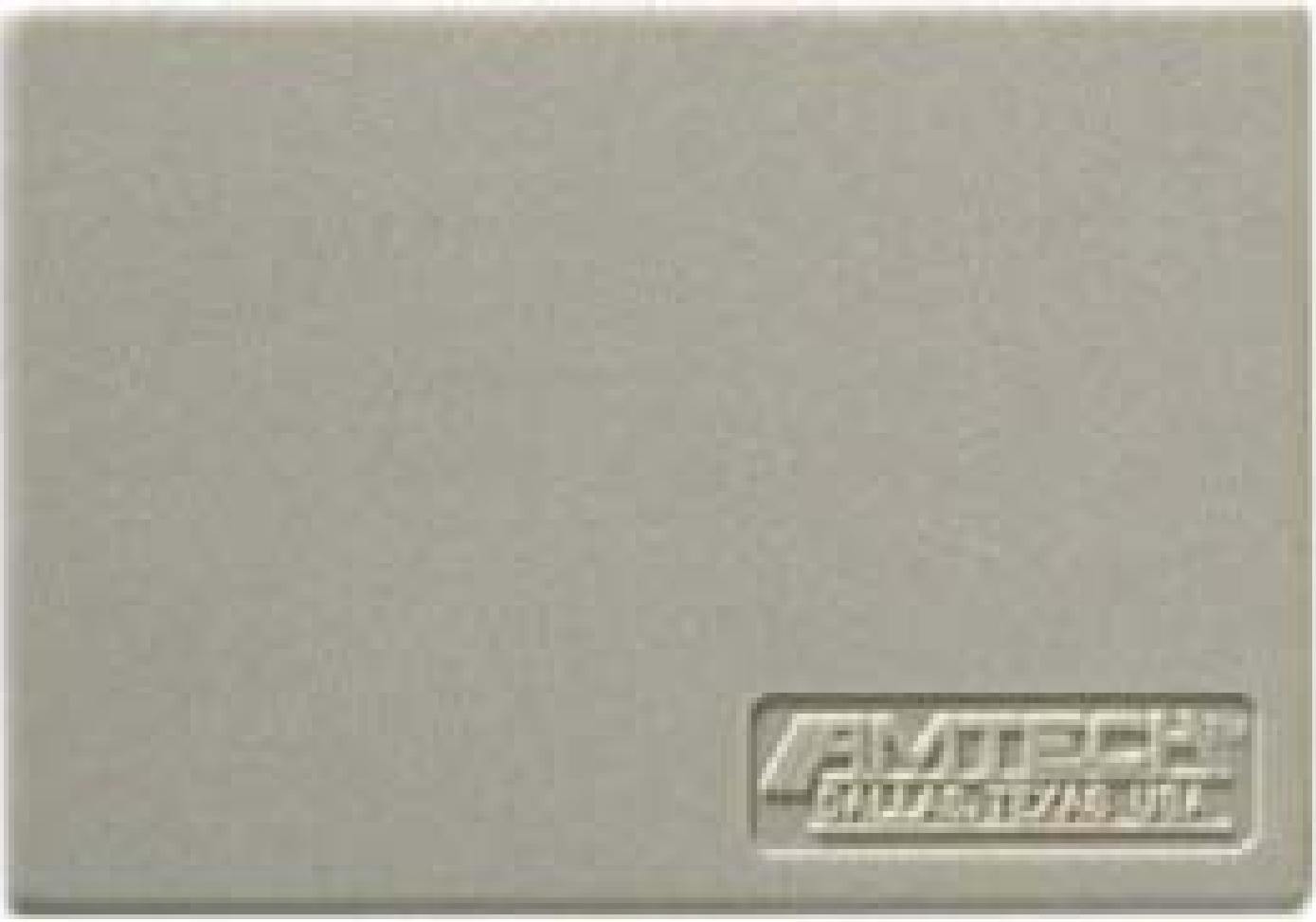
- Performs better monitoring of variable locations to avoid any persistens ”by-pass” of known Reader position
- Provides special operations
- Realise additional help to FTR and HTR applications

Roadside Transportable Reader

Configuration of Toll Tag

- The slim-profile, dual-frequency tag (902 to 928 MHz and 2400 to 2500 MHz) is ideal if the application requires a compact-size tag to be mounted on a non-conductive surface within a protected environment, such as the inside of a vehicle windshield.
- This device encodes the signal received from a Reader system with an identification number or a data message. The encoded signal reflects back (backscatters) to the Reader system.

Toll Tag



Configuration of eGo Tag

- The eGo wireless communications tag is a paper-thin device, tamper-resistant windshield sticker Tag with single-chip technology that allows user-defined information to be read from or communicated to the Tag.
- It requires no battery and sets a new price/performance standard for AVI dual-frequency Tags.

eGo Tag

What is EVR?

EVR enables State and National Agencies to automatically detect and screen, via RFID technology, motor vehicles for compliance with State or Provincial registration regulations and to correspondingly automate enforcement actions and includes violation processing for non-compliant vehicles.

Regulation compliance checks could include:

- Vehicle registration,
- Emissions,
- Mechanical safety,
- Valid owner insurance, and
- Outstanding unpaid violations.

Additionally, EVR enables automated identification and collection of vehicle data to facilitate data capture accuracy and efficiency in officer-generated report generation (accident reports and / or traffic violation citations).

Why EVR?

- **Automate Compliance Screening - Manual compliance monitoring methods are sporadic and usually depend upon other incident detection events, resulting in minimal sampling of the total vehicle population.**
- **Recoup Lost Revenues - Government agencies lose millions of Rands each year due to an estimated 7 to 15% of vehicles not compliant with annual registration requirements, which trickles down to tax payers and law-abiding citizens who foot the bill.**
- **Improve Public Safety and Security - Thousands of unsafe, uninsured and/or excessively polluting vehicles in violation of government regulations are on our roads at any given time. The inability to track and monitor vehicles in secure areas and throughout various transportation corridors limits national security goals.**

EVR Utilization

When is EVR Utilized?

1. During Inspection Time

Motorists can take advantage of increased speed, convenience, and accuracy as a result of EVR at inspection centers. Using EVR, vehicle information such as VIN, make, model, and license plate number is automatically transmitted to a database for inspector to validate data and perform inspection. After inspection, updated information is loaded to a DMV database for inter-agency use.

2. Handling Vehicular Offenses

Vehicle information can be compared in mil/sec in DMV's database to determine if the vehicle is stolen, non compliant with governmental requirements, or if there are unpaid offenses. Incident reports or tickets can be generated automatically via violation-processing center.

3. In Response to Accidents

EVR is used to automatically collect driver and vehicle data, ensuring accuracy for reports, and allowing officers to concentrate on the people involved, including other aspects in accident.

When equipped with a portable printer and laptop, accident reports can be printed at the scene and given to drivers. EVR is also an added advantage to mobile data transmission abilities in many patrol cars.

4. **Expanded Coverage in Times of Crises**

Increase the level of control coverage without significantly increasing the number of agents and ensure public safety using spontaneous monitoring in the face of Alerts, Homeland Security Threat Level Advisories, or special events that cause traffic congestion.

How does EVR Impact DMV Agencies?

EVR relieves operational burdens and improves fiscal performance for state DMV agencies providing an equitable means to enforce and strengthen the integrity of vehicle registration law by:

- Automating the registration enforcement system
- Eliminating sporadic enforcement
- Reducing avoidance of fees
- Reducing non-insured vehicles
- Ensuring state inspection requirements are met

How does EVR Impact Law Enforcement Agencies?

EVR provides law enforcement with the ability to increase vehicle registration compliance. EVR strengthens law enforcement capabilities by enabling:

- Faster apprehension of serious law offenders
- Automated detection and citation generation of non-compliant vehicles
- Easy access to, and sharing of, inter-agency information
- Officers to be alerted prior to approaching a vehicle with a history of incidents

Who will Utilize EVR?

1. State and Provincial Departments:

DOD, DOT, Secretariat for Safety and Security, SA Police Service, Department of Home Affairs, NIA and all other departments need to control their vehicles, gates and parkings.

2. State and Private Organizations:

Transnet, ACSA, Hospitals, Shopping and Sport Centres, Power/Chemical Plants, Oil Refineries, Corporate Facilities, Gates and Parkings, and so on enabling better management and monitoring of vehicle activities.

Thanks for your attention!!!

Please, any questions?!

The End

Thank you for your attention!

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