

VESPLEX™ IR Bringing Short-Range Wireless Comms to Trucking

With today's ultra-sophisticated trucks offering megabits of data on fuel usage, engine status, brake diagnostics, and cargo information, truck fleets are struggling to use the data effectively. One hindrance has been the need to physically offload the rich on-board store of information, which in many cases requires a technician to connect cables and download data into maintenance shop computers. This constitutes a well-known "weak link," since operations in a fleet maintenance yard can be hectic

*and hardware/human failures can occur for any number of reasons. **Vehicle Enhancement Systems (VES)** has developed the VESPLEX IR system to provide an automatic wireless communications approach to address these problems and get the data off the truck and into fleet management systems ... and there are plenty of other applications, too. **iVSource** asked **Alan Lesesky**, President and Founder of VES, to highlight the potential for this new system. — Ed.*

The **VESPLEX™ IR** system is a dynamic communications system that uses infrared (IR) technology. The VESPLEX IR technology evolved from an earlier concept, known as VESPLEX™, originally derived from VES' research and development into multiplexing tractor/trailer connectors. VESPLEX enables a much broader range of communications for a variety of applications that previously required wired connections between a vehicle and a base station. VES has been in the process of developing this wireless communications with the intent of making VESPLEX IR an industry standard.

The product enables data transfer between a stationary base unit (SBU) and a mobile truck unit (MTU) via an infrared link. Simply put, an onboard vehicle component converts the existing SAE J1587 standard serial line data into the worldwide IrDA standard, using a special transceiver chip and software. The base unit then converts the signal back to the original J1587 format, passing along the data just as if there were a direct wired connection. The system completely eliminates the need for the driver or technician to download data by wire.

Infrared has certain inherent transmission/reception properties that are superior to those of

other forms of data communications. Unlike RF (radio frequency), which has a wide range of transmission requiring sophisticated -- and therefore somewhat expensive -- equipment, IR has a narrower and more defined spectrum that can be increased or decreased to target a specific "receiving zone", i.e. MTU. Thus, infrared allows for peripheral physical mounting using simpler and more cost-effective equipment to generate accurate, specific, selected isolated data transmission(s) and reception(s).

The design of the VESPLEX IR is based on IrDA® infrared transceiver chips that have been successfully tested with bi-

directional data up to 9600 bits per second. The IrDA standard is a worldwide communications protocol for infrared devices, enabling cordless connectivity between devices wherever sophisticated communications is required.

Mobile and Stationary Units Automatically Communicate

As mentioned above, the system consists of a *Stationary Base Unit* (SBU) and a *Mobile Truck Unit* (MTU).

The SBU has been designed for installation on a variety of fixed, application-determined locations, such as (but not limited to) fuel islands, entry gate posts, or service bay walls. It consists of an electronics module and an integral transceiver “eyeball” with a 90-degree conical field of view at ten feet (3 m) or less.

Powered by 110VAC, the SBU continuously transmits a signal from the eyeball designed to “wake up” any truck system that enters its field of view. Once the SBU has “awakened” a truck system, it receives the relevant data bus information transmitted from the truck in an IrDA format and converts it back to data bus format or, if appropriately pro-

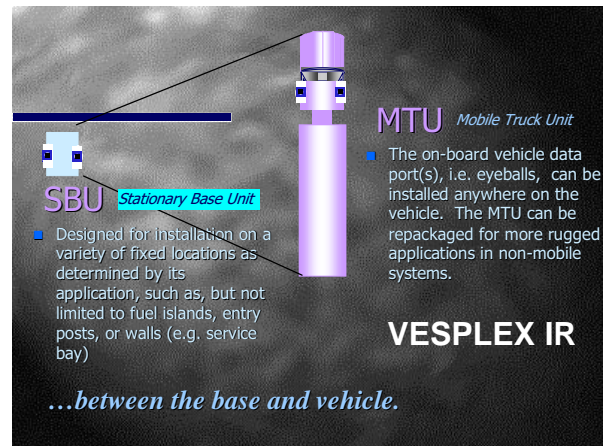
grammed, into a suitable network protocol. If multiple truck “eyeballs” are within the field of view of the SBU, it will sequentially interrogate multiple vehicles without cross-talk or data confusion.

The MTU, on the other hand, consists of two transceiver “eyeballs” mounted on either side of the truck that receive and transmit IrDA information from the electronics module. The truck data

electronic module is mounted in an inconspicuous area within the cab; the eyeballs are mounted to the exterior of the vehicle as determined by preference and application specifications.

Bi-Directional Operations Planned

The VESPLEX IR has been designed using transceiver chips -- successfully tested and now being commercialized -- to process bi-



port is normally closed unless “awakened” by a wake up signal from an SBU transmitting within the field of view of either of the truck “eyeballs.” The VESPLEX IR MTU consists of an electronic module housed in a black box (6” x 6” x 1.5” approx) (15 cm x 15 cm x 4 cm), and two eyeballs (3.5” x 2” x 2” approx) (9 cm x 5 cm x 5 cm). The

directional data up to 9600 bits per second. Currently, the VESPLEX IR technology supports communications at distances of sixty feet (18.5 m) in non-sunlight conditions, and thirty feet (9.2 m) in bright sunlight conditions. However, the fully developed system will support communication speeds up to 4 megabits per second.

VESPLEX IR will transfer any data, regardless of selected manufacturer software; it has been designed to operate with unlimited system configurations and is therefore software independent. VESPLEX IR meets or exceeds the applicable environmental protocol SAE J1455 as set forth by the Society of Automotive Engineers, and has been designed to communicate in temperatures ranging from -40°F to 185°F.

are transmitted between the two devices. The code is designed such that it selects the reception of only one MTU at a time. When the SBU senses that the data connection has ceased, it instantaneously transmits code searching for the next vehicle, allowing the SBU to service multiple vehicles consecutively without cross talk.

Fleets Examining Multiple Applications

VESPLEX IR will enable

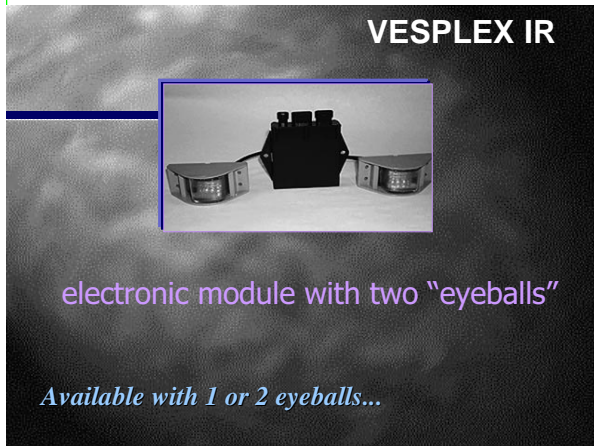
trailers as well as down-load operational data (e.g. fuel used, fuel economy, average speed, max speed, etc.).

Fault Code Monitoring: Engine and other fault codes (e.g. air conditioning codes) currently resident on the data bus could be automatically downloaded whenever the vehicle is refueling (or when passing through an entry gate).

Vehicle Service Diagnostics: If installed in a service bay, the service writer could have full access to all relevant fault codes and history before the driver even exits the vehicle. Similarly, the system can be used to interface with commercially available service tools.

Vehicle Computer Programming Changes: Any SBU could automatically update applicable software in a vehicle/engine.

Weigh Station Communications: Subject to appropriate regulatory changes, base stations could be installed at truck weighstations for transmittal of vehicle identification, vehicle weights (if equipped with an approved on-board weighing system) and brake stroke condition (if suitably equipped).



On-Board Vehicle Data Protected

A unique software feature of the VESPLEX IR allows the on-board vehicle data port (MTU) to remain in a "closed" position. MTU data port will only open in the presence of the off-board data port (SBU), when a unique sequence of codes

a much broader range of communications for a variety of applications that previously required wired communications between a vehicle and a base station:

Asset Tracking: Installation at an entry/exit gates would enable a fleet to track the movement of tractors and



Alternative to Satellite Communications:
VESPLEX IR would enable lower cost transmittal of non-critical data over telephone lines (the SBU could be interfaced with a modem for land communications).

Commercial Truck Stops:
Universal SBUs could be installed at truck stops on a pay-per-use basis to enable fleet to truck communications and vice versa. These systems would be programmed to recognize the applicable truck/fleet and transmit via modem any desired information.

Manufacturing Facilities:
Programming of electronic products of items such as vehicle engines, transmissions, and electronic subsystems, thus eliminating the use of wires that run alongside the production line.

Strong Industry Interest

Several industry OEMs have enthusiastically praised the design and concept of the VESPLEX IR technology and consequently have expressed their desire to join VES as frontrunners in bringing this product to the market. Units are

being evaluated currently by several fleets and are being integrated within supplier product lines. VES is in the process of negotiating with several marketers / distributors for the product, and is looking to partner with a manufacturer with worldwide marketing and distribution channels, as it wishes to make the VESPLEX IR system an industry standard. VES believes that widespread application of the product will reduce production costs, precipitate further R&D efforts, and foster other potential applications.

For more information, contact
VES at vesi@rhtc.net.

About VES:

Since the company's inception in 1991, Vehicle Enhancement Systems (VES) has dedicated considerable resources towards the enhancement and modernization of tractor/trailer communications. Several patent applications have already been submitted by VES for the exclusive development of a low cost wireless communication product known as VESPLEX™. This concept continues to evolve and now includes the dynamics of infrared (IR) technology, the VESPLEX™ IR.

Led by founder and president Alan Lesesky, a 25-year veteran of the trucking industry, VES offers a full array of engineering design services including research and development, testing, and consulting. VES' "systems" design approach, which integrates electronic, electrical, and electromechanical applications, has attracted an extensive customer base that includes OEMs, fleets, suppliers, government, and industry agencies. VES has been contracted to develop, design, prototype, and test a variety of subsystems (electrical, electronic, pneumatic, communication, instrumentation, etc.) on heavy-duty vehicles. The company is located in Rock Hill, South Carolina.