Emergency Vehicle Alert System

Transmitter Unit
Installation and Operating Instructions

Preliminary Draft, July 2007

Energy and Life-Saving Devices, Inc.
1310 N. Pierce Rd.
Spokane Valley, WA 99206

FCC NOTICE

This device (FCC ID: VEQMA-T1) complies with the rules set forth in Part 15 by the Federal Communications Commission. Operation is subject to the following conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.
3. An approved antenna must be connected to the device's RP-SMA connector.
4. The device must not be modified in any way.

Any changes or modifications could void the user's authority to operate the equipment.

MertsAlert Transmitter unit, FCC ID: VEQMA-T1

Contact:

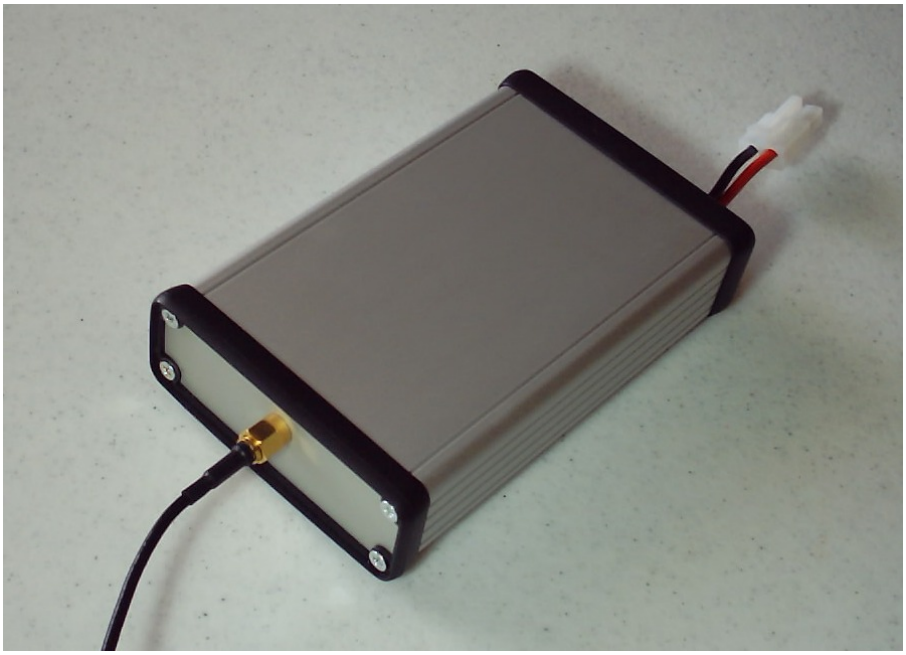
Energy and Life-Saving Devices, Inc.
1310 N. Pierce Rd.
Spokane Valley, WA 99206
509-926-9930
http://www.mertsalert.com/

Introduction

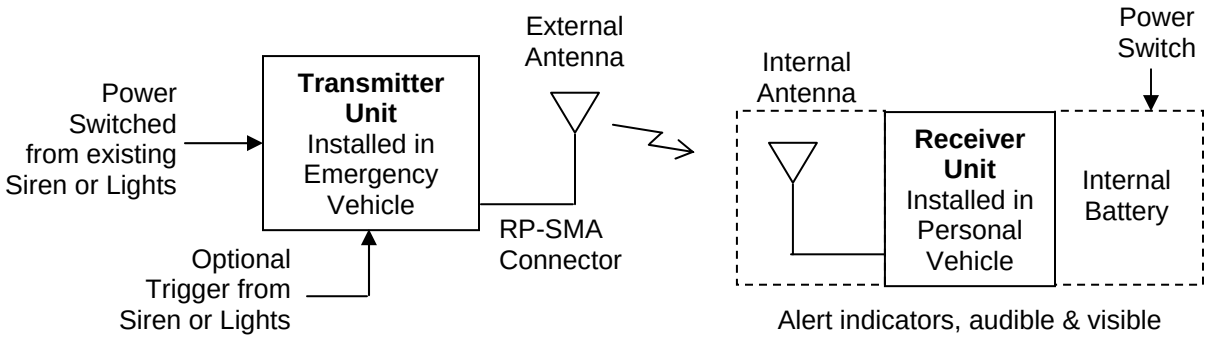
This manual includes installation information and operating instructions for the MertsAlert Transmitter unit, Model TA-1.

The MertsAlert system contains a wireless transmitter and receiver pair which functions as a mobile system to warn drivers of nearby emergency vehicles, such as ambulances and fire trucks. The purpose of the system is to decrease the instances of automobile accidents by alerting drivers with a visual & audible signal present within their vehicles.

The consumer portion of the system is the MertsAlert receiver unit for use within personal vehicles. The receiver is powered by a replaceable internal battery, contains an internal antenna, and has a minimal user interface for volume control and other features. The commercial portion of the system is the MertsAlert transmitter unit for permanent installation in a fleet of emergency vehicles. The transmitter is powered from the emergency vehicle's power, and is triggered automatically by the vehicle's siren device or emergency lighting device. An external dipole antenna may be mounted vertically on the vehicle or near a window.



MertsAlert System Block Diagram



MertAlert Transmitter Unit

MertAlert Receiver Unit

Theory of Operation

When the alarm system in the fire truck or ambulance is turned on, power is also applied to the MertsAlert transmitter. There is no additional procedure needed for the vehicle operator. A unique, low-power radio signal is transmitted periodically on an unlicensed band of radio frequencies. The signal contains information to identify the source of the alert, and is encoded to minimize interference from unrelated transmitters using the same frequency band.

The MertsAlert receiver detects and decodes the transmitting signal. If the source is identified as a MertsAlert transmitter and the signal strength is adequate, the alert signal will warn the driver of a nearby emergency vehicle. The range is typically 2 or 3 city blocks in an urban area or approximately 1/3 mile in a rural setting.

Transmitter Installation

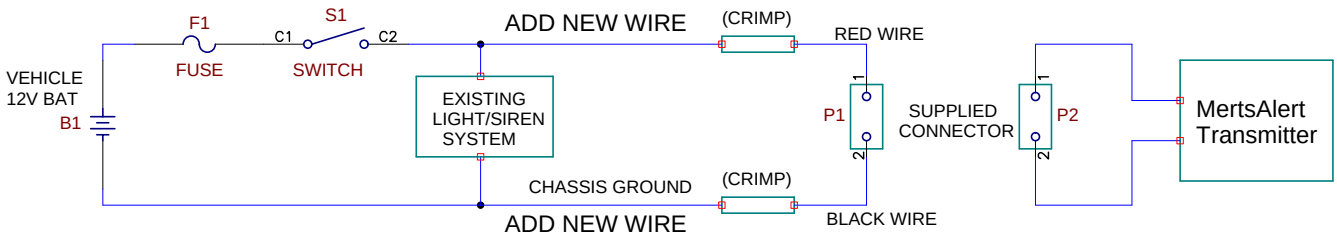
PHYSICAL MOUNTING

The MertsAlert transmitter is housed in a small, rugged aluminum enclosure for permanent installation in an emergency vehicle. The box may be strapped under the dash or mounted on a bracket wherever convenient and non-obtrusive inside the vehicle. There is no significant heat or radio interference produced by the unit.

POWER CONNECTION

The only required connection, other than the antenna, is the power input. The unit is designed to be powered automatically whenever the vehicles emergency lights or siren is activated.

A latching disconnector is supplied on the unit to allow easy removal and replacement after the installation is done. The mating connector is supplied with crimp-type barrel termination. Connect this power signal to the switched power that goes to the vehicles alarm system. Locate the switch and connect a wire to the side of the switch that goes to the siren/light system. The details of the electrical wiring will vary from one type of vehicle to another. The following schematic shows a generic wiring diagram.



ANTENNA CONNECTION

The antenna supplied with the MertsAlert transmitter may be used with its attached 7ft cable or a longer cable may be ordered if necessary. Only connect the antenna with a cable supplied and approved by the MertsAlert manufacturer! The antenna mounting has two options: roof-mounted (permanent) or window-mounted (temporary). Other physical mounting options are possible; please contact the company for custom installation procedures for specific emergency fleet vehicles.

Specifications

Configuration	Transmit-only unit and Receive-only unit, operating as a pair.
Frequency of operation	ISM Band Fixed center frequency: 915 MHz
RF Power Output	-1 dBm, spread over a 500KHz bandwidth
Transmitter duty cycle	10% Duty Cycle on a single channel when alert is activated. No transmitted power when an alert is not activated.
Modulation	Wideband FSK with additional spectral randomization using digital encoding algorithms. Deviation is +/-235KHz.
Antennas	Transmitter: - single, external dipole antenna, omni-directional pattern, 2dB gain. Antenna mounting may be either temporary inside a window or permanently mounted on roof (whip style). Both types use reverse-polarity SMA connectors and RG-174 coax cable. Receiver: - single, internal, grounded-line patch antenna.
Power sources	Transmitter: nominal 13.7V vehicle power source. Functional operating range of 3.5V to 16V. Current requirements: 30mA, typical. Receiver: nominal 9V user-replaceable battery. Functional operating range of 3.5V to 16V. Current requirements: 3mA typical average during scan, and 15mA typical during alert.
Certified use	United States only. FCC Part 15.249. FCC ID: : VEQMA-T1