

VLU11 Operation description

The VLU11 is a stolen vehicle recovery system (SVR), a single box enclosure incorporating a processor, VHF Silent Radio Transceiver, GPS receiver, wireless data modem in addition to BLE chip transceiver, vehicle-rated power supply.

VHF LoJack:

Transmits on a radio (RF) carrier frequency of 173.075 MHz.

There are two modes of operation for the low jack radio:

The tracking mode is activated whenever the vehicle is reported as stolen. In tracking mode the radio transmits for 200 ms every 1 s.

Vehicles with the system installed send a 200 millisecond (ms) chirp every fifteen seconds on this frequency when the car moves without a proper identification of the car key.

Under all other conditions the radio is in receive only mode.

The max power setting to the transmitter is as per settings used in testing and in the production is 33.62 dBm. The CC1125 low jack radio chip is set to 16 dBm output power. The power amplifier stage will amplify by 17.5 dB.

The expected gain of the whip antenna is about -10 dBi.

Lowjack supports FSK modulation

What is the LoJack Stolen Vehicle Recovery System and how does it work?

The LoJack® product is a battery operated, stolen vehicle recovery system that helps law enforcement to track and recover your stolen vehicle. A LoJack® Unit is hidden in your vehicle by a certified technician and your vehicle is registered in the LoJack database. When you file a stolen vehicle report with law enforcement and the theft is recorded in the national stolen vehicle database, law enforcement computers send a silent radio signal to your car. If your vehicle is within a LoJack coverage area, the LoJack Transceiver in your stolen vehicle can be automatically activated, allowing law enforcement to track and recover your vehicle.

Are there different LoJack® Systems?

LoJack Products include the LoJack® Stolen Vehicle Recovery System, which helps law enforcement **track** and recover your vehicle after you report it stolen, and the LoJack Early Warning® System, which is an additional layer of protection on top of the LoJack® Stolen Vehicle Recovery System. Early Warning contacts you if your car has been moved without your Key Pass present (subject to vehicle being in LoJack coverage areas; please see here for details)

BLE (Bluetooth LE): is optional and use 2.4GHz designed by CalAmp wireless network based on the Texas instrument Chip CC2640 and operation range on 2402 - 2480 MHz bands and using Custom designed antenna with peak gain of 5.36 dBi. The max power setting to the transmitter is as per settings used in testing and in production is 0 dBm

The cellular connectivity: provided by uBlox Sara-R410M certified under grants below:

FCC ID: XPY2AGQN4NNN

ISED: 8595A-2AGQN4NNN

The module without modification as delivered by UBlox is used and hence the default module power settings are delivered to the antenna.

The used antenna is also a custom design for the product with 2.58 dbi peak gain.

Regulatory Information

Human Exposure Compliance Statement Pursuant to 47 CFR § 24.52 of the FCC Rules and Regulations, personal communications services (PCS) equipment is subject to the radio frequency radiation exposure requirements specified in § 1.1307(b), § 2.1091 and § 2.1093, as appropriate.

CalAmp DataCom Inc. certifies that it has determined that the VLU11 complies with the RF hazard requirements applicable to broadband PCS equipment operating under the authority of 47 CFR Part 24, Subpart E of the FCC Rules and Regulations. This determination is dependent upon installation, operation and use of the equipment in accordance with all instructions provided.

The VLU11™ is designed for and intended to be used in fixed and mobile applications. “Fixed” means that the device is physically secured at one location and is not able to be easily moved to another location. “Mobile” means that the device is designed to be used in other than fixed locations and generally in such a way that a separation distance of at least 20 cm is normally maintained between the

transmitter's antenna and the body of the user or nearby persons. The VLU11™ is not designed for or intended to be used in mobile applications (within 20 cm of the body of the user) and such uses are strictly prohibited.

To ensure that the VLU11™ complies with current FCC regulations limiting both maximum RF output power and human exposure to radio frequency radiation, a separation distance of at least 20 cm must be maintained between the unit's antenna and the body of the user and any nearby persons at all times and in all applications and uses.

FCC Rules and Industry Canada (IC) regulatory information
Compliance Statement (Part 15.19)

The VLU11 device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by CalAmp could void the user's authority to operate the equipment. Manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment.

Compliance Statement (Part 15.105(b))

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de

brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Class B digital device notice "CAN ICES-3 (B)/NMB-3(B)" RF Radiation Exposure Statement

This equipment complies with the FCC/IC radiation exposure limits set fourth for mobile transmitting devices operation in an uncontrolled environment. End users must follow the specific operating instructions to satisfy RF exposure compliance. The equipment should only be used where there is normally at least 20cm separation between the antenna and all person/user. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter, except tested built-in radios.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Cet appareil et son antenne ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, exception faites des radios intégrées qui ont été testées.