

NexTraq™



The NexTraq VT-2200 Installation Guide



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Introduction

Following the purchase of VT-2200, there will be several factors to consider prior to its installation, including placement of the VT-2200 hardware and the selection and placement of the antenna(s). This installation guide is designed to provide instructions for the installation of the VT-2200 hardware for use with the NexTraq™ Fleet Tracking platform.

This document is designed for new and experienced installers and their managers to help overcome any questions associated with VT-2200 installations.

This installation guide covers the following:

- Equipment and Tools
- Types of Antenna Mounts
- Placement of VT-2200
- Installations
- Troubleshooting

VT-2200 Hardware

The VT-2200 consists of a nylon plastic engineered housing containing the electronic components. Additional equipment includes a separate power connection cable and a modular cellular GPS antenna.

Specifications for the VT2200 can be found in Appendix A.

VT-2200 is powered by an external power supply; vehicle power (8-24 volts). The device is designed to be installed in the vehicle's cab.

The unit is not waterproof or dustproof, nor is it designed to be placed near or on heat-generating sources (ex: in the engine compartment, attached to the heater).



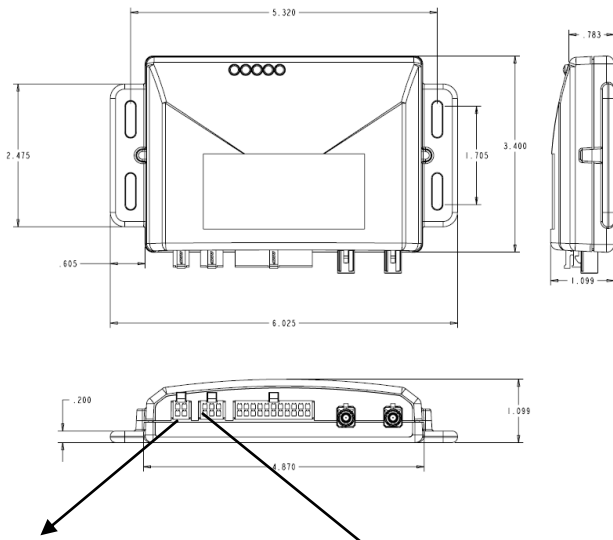
Fig. 1 – VT-2200



External mounting tabs are provided that allow VT-2200 to be secured to the chassis of the vehicle. If you are replacing a Wahoo 2, VT-2200 will fit in the area you have the Wahoo 2 secured. Additional equipment is required to properly mount the VT-2200 hardware and is provided in the installation kit for each VT-2200.

The VT-2200 connector configuration is composed of dissimilar connectors to eliminate the chance of an installer incorrectly wiring the unit. Five connectors make up the VT-2200's configuration. The connectors are power, GPIO, a serial port interface, GSM antenna connector and GPS antenna connector.

VT-2200 Wiring Diagrams



Pin Out Power		
Pin	Signal	Color
1	Ground	Black
2	No Connect	No Connect
3	Ignition	White
4	Battery	Red

Pin Out IO		
Pin	Signal	Color
1	Positive Edge Signal	Green
2	Negative Edge Signal 1	Yellow
3	Negative Edge Signal 2	Blue
4	Output 1	Orange/White
5	Output 2	Blue/White
6	No Connect	No Connect

Fig – 2 -Schematic of VT-2200

Equipment and Tools

The following is a general list of tools and supplies required for a VT-2200 installation:

Recommended Equipment

- Digital Volt and Ohm Meter (DVOM)
- Screwdrivers (standard, Phillips, Torx, Hex)
- Wire Strippers/Wire Cutters
- Coax Stripper
- Pliers
- Razor Knife
- Cordless Drill
- Drill Bits
- Wire Snake
- Crimping tool
- Upholster Removal Tool
- Flashlight
- Standard & Metric Socket Set

Recommended Supplies

- Electrical Tape
- Double-sided Tape
- Velcro
- Silicon Sealant
- 5 Amp Fuses
- Ground Terminals
- Tie-wraps
- Grommets
- Crimp Connectors
- Butt End Connectors
- Sheet Metal Screws
- 18-gauge Wire

Antennas

Among all installation variables, antenna location has the greatest impact on the performance of the radio module. Great care should be taken before installing the antennas. The standard antenna type used for the VT-2200 is a combination antenna. Two FAKRA connectors provide connection for GPS (blue) and GSM (violet).



Fig. 3 – Combination Antenna

The combination antenna combines the cellular and GPS antennas into a single antenna package. The combination antenna can be mounted on glass, on the dashboard or as a covert installation.

Installation Types

Glass Mount

When mounting the antenna, it should be oriented with the top section (the flat side) facing the sky. **Please note that the antenna specifies which side is the bottom.** The glass mount provides the best reception for cellular and GPS. It is recommended that the antenna have a view of at least 40 percent of the sky. The antenna needs to be mounted as horizontal as possible. The antenna should not be mounted behind windscreens, ladder racks or other radio transmission antennas.



Fig. 4 0 - Glass Mount

Dashboard Mount

The antenna should be mounted on the dashboard with a view of at least 40 percent of the sky. It is recommended that the antenna be as horizontal as possible. When mounting the antenna, it should be oriented with the top section (the flat side) facing the sky.



Fig. 5 – Dashboard Mount

Covert Installation

When mounting a covert installation, care should be taken not to mount that antenna shielded by metal. However, it can be mounted on non-metallic materials such as plastic, fiberboard, fiberglass, etc. The antenna orientation should be that the top part of the antenna faces the sky.



Fig. 5 – Covert Mount



The minimum distance between other transmission antennas should be at least 18 inches for all antenna installations.

Vehicle Wiring

The 4-pin Molex connector on the back of VT-2200 contains the power, ground and ignition leads. The supplied power cable plugs into the Molex connector. The opposite end of the cable has a black wire for ground, a red wire for vehicle power and a white wire for vehicle ignition.



Fig 6 – Power Harness

Ground

Make sure the ground point is welded, not bolted, to the vehicle's dash support structure. Strip enough slack in the power cable to allow sufficient length as to attach the black wire to a solid metal surface that is welded, not bolted to an under dash support. Add a grounding ring connector to the end of the black wire, crimp it and screw it securely onto a non-painted metal frame or plate. Temporarily connect VT-2200 to ensure it is on constant power before your final placement.

Power

Find constant 12+v wire and slide crimp over wire. Slide red fused wire from NexTraq power cable all the way into the holder and crimp with pliers. Cable tie the fused wire to the lead wire. Next, find an ignition wire that is 12+v when ignition is in the "ON" position and open or ground when ignition is "OFF." Slide crimp onto lead wire and the insert fused ignition lead into side of crimp and crimp with pliers. Cable tie the fused wire to the lead wire. Optional step: apply torque seal to all connections.

A constant power source is essential in the retention of GPS data inside VT-2200, and is required. Be sure to verify that the power source you have chosen will work when the vehicle is not running, and the keys are removed. **Verify a 5-amp fuse is inline with the power and ignition lead.** This will protect the unit against power surges and voiding the warranty.

Ignition

An ignition source is also required for proper installation of VT-2200. Connect the white wire to the vehicle ignition source. This wire can be found in close proximity to the main power wire. Be sure that the tapped wire is a vehicle ignition wire and not an accessory wire. Some vehicles have wires that are only powered when the vehicle is running, this is the preferred wire. Ignition wires maintain a voltage through the crank. Note: turn off all other vehicle accessories including A/C, radio, etc. to ensure a good ignition source is found.

The best place to pull power is at the ignition harness leading to the ignition switch.



If there are any questions on what wire colors to use, you can contact Customer Support at 855.358.6178.

Late Model Vehicle Installation

When installing VT-2200 in any late model vehicle, verify all connections using a digital multi-meter. In some instances, obtaining power will require direct connection to the battery. CAN-based vehicles will contain data lines that will show voltage on the line itself (usually 5V), but the line is actually a data line. Most late model vehicles can utilize CAN-based ignition and accessory circuits so the ignition line running down the center of the steering column is actually a data circuit. Connecting VT-2200 to these circuits can and will cause the unit to malfunction and may damage the OEM electronic modules within the vehicle. As a rule of thumb, always use the thickest wires as they carry the most amperage. **If there are any questions, please contact Customer Support at 855.358.6178.**

See Appendix A for specifications relating to power, ground and ignition.

VT-2200 Location

VT-2200 placement is dependent on several factors:

- The type of vehicle
- The placement of the antennas
- The availability of a constant 12-volt power supply

In most vehicles, the VT-2200 can be placed inside or underneath the dashboard. The vehicle's radio can be removed and the unit placed behind the radio. A kick plate can be removed and the unit can be safely secured to a firewall or zip-tied onto a permanent fixture. VT-2200 can be secured underneath the dashboard on either the driver or passenger side, in any location that will not interfere with the safety of vehicle operation. The device can be secured by the individual tie-wraps or by self-taping screws or Velcro tape.



Fig. 7 – VT-2200 Location

Avoid placing VT-2200 near moving parts, or next to any vehicle pedals. Always consider the placement of antennas and be sure the cables can reach the desired location of the mobile. Permanently mount the VT-2200.

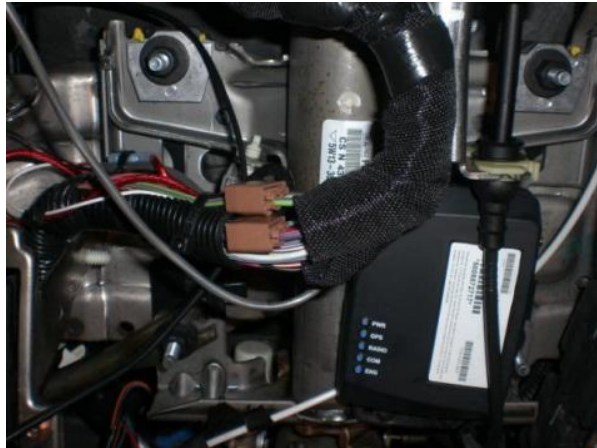


Fig. 8 - VT-2200 Placement

Connect the radio, GPS and power cables to VT-2200. Wrap any extra cable neatly with tie-wraps or electrical tape. Replace any paneling or molding that was removed in the running of any antenna wires or power cable.



Fig 9 – VT-2200 Mounting

Post-Installation Testing

VT-2200 registers in the NexTraq platform when radio, GPS coverage and ignition are switched on. A determination whether the unit is in coverage is provided by the presence of solid blue



lights on the face of VT-2200. When VT-2200 is operating correctly, there should be a solid blue light on PWR, GPS and COM. **Note:** the radio LED will flicker while transmitting.

1. Login to the NexTraq application
2. Verify the VT-2200 is operational and displayed in the application.
3. Check the recent history in NexTraq to verify the unit is operational.

If you have a Web-enabled cell phone or Internet Explorer, go to <http://www.marcusinstall.com> and verify operation. Login information is required to verify this operation. If you don't have your login information, please contact customer service.

Installation Troubleshooting

VT-2200 will not power up.

- Check connection to power supply.
- Check fuse holder for voltage.
- Check with volt meter that there is 12-volts on the red power wire at the plug end.
- Make sure the unit is properly grounded snugly to a non-painted metal surface (chassis ground).

Vehicle will not appear in NexTraq Web application.

- Be sure PWR, GPS and COM are on and solid blue. Check that the ignition light tracks the vehicle ignition.
- Check to see if the radio light flickers when the ignition is turned on or off.
- Check power on mobile.
- Be sure to view the correct mobile in the NexTraq Web application.
- Check antenna connections and placement.
- Drive the vehicle for more than two miles at 30 mph.

GPS light blinking or not on at all.

- Check GPS antenna connections.
- Ensure that nothing obstructs antenna's view of the sky.
- Check the antenna cable for pinching or crimping in the corner.
- Reset power.

COM light not on or blinks.



- Check GSM antenna connections.
- Ensure that nothing obstructs the antenna such as metallic sunscreens.
- Make sure VT-2200 is within the [AT&T coverage map](#).
- Reset power.

Ignition light is not on when vehicle is switched on.

- It is mandatory that the ignition wire be correctly wired to “on” power and not an accessory line.
- Test the circuit used for ignition voltage with a digital volt meter

See Appendix B for Installation Notes.



Appendix A – Technical Specifications

The VT-2200 GPRS device is the latest hardware component from NexTraq that enables vehicle location and tracking through the NexTraq™ platform.

- ARM Processor
- GSM/GPRS Modem
- GPS Receiver
- Digital Inputs/Outputs
- Serial Port Data Communications

Specifications:

Mechanical

The VT-2200 consists of an ABS Plastic engineered housing containing the electronic components.

Enclosure	UV Stabilized ABS Plastic, Black
Weight	158.75g (5.6 oz)
Dimensions	28mm x 86mm x 153mm (1.09" x 3.40" x 6.02")
Connectors	Automotive Grade FAKRA connectors

Electrical

The VT-2200 power harness is a 4-pin connector for simple installation. The power harness is preconfigured for battery, ground and ignition.

Power Operating Range	8v – 24v DC
Supply Voltage	3.3v -4.5v DC

Consumption

Normal	55-60mA
Idle	15-20 mA
Hibernate	> 1mA

GSM/GPRS Modem

The VT-2200 uses a quad-band GSM modem for maximum network compatibility.

Frequency Bands	850/900/1800/1900 MHz
GPRS	Class 12 max
Data Methods	GPRS (UDP), SMS

GPS Receiver

The VT-2200 uses the latest GPS technology to ensure most reliable and accurate position, velocity and time information. Under normal, clear conditions the GPS performance characteristics are:

Tracking Sensitivity	-159 to -160 dBm
Acquisition Time	~3 s Hot Start ~30 s Warm Start ~35 s Cold Start
Position Accuracy	~2.5m CEP

1 dedicated full serial port for future use

Data Communication Interfaces

The VT-2200 can interface with external devices for enhanced tracking and navigation. These options include:

- 1 dedicated serial port with GPS NMEA output for in vehicle navigation
- 1 dedicated serial port for personal navigation device connectivity
- 1 full serial interface for future use

Auxiliary Inputs/Outputs

Digital Inputs	2 negative triggered 1 positive triggered
Digital Outputs	2 relay driver (500 mA)

Accessories

The VT-2200 has cabling available for standard installation needs. The possible accessories include:

- 2m (6.5ft) GPS/GPRS combo blade antenna with automotive grade FAKRA connectors
- 3 wire power adapter (battery, ground, ignition)
- Data interface adapter cables

Environmental

Operating Temperature	32°C to +85°C
Storage Temperature	-32°C to +85°C

Certifications & Classifications

Industry	PTCRB, GCF
Government	FCC, e-Mark



Appendix B – Installation Notes

The first choice for power connections should always be at the ignition column. An industry standard poke-tape-tie-wrap method should be used to secure connections. If column is unobtainable or there is too many other devices wired to the column, then going to the input wires behind the fuse box can be a valid alternative. If connections must be made to fuses at the fuse box, then using a fuse tap pictured below is acceptable, but should be a “last resort.”

Antenna placement is optimal underneath a removable plastic cover near the windshield on the top of the dashboard. If no removable cover is present, then removing the front dash bezel, the radio or instrument cluster to gain access to under the dashboard is good. Behind the plastic A pillar cover also works well, but should be a second choice. If the dashboard is metal and/or not enough clearance is present behind the A pillar, then mount the antenna at either top center of the windshield behind the rear view mirror, or at the top right corner of the windshield.

As for mounting the VT-2200, it only comes with 3' of power cable so the unit must be placed within the vicinity of your power connections. Try to locate a flat metal or plastic surface big enough to fit the unit and use at least two screws to mount. Tie-wrapping VT-2200 to a wiring harness is also acceptable. At no point should VT-2200 be “wedged” or left unmounted since 90 percent of power connections are on the driver’s side and an unmounted box can easily fall down and interfere with the braking and/or gas pedal of the vehicle causing a serious safety hazard.