

Making Sense of Search Sense Mode

Several of Trace Engineering's inverter's incorporate a power saving "Search Sense Mode". The purpose of this is so that the inverter does not have to idle at full output voltage when there are no loads to run.

How does Search Sense Work?

While idling in the search sense mode, the inverter sends out a pulse about once per second. This electrical pulse travel through the AC wiring "looking" for loads that are connected to the system.

When a load is detected, the inverter then has to make a decision as to whether or not the load is large enough to bother with. This decision point is user adjustable via the Search Sensitivity control on the inverter. The sensitivity is given in watts. The lowest setting is usually 5 watts and the highest setting is 100 watts.

For example, if the search sensitivity is set at 40 watts, and no loads are present that are 40 watts or greater the inverter will "ignore" these smaller loads and remain in idle mode. When a load that is greater than 40 watts appears, the inverter recognizes this as time to go to work, and applies power to the load.

The search sense mode is defeatable by setting it to "off" or defeat. In this case the inverter remains at full output voltage at all times, while waiting for loads.

Why do I need search sense?

Search sense allows you to selectively power only items that draw more than a certain amount of power, but the bigger reason lies in power savings. Imagine an inverter that has a no load idle power of 8 watts. This means the inverter needs 8 watts to power itself even if no loads are present.

In example if a water pump is driven by the inverter for only one hour total per day then the other twenty-three hours out of the day the inverter is using 8 watts per hour just to sit there and do nothing. That power comes from the batteries.

You then set the search sense so that the inverter sleeps until the pump wants to run, and the situation we just looked at greatly improves. Now instead of the inverter idling at 8 watts, only ½ watt is drawn while in search mode. This is a savings of 7½ watts per hour or 172.5 watt-hours. This converts directly to 14 amp-hours for a 12 volt battery system.

In systems with small batteries or limited charging capability, this could be a substantial savings.

Why does the search sense act unusually with certain loads?

Unfortunately, not all things in life are perfect and search sense is no exception. Several types of loads can cause problems with search sense mode, either causing the unit to turn on and then off, or not to turn on at all.

Incandescent Lights: These have a higher starting wattage when the filament is cold than the continuous rating of the bulb. For example, if the inverter is set to sense a 40 watt load, and a 30 watt bulb is turned on the inverter will initially sense this since the bulbs cold starting wattage is higher. The bulb will then go off and after a cool down period will come back on, and so on.

Fluorescent Bulbs: These work the opposite of incandescent light bulbs. If the inverter is set to detect a 30 watt load and a 40 watt fluorescent is switched on, the inverter will not detect it, This is because the fluorescent tube is less than 30 watts until the gas in the tube ionizes.

Other loads: There are some appliances which draw power even though they are turned off. TV's with instant on circuits, microwaves with digital clocks, VCR's, and clocks. If the search sensitivity is set higher than the combined loads, then an auxiliary load must be used to bring the inverter out of search mode before the appliances can be turned on. If the sensitivity is set lower than the combination of the loads, the loads will remain on and excess battery drain will occur since the inverter won't ever go to sleep.(3 such 15 watt loads would amount to an additional 90 amp-hours per 24 hours in a

12VDC system). One solution is to turn the item off at the wall, use an extension cord with a rocker switch, a switch at the outlet, or an appropriate circuit breaker.

How to confirm that search sense does work!

A neon-type night light may be used as a remote indicator to show whether the inverter is searching or not. Plug the night light into the wall and if the inverter is in search mode the light will blink, showing the search pulses sent out by the inverter. If the inverter is running a load the light will be solid since continuous power is being delivered to a load. A normal incandescent type night light may also work to show the pulses, however it will use more power.

How do I set up the search mode feature on the inverter?

The search sense feature on the inverter is only valuable if the inverter can spend a fair amount of time “sleeping” each day. Therefore, if search sense is to be utilized it must be adjusted properly. The initial adjustment should be made so that the inverter comes on only when needed.

The sensitivity control should be adjusted so that the smallest load being run can “wake” the inverter up and cause it to deliver power to the load.

If loads change significantly, then re-tuning of the search sensitivity will be required. It may take several adjustments to tweak the sensitivity to just the right point.

If problem loads are in the system such as discussed previously, follow the suggestions given to eliminate the problem. Some TV's with instant on circuits have a menu or control to disable it. If clocks are the problem load, consider using battery powered units.

If the problem loads just can't be eliminated in one of the suggested manners the only choice is to disable the search sense feature, causing the inverter to always remain at full output voltage.

