



## USING THE SINE WAVE SERIES 1500 INVERTER WITH OPTIONAL TRANSFER SWITCH



### OVERVIEW

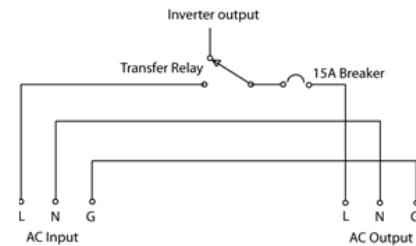
ICT Sine Wave Series 1500 watt inverters provide a compact, versatile and high efficiency solution for providing backup and primary AC power to critical loads. When ordered with the optional built-in AC transfer switch (option suffix "T"), the connected load can be primarily powered from an external AC source like the grid or a generator with the inverter acting as an offline uninterruptible AC power supply, or the load can be primarily powered from the inverter, acting as an online uninterruptible AC power supply.

### Operating the Inverter as an Offline Backup AC Power Source

Using the built-in transfer switch will maximize the efficiency of an uninterruptible power system as the inverter is only used when the normal AC source fails. With the transfer switch installed, the load is connected to the AC output of the inverter using either the AC output connector on the back panel or the front panel outlets. The external AC source (grid branch circuit, or a generator powered branch circuit) is connected to the AC Input connector on the back panel of the inverter (Figure 1).

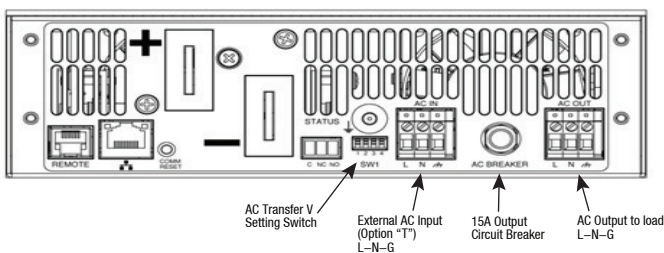
The wiring diagram in Figure 2 shows the internal connections between the input, inverter, and output via the internal transfer relay. The transfer relay will normally connect the output to the external AC to reduce loading on the battery, unless the AC source either fails or falls out of the normal operating range. Then it will automatically transfer the load to the AC output of the inverter, providing uninterruptible service to the load.

Figure 2 - Schematic of the Internal AC Transfer Switch Wiring



The external AC source (such as grid or AC generator) is connected to the AC Input, the load to the AC Output.

Figure 1 - Back Panel Connections



### Configuring and Using the Automatic AC Transfer Switch

The internal AC transfer switch constantly monitors the voltage of the external AC source. It will automatically switch the load to the inverter output whenever the external AC supply voltage drops too low. When the voltage is back in range, it will automatically reconnect the load to the AC source. This automatic transfer prevents the connected load from receiving an input AC voltage that is below its required input specification. Transfer time is typically less than one AC cycle, which is typically within the allowable tolerance for most modern electronic equipment.

Continued on page 2



The voltage transfer thresholds are also adjustable using the back panel DIP switch settings on the inverter. If the connected load can tolerate input from an AC voltage line that is less than the Since Wave Series factory default of 100 volts AC, then the AC Voltage-Low transfer point may be set to a lower voltage range. This will allow the load to continue to operate from the external AC source during voltage dips without transferring to inverter operation. This can be useful to prevent nuisance transfers seen when operating from an AC generator, which typically have larger output voltage fluctuations than seen on a normal AC grid connection.

TECH NOTE

The ICT Sine Wave Series 1500 inverter is available with an optional TCP/IP Ethernet port ('C' suffix) that allows remote monitoring of conditions such as battery voltage, inverter output voltage and inverter power output. It also allows remote disabling of the inverter AC output, allowing connected loads to be power-cycled.

When equipped with both the transfer switch and Ethernet options ('TC' suffix), disabling the inverter output using the optional remote network control capability will not cut power to the load if the AC output is being supplied by an external source via the internal transfer relay (also referred to as "AC passthrough mode").

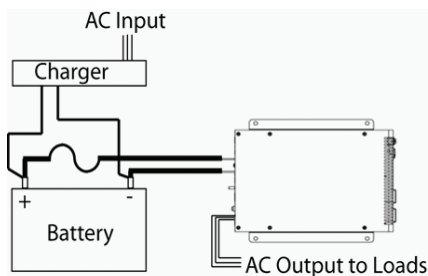
### Transfer Time Using The Built-In Transfer Relay

The transfer of the load connection from the external AC source to the inverter output is very fast, and typically requires less than the duration of one AC cycle of time to switch over. Virtually all modern electronic equipment such as computer servers, network routers and switches, etc., will accommodate this short interruption in power without affecting their operation.

### Operating the Inverter as an Online Uninterruptible Power System

With some critical applications it may be desirable to have power continuously supplied to the loads by the inverter in order to provide a stable, uninterruptible, well regulated 1500 watt power source for critical equipment. In this configuration, shown in Figure 3, the inverter is supplying the load at all times. The loads will not experience any interruption in power when the external AC source fails, since the power for the loads is always being provided by the inverter.

Figure 3 - Inverter Used as an Online UPS



The inverter is supplied by a battery that is connected to a high reliability charging source that maintains the battery at a fully charged state. When AC fails there is no disruption of any kind to the load. The battery can be sized according to the expected amount of time the AC power will be out, and the charging system can also have its own backup power source such as a generator.

Inverters used in this configuration do not require the optional built in transfer switch.

### Conclusion

The ICT Sine Wave Series 1500 family of DC-AC inverters provides a high-performance, high-efficiency solution for a variety of applications. With a unique range of options, the Sine Wave Series can be configured to operate as an online or offline UPS to back up or maintain critical loads.

Whether you need high-quality AC power to run AC loads at your site such as servers or switches and lights or radios at remote outdoor power stations, or to provide uninterruptible power for your mission critical communications infrastructure, the Sine Wave Series provides the most versatile, flexible and reliable solution available.

To find out more, or to download the product data sheet, visit [www.ict-power.com](http://www.ict-power.com).

