Linear Technology AC Power Source TL Series

Quiet Linears

- **Low Noise, Low Distortion**
  Clean AC power output for noise sensitive applications
- **350 VA or 250 VA Output Power**
  Capable of handling many special purpose AC power applications
- **16 Hz to 8000 Hz Frequency Range**
  Commercial, Military and Avionics applications
- **Precision Measurements**
  Accurately measures TRMS Volt, TRMS Current, Peak Current, Crest Factor, Real Power and Power Factor when equiped with measurement option.
- **Remote Control**
  Available IEEE-488 and RS232C Interface for automated test applications. Includes Windows™ operating software

Model 351TL

CE

Compact AC Power

Using state of the art linear technology, the TL Series programmable AC power sources are ideally suited for applications where a low distortion, low noise sinewave is required.

Selectable input voltage ranges allow this power source to be used anywhere in the world to provide a convenient source of variable voltage and frequency power for testing and evaluating AC powered equipment. All common line voltage and frequency combinations are covered.

In addition, the frequency range extends to 8000 Hz, making these products suitable for both conventional and special purpose applications.

Accurate measurement functions are available as an option to eliminate the need for external test equipment in many test setups. Voltage, current, peak current, power, and power factor can be read directly on the large LCD display or over the bus.

Easy To Use Controls

Front panel digital rotary encoders are used to set voltage and frequency and current limit. These controls have an analog feel, with the precision and reliability of digital circuits. Settings and measurements are read directly on the large, high contrast LCD displays.

Dual output voltage ranges of 135 Vrms L-N and 270 Vrms L-N, provide maximum current at the required voltage.

The output frequency can be varied from 16 Hz up to 8000 Hz to cover commercial, avionics and defense power applications.

Product Development

The precise voltage regulation, low distortion and noise levels and wide frequency range of the TL Series, combined with its easy to use front panel, make it a great precision Lab AC source. Built in measurements may be added (option -OP1) to extend the units usefulness for design applications of AC powered products.

Special Applications

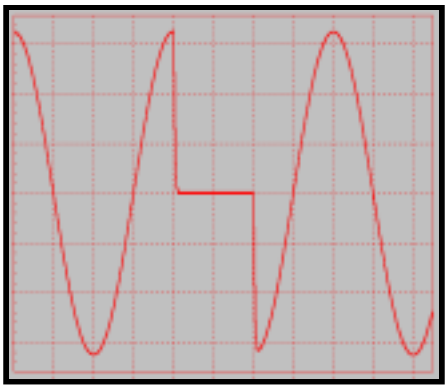
Applications requiring high frequency output such as gyro's, sensors and variable frequency controllers can be tested and operated by a TL Series unit at up to 8000 Hz. Contact factory for higher frequency requirements.

Output Power

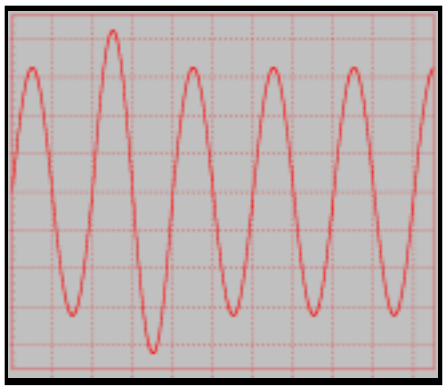
The 351TL AC power source is rated for 350 VA with an output voltage between 90 % and 100 % of range and a load power factor of 0.7 to reflect typical operating conditions. Maximum RMS current is 2.8 A in the 135 V range. The 251TL is rated for 250 VA with an output voltage between 78 % and 100 % of range and a load power factor of 0.7. It's maximum current is 2.4 A in the 135 V range.

California Instruments

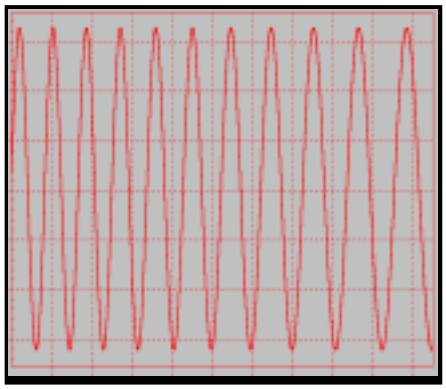
TL Series - For Easy Transient Programming



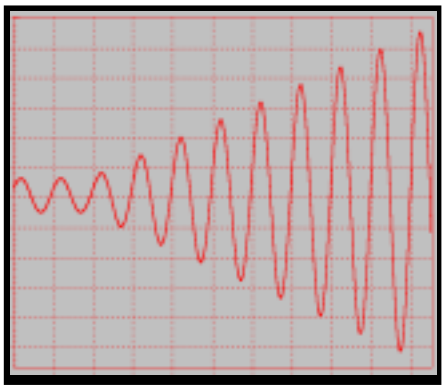
Drop transient causes output voltage to drop to zero for a user specified period



Voltage Surge transient causes output voltage to surge.



Frequency Sweep transient causes the output frequency to change at a user specified rate.



Voltage Sweep transient causes output voltage to change at a programmed rate.

Extensive Transient Control[1]

With the addition of the remote control interface option, TL Series units are capable of producing transients with a high degree of user programmability. Setting up transient programs is facilitated by a Windows™ Graphical User Interface program that allows amplitude, frequency and event duration to be programmed from a PC. Time resolution is 1 ms (0.001 sec) with a minimum time interval ranging from 1 to 40 ms, depending on the transient type. Maximum transient time intervals are 9999 seconds. Transient programming allows the effects of common line disturbances such as voltage surges, sags, drop-outs and frequency fluctuations on the unit under test to be evaluated.

Precision Measurements

For bench or automated test equipment (ATE) applications, the TL Series can be ordered with the -OP1 option, offering both IEEE-488 and RS232C remote control interfaces as well as extended measurements. These measurements are available from the front panel and over the bus. The TL Series uses closed-case calibration for both output and measurement calibration, lowering cost of ownership.

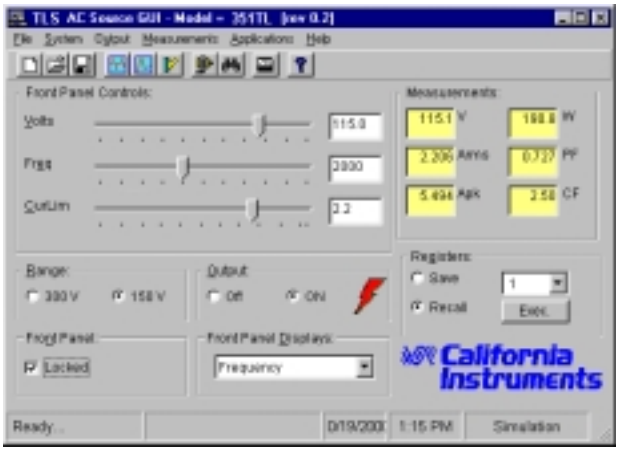
SCPI Protocol Programming Commands

All functions of the TL Series are programmable over the available IEEE-488 or RS232C interface. For example, the following tasks can be performed over the bus:

- Set voltage to any level
- Change frequency
- Generate voltage dropouts, sags or surges
- Measure TRMS current, peak current, crest factor, TRMS voltage, true power, apparent power and power factor
- Recall eight complete instrument setups from non-volatile memory
- Adjust current limit value
- Lock the front panel to prevent operator interference
- Switch between high and low voltage range
- Drop output voltage at specific phase angles for specified durations

Application Software

Windows™ application software is included with the -OP1 option package. This easy to use graphical interface program provides complete control over all instrument functions using the RS232C or IEEE-488 interface. With enhanced capabilities such as output sequencing, data logging and transient generation, many applications can be addressed without the need to write software.



Free Windows™ Graphical User Interface software included with option package OP1.

Note 1: Voltage drop out transients can be programmed at random phase angles or at 0, 90, 180 and 270 degrees.

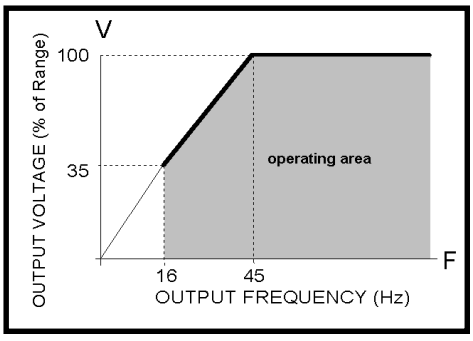
Specifications

California Instruments

Total Customer Satisfaction is the goal of all California Instruments' employees. It is the driving force behind everything we do. This not only affects the product that you purchase from California Instruments, but everything about your interface with the company. Our applications engineers are ready to assist you with your AC power application. With over 35 years of experience designing and building precision AC power supplies, chances are we can meet your needs and exceed your expectations. The same dedication to customer satisfaction you will find in our applications group also permeates our modern manufacturing facility where our products are carefully built. No unit leaves our factory without being thoroughly tested to ensure quality, reliability and conformance to specifications.

Power Ratings:

The 351TL is rated for 350 VA of power down to 90 % of voltage range. The 251TL is rated for 250 VA of power down to 78 % of voltage range.



V-F Rating chart

Parameter		251TL	351TL	Unit
Controller				
Type			Programmable	
Controls			Digital Encoders	
Readouts			dual 4 digit LCD's	
Non Volatile Setups (with -OP1 option)			1 (8)	
Output				
AC Power	maximum	250	350	VA
Load Connection			Rear panel terminal block Floating neutral	
Voltage				
High range / Low range			0 - 270 / 0 - 135	V RMS
Accuracy	16 Hz - 100 Hz		± 0.1	% FS
	100 Hz - 5000 Hz		± 0.2	% FS
	5000 Hz - 8000 Hz		± 0.3	% FS
Resolution			0.1	V
Load Regulation	< 2000 Hz		0.1	% FS
	2000-5000 Hz		0.15	% FS
	> 5000 Hz		0.25	% FS
Line Regulation	10 % Line change		± 0.02	% FS
T.H.D. (into a	16 Hz - 999 Hz		< 0.5	%
resistive load)	1000 Hz - 8000 Hz		< 2.0	%
Output Noise	full scale at full power		-73 dB	Max.
Frequency (See V-F Rating chart)				
Range			16 - 8000	Hz
Accuracy			± 0.02	%
Resolution	16.00 Hz - 79.99 Hz		0.01	Hz
	80.0 Hz - 799.9 Hz		0.1	Hz
	800 Hz - 8000 Hz		1	Hz
Current (Maximum, see Power Ratings side bar)				
RMS Current	High / Low Vrange	1.2 / 2.4	1.4 / 2.8	A_{RMS}
Peak Current	High / Low Vrange	3.0 / 6.0	3.0 / 6.0	A_{peak}
Protection				
Adj. Current limit	Resolution		0.1	A RMS
Modes			Const. Voltage or Const. Current	
Over Temperature and Over Voltage			√	
Input				
Connection			Rear panel terminal block	
Line Voltage	2 wire + GND		100, 115, 200, 230 ± 10%	V RMS
Line Current			< 16	A RMS
Line Frequency			47 - 440	Hz
Holdup Time			10	ms
Measurements (* Requires Option -OP1)				
Current	Range		4.000	A RMS
	Accuracy		0.2 % FS + 0.3 % rdng	
	Resolution		0.001 / 0.01	A RMS
Peak Current*	Range		12.00	A
	Accuracy		0.5 % FS + 0.5 % rdng	
	Resolution		0.01 / 0.1	A
Voltage*	Range		0 - 300.0	V RMS
	Accuracy		0.1 % FS + 0.05 % rdng	
	Resolution		0.1	V RMS
Power*	Range		400.0	W
	Accuracy		0.5 % FS	
	Resolution		0.2	W
Power Factor*	Range		0.00 - 1.00	
	Resolution		0.01	
Remote Control (* Requires Option -OP1)				
Interface*			RS232C and IEEE-488	
	IEEE Functions		SH1, AH1, T8, L3, RL2	
	RS232C settings		19200,8,n,1	
	Command Language		SCPI	
Remote Inhibit*	Output shut down		TTL in, active low	BNC
Function Strobe*	On V or F change		TTL out, active low	BNC
Physical				
Dimensions	HxWxD		5.25 x 19 x 22	inches
	HxWxD		133 x 483 x 560	mm
Weight (net)			75 / 34	lbs / kg
Vibration and Shock			Designed to meet NSTA-1A	
Temperature	Operating		0 to 40	° C
	Storage		- 40 to + 85	° C

Note: Specifications shown are valid over an ambient temperature range of 25°±5°C.

Remote Control Option

The TL Series can be ordered with option package 1 (-OP1) to add a combined RS232C and IEEE-488 remote control interface. Front panel and bus measurements are included with this option.

Ordering Information

Models:

351TL 350 VA linear AC Source
251TL 250 VA linear AC Source

Options:

-EXT External Oscillator Input. (Removes internal oscillator)
-L22 Locking knobs
-OP1 Option package 1:
- Measurements
- IEEE-488 / RS232C Interface and GUI software
- Remote Inhibit input
- Function Strobe output

-RMS Rack Mount Slides

Supplied with:

- User and Programming Manual on CD ROM
- Windows™ Graphical User Interface (with -OP1 option)
- RS232C Serial Cable (with -OP1 option)

Higher Power Switchers

For applications requiring more than 350 VA of output power, the RP Series of AC switchers offer power levels of 800 to 2000 VA . These models are housed in a 3.5 inch or 5.25 inch high rackmount enclosures. Refer to the 801RP/ 1251RP , 2001RP and 2003RP data sheets for details.

Customer Support

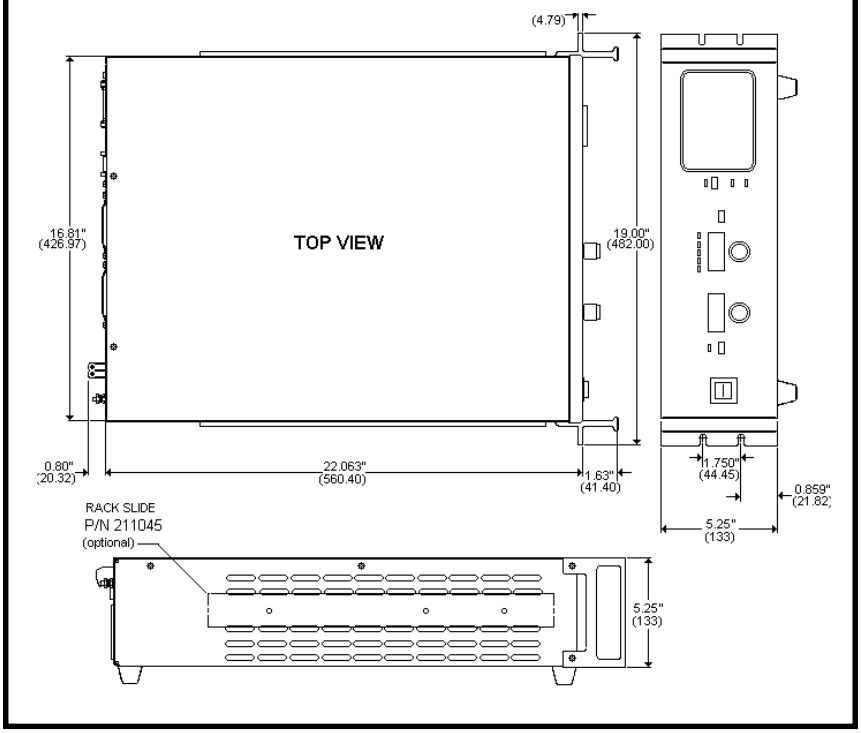
For technical support and service, or to discuss your AC power application needs, contact California Instruments Corp. or your local representative.

CE Mark

The TL Series has been fully tested for compliance with all applicable CE Mark requirements.

CE

351TL and 251TL *Dimensions*



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