IT8500+ Programmable DC Electronic Load

IT8500+ series single channel programmable electronic load with high density, high resolution and high accuracy supports dynamic test function, automatic test function, etc., which is suited for applications in areas such as LED driver testing, switching power testing, battery performance testing, etc. IT8500+ also provides standard SCPI protocol to build intelligent test platform that is ideal for multiple industries.

Applications

Battery test, lithium protection board test, power supply test, charger test, ATE, component test, etc.

Feature

- Four operating modes: CV, CC, CR, CP
- Battery test function, automatic test function, OPP test, OCP test function and CR-LED function
- Dynamic mode up to 10kHz
- Voltage measurement resolution up to 0.1mV / 0.1mA
- Remote sense
- Short circuit function
- Current monitoring function
- Power-off memory function
- 100 groups memory capacity
- Optional USB / RS232 / RS485 interface

*IT8514B+, IT8514C+, and IT8516C+ are built-in RS232 and USB interface.

Model	Voltage	Current	Power	Size
IT8511A+	150V	30A	150W	1/2 2U
IT8511B+	500V	10A	150W	1/2 2U
IT8512A+	150V	30A	300W	1/2 2U
IT8512B+	500V	15A	300W	1/2 2U
IT8512C+	120V	60A	300W	1/2 2U
IT8512H+	800V	5A	300W	1/2 2U
IT8513A+	150V	60A	400W	1/2 2U
IT8513C+	120V	120A	600W	1/2 2U
IT8514B+	500V	60A	1500W	2U
IT8514C+	120V	240A	1500W	2U
IT8516C+	120V	240A	3000W	4U

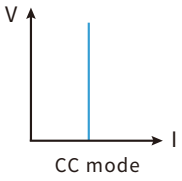
Optional interface	
IT-E121	RS232 communication cable
IT-E122	USB communication cable

Automatic Test Function

IT8500+ supports two automatic test editing modes. One is special automatic test editing mode that can save up to 10 groups of test files, and the other is compatible with the IT8500 automatic test editing mode that can save up to 50 groups of test files, both of which can be called and tested at any time. Test operation is simple, the button can be completely locked to prevent accidental touch on the keyboard from affecting normal testing.

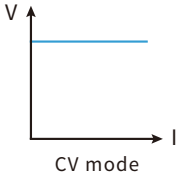
Constant Current（CC）

In CC mode, the electronic load will sink a constant current regardless of the changes of input voltage.



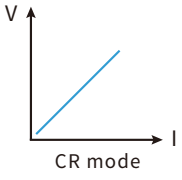
Constant Voltage（CV）

In CV mode, the electronic load will attempt to sink enough current to control the source voltage to the programmed value.



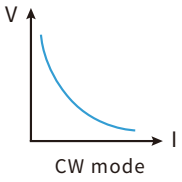
Constant Resistance（CR）

In CR mode, the module will sink a current linearly proportional to the input voltage in accordance with the programmed resistance.



Constant Power（CW）

In CP mode, the electronic load will dissipate power in accordance with the programmed value.
If input voltage increase, input current will decrease.

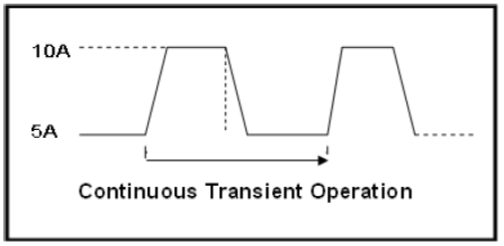


Transient Mode

Transient operation enables the module to periodically switch between two load levels, as might be required for testing power supplies. Transient operation can be turned on and off from the front panel (shift + numeric key"2"). Before you turn on the operation, you should set the parameters associated with the transient operation. The parameters include: A level, B level,frequency, duty cycle and transient testing modes. There are three different transient testing modes: continuous, pulse, and toggle.

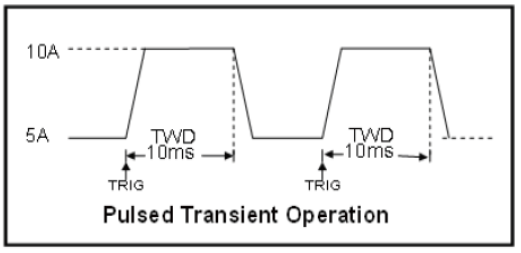
Continuous Mode

In continuous mode, the electronic load generates a repetitive pulse stream that toggles between two load levels. Load could switch the state between two value settings, A/B.



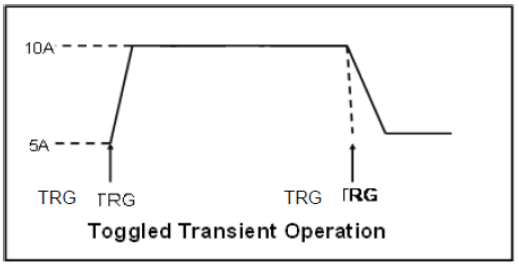
Pulse Mode

In pulse mode, the electronic load generates a transient pulse of programmable width when pulse transient operation is in effect. The load will automatically switch to A level after maintaining A width time. Then it will switch to B level. The load will not switch to A level again until the instrument receives the pulse signal.



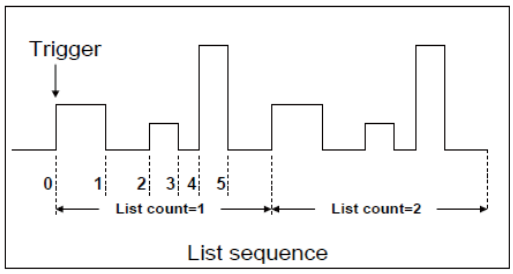
Toggle Mode

In toggle mode, the electronic load will switch between A level and B level when receiving a trigger signal after the transient operation is enabled. The following picture shows the current waveform in toggle transient operation.



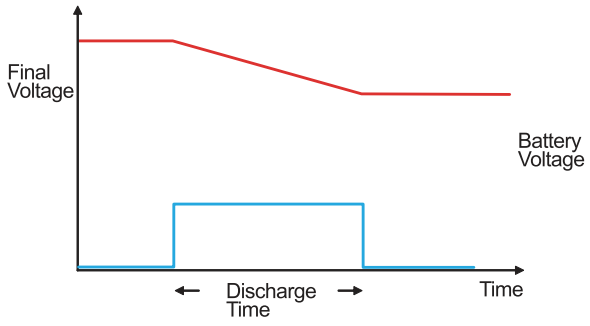
List Mode

List mode allows you to generate a complex current sequence. Moreover, the mode change can be synchronized with an internal or external signal, to accomplish dynamic and precise test which can save cost for users. Users can edit step value, pulse width and slope sequence and meet a complex test request. A list file includes following parameters: file name step counts (range 2-84), time width of single step (0.00005s-3600s), step value and slope. The edited list file can be recalled easily. The DC load provides 7 nonvolatile registers to save list files setting for recall later. In the list mode, the load starts to run the list file once receiving a trigger signal, continue to run until end of the operation or receiving another trigger.



Battery Mode

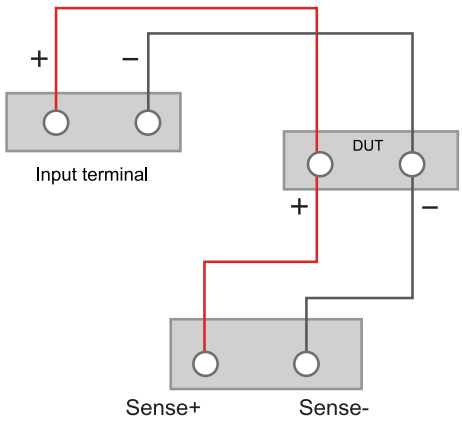
Battery discharge test of IT8500+ series can be achieved under CC mode. There are three cut-off conditions for IT8500+ include cut-off voltage, cut-off capacity and cut-off time, when any of the three conditions are met, discharge test will be stopped, the load will be automatically switched to OFF. Moreover, the battery voltage, discharge time and discharged capacity can be observed during the test.



Battery discharge function

Remote Sense

When working in CC, CV, CP and CR mode, if the electronic load consumes a very large current, it will cause a voltage drop in the leads between the connected device and terminals of the electronic load. In order to ensure testing accuracy, the electronic load provides a pair of remote sensing terminals in the rear panel where users can sense the output terminal voltage of the connected device. Users should set the electronic load in REMOTE SENSE mode before using this function. By eliminating the effect of the voltage drop in the load leads, remote sensing provides greater accuracy by allowing the electronic load to regulate directly at the source's output terminals.

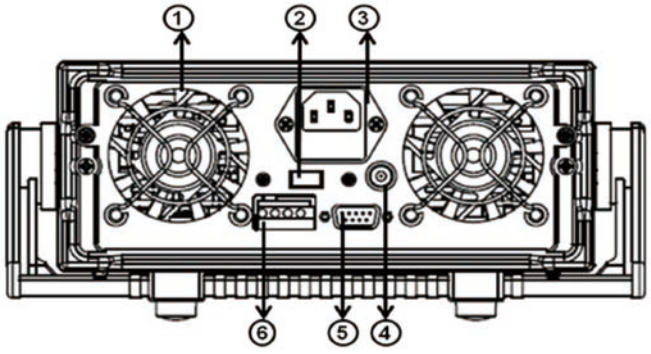


IT8500+ Specifications

		IT8511A+		IT8511B+		IT8512A+	
Rated	Voltage	0~150V		0~500V		0~150V	
(0～40 ℃)	Current	0~3A	0~30A	0~3A	0~10A	0~3A	0~30A
	Power	150W		150W		300W	
	MOV	0.25V at 3A	3V at 30A	1.2V at 3A	4V at 10A	0.14V at 3A	1.4V at 30A
CV mode	Range	0~18V	0~150V	0.1~50V	0.1~500V	0.1~18V	0.1~150V
	Resolution	1mV	10mV	1mV	10mV	1mV	10mV
	Accuracy	±(0.05%+0.025%FS)	±(0.05%+0.025%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)
CC mode	Range	0~3A	0~30A	0~3A	0~10A	0~3A	0~30A
	Resolution	0.1mA	1mA	0.1mA	1mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
CR mode	Range	0.1Ω~10Ω	10Ω~7.5KΩ	0.5Ω~10Ω	10Ω~7.5KΩ	0.05Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit		16bit	
	Accuracy	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
CP mode	Range	150W		150W		300W	
	Resolution	10mW		10mW		10mW	
	Accuracy	±(0.1%+0.1%FS)		±(0.1%+0.2%FS)		±(0.1%+0.1%FS)	
Dynamic mode	T1&T2	20uS~3600S /Res:1 uS		20uS~3600S /Res:1 uS		20uS~3600S /Res:1 uS	
	Accuracy	2uS±100ppm		2uS±100ppm		2uS±100ppm	
Min response time	Up/down slope	0.0001~0.12A/uS≒10uS	0.001~0.6 A/uS≒10uS	0.0001~0.2A/uS≒10uS	0.001~0.8A/uS ≒10uS	0.0001~0.2A/uS	0.001~1.5A/uS
		Measuring range					
Readback	Range	0~18V	0~150V	0~50V	0~500V	0~18V	0~150V
Voltage	Resolution	0.1 mV	1mV	1 mV	10 mV	0.1 mV	1 mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Readback	Range	0~3A	0~30A	0~3A	0~10A	0~3A	0~30A
Current	Resolution	0.1mA	1mA	0.1mA	1mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Readback	Range	150W		150W		300W	
Power	Resolution	10mW		10mW		10mW	
	Accuracy	±(0.1%+0.1%FS)		±(0.1%+0.2%FS)		±(0.1%+0.1%FS)	
		Protected range					
Over power protection		≒160W		≒160W		≒320W	
Over current protection		≒3.3A	≒33A	≒3.3A	≒11A	≒3.3A	≒33A
Over voltage protection		≒160V		≒530V		≒160V	
Over temperature protection		≒85℃		≒85℃		≒85℃	
				Specification			
Short circuit	CC	≒3.3/3A	≒33/30A	≒3.3/3A	≒11/10A	≒3.3/3A	≒33/30A
	CV	≒0V		≒0V		≒0V	
	CR	≒80mΩ		≒400mΩ		≒180mΩ	
Input terminal impedance		≒300KΩ		≒1MΩ		≒300KΩ	
Size(W*H*D)		214.5mm*88.2mm*354.6mm		214.5mm*88.2mm*354.6mm		214.5mm*88.2mm*354.6mm	

*This information is subject to change without notice

IT8511A+ / IT8512A+/ IT8511B+ / IT8512B+ / IT8512C+ / IT8512H+ / IT8513A+/ IT8513C+



① Air vents

② Voltage switch（110V/220V）

③ AC line input

④ Current monitoring Terminal

⑤ 9-Pin serial port interface connector

⑥ Trigger and remote sensing terminal block

IT8500+ Specifications

		IT8512B+		IT8512H+	
Rated	Voltage	0~500V		0~800V	
(0~40 °C)	Current	0~3A	0~15A	0~1A	0~5A
	Power	300W		300W	
	MOV	0.6V/3A	3V/15A	1.4V at 1A	7V at 5A
CV mode	Range	0.1~50V	0.1~500V	0.1~80V	0.1~800V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)
CC mode	Range	0~3A	0~15A	0~1A	0~5A
	Resolution	0.1mA	1mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.1%FS)	±(0.05%+0.05%FS)
CR mode	Range	0.3Ω~10Ω	10Ω~7.5KΩ	2Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S	0.01%+0.0008S	0.01%+0.08S*2	0.01%+0.0008S
CP mode	Range	300W		300W	
	Resolution	10mW		10mW	
	Accuracy	± (0.1%+0.2%FS)		0.2%+0.2%FS	
Dynamic mode	T1&T2	20uS~3600S /Res:1 uS		20uS~3600S /Res:1 uS	
	Accuracy	2uS±100ppm		2uS±100ppm	
Min response time	Up/down slope	0.0001~0.2A/uS≒10uS	0.001~0.8A/uS ≒10uS	0.0001~0.04A/uS≒20uS	0.001~0.2A/uS ≒20uS
		Measuring range			
Readback Voltage	Range	0~50V	0~500V	0~80V	0~800V
	Resolution	1 mV	10 mV	1 mV	10 mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Readback Current	Range	0~3A	0~15A	0~1A	0~5A
	Resolution	0.1mA	1mA	0.1mA	1mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)	
Readback Power	Range	300W		300W	
	Resolution	10mW		10mW	
	Accuracy	±(0.1%+0.2%FS)		±(0.2%+0.2%FS)	
		Protected range			
Over power protection		≒320W		≒320W	
Over current protection		≒3.3A	≒16A	≒1.1A	≒5.5A
Over voltage protection		≒530V		≒850V	
Over temperature protection		≒85°C		≒85°C	
		Specification			
Short circuit	CC	≒3.3/3A	≒16/15A	≒1.1/1A	≒5.5/5A
	CV	≒0V		≒0V	
	CR	≒180mΩ		≒1.4Ω	
Input terminal impedance		1MΩ		2MΩ	
Size(W*H*D)		214.5mmW*354.6mmD*88.2mmH		214.5mmW*354.6mmD*88.2mmH	

		IT8513A+		IT8513C+	
Rated	Voltage	0~150V		0~120V	
(0~40 °C)	Current	0~6A	0~60A	0~12A	0~120A
	Power	400W		600W	
	MOV	0.25V at 6A	2.5V at 60A	0.2V at 12A	2V at 120A
CV mode	Range	0.1~18V	0.1~150V	0.1~18V	0.1~120V
	Resolution	1mV	10mV	1mV	10mV
	Accuracy	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)	±(0.05%+0.02%FS	±(0.05%+0.025%FS)
CC mode	Range	0~6A	0~60A	0~12A	0~120A
	Resolution	0.1mA	1mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.1%FS)
CR mode	Range	0.1Ω~10Ω	10Ω~7.5KΩ	0.05Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit	
	Accuracy	0.01%+0.08S	0.01%+0.0008S	0.01%+0.08S *2	0.01%+0.0008S
CP mode	Range	400W		600W	
	Resolution	10mW		10mW	
	Accuracy	±(0.2%+0.2%FS)		± (0.2%+0.2%FS)	
Dynamic mode	T1&T2	100uS~3600S /Res:1 uS		100uS~3600S /Res:1 uS	
	Accuracy	10uS+100ppm		10uS±100ppm	
Min response time	Up/down slope	0.001~0.15A/uS	0.01~1 A/uS	0.001~0.2A/uS≒60uS	0.01~1.6A/uS ≒60uS
		Measuring range			
Readback Voltage	Range	0~18V	0~150V	0~18V	0~120V
	Resolution	0.1 mV	1mV	0.1 mV	1mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Readback Current	Range	0~6A	0~60A	0~12A	0~120A
	Resolution	0.1mA	1mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.1%FS)
Readback Power	Range	400W		600W	
	Resolution	10mW		10mW	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
		Protected range			
Over power protection		≒420W		≒620W	
Over current protection		≒6.6A	≒66A	≒13A	≒130A
Over voltage protection		≒165V		≒125V	
Over temperature protection		≒85°C		≒95°C	
		Specification			
Short circuit	CC	≒6.6/6A	≒66/60A	≒13/12A	≒130/120A
	CV	≒0V		≒0V	
	CR	≒30mΩ		≒15mΩ	
Input terminal impedance		≒280KΩ		150KΩ	
Size(W*H*D)		214.5mm*88.2mm*453.5mm		214.5mm*88.2mm*453.5mm	

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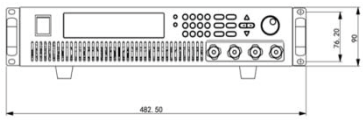
IT8500+ Specifications

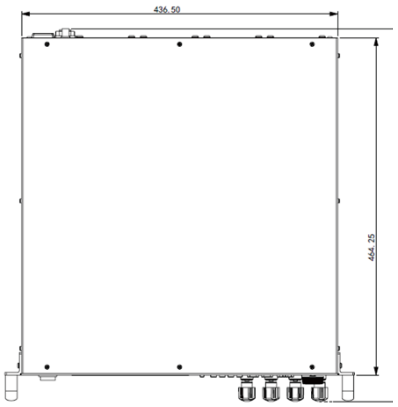
		IT8514C+		IT8514B+		IT8516C+	
Rated (0~40 °C)	Voltage	0~120V		0~500V		0~120V	
	Current	0~24A	0~240A	0~6A	0~60A	0~24A	0~240A
	Power	1500W		1500 W		3000W	
	MOV	0.25V at 24A	2.5V at 240A	0.5V at 6A	3V at 60A	0.15V at 24A	1.5V at 240A
CV mode	Range	0~18V	0.1~120V	0.1~50V	0.1~500V	0.1~18V	0.1~120V
	Resolution	1mV	10mV	1mV	10mV	1mV	10mV
	Accuracy	±(0.05%+0.02%FS	±(0.05%+0.025%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.05%+0.02%FS)	±(0.05%+0.025%FS)
CC mode	Range	0~24A	0~240A	0~6A	0~60A	0~24A	0~240A
	Resolution	1mA	10mA	1mA	10mA	1mA	10mA
	Accuracy	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)	±(0.05%+0.05%FS)	±(0.05%+0.05%FS)	±(0.1%+0.1%FS)	±(0.1%+0.1%FS)
CR mode	Range	0.05Ω~10Ω	10Ω~7.5KΩ	0.05Ω~10Ω	10Ω~7.5KΩ	0.05Ω~10Ω	10Ω~7.5KΩ
	Resolution	16bit		16bit		16bit	
	Accuracy	0.02%+0.08S	0.01%+0.0008S	0.02%+0.08S*1	0.02%+0.0008S	0.02%+0.08S*1	0.02%+0.0008S
CP mode	Range	1500W		1500W		3000W	
	Resolution	10mW		10mW		10mW	
	Accuracy	± (0.2%+0.2%FS)		± (0.2%+0.2%FS)		± (0.2%+0.2%FS)	
Dynamic mode	T1&T2	100uS~3600S /Res:1uS		100uS~3600S /Res:1 uS		120uS~3600S /Res:1 uS	
	Accuracy	10uS±100ppm		10uS±100ppm		10uS±100ppm	
Min response time	Up/down slope	0.001~0.3A/uS	0.01~3.2A/uS	0.001~0.15A/uS≒60uS	0.01~0.8A/uS≒60uS	0.001~0.25A/uS≒70uS	0.01~2.4A/uS≒70uS
		Measuring range					
Readback Voltage	Range	0~18V	0~120V	0~50V	0~500V	0~18V	0~120V
	Resolution	0.1 mV	1mV	0.1 mV	1mV	0.1 mV	1mV
	Accuracy	±(0.025%+0.025%FS)		±(0.025%+0.025%FS)		±(0.025%+0.025%FS)	
Readback Current	Range	0~24A	0~240A	0~6A	0~60A	0~24A	0~240A
	Resolution	1mA	10mA	1mA	10mA	1mA	10mA
	Accuracy	±(0.05%+0.05%FS)		±(0.05%+0.05%FS)		±(0.1%+0.1%FS)	
Readback Power	Range	1500W		1500W		3000W	
	Resolution	10mW		10mW		10mW	
	Accuracy	±(0.2%+0.2%FS)		±(0.2%+0.2%FS)		±(0.2%+0.2%FS)	
		Protected range					
Over power protection		≒1550W		≒1550W		≒3050W	
Over current protection		≒26.7A	≒267A	≒6.7A	≒67A	≒26A	≒260A
Over voltage protection		≒125V		≒530V		≒125V	
Over temperature protection		≒85°C				≒85°C	
		Specification					
Short circuit	CC	≒26.7/24A	≒267/240A	≒6.7/6A	≒67/60A	≒26/24A	≒260/240A
	CV	≒0V		≒0V		≒0V	
	CR	≒8mΩ		≒50mΩ		≒6mΩ	
Input terminal impedance		300KΩ		1MΩ		300KΩ	
Size(W*H*D)		436.5mm*88.2mm*463.5mm		436.5mm*88.2mm*463.5mm		436.5mm*176mm*463.5mm	

*1 Resistance readback range: (1/(1/R+(1/R)*0.01%+0.08),1/(1/R-(1/R)*0.01%-0.08))
IT8514B+/14C+/16C+: (1/(1/R+(1/R)*0.02%+0.08),1/(1/R-(1/R)*0.02%-0.08))

*This information is subject to change without notice

IT8514B+/IT8514C+ Dimension figure





unit: mm