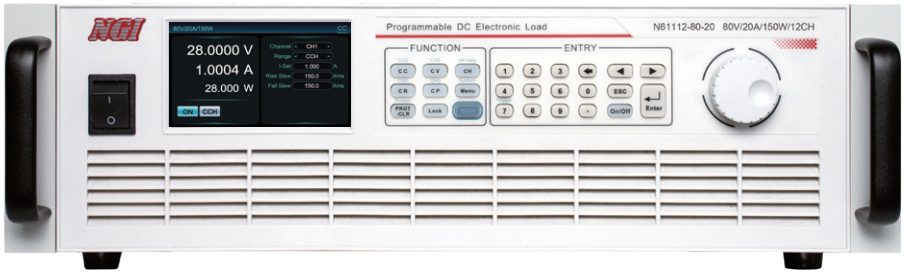
N61100 Series Multi-channel High Performance DC Electronic Load



Product Introduction

N61100 series is a multi-channel programmable electronic load with high performance and rich functions. It is tailored for integrated applications, featuring in high communication response speed and high stability, multi-channel response time <10ms. N61100 series is with 19-inch 3U size, up to 12 channels, and supports LAN, RS232, and RS485 communication interfaces, equipped with eight test modes, such as LED Simulation, Ripple Measurement,OCP/OPP/OVP Test, Load Effect Test etc. In most integrated applications, N61100 series can replace low-power standalone electronic loads and save much cost for users.

Application Fields

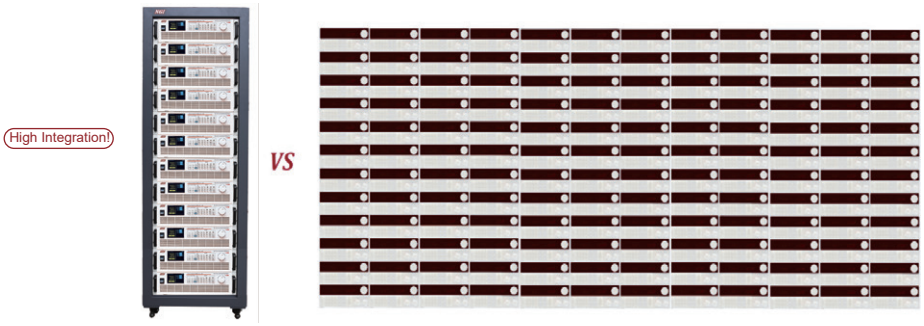
- Low power supply test, such as AC/DC power, DC/DC converter, LED power, communication power, etc.
- Test of automotive wiring harness, connector, fuse, relay, BEC(Bussed Electrical Center)
- Discharge test of lithium battery, storage battery, etc.

Main Features

- Voltage range: 0~80V/0~150V/0~600V
- Current range: 0~120A/0~30A
- Power range: 150W/12CH, 300W/6CH, 540W/4CH, 900W/2CH
- OCP/OVP/OPP test mode
- Supporting LED light simulation function
- Dual measurement range for CC, CV, CP, CR mode
- High integration, single device up to 12 channels
- 8 kinds of test mode: CC, CV, CR, CP, CV+CC, CV+CR, CR+CC, CP+CC
- Voltage, current, resistance, power dual range, wide measurement range
- Sequence(SEQ) test, auto test, Von/Voff, short circuit simulation, waveform measurement
- Load effect test, dynamic sweep, time measurement, discharge test
- Support synchronous load, convenient for multi-channel power supply test
- Support CC, CV, CR, CP dynamic test, CC dynamic frequency up to 30kHz
- Adjustable rise/fall slew and voltage loop response speed
- Equipped with 4.3 inch LCD screen, local/remote control, and professional test software
- Communication interfaces: LAN, RS232, RS485

Ultra-high integration, single device with up to 12 channels

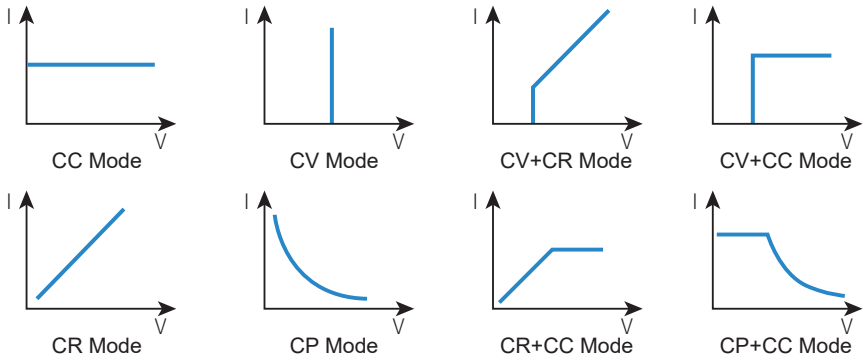
N61100 series DC electronic load supports up to 12 channels in a single device. Each channel is electrically isolated. It can be controlled separately, and also can be controlled up to 120 channels at the same time. The ultra-high integration in multi-channel batch test system applications reduces test cost and instrument occupation for users. Combined with up to 5ms readback speed, the test efficiency can be greatly improved.



▲N61100 Electronic Load ▲Traditional Electronic Load

Multiple operation modes

N61100 series not only supports four basic modes of CC, CV, CP, and CR, but also supports four combined working modes of CV+CC, CR+CC, CV+CR, CP+CC, CR+CC mode is suitable for power-on test of source, preventing over current protection during power-on. CV+CR mode can replace Von function. CV+CC mode can simulate the working mode conversion process of battery charging. Users can select different operation modes according to their test application.

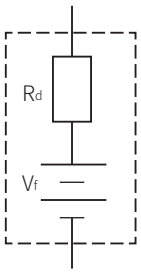


LED light simulation to test LED driving power

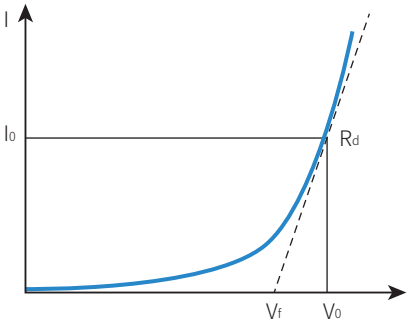
The electronic load has LED light simulation function. As shown in the figure, the LED equivalent circuit is to connect the resistance Rd with the voltage source Vf in series. Its I-V curve is equivalent to tangent of the real LED nonlinear I-V curve at the operating point (Vo, Io).As the I-V curve of LEDs is non-linear, conventional electronic loads with CR or CV modes do not match the testing needs of LED power supplies, so more sophisticated load models are needed to simulate the behaviour of LEDs.

Under LED mode, users need to set three parameters to simulate real LED light loading condition, including the rated output current of LED driving power, LED operating voltage, and resistance coefficient.

LED equivalent circuit

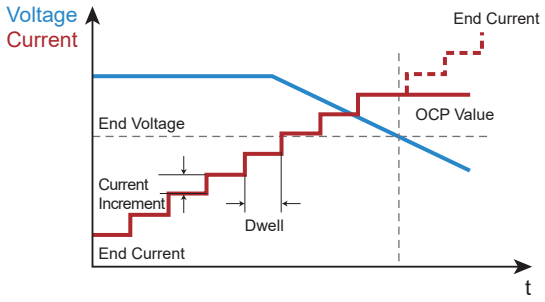


LED I-V curve

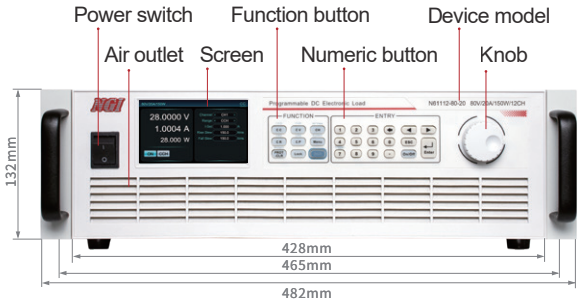


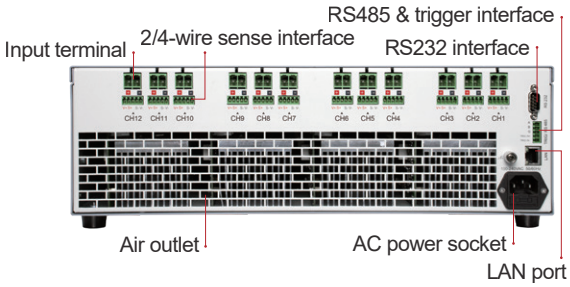
OCP (over current protection) test

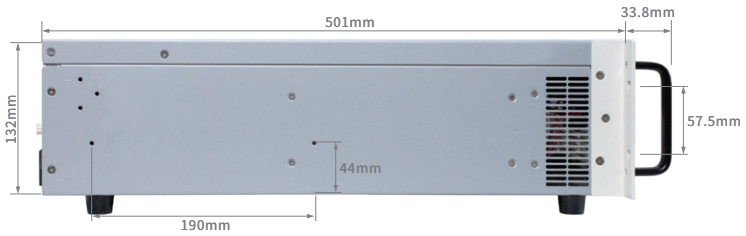
During OCP test, N61100 will load under CC mode and check whether the DUT voltage is lower than end voltage. If lower, N61100 will record the present loading current as the test result and shut the input to stop the test. If the DUT voltage is higher than end voltage, N61100 will increase the loading current until the DUT voltage is lower than end voltage or it reaches the Max. loading current.



Product Dimension

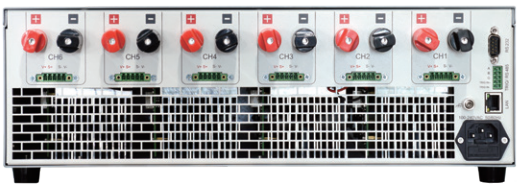




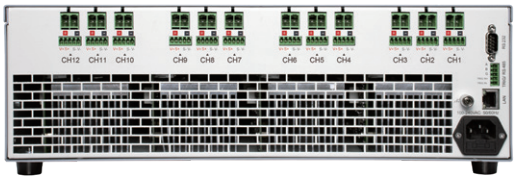


▲ 2CH

▲ 4CH



▲ 6CH



▲ 12CH

Technical Data Sheet (1)

Model	N61112-80-20		N61112-150-20		N61112-600-05	
Voltage	80V		150V		600V	
Current	20A		20A		5A	
Power	150W					
Min. Operating Voltage	0.5V@2A	1V@20A	0.5V@2A	1V@20A	0.6V@0.5A	1.5V@5A
Channels	12CH					
CV Mode						
Range	0~8V	0~80V	0~15V	0~150V	0~60V	0~600V
Setting Resolution	0.1mV	1mV	1mV	10mV	1mV	10mV
Setting Accuracy (23±5℃)	0.025%+0.025%F.S.					
Readback Resolution	10μV	0.1mV	0.1mV	1mV	0.1mV	1mV
Readback Accuracy (23±5℃)	0.025%+0.025%F.S.					
CC Mode						
Range	0~2A	0~20A	0~2A	0~20A	0~500mA	0~5A
Setting Resolution	0.1mA	1mA	0.1mA	1mA	10μA	0.1mA
Setting Accuracy (23±5℃)	0.05%+0.05%F.S.					
Readback Resolution	10μA	0.1mA	10μA	0.1mA	1μA	10μA
Readback Accuracy (23±5℃)	0.05%+0.05%F.S.					
CP Mode						
Range	15W	150W	15W	150W	15W	150W
Setting Resolution	1mW	10mW	1mW	10mW	1mW	10mW
Setting Accuracy (23±5℃)	0.1%+0.1%F.S.					
Readback Resolution	0.1mW	1mW	0.1mW	1mW	0.1mW	1mW
Readback Accuracy (23±5℃)	0.1%+0.1%F.S.					
CR Mode						
Range	1Ω~16000Ω	0.1Ω~1600Ω	1Ω~30000Ω	0.1Ω~3000Ω	3Ω~99000Ω	0.3Ω~9900Ω
Setting Resolution	1Ω	0.1Ω	1Ω	0.1Ω	1Ω	0.1Ω
Setting Accuracy (23±5℃)	(Vin/Rset)*0.1%+0.1%IF.S.					
Slew Rate						
Current	0.1~130A/ms	0.1~1600A/ms	0.1~130A/ms	0.1~1600A/ms	0.1~45A/ms	0.1~600A/ms
Power	0.1~130A/ms	0.1~1600A/ms	0.1~130A/ms	0.1~1600A/ms	0.1~45A/ms	0.1~600A/ms
Resistance	0.1~130A/ms	0.1~1600A/ms	0.1~130A/ms	0.1~1600A/ms	0.1~45A/ms	0.1~600A/ms
Dynamic Mode (CCD)						
T1&T2	0.016ms~60000ms/0.016s~60000s					
Resolution	1μs/1ms					
Rise/Fall Slew Rate	0.1~130A/ms	0.1~1600A/ms	0.1~130A/ms	0.1~1600A/ms	0.1~45A/ms	0.1~600A/ms
Others						
Protection	OVP/OCP/OPP/OTP/RV					
Interface	LAN/RS232/RS485					
Communication Protocol	Modbus-RTU protocol, SCPI protocol, TCP/IP, UDP protocol					
Communication Response Time	≤5ms					
Ripple Measurement	Bandwidth 10Hz~100kHz					
AC Input	Single phase, 100~240V AC, frequency 47Hz~63Hz, current≤1A@220V, current≤2A@110V					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa					
Net Weight	Approx.18kg					
Dimension	3U, 132.0(H)*482.0(W)with handle*501.0(D)mm					

Note 1: For other specifications, please contact NGI.
Note 2: All specifications are subject to change without notice.

Technical Data Sheet (2)

Model	N61106-80-40		N61106-150-40		N61106-600-10	
Voltage	80V		150V		600V	
Current	40A		40A		10A	
Power	300W					
Min. Operating Voltage	0.5V@4A	1V@40A	0.5V@4A	1V@40A	0.6V@1A	1.5V@10A
Channels	6CH					
CV Mode						
Range	0~8V	0~80V	0~15V	0~150V	0~60V	0~600V
Setting Resolution	0.1mV	1mV	1mV	10mV	1mV	10mV
Setting Accuracy (23±5℃)	0.025%+0.025%F.S.					
Readback Resolution	10μV	0.1mV	0.1mV	1mV	0.1mV	1mV
Readback Accuracy (23±5℃)	0.025%+0.025%F.S.					
CC Mode						
Range	0~4A	0~40A	0~4A	0~40A	0~1A	0~10A
Setting Resolution	0.1mA	1mA	0.1mA	1mA	0.1mA	1mA
Setting Accuracy (23±5℃)	0.05%+0.05%F.S.					
Readback Resolution	10μA	0.1mA	10μA	0.1mA	10μA	0.1mA
Readback Accuracy (23±5℃)	0.05%+0.05%F.S.					
CP Mode						
Range	30W	300W	30W	300W	30W	300W
Setting Resolution	1mW	10mW	1mW	10mW	1mW	10mW
Setting Accuracy (23±5℃)	0.1%+0.1%F.S.					
Readback Resolution	0.1mW	1mW	0.1mW	1mW	0.1mW	1mW
Readback Accuracy (23±5℃)	0.1%+0.1%F.S.					
CR Mode						
Range	0.5Ω~8000Ω	0.05Ω~800Ω	1Ω~15000Ω	0.1Ω~1500Ω	2Ω~99000Ω	0.2Ω~9900Ω
Setting Resolution	0.1Ω	0.01Ω	1Ω	0.1Ω	1Ω	0.1Ω
Setting Accuracy (23±5℃)	(Vin/Rset)*0.1%+0.1%IF.S.					
Slew Rate						
Current	0.1~260A/ms	0.1~3200A/ms	0.1~260A/ms	0.1~3200A/ms	0.1~90A/ms	0.1~1200A/ms
Power	0.1~260A/ms	0.1~3200A/ms	0.1~260A/ms	0.1~3200A/ms	0.1~90A/ms	0.1~1200A/ms
Resistance	0.1~260A/ms	0.1~3200A/ms	0.1~260A/ms	0.1~3200A/ms	0.1~90A/ms	0.1~1200A/ms
Dynamic Mode (CCD)						
T1&T2	0.016ms~60000ms/0.016s~60000s					
Resolution	1μs/1ms					
Rise/Fall Slew Rate	0.1~260A/ms	0.1~3200A/ms	0.1~260A/ms	0.1~3200A/ms	0.1~90A/ms	0.1~1200A/ms
Others						
Protection	OVP/OCP/OPP/OTP/RV					
Interface	LAN/RS232/RS485					
Communication Protocol	Modbus-RTU protocol, SCPI protocol, TCP/IP, UDP protocol					
Communication Response Time	≤5ms					
Ripple Measurement	Bandwidth 10Hz~100kHz					
AC Input	Single phase, 100~240V AC, frequency 47Hz~63Hz, current≤1A@220V, current≤2A@110V					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa					
Net Weight	Approx.18kg					
Dimension	3U, 132.0(H)*482.0(W)with handle*501.0(D)mm					

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Technical Data Sheet (3)

Model	N61104-80-60		N61104-150-60		N61104-600-15	
Voltage	80V		150V		600V	
Current	60A		60A		15A	
Power	540W					
Min. Operating Voltage	0.5V@6A	1V@60A	0.5V@6A	1V@60A	0.6V@1.5A	1.5V@15A
Channels	4CH					
CV Mode						
Range	0~8V	0~80V	0~15V	0~150V	0~60V	0~600V
Setting Resolution	0.1mV	1mV	1mV	10mV	1mV	10mV
Setting Accuracy (23±5℃)	0.025%+0.025%F.S.					
Readback Resolution	10μV	0.1mV	0.1mV	1mV	0.1mV	1mV
Readback Accuracy (23±5℃)	0.025%+0.025%F.S.					
CC Mode						
Range	0~6A	0~60A	0~6A	0~60A	0~1.5A	0~15A
Setting Resolution	0.1mA	1mA	0.1mA	1mA	0.1mA	1mA
Setting Accuracy (23±5℃)	0.05%+0.05%F.S.					
Readback Resolution	10μA	0.1mA	10μA	0.1mA	10μA	0.1mA
Readback Accuracy (23±5℃)	0.05%+0.05%F.S.					
CP Mode						
Range	54W	540W	54W	540W	54W	540W
Setting Resolution	1mW	10mW	1mW	10mW	1mW	10mW
Setting Accuracy (23±5℃)	0.1%+0.1%F.S.					
Readback Resolution	0.1mW	1mW	0.1mW	1mW	0.1mW	1mW
Readback Accuracy (23±5℃)	0.1%+0.1%F.S.					
CR Mode						
Range	0.5Ω~5000Ω	0.05Ω~500Ω	1Ω~10000Ω	0.1Ω~1000Ω	1Ω~99000Ω	0.1Ω~9900Ω
Setting Resolution	0.1Ω	0.01Ω	1Ω	0.1Ω	1Ω	0.1Ω
Setting Accuracy (23±5℃)	(Vin/Rset)*0.1%+0.1%IF.S.					
Slew Rate						
Current	0.1~390A/ms	0.1~4800A/ms	0.1~390A/ms	0.1~4800A/ms	0.1~135A/ms	0.1~1800A/ms
Power	0.1~390A/ms	0.1~4800A/ms	0.1~390A/ms	0.1~4800A/ms	0.1~135A/ms	0.1~1800A/ms
Resistance	0.1~390A/ms	0.1~4800A/ms	0.1~390A/ms	0.1~4800A/ms	0.1~135A/ms	0.1~1800A/ms
Dynamic Mode (CCD)						
T1&T2	0.016ms~60000ms/0.016s~60000s					
Resolution	1μs/1ms					
Rise/Fall Slew Rate	0.1~390A/ms	0.1~4800A/ms	0.1~390A/ms	0.1~4800A/ms	0.1~135A/ms	0.1~1800A/ms
Others						
Protection	OVP/OCP/OPP/OTP/RV					
Interface	LAN/RS232/RS485					
Communication Protocol	Modbus-RTU protocol, SCPI protocol, TCP/IP, UDP protocol					
Communication Response Time	≤5ms					
Ripple Measurement	Bandwidth 10Hz~100kHz					
AC Input	Single phase, 100~240V AC, frequency 47Hz~63Hz, current≤1A@220V, current≤2A@110V					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa					
Net Weight	Approx.18kg					
Dimension	3U, 132.0(H)*482.0(W)with handle*501.0(D)mm					

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Technical Data Sheet (4)

Model	N61102-80-120		N61102-150-120		N61102-600-30	
Voltage	80V		150V		600V	
Current	120A		120A		30A	
Power	900W					
Min. Operating Voltage	0.5V@12A	1V@120A	0.5V@12A	1V@120A	0.6V@3A	1.5V@30A
Channels	2CH					
CV Mode						
Range	0~8V	0~80V	0~15V	0~150V	0~60V	0~600V
Setting Resolution	0.1mV	1mV	1mV	10mV	1mV	10mV
Setting Accuracy (23±5℃)	0.025%+0.025%F.S.					
Readback Resolution	10μV	0.1mV	0.1mV	1mV	0.1mV	1mV
Readback Accuracy (23±5℃)	0.025%+0.025%F.S.					
CC Mode						
Range	0~12A	0~120A	0~12A	0~120A	0~3A	0~30A
Setting Resolution	1mA	10mA	1mA	10mA	0.1mA	1mA
Setting Accuracy (23±5℃)	0.05%+0.05%F.S.					
Readback Resolution	0.1mA	1mA	0.1mA	1mA	10μA	0.1mA
Readback Accuracy (23±5℃)	0.05%+0.05%F.S.					
CP Mode						
Range	90W	900W	90W	900W	90W	900W
Setting Resolution	1mW	10mW	1mW	10mW	1mW	10mW
Setting Accuracy (23±5℃)	0.1%+0.1%F.S.					
Readback Resolution	0.1mW	1mW	0.1mW	1mW	0.1mW	1mW
Readback Accuracy (23±5℃)	0.1%+0.1%F.S.					
CR Mode						
Range	0.5Ω~2600Ω	0.05Ω~260Ω	0.5Ω~5000Ω	0.05Ω~500Ω	1Ω~80000Ω	0.1Ω~8000Ω
Setting Resolution	0.1Ω	0.01Ω	0.1Ω	0.01Ω	1Ω	0.1Ω
Setting Accuracy (23±5℃)	(Vin/Rset)*0.1%+0.1%IF.S.					
Slew Rate						
Current	0.1~780A/ms	0.1~9600A/ms	0.1~780A/ms	0.1~9600A/ms	0.1~270A/ms	0.1~3600A/ms
Power	0.1~780A/ms	0.1~9600A/ms	0.1~780A/ms	0.1~9600A/ms	0.1~270A/ms	0.1~3600A/ms
Resistance	0.1~780A/ms	0.1~9600A/ms	0.1~780A/ms	0.1~9600A/ms	0.1~270A/ms	0.1~3600A/ms
Dynamic Mode (CCD)						
T1&T2	0.016ms~60000ms/0.016s~60000s					
Resolution	1μs/1ms					
Rise/Fall Slew Rate	0.1~780A/ms	0.1~9600A/ms	0.1~780A/ms	0.1~9600A/ms	0.1~270A/ms	0.1~3600A/ms
Others						
Protection	OVP/OCP/OPP/OTP/RV					
Interface	LAN/RS232/RS485					
Communication Protocol	Modbus-RTU protocol, SCPI protocol, TCP/IP, UDP protocol					
Communication Response Time	≤5ms					
Ripple Measurement	Bandwidth 10Hz~100kHz					
AC Input	Single phase, 100~240V AC, frequency 47Hz~63Hz, current≤1A@220V, current≤2A@110V					
Temperature	Operating temperature: 0℃~40℃, storage temperature: -20℃~60℃					
Operating Environment	Altitude <2000m, relative humidity: 5%~90%RH(non-condensing), atmospheric pressure: 80~110kPa					
Net Weight	Approx.18kg					
Dimension	3U, 132.0(H)*482.0(W)with handle*501.0(D)mm					

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