

## N3410 Series Triple-channel Programmable DC Power Supply



### Product Introduction

N3410 series is a triple-channel programmable DC power supply with high performance and high reliability. N3410 is with half 19 inch 2U size, integrating three independent output channels, and supporting both front and rear wiring. It has compact size and elegant appearance. N3410 supports both benchtop application with carrying handle and tilt stand, and supports rack installation for system integration. Test and measurement information is displayed intuitively on the 4.3 inch LCD screen. It provides DVM measurement as an optional function to meet different test demands.

### Application Fields

- ▶ School laboratory
- ▶ Production line inspection
- ▶ R&D laboratory
- ▶ Maintenance test

### Main Features

- ▶ Voltage range: 6V/32V/60V, supporting series connection to increase voltage
- ▶ Current range: 3A/5A, supporting parallel connection to increase current
- ▶ 3 channels in a standalone, each channel isolated
- ▶ Low ripple&noise
- ▶ High accuracy and resolution, as low as 0.1mV/0.1mA<sup>1</sup>
- ▶ Dynamic response time less than 1ms
- ▶ Supporting series, parallel and trace output modes
- ▶ High accuracy DVM measurement (for N3411P/N3412P/N3413P only)
- ▶ 4.3 inch LCD screen, supporting screenshot via USB port
- ▶ Sequence(SEQ) test function<sup>2</sup>
- ▶ Graph for real-time output waveform display<sup>3</sup>
- ▶ Half 19 inch 2U size with tilt stand
- ▶ Front and rear output terminals
- ▶ LAN port and RS232 interface

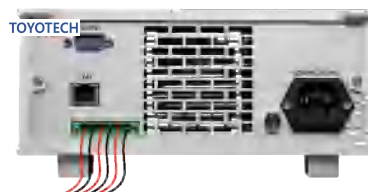
Remark 1: N3411E/N3412E/N3413E are with 10mV/1mA resolution.

Remark 2: SEQ is not available for N3411E/N3412E/N3413E.

Remark 3: Graph is not available for N3411E/N3412E/N3413E.

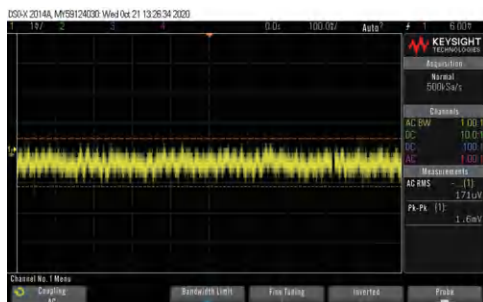
### Front and rear wiring design

N3410 series supports both front and rear panel wiring. User can place N3410 on the bench top or integrate it on the rack, which brings a convenient experience.



## High accuracy and low ripple

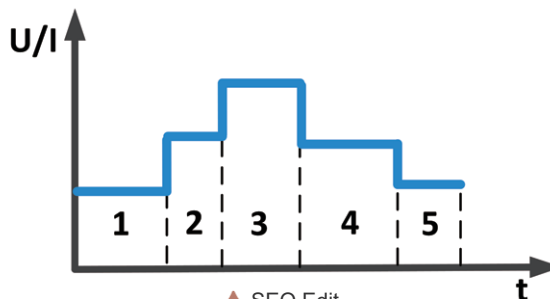
N3410 has excellent performance in output accuracy. It also has ultra-low ripple & noise. The ripple  $V_{rms}$  is less than  $400\mu V$ , and  $V_p-p$  less than  $5mV$ .



▲ Ripple Test

## SEQ test function

N3410 series supports sequence edit. Users can set the output voltage, output current and single step running time. 100 groups of voltage and current sequences can be user-defined. Sequence files can also be imported through the USB type-A interface on front panel.



▲ SEQ Edit

## Series, parallel and trace output modes

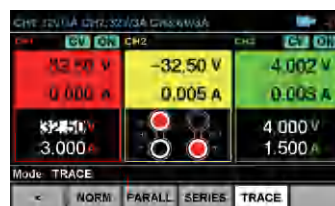
N3410 series has three output modes: CH1/CH2 series, parallel and trace, which can be switched on the front panel, without external serial and parallel wiring, to meet the needs of different ranges and voltage output.



▲ Series Mode



▲ Parallel Mode



▲ Trace Mode

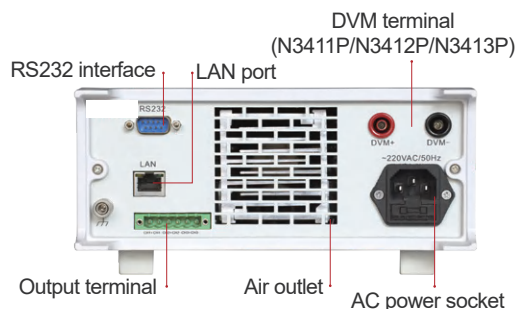
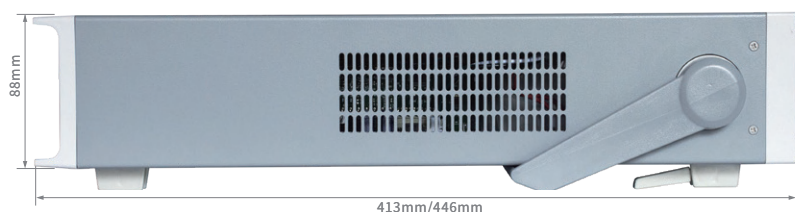
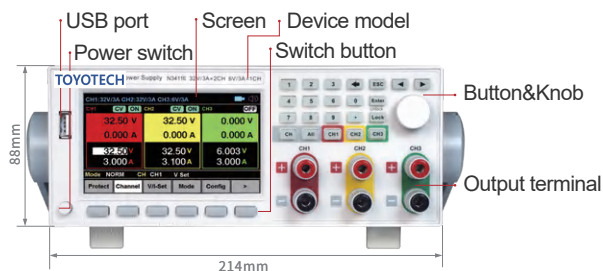
## DVM measurement (for N3411P/N3412P/N3413P only)

N3411P/N3412P/N3413P have built-in one channel high-accuracy DVM to test external voltage, with range of  $-600V \sim +600V$ . It has three automatic ranges:  $\pm 600V/\pm 60V/\pm 6V$ , with measurement accuracy of  $0.01\%$  F.S., and measurement resolution of  $5\frac{1}{2}$  digit. The measurement data is refreshed on the HD screen in real time, which is convenient to observe the voltage variation.

## Graph

Graph can be used to display the output waveform in real time. The waveform display content can be edited, such as voltage-time, current-time, power-time, etc.

## Product Dimension



## Technical Data Sheet (1)

Model	N3411/N3411P		N3412/N3412P	
Channel	CH1/CH2	CH3	CH1/CH2	CH3
Voltage	32V	6V	32V	6V
Current	3A	3A	5A	3A
Series Mode-Voltage	64V	N/A	64V	N/A
Parallel Mode-Current	6A	N/A	10A	N/A
Total Power	210W		338W	
Setting Resolution-Voltage	0.1mV	1mV	0.1mV	1mV
Setting Resolution-Current	0.1mA	1mA	0.1mA	1mA
Setting Accuracy-Voltage (23±5℃)	< 0.01% + 10mV	< 0.03% + 10mV	< 0.01% + 10mV	< 0.03% + 10mV
Setting Accuracy-Current (23±5℃)	< 0.05% + 5mA	< 0.05% + 10mA	< 0.05% + 10mA	< 0.05% + 10mA
Setting Temperature Coefficient	30ppm/℃			
Readback Resolution-Voltage	0.1mV	1mV	0.1mV	1mV
Readback Resolution-Current	0.1mA	1mA	0.1mA	1mA
Readback Accuracy-Voltage (23±5℃)	< 0.01% + 10mV	< 0.03% + 10mV	< 0.01% + 10mV	< 0.03% + 10mV
Readback Accuracy-Current (23±5℃)	< 0.05% + 5mA	< 0.05% + 10mA	< 0.05% + 10mA	< 0.05% + 10mA
Readback Temperature Coefficient	30ppm/℃			
Long-term Stability	≤50ppm/1000h			
Voltage Ripple Noise (20Hz ~ 20MHz)	≤5mVp-p	≤10mVp-p	≤5mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms			
Current Ripple Noise (20Hz ~ 20MHz)	≤3mArms			
Dynamic Characteristics				
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	400ms	200ms	400ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms	45ms	13ms
Transient Recovery Time	≤1ms			
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+1mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV			
Load Regulation-Current	≤0.01%+3mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
DVM Measurement (For N3411P/N3412P Only)				
Channels	1CH			
Voltage Range	±600V/±60V/±6V			
Measurement Resolution	5½digits			
Measurement Accuracy	0.01% + 0.01%F.S.			
Measurement Frequency	4Hz			
Input Impedance	10MΩ			
Terminal	Pluggable terminal			
Temperature Coefficient (0~40℃)	20ppm/℃			
Others				
Isolation (Output to Ground)	500V DC			
Communication Response Time	≤5ms			
Interface	LAN/RS232			
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz			
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. 9kg		Approx. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*413.0(D)mm		2U, 88.0(H)*214.0(W)*446.0(D)mm	

## Technical Data Sheet (2)

Model	N3413/N3413P	
Channel	CH1/CH2	CH3
Voltage	60V	6V
Current	3A	3A
Series Mode-Voltage	120V	N/A
Parallel Mode-Current	6A	N/A
Total Power	378W	
Setting Resolution-Voltage	0.1mV	1mV
Setting Resolution-Current	0.1mA	1mA
Setting Accuracy-Voltage (23±5℃)	< 0.02% + 20mV	< 0.03% + 10mV
Setting Accuracy-Current (23±5℃)	< 0.05% + 5mA	< 0.05% + 10mA
Setting Temperature Coefficient	30ppm/℃	
Readback Resolution-Voltage	0.1mV	1mV
Readback Resolution-Current	0.1mA	1mA
Readback Accuracy-Voltage (23±5℃)	< 0.02% + 20mV	< 0.03% + 10mV
Readback Accuracy-Current (23±5℃)	< 0.05% + 5mA	< 0.05% + 10mA
Readback Temperature Coefficient	30ppm/℃	
Long-term Stability	≤50ppm/1000h	
Voltage Ripple Noise (20Hz ~ 20MHz)	≤10mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms	
Current Ripple Noise (20Hz ~ 20MHz)	≤3mA <sub>rms</sub>	
Dynamic Characteristics		
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	800ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms
Transient Recovery Time	≤1ms	
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV	
Load Regulation-Current	≤0.01%+6mA	≤0.02%+3mA
DVM Measurement (For N3413P Only)		
Channels	1CH	
Voltage Range	±600V/±60V/±6V	
Measurement Resolution	5½ digits	
Measurement Accuracy	0.01% + 0.01%F.S.	
Measurement Frequency	4Hz	
Input Impedance	10MΩ	
Terminal	Pluggable terminal	
Temperature Coefficient (0~40℃)	20ppm/℃	
Others		
Isolation (Output to Ground)	500V DC	
Communication Response Time	≤5ms	
Interface	LAN/RS232	
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz	
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. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*446.0(D)mm	

## Technical Data Sheet (3)

Model	N3411E		N3412E	
Channel	CH1/CH2	CH3	CH1/CH2	CH3
Voltage	32V	6V	32V	6V
Current	3A	3A	5A	3A
Series Mode-Voltage	64V	N/A	64V	N/A
Parallel Mode-Current	6A	N/A	10A	N/A
Total Power	210W		338W	
Setting Resolution-Voltage	10mV	1mV	10mV	1mV
Setting Resolution-Current	1mA			
Setting Accuracy-Voltage (23±5℃)	< 0.01% + 20mV	< 0.03% + 10mV	< 0.01% + 20mV	< 0.03% + 10mV
Setting Accuracy-Current (23±5℃)	< 0.05% + 10mA		< 0.05% + 20mA	< 0.05% + 10mA
Setting Temperature Coefficient	50ppm/℃			
Readback Resolution-Voltage	10mV	1mV	10mV	1mV
Readback Resolution-Current	1mA			
Readback Accuracy-Voltage (23±5℃)	< 0.01% + 20mV	< 0.03% + 10mV	< 0.01% + 20mV	< 0.03% + 10mV
Readback Accuracy-Current (23±5℃)	< 0.05% + 10mA		< 0.05% + 20mA	< 0.05% + 10mA
Readback Temperature Coefficient	50ppm/℃			
Long-term Stability	≤50ppm/1000h			
Voltage Ripple Noise (20Hz ~ 20MHz)	≤5mVp-p	≤10mVp-p	≤5mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms			
Current Ripple Noise (20Hz ~ 20MHz)	≤3mA <sub>rms</sub>			
Dynamic Characteristics				
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	400ms	200ms	400ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms	45ms	13ms
Transient Recovery Time	≤1ms			
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+1mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV			
Load Regulation-Current	≤0.01%+3mA	≤0.02%+3mA	≤0.01%+3mA	≤0.02%+3mA
Others				
Isolation (Output to Ground)	500V DC			
Communication Response Time	≤5ms			
Interface	LAN/RS232			
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz			
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. 9kg		Approx. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*413.0(D)mm		2U, 88.0(H)*214.0(W)*446.0(D)mm	

## Technical Data Sheet (4)

Model	N3413E	
Channel	CH1/CH2	CH3
Voltage	60V	6V
Current	3A	3A
Series Mode-Voltage	120V	N/A
Parallel Mode-Current	6A	N/A
Total Power	378W	
Setting Resolution-Voltage	10mV	1mV
Setting Resolution-Current	1mA	
Setting Accuracy-Voltage (23±5℃)	< 0.02% + 40mV	< 0.03% + 10mV
Setting Accuracy-Current (23±5℃)	< 0.05% + 10mA	
Setting Temperature Coefficient	50ppm/℃	
Readback Resolution-Voltage	10mV	1mV
Readback Resolution-Current	1mA	
Readback Accuracy-Voltage (23±5℃)	< 0.02% + 40mV	< 0.03% + 10mV
Readback Accuracy-Current (23±5℃)	< 0.05% + 10mA	
Readback Temperature Coefficient	50ppm/℃	
Long-term Stability	≤50ppm/1000h	
Voltage Ripple Noise (20Hz ~ 20MHz)	≤10mVp-p	≤10mVp-p
Voltage Ripple Noise (20Hz ~ 20MHz)	≤1mVrms	
Current Ripple Noise (20Hz ~ 20MHz)	≤3mArms	
Dynamic Characteristics		
Voltage Rise Time (no load) (10%-90%F.S. Variation Time)	20ms	20ms
Voltage Rise Time (full load) (10%-90%F.S. Variation Time)	50ms	21ms
Voltage Fall Time (no load) (90%-10%F.S. Variation Time)	800ms	200ms
Voltage Fall Time (full load) (90%-10%F.S. Variation Time)	45ms	13ms
Transient Recovery Time	≤1ms	
Line Regulation-Voltage	≤0.01%+1mV	≤0.01%+3mV
Line Regulation-Current	≤0.01%+3mA	≤0.02%+3mA
Load Regulation-Voltage	≤0.01%+3mV	
Load Regulation-Current	≤0.01%+6mA	≤0.02%+3mA
Others		
Isolation (Output to Ground)	500V DC	
Communication Response Time	≤5ms	
Interface	LAN/RS232	
AC Input	Single phase, 220V AC±10%, frequency 47Hz~63Hz	
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. 11kg	
Dimension	2U, 88.0(H)*214.0(W)*446.0(D)mm	