

# DC Voltage/Current Source

DC215 — Voltage/current source



## DC215 DC Voltage/Current Source

- Low-noise, precision DC source
- Sources voltage up to  $\pm 32$  V
- Sources current up to  $\pm 240$  mA
- 4 quadrant operation (voltage/current source/sink)
- 5½-digit output resolution
- Output sequences (up to 1k steps)
- Data logging and USB mass storage
- Multi-unit synchronization
- GPIB, ethernet & RS-232 interfaces

• DC215 ... \$3890 (U.S. list)

The DC215 DC Voltage/Current Source lets you generate extremely low-noise voltage and current signals with the precision and accuracy needed in the toughest applications. The instrument also measures and displays voltage and current, making it a convenient signal monitor in addition to being a precision source.

The DC215's bipolar, four-quadrant output lets you source and sink voltage ( $\pm 32$  V) and current ( $\pm 240$  mA). In four-wire mode, the instrument corrects for lead resistance delivering accurate voltage and current to your load.

Up to 1000 step sequences can be output, which are controlled by internal or external triggers. Voltage and current measurements can be logged to the USB port or one of the computer interfaces.

### Low-Noise Design

In addition to its precise 5½-digit resolution, the DC215 is highly stable and accurate. It also has impressive noise performance: less than  $75 \mu\text{Vpp}$  (10 V range) and  $70 \text{nApp}$  (10 mA range).

And with its custom linear power supplies, there is no need to worry about switching frequency interference — there isn't any.

# DC215 DC Voltage/Current Source

## Bipolar, Four-Quadrant Output

The DC215 can source or sink voltage or current and is fully floating. Two-wire or four-wire operation can be selected. In four-wire mode (remote sense), the instrument senses the output voltage at the load eliminating the effect of lead resistance. Programmable voltage and current limits can protect sensitive loads.

## Voltage and Current Monitoring

Unlike some competitive models, voltage and current measurement & display is a standard feature of the DC215. A common use of this feature is to monitor current while generating voltage, or monitor voltage while generating current. These measured values can be logged to the USB port or to a computer.

## Sequencing and Data Logging

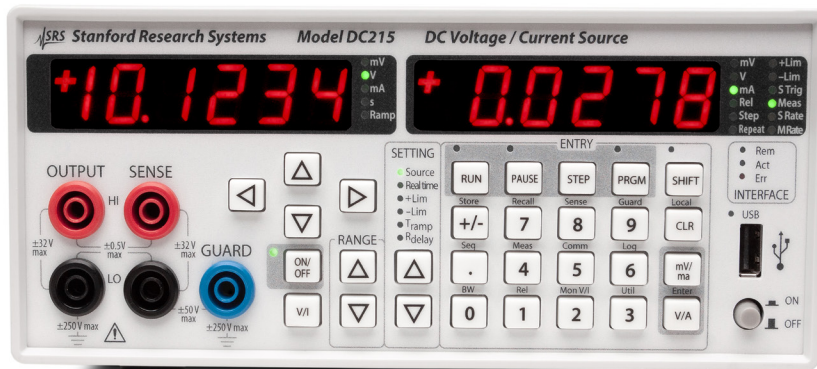
The DC215 lets you define up to 1000 step output sequences, with full control of the output range and value of each step. Sequences can be created on the DC215 directly, or downloaded from a USB drive or over one of the computer interfaces. Internal and external step triggers and ramping control the output sequence.

## Multi-Unit Synchronization

When channel expansion is needed, the DC215 has built-in digital I/O for synchronizing multiple units. It also supports synchronization to external DMMs or other devices.

## Computer Interfaces

The DC215 is fully programmable over its RS-232, GPIB and Ethernet interfaces. All functions of the instrument can be set or read via the interfaces.



DC215 front panel



DC215 rear panel

## DC215 Specifications

Preliminary Specifications - March, 2023

### Voltage Source

Range	Source Range	Resolution	Stability (24 hr.) <i>±(ppm of setting + <math>\mu V</math>)</i>	Accuracy (1 day) <i>±(ppm of setting + <math>\mu V</math>)</i>	Accuracy (90 day) <i>±(ppm of setting + <math>\mu V</math>)</i>	Accuracy (1 yr.) <i>±(ppm of setting + <math>\mu V</math>)</i>
10 mV	±12.0000 mV	100 nV	20 + .05	50 + 1	60 + 4	tbd
100 mV	±120.000 mV	1 $\mu V$	30 + 1	50 + 2	60 + 5	tbd
1 V	±1.20000 V	10 $\mu V$	10 + 2	15 + 6	35 + 12	tbd
10 V	±12.0000 V	100 $\mu V$	10 + 6	15 + 4	35 + 50	tbd
32 V	±32.000 V	1 mV	10 + 20	20 + 150	50 + 250	tbd

Range	Output Current	Output R	Noise <i>(DC to 10 Hz)</i>	Noise <i>(DC to 10 kHz)</i>	CMMR <i>(50/60 Hz)</i>	Temp. Coef. <i>±(ppm setting + <math>\mu V</math>)/°C</i>
10 mV	---	~2 $\Omega$	1.0 $\mu V_{pp}$	12 $\mu V_{pp}$	110 dB	16 + 0.2
100 mV	---	~2 $\Omega$	1.5 $\mu V_{pp}$	15 $\mu V_{pp}$	110 dB	16 + 0.4
1 V	±240 mA	≤3 m $\Omega$	7 $\mu V_{pp}$	50 $\mu V_{pp}$	120 dB	5 + 1
10 V	±240 mA	≤3 m $\Omega$	20 $\mu V_{pp}$	75 $\mu V_{pp}$	120 dB	5 + 3
32 V	±240 mA	≤3 m $\Omega$	50 $\mu V_{pp}$	150 $\mu V_{pp}$	120 dB	5 + 10

### Current Source

Range	Source Range	Resolution	Stability (24 hr.) <i>±(ppm of setting + nA)</i>	Accuracy (1 day) <i>±(ppm of setting + nA)</i>	Accuracy (90 day) <i>±(ppm of setting + nA)</i>	Accuracy (1 yr.) <i>±(ppm of setting + nA)</i>
1 mA	±1.20000 mA	10 nA	10 + 1	30 + 20	50 + 25	tbd
10 mA	±12.0000 mA	100 nA	10 + 10	30 + 200	50 + 250	tbd
100 mA	±120.000 mA	1 $\mu A$	20 + 100	55 + 1500	70 + 2000	tbd
200 mA	±240.00 mA	10 $\mu A$	20 + 200	155 + 15000	175 + 25000	tbd

Range	Output Voltage	Output R	Noise <i>(DC to 10 Hz)</i>	Noise <i>(DC to 10 kHz)</i>	CMMR <i>(50/60 Hz)</i>	Temp. Coef. <i>±(ppm setting + nA)/°C</i>
1 mA	±32 V	≥100 M $\Omega$	5 nApp	50 nApp	100 nA/V	9 + 1
10 mA	±32 V	≥100 M $\Omega$	70 nApp	200 nApp	100 nA/V	9 + 10
100 mA	±32 V	≥10 M $\Omega$	600 nApp	2.5 $\mu A_{pp}$	100 nA/V	12 + 100
200 mA	±32 V	≥10 M $\Omega$	1 $\mu A_{pp}$	10 $\mu A_{pp}$	100 nA/V	12 + 200

### Ordering Information

DC215	Precision voltage source	\$3890
O215RMS	Single rack mount kit	\$100
O215RMD	Dual rack mount kit	\$100

## Voltage Monitor

Range	Source Range	Max Resolution*	Stability (24 hr.) <i>±(ppm of setting + <math>\mu V</math>)</i>	Accuracy (1 yr.) <i>±(ppm of setting + <math>\mu V</math>)</i>	Temp. Coef. <i>±(ppm of setting + <math>\mu V</math>)</i>
Current Out <i>(all ranges)</i>	±32.000 V	10 $\mu V$	50 + 100	tbd	tbd
Voltage Out					
10 mV	±12.0000 mV	10 nV	20 + 2	tbd	tbd
100 mV	±120.000 mV	100 nV	20 + 3	tbd	tbd
1 V	±1.20000 V	1 $\mu V$	10 + 5	tbd	tbd
10 V	±12.0000 V	1 $\mu V$	10 + 10	tbd	tbd
32 V	±32.000 V	10 $\mu V$	10 + 30	tbd	tbd

## Current Monitor

Range	Source Range	Max Resolution*	Stability (24 hr.) <i>±(ppm of setting + nA)</i>	Accuracy (1 yr.) <i>±(ppm of setting + nA)</i>	Temp. Coef. <i>±(ppm of setting + nA)</i>
Voltage Out <i>(all ranges)</i>	±240.00 mA	100 nA	50 + 3000	tbd	tbd
Current Out					
1 mA	±1.20000 mA	10 nA	10 + 10	tbd	tbd
10 mA	±12.0000 mA	10 nA	10 + 1000	tbd	tbd
100 mA	±120.000 mA	100 nA	20 + 800	tbd	tbd
200 mA	±240.00 mA	100 nA	20 + 1400	tbd	tbd

\* Maximum resolution is always available over remote interfaces but may be limited on the front panel

## V & I Monitor

Integration time	Slow (588 ms), Medium (294 ms), Fast (147 ms), Very Fast (74 ms)
Noise rejection	87 dB at 50/60 Hz
Triggering	Auto, Timed (0.1 to 3600 s), Ready, Command

## Limiting

Limit type	Positive and negative limits
I-limit ranges	1, 10 and 30 V ranges
I-limit magnitude	1 mA to 240 mA
I-limit resolution	1 mA
V-limit ranges	1, 10, 100 and 200 mA ranges
V-limit magnitude	0.1 V to 32 V
V-limit resolution	0.1 V

## Response Time (typ.)

HiBW mode	<8 ms
LoBW mode	<10 ms
Accuracy	0.1 % of final value (typ.)

## Reactive Load

Capacitive load	≥100 $\mu F$ (LoBW) (Voltage Out and Voltage Limit)
-----------------	--

Reactive load	≥1 mH (LoBW) (Current Out and Current Limit)
---------------	---

## Logging

Storage	Log data to a USB thumb drive or over the remote interfaces
Number of points	1 through 199999, or continuous

## Output Sequences

Number of steps	2 to 1000
Trigger source	Manual, Timed (0.1 to 3600 s), Command, External Step Trigger

## General

Interfaces	IEEE488.2, RS-232, and Ethernet
Operating Temp.	0 to 50 °C, ≤85 % RH, non-condensing
Power	40 W, 100/120/220/240 VAC, 50/60 Hz
Dimensions	8.3" × 3.55" × 16" (WHL)
Weight	10 lbs.

*All performance specifications after 1 hour warmup at 23 ±1 °C, unless otherwise stated.*