The 7016 SIGNAL SOURCE incorporates high-performance DMM functions into a handy signal generator to provide a convenient, multi-function calibrator at a low price. In addition to generating constant voltage and constant current, it generates pulse signals such as the voltage pulses used for calibrating flow meters and similar devices. Along with its many signal generator functions, the substantial stand-alone DMM measurement functions of Model 7016 include AC and DC voltage and current, resistance, frequency and temperature, and continuity checking. Moreover, with the optional 3856 Communication Package, measured values can be sent to a PC, which can also control functions such as source voltage settings and measurement range selection. The 7016 gives you multiple functions, high precision and high performance at low cost in an instrument that is suitable for use in the laboratory as well as in the field.
A handy signal generator that can simultaneously measure and generate pulse for calibration of industrial instruments

As a signal generator

- DCCV [±1.5000 V to 15.000 V range]
- DCCA [±25.000mA range]
- PULSE [0.5 Hz to 4800 Hz, 5 V/12 V/±5 V±12 V]

Other Standard Features

- Bipolar sink/source generation, pulse generation with variable duty ratio, pulse width, and amplitude, memory generation, scan generation, and ramp generation function

Convenient pulse source for calibrating flow meters, as well generation of constant current and constant voltage

Meters that use pulse output as sensor signals, such as flow meters, can easily be calibrated in the field by using the 7016 as a pulse generator to supply reference signal input. Its ability to generate constant voltage and constant current in the range from 1-5 V and 4-20 mA makes it ideally suited to a variety of maintenance needs, such as calibration of equipment instrumentation in the 1-5 V/4-20 mA range.

Bipolar output expands test utility

Ability to function both as source and sink makes the 7016 well suited for signal loop testing in instrumentation systems or testing charge/discharge of secondary batteries.

Up to 16 steps of memory scan output

Memory scan output allows the 7016 to quickly accommodate calibration requirements that involve repetitive checks.

As a DMM

- DC/ACV [50 mV to 250 V range]
- DC/ACA [50 mA to 500 mA range]
- OHM [500 Ω to 50 MΩ range]
- FREQ [measurement range 1 Hz to 200 kHz]
- Continuity check
- Diode check
- Temperature [-40˚C to 1372˚C]
- [40˚F to 2502˚F]
- AC+DC RMS measurement of voltage and current, 1 ms peak hold function

High resolution, high accuracy and advanced measurement functions

The 7016 achieves unparalleled performance for a handy DMM, providing DC voltage measurement accuracy of ±0.03% rdg. ±5 dgt. (excluding 50 mV range), with display switchable to 51000 count. Also, in addition to the basic measurements of DC voltage, DC current, AC voltage, resistance, diode, and grounding, this multi-function instrument also supports frequency and temperature measurement.

AC+DC measurement function provides RMS measurement of full- and half-wave rectified waveforms

The 7016 can measure RMS values of full-wave and half-wave rectified waveforms used in household electrical equipment.

1ms Peak Hold Function maintains maximum/minimum peak values

The waveform peak values can be acquired and the crest factors calculated from measurement of the instantaneous peak value and calculated true RMS value.

Temperature measurement function

Measuring temperature by connecting the 7016 to the optional 9180-9183 or 9472-9476 temperature probes.

Signal generator and measurement functions can be used simultaneously to measure input/output insulation

When measuring insulation between inputs and outputs, the 7016 can be simultaneously used as both a signal generator and DMM without compromising the functionality of either. A dual display makes it easy to simultaneously check inspection results for both inputs and outputs.

3-way power supply for use in any location

Power the 7016 with a choice of 3 different power supplies for easy use regardless of your location: AA alkaline batteries, Ni-MH battery pack, and AC adapter.

A wide variety of accessories

A wide variety of accessories, such as an AC adapter, Ni-MH battery and three types of test leads are provided with the 7016 as standard features. The 7016 is also equipped with a carrying case for transporting the unit together with all of its accessories.
Control and data import by PC

Full data transfer compatibility included as a standard feature

(Dedicated cable and communication software sold separately)

The optional 3856 COMMUNICATION PACKAGE consists of a dedicated cable and software for transferring measurement data and control signals to and from a PC. Imported data can be stored in text format on the PC, enabling efficient data management using commercial spreadsheet software. Both RS-232C and USB connections are available.

3856-01 COMMUNICATION PACKAGE(RS-232C)
3856-02 COMMUNICATION PACKAGE(USB)

Generation Range and Accuracy

Accuracy is guaranteed at 23±5°C and at 80% rh or less after 5 minutes warm-up. In other conditions, add ±(50 ppm setting + 0.5dgt)/˚C.

DC constant voltage generation (CV)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>±5.000 V</td>
<td>±0.01 mV</td>
<td>±(0.03% setting + 3dgt.)</td>
<td>sink/source output</td>
</tr>
<tr>
<td>±15.000 V</td>
<td>±0.03 mV</td>
<td>±(0.03% setting + 3dgt.)</td>
<td>max. output: ±25 mA</td>
</tr>
</tbody>
</table>

Load regulation: 0.012 mV/µA
Maximum input voltage: ±30 Vdc

DC constant current generation (CC)

<table>
<thead>
<tr>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>±25.000 mA</td>
<td>±1 µA</td>
<td>±(0.03% setting + 5dgt.)</td>
<td>sink/source output</td>
</tr>
</tbody>
</table>

Load regulation: ±50 ppm/µA
Maximum input voltage: ±30 Vdc

General Specifications

Generator functions: DC constant voltage, DC constant current, pulse generation
Measurement functions: AC voltage, DC voltage, AC+DC voltage, AC current, DC current, AC+DC current, resistance, diode, continuity, temperature, frequency, duty ratio, pulse width measurement
Output method: Bipolar sink/source output
AC measurement method: True RMS

Additional functions:
- Settable duty ratio, pulse width and amplitude pulse generation, memory generation (16 memory data settings per range), scan generation (single/continuous); ramp generation, AC+DC RMS voltage/current measurement, 1-ms peak hold (for voltage/current measurement), recording, data hold/refresh hold, relative display, 4-20 mA current-loop percentage display, 0-20 mA percentage display, RS-232C data communications, power-on option.
- Full auto or manual
- LCD with backlight
- Two 5-digit numeric digital displays (for generation and measurement functions, one large main display and one small sub display)
- Max. measurement count: 51,000 counts
- Auto power off: Settable 0 to 99 minutes in 1-minute intervals
- Battery charge state: Warning on LCD when battery voltage falls below 9V
- Sampling rate: 3/s (except AC+DC and frequency measurement)
- 1/s for AC+DC and frequency measurement
- 0.25 - 4/s for duty ratio and pulse width measurement
- Noise susceptibility: NMMR DCV; - 60 dBA or more(50/60 Hz)
- CMRR DCV; - 90 dBA or more(50/60 Hz)
- Withstand voltage: [Case]-[Combined power supply terminals]
- [Case]-[Combined output terminals]
- [Combined power supply terminals]-[Combined output terminals]
- [Combined output terminals]-[Combined input terminals]
- AC Adapter (Model SA-141A0F-11 supplied, for 100 to 250 VAC, 47 to 63 Hz)
- Maximum rated power: 5 VA
- Continuous operation: 4 h or more (generation and measurement)
- Charging time: Approx. 90% × 120h × 540 min, 735 g (instrument only)

Related Product

The 7011 DC SIGNAL SOURCE: a DC signal generator for calibrating thermocouples.

In addition to measuring and generating ±25 V, ±25 mA, the 7011 is capable of generating seven types of thermoelectromotive force by temperature settings.

Pulse generation (PULSE)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Output range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>0.5, 1, 2, 5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100, 120, 150, 200, 240, 300, 400, 480, 600, 800, 1200, 1600, 2400, 4800 Hz</td>
<td>–</td>
<td>±0.005% setting + 0.01Hz</td>
</tr>
<tr>
<td>Duty ratio</td>
<td>0.39 % to 99.60 %</td>
<td>0.390625%</td>
<td>±(0.01% setting + 0.2%) *1</td>
</tr>
<tr>
<td>Pulse width</td>
<td>–</td>
<td>1/256 x f</td>
<td>±(0.01% setting + 0.3 ms)</td>
</tr>
<tr>
<td>output voltage</td>
<td>5 V, 12 V</td>
<td>5 V, 12 V</td>
<td>±(2% setting + 0.2 V)</td>
</tr>
<tr>
<td>–</td>
<td>±5 V, ±12 V</td>
<td>–</td>
<td>±(2% setting + 0.4 V)</td>
</tr>
</tbody>
</table>

*1: Duty ratio and pulse width should be set so that positive-polarity pulse width is at least 50 µs.
*2: Duty ratio, pulse width and output voltage accuracy specifications are based on at least 50 µs positive-polarity pulse width.
*3: Maximum applied voltage: ±30 VDC

Operating environment

PC requirements: At least 200-MHz Pentium running Windows 98SE/ME/2000XP*/ RAM: At least 128 MB / Display: At least 800 × 600 SVGA / Hard disk: At least 40 MB free space

* Windows 98/ME/2000/XP are registered trademarks of Microsoft Corp., USA
### DC Voltage (DCV) / AC Voltage (ACV) / AC+DC Voltage (ACDCV) / 1-mS peak-hold Voltage (V)

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>DCV Accuracy</th>
<th>ACV Accuracy</th>
<th>ACDCV Accuracy</th>
<th>V Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mV</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>500 mV</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>5 V</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>50 V</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>250 V</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
</tbody>
</table>

### DC Current (DCA) / AC Current (ACA) / AC+DC Current (ACDCA) / 1-mS peak-hold Current (A)

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>DCA Accuracy</th>
<th>ACA Accuracy</th>
<th>ACDC A Accuracy</th>
<th>A Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mA</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>500 mA</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.1% rdg. + 3 dgt.</td>
</tr>
</tbody>
</table>

### Resistance (OHM)

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Resolution</th>
<th>Measurement current</th>
<th>Open terminal voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Ω</td>
<td>0.10 mΩ</td>
<td>±0.15% rdg. + 4 dgt.</td>
<td>&lt; +4.8 VDC</td>
</tr>
<tr>
<td>5 kΩ</td>
<td>0.01 mΩ</td>
<td>±0.15% rdg. + 4 dgt.</td>
<td>&lt; +4.8 VDC</td>
</tr>
<tr>
<td>50 kΩ</td>
<td>0.10 mΩ</td>
<td>±0.15% rdg. + 4 dgt.</td>
<td>&lt; +4.8 VDC</td>
</tr>
<tr>
<td>500 kΩ</td>
<td>1.00 mΩ</td>
<td>±0.15% rdg. + 4 dgt.</td>
<td>&lt; +4.8 VDC</td>
</tr>
</tbody>
</table>

### Frequency (FREQ)

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Hz</td>
<td>0.001 Hz</td>
<td>±0.002% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>1 kHz</td>
<td>0.01 Hz</td>
<td>±0.002% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>10 kHz</td>
<td>0.1 Hz</td>
<td>±0.002% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>100 kHz</td>
<td>1 Hz</td>
<td>±0.002% rdg. + 3 dgt.</td>
</tr>
<tr>
<td>200 kHz</td>
<td>10 Hz</td>
<td>±0.002% rdg. + 3 dgt.</td>
</tr>
</tbody>
</table>

### Temperature (TEMP) (K type thermocouple)

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 °C</td>
<td>0.1 °C</td>
<td>±0.3% rdg. + 3 °C</td>
</tr>
<tr>
<td>1000 °C</td>
<td>10 °C</td>
<td>±0.3% rdg. + 3 °C</td>
</tr>
</tbody>
</table>

### Duty test (DIODE), Continuity test (CONT)

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 mV</td>
<td>±0.05% rdg. + 3 dgt.</td>
<td>±0.05% rdg. + 3 dgt.</td>
</tr>
</tbody>
</table>

### Probes

9180, 9183 SHEATH TYPE TEMPERATURE PROBE (9180, 9183 SHEATH TYPE TEMPERATURE PROBE)

### 7016 SIGNAL SOURCE

[Accessories: Carrying case 1, AC adapter 1, Ni-MH battery 8, 3851-10 Test lead 1 set (for measurement), Test lead 1 set (for generation), Test lead 1(yellow), Alligator clip 1 set]

### OPTION

3856-01 COMMUNICATION PACKAGE (RS-232C)
3856-02 COMMUNICATION PACKAGE (USB)
9180 SHEATH TYPE TEMPERATURE PROBE

DISTRIBUTED BY
99 Washington Street
Melrose, MA 02176
Phone 781-665-1400
Toll Free 1-800-517-8431

Visit us at www.TestEquipmentDepot.com

All information correct as of Jul. 23, 2004. All specifications are subject to change without notice.

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