Data Acquisition System

3-slot mainframe, with 7 available modules

DAQ4070A

Features

- 3 slots mainframe with internal 6½ digit DMM.
- 7 switch and control plug-in modules.
- Basic 0.003% DCV accuracy.
- Scan rates of up to 450 channels/second.
- Up to 120 channels per system.
- 4.3” color display.
- Measures and converts 14 different input signals: DC/AC volts, DC/AC current, 2- and 4-wire resistance, strain gage, frequency and period, capacitance, temperature with thermocouples, RTDs, and thermistors.
- With PC software for easy configuration and front panel control.
- USB flash drive support to copy/log data in standalone applications.
- Standard USB, LAN, RS-232/485, and Optional GPIB interface.

Modules

A complete selection of plug-in modules gives you a choice of high-quality measurement, switching, and control capabilities. Mix and match modules to get the functionality you need.

Module No.	Description	Speed (ch/sec)	Max Voltage	Max Current	Comment
DAQM4000A	20 ch. solid-state multiplexer	450	120V	0.02A	A quadratic relay module that provides two groups (A/B), each with 10 (2-wire) channels. All 20 channels can be switched to high (HI) and low (LO) inputs, providing fully isolated inputs for built-in digital multimeter or external bit devices. During 4-wire resistance measurement, the channels of Group A are automatically paired with the channels of Group B to provide power and sensing connections. The module has built-in cold contact technology that can greatly reduce the error caused by thermal changes when measuring thermocouples.
DAQM4001A	20 ch. multiplexer + 2 current channels (22 ch. total) (2/4-wire) module	80	300V	1A	An integrated multiplexer for universal scanning. The same module can mix 2- and 4-wire channels; at the same time, 2 additional current input channels can be used for AC and DC current measurements without the need for external partial current resistors (max. 1A per channel). It has 22 channels, dense multifunction switching and scan rates up to 80 channels per second, suitable for a variety of data acquisition applications. Built-in cold junction reference.

DAQM4002A	16 ch. multiplexer (2/4-wire) module	80	300V	50mA	It can achieve a scan rate of up to 80 channels per second. This module is suitable for high-throughput automatic testing applications, as well as igh-speed data recording and monitoring tasks. 16 two-wire inputs can be switched to 300V. 2- and 4-wire channels can be mixed on the same module. Current measurement requires the use of a shunt resistor equipped by the user. Built-in thermocouple reference node.
DAQM4003A	20 ch. actuator/GP switch module Form C (SPDT) switches	120	300V	1A	It has 20 independent single pole double throw (SPDT) relays. It can turn on and cut off the power supply circuit of the product under test, the control indicator and the status light, and stimulate external power relays and solenoids. Combined with matrix and multiplexer modules, it can form a customized switching system with 300V and 1A contacts that can withstand power up to 50W.
DAQM4004A	4x8 matrix, 2-wire	120	300V	1A	It provides the most flexible connection path between the DUT and the test system, allowing different test instruments to be connected to multiple points on the DUT at the same time. It can connect rows and columns of multiple modules to build larger matrices such as 8x8, 4x16, etc. Up to 96 intersections can be constructed in a single instrument.
DAQM4005A	2 GHz dual 1:4 RF mux 50Ω module	60	42V	0.7A	It provides broadband switching functions for high frequency and pulse signals. They can be used to route test signals between the device under test and a signal generator, oscilloscope, spectrum analyzer, or other instruments. This module serves as two separate 1x4 multiplexers, each containing a common shielding layer and a switch center conductor. The connection can be directly connected to an SMB input with 2GHz available bandwidth, or to a BNC-to-SMB adapter that provides 1GHz bandwidth. If the application requires a larger topology, multiple switch groups can also be cascaded to create a 16:1 multiplexer in one instrument.
DAQM4008A	40-ch. single-ended mux common low	80	300V	1A	It can switch 40 single-wire inputs for each module, such as battery test, component features and desktop tests. The low voltage connection is isolated from the ground and can float to 300V. Its also supports all 2-wire internal measurements except current.

Accuracy Specification

Range[2]	24 Hour[3] Tcal ± 1 °C	90 Days Tcal ± 5 °C	1 Year Tcal ± 5 °C	2 Year Tcal ± 5 °C	Temperature Coefficient/°C[4]
Accuracy ± (% of reading + % of range)[1]					
DC Voltage					
100 mV	0.0030+0.0030	0.0040+0.0035	0.0050+0.0035	0.0065+0.0035	0.0005+0.0005
1 V	0.0020+0.0006	0.0030+0.0007	0.0040+0.0007	0.0055+0.0007	0.0005+0.0001
10 V	0.0015+0.0004	0.0020+0.0005	0.0035+0.0005	0.0050+0.0005	0.0005+0.0001
100 V	0.0020+0.0006	0.0035+0.0006	0.0045+0.0006	0.0060+0.0006	0.0005+0.0001
300 V	0.0020+0.0006	0.0035+0.0010	0.0045+0.0010	0.0060+0.0010	0.0005+0.0001
True RMS AC Voltage[2,5,6]					
100 mV, 1 V, 10 V, 100 V, and 750 V ranges					
5 Hz - 10 Hz	0.35+0.02	0.35+0.03	0.35+0.03	0.35+0.03	0.35+0.03
10 Hz - 20 kHz	0.04+0.02	0.05+0.03	0.06+0.03	0.07+0.03	0.005+0.003
20 kHz - 50 kHz	0.10+0.04	0.11+0.05	0.12+0.05	0.12+0.05	0.011+0.005
50 kHz - 100 kHz	0.55+0.08	0.60+0.08	0.60+0.08	0.60+0.08	0.60+0.08
100 kHz - 300 kHz	4.00+0.50	4.00+0.50	4.00+0.50	4.00+0.50	0.200+0.020
True RMS AC Current[2,6,9]					
100µA (<0.011V[16]), 1mA (<0.11V[16]), 10mA (<0.05V[16]), 100mA (<0.5V[16]), 1A (<0.7V[16]), 3A (<2.0V[16]), 10A[8] (<0.5V[16]) ranges					
3 Hz - 5 kHz	0.10+0.04	0.10+0.04	0.10+0.04	0.10+0.04	0.015+0.006
5 kHz - 10 kHz	0.10+0.04	0.10+0.04	0.10+0.04	0.10+0.04	0.030+0.006
Frequency					
Accuracy ± (% of reading)[12, 13]					
100 mV, 1 V, 10 V, 100 V, and 750 V ranges [14]					
10 Hz - 100 Hz	0.03	0.03	0.03	0.03	0.035
100 Hz - 1 kHz	0.003	0.008	0.01	0.01	0.015
1 kHz - 300 kHz	0.002	0.006	0.01	0.01	0.015
Square Wave	0.001	0.006	0.01	0.01	0.015
Capacitance[17]					
1.000 nF	0.50+0.50	0.50+0.50	0.50+0.50	0.50+0.50	0.50+0.50
10.00 nF	0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
100.0 nF	0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
1.000 µF	0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
10.00 µF	0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
100.0 µF	0.40+0.10	0.40+0.10	0.40+0.10	0.40+0.10	0.05+0.01
Diode Test[10]					
5V	0.002+0.030	0.008+0.030	0.010+0.030	0.012+0.030	0.001+0.002

Aperture (resolution/range)	1 Second	0.1 Second	0.01 Second		
Additional Frequency Errors (% of reading)[13]					
3 Hz - 40 Hz	0	0.2	0.2		
40 Hz - 100 Hz	0	0.06	0.2		
100 Hz - 1 kHz	0	0.02	0.2		
1 kHz - 300 kHz	0	0.004	0.03		
Square Wave[15]	0	0	0		

Range[2]	Internal Resistance Voltage Drop	24 Hour[3] Tcal ± 1 °C	90 Days Tcal ± 5 °C	1 Year Tcal ± 5 °C	2 Year Tcal ± 5 °C	Temperature Coefficient/°C[4]
Accuracy ± (% of reading + % of range)[1]						
DC Current						
100 µA	<0.03 V	0.010+0.020	0.040+0.025	0.050+0.025	0.060+0.025	0.0020+0.0030
1 mA	<0.3 V	0.007+0.006	0.030+0.006	0.050+0.006	0.060+0.006	0.0020+0.0005
10 mA	<0.05 V	0.007+0.020	0.030+0.020	0.050+0.020	0.060+0.020	0.0020+0.0020
100 mA	<0.5 V	0.010+0.004	0.030+0.005	0.050+0.005	0.060+0.005	0.0020+0.0005
1 A	<0.7 V	0.050+0.006	0.080+0.010	0.100+0.010	0.120+0.010	0.0050+0.0010
3 A	<2.0 V	0.180+0.020	0.200+0.020	0.200+0.020	0.230+0.020	0.0050+0.0020
10 A[8]	<0.5 V	0.050+0.010	0.120+0.010	0.120+0.010	0.150+0.010	0.0050+0.0010

Range[2]	Test Current	24 Hour[3] Tcal ± 1 °C	90 Days Tcal ± 5 °C	1 Year Tcal ± 5 °C	2 Year Tcal ± 5 °C	Temperature Coefficient/°C[4]
Resistance[7]						
100 Ω	1 mA	0.003+0.0030	0.008+0.004	0.010+0.004	0.012+0.004	0.0006+0.0005
1 kΩ	1 mA	0.002+0.0005	0.008+0.001	0.010+0.001	0.012+0.001	0.0006+0.0001
10 kΩ	100 µA	0.002+0.0005	0.008+0.001	0.010+0.001	0.012+0.001	0.0006+0.0001
100 kΩ	10 µA	0.002+0.0005	0.008+0.001	0.010+0.001	0.012+0.001	0.0006+0.0001
1 MΩ	5 µA	0.002+0.0010	0.008+0.001	0.010+0.001	0.012+0.001	0.0010+0.0002
10 MΩ	500 nA	0.015+0.0010	0.020+0.001	0.040+0.001	0.060+0.001	0.0030+0.0004
100 MΩ	500 nA	0.300+0.0100	0.800+0.010	0.800+0.010	0.800+0.010	0.1500+0.0002

Probe		DMM
Temperature[11]		
RTD PT100 (DIN/IEC751)	Accuracy	0.05℃
Thermistor 5K	Accuracy	0.1℃

1. The specifications are for a 60 minutes warm up, an integration setting of 10 or 100NPLC, automatic zero on, an AC slow filter run within the last two days.
2. 20% over range on all ranges, except 1,000 VDC, 750 VAC, 10 ADC, 3 AAC, 10 AAC and diode test have 0%.
3. Relative to the calibration standards.

4. Add this for each degree (℃) outside the last TCAL±5℃.

5. Specifications are for sinewave input >5% of range and >1mVrms. 750 VAC range is limited to 8 × 10^7 Volt-Hz. For inputs within 1% and 5% of range and frequency<50 kHz, add 0.1% of range additional error. For 50kHz to 100kHz, add 0.13% of range additional error.

6. Low frequency performance:three filter settings are available: 3Hz, 20Hz, and 200Hz. Frequencies greater than these filter settings are specified with no additional errors.

7. Specifications are for 4- wire ohms function or 2-wire ohms using math null for offset. Without math null, add 0.2 Ω additional error in the 2-wire ohms function.

8. The 10A range is available on the front connector only. Each amplifier adds a 2mA base current value, or input current >5Arms.

9. Specifications are for sine wave input >1.5% of range and >10μA AC.

10. Specifications are for the voltage measured at the input terminals. The 1mA test current is typical. Variations in the current source will create variations in the voltage drop across a diode junction.

11. The selected probe limits the actual measuring range and measurement errors. Probe accuracy has included all measurement and ITS-90 temperature conversion errors. PT100Ro can be set to 100Ω±5Ω, to eliminate the original probe error.

12. Unless stated otherwise, the specifications are sine wave input. Specifications are for 1s gate time (7 digits).

13. Input ≥100 mV. For 10mV to 100mV inputs, multiply the % of reading error x 10.

14. Amplitude 10% to 120% below 750 ACV.

15. The square wave input is specified for 10 Hz - 300 kHz for a 1s aperture.

16. Internal resistance voltage drop.

17. Specifications are for using Math Null zeroing. High dissipation factor capacitors may show different results than a single frequency measurement. Film capacitors usually have lower dissipation factors than other dielectrics.

OSCOMP GmbH
Otto-Hahn-Str. 28-30 • 85521 Riemerling • Germany
Tel. +49 89 609 9843 • Email: info@oscomp.de
www.oscomp.de