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Find the *ISAS DM224* at our website: *Click HERE*

Summary

The DM224 card combines two independent $6^{1/2}$ digit multimeters with a host of digital features that make it ideally suited to diagnostic measurements and system control. Combined with the power of a laptop, the DM224 becomes the cornerstone of your portable field test equipment. The DM224 is a Type II PC-Card which can be used in DOS, Windows3.1x, Windows95/98 and WindowsNT4.



ISAS DM224

Dual 6 $^{1/2}$ Digit DMM Multifunction PC-Card with "STORAGE SCOPE" Capability

Features

- Dual isolated 6 $^{1/2}$ digit multimeters with independent mode, range and rate settings
- Sample buffer of 4096 readings per DMM
- Digitizing "storage scope" operation including edge and level triggering modes. Pre-triggering up to 4095 samples. Internal or external triggering
- Continuous "FIFO" data streaming mode or single conversion mode
- Reading rates from 10Hz to 10KHz on both DMMs
- DC ranges of ±200mV, ±1V, ±2V, ±10V, ±20V, and ±100V
- True RMS AC ranges of 1V, 10V and 100V on DMM1 up to 12KHz bandwidth
- Resistance readings from 1.0Ω to 2.0MΩ plus extended 20MΩ range
- Diode check function
- Zener diode test up to 10V
- 16 digital I/Os configurable as any number of ins & outs
- 2x 24-bit counters with built in frequency, pulse and period measurement logic
- External clock and timing pulse generator

Due to a policy of continuous product improvement, specifications are subject to change without notice.

ISAS DM224

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6 $^{1/2}$ Digits Twice!

To target applications where taking one measurement at a time is just not sufficient, the DM224 packs TWO $6^{1/2}$ digit multimeters into one PC-Card. This gives it the ability to measure two independent parameters at the same time. So why be content with measuring only "cause" or "effect"? Now you can measure both at the same time !

And with $6^{1/2}$ digit resolution, you can hunt down changes that are measured in parts-per-million. Low noise conversion techniques make the DM224 good to resolve changes that are as small as 2uV in a ±10V range.

DMM Isolation

Placing two separate DMMs on the same card is useful only if they are isolated from each other. The DM224 provides true Galvanic isolation between the two DMMs and between them and the computer's ground. This means that readings on DMM1 do not effect those on DMM2, and that the connection of your computer to the same power bus as the item being measured is also no longer a concern.

Beware of competitors' products that do not offer this true isolation: using two such cards to get two simultaneous readings can give you cross-channel measurement errors at best and a potential destructive ground loop at worst.

Frequency Measurement

The DM224 includes two independent 24-bit counters. These can be used for general purpose counting using external GATE and CLK signals (both with programmable polarity). Alternatively, the counters can be used in one of three pre-configured modes to measure frequency, period or pulse width.

The card includes timing reference generation as well as frequency reference generation to make these readings possible and to allow a complete auto-ranging system to be realized. Frequencies from nano Hz to 20MHz can be measured, and pulse widths from 100ns to 194days ! Very low frequency measurements can be affected using the reciprocal period measurement technique and so reducing the integration time required for an accurate reading.

Digital I/O

To control an external target or a signal routing multiplexer, the DM224 provides 16 digital I/O lines. These are under direct software control and can be configured as any number of inputs or outputs.

Additionally, two of the I/Os can be used to output the timing and frequency references that the card generates.

Storage Scope Features

A traditional DMM is limited by two main factors: i) its maximum reading rate is very low ii) it cannot store its results in a local buffer to allow waveform digitization.

The DM224 *breaks these limitations* by combining the dual DMMs with features that are normally found only on Digital Storage Scopes.

Firstly, the card has sample rates that are programmable between 10Hz and 10KHz on each DMM. It is even possible to run the two DMMs at different rates if required.

Secondly, the card has a 4096 point sample buffer for each DMM. Each reading is saved in the buffer as a full 24-bit signed sample. The buffer can be operated in two ways: "FIFO" mode that allows continuous data streaming, and "Burst" mode that allows an event triggered run-until-full scheme.

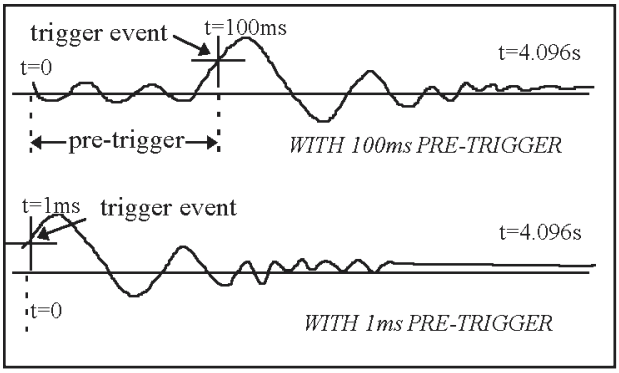
FIFO Mode

FIFO mode allows software to continuously collect samples from the buffer under polled or interrupt control. This mode makes the sample depth equivalent to the amount of storage you have available in your PC.

Burst Mode

Burst mode uses either an internal or an external trigger event to begin the sample storage to the card's internal buffer. When the buffer becomes full, the sampling stops. The internal trigger uses an 8-bit signed trigger threshold together with +ET,-ET,>,< logic comparing the sample values coming from DMM1. The external trigger uses a special trigger signal to initiate the sampling.

In Burst mode, the buffer can be configured to allow pre-trigger up to a depth of 4095 samples.
Pre-triggering in Burst Mode at 1KHz sample rate



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Voltage Ranges

The high resolution of the DM224 makes it possible to offer six basic ranges in DC and three ranges in AC (DMM1 only) modes

±200mV, resolution 200nV (DC only)
±1V, resolution 200nV
±2V, resolution 500nV (DC only)
±10V, resolution 2uV
±20V, resolution 2uV (DC only)
±100V, resolution 20uV

In the 200mV,1V, 2V and 10V ranges the DC input impedance is greater than 1GΩ, with a leakage of less than 200pA. In the 20V & 100V ranges the DC impedance is 1.1MΩ.

Creast factors of up to 5 can be handled by the card and the 3dB bandwidth of the True RMS converter is 20Hz to 12KHz.

Resistance Ranges

Two precision current sources are used to measure an unknown resistance. These give ranges of 20K and 2.0MΩ. Using the two DMMs, a four wire resistance check can be made, where DMM1 supplies the test current and DMM2 measures the induced voltage. This scheme can also be used to null any stray offset voltages by measuring the induced voltage when the test current is turned off. An extended 20MΩ range is also included (lower accuracy).

Continuity Test

A simple continuity test can be performed using either the high or the low current source. This can be useful to verify that sensors and transducers have not burnt out or to test whether an electrical connection exists between two points.

Diode Test

The forward conductivity of diodes can be tested using one of the current sources. The range of compliance of the source makes it possible to test Zener diodes up to 10V.

Temperature Sensor

To allow the DM224 to perform a first order temperature drift compensation in software, each DMM has its own temperature sensor to asses the absolute temperature of each reference device. This feature also makes it possible to monitor the warm up of the card from power up, and so allows software to "advise" when the stated accuracy can be expected from the meter.

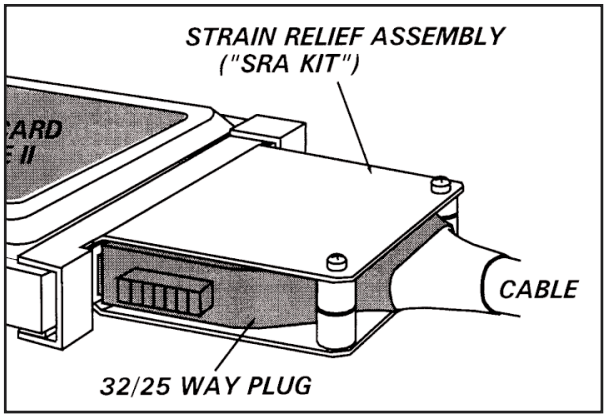
Overload Protection

All DMM modes are protected from accidental mis-connection up to 125V peak.

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Card Connection

The DM224 uses a 32 way mini I/O connector to carry all signals to/from the card. Uniquely, this card and cable interface can be supplied with a stainless-steel Strain Relief Assembly that protects the connector from otherwise damaging forces. The SRA1 can be push fitted and can also be attached directly to the DM224 allowing the connection between card and cable to be semi-permanent. This makes the interface non-reliant on the connector's latches, using instead the strength of two stainless steel screws for "pull" protection.



Calibration

The DM224 uses additional circuitry inside each DMM that allows it to dynamically compute its own correction factors. This means that software can null out offset and gain changes "on-the-fly" that naturally change with time and temperature. Additionally, the tempco of the internal references is stored at manufacture and this, in combination with the internal temperature sensors, allows a first order correction of temperature drift effects.

A yearly "external" calibration interval is recommend for the card. Again, the extra calibration circuitry means that all external tests to measure the internal references can be done without opening the case of the DM224. This is important for long term stability and reliability. It also means that calibration readings do not have to be deduced based on other measurements and then manually entered into a calibration correction table. All parameters are measured directly by a calibrated reference DMM and are then burned directly into an internal E^2PROM.

Contact Information

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