ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

**Artisan Technology Group**
(217) 352-9330 | sales@artisantg.com | artisantg.com

**Full-service, independent repair center**
with experienced engineers and technicians on staff.

**We buy your excess, underutilized, and idle equipment**
along with credit for buybacks and trade-ins.

**Custom engineering**
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

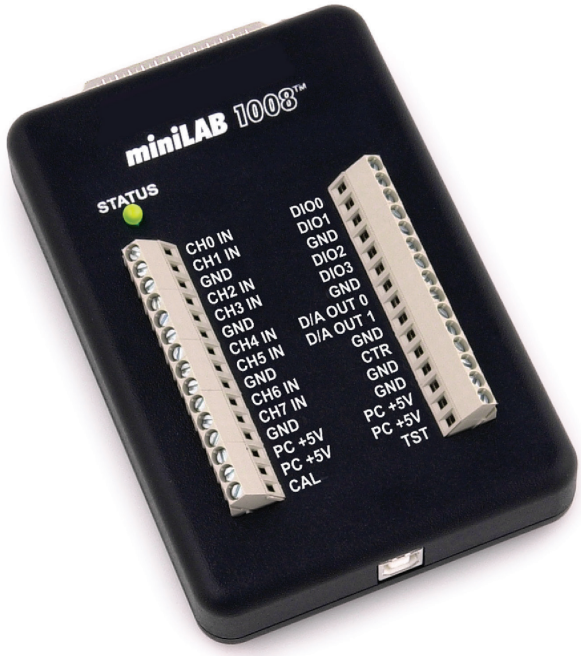
**Expert team | Trust guarantee | 100% satisfaction**

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Measurement Computing MiniLAB 1008* at our website: *Click HERE*

# miniLAB 1008

## Multifunction USB Device




*The miniLAB 1008 features 8 single-ended or 4 differential analog inputs, two analog outputs, 28 bidirectional DIO lines, one 32-bit event counter, and a rugged enclosure*

## Features

- 8 single-ended or 4 differential analog inputs
- 11-bit (SE) or 12-bit (DIFF) resolution
- Two 10-bit analog outputs
- 28 bidirectional digital I/O
- One 32-bit external event counter
- No external power required

### Supported Operating Systems

- Windows® 10/8/7/Vista®XP, 32/64-bit

## Overview

The miniLAB 1008 is an accurate, powerful, low-cost, USB-based data acquisition device featuring 8 single-ended or 4 differential 12-bit analog inputs, two 10-bit analog outputs, 32 total digital I/O lines (4 through screw terminals, 28 through a 37-pin connector), and an event counter.

Combined with Measurement Computing DAQ software, the miniLAB 1008 turns your personal computer into a data acquisition and control system that may be used to automate experiments, construct product test stands, or monitor and control production equipment.

The miniLAB 1008 is bus-powered, USB plug-and-play, and easy to use.

## Analog Input

The miniLAB 1008 provides eight single-ended or four differential analog inputs.

When configured for single-ended mode, each input has 11-bit resolution and a range of ±10 V.

When configured for differential mode, each input has 12-bit resolution and software selectable ranges. A low-noise PGA provides gains of up to 20 and a dynamic range of up to 16 bits.

## Sample Rate

The maximum continuous scan rate is an aggregate rate. The total acquisition rate for all channels cannot exceed 1.2 kS/s.

In hardware paced mode, users can acquire data from one channel at 1.2 kS/s, two channels at 600 S/s, four channels at 300 S/s, and so on, up to 8 channels at 150 S/s.

In software paced mode, the maximum throughput sample rate is 50 S/s.

When using burst scan mode, the maximum sample rate is 8 kS/s divided by the number of channels being read.

## Analog Output

Two 10-bit analog output channels can be updated simultaneously at a rate up to 50 S/s per channel. One output can be updated at a rate up to 100 S/s. The output range is fixed at 0 V to 5 V.

## Digital I/O

The miniLAB 1008 screw terminal provides four digital I/O bits. These bits are protected from overvoltage or short circuit conditions with 1.5 kΩ series resistors. Each bit is 5V/TTL compatible, and configurable for either input or output.

A 37-pin connector provides an additional 24 digital I/O bits as two 8-bit ports and two 4-bit ports. These bits are pulled up by default, are TTL compatible, and port-configurable for either input or output.

## Counter Input

The 32-bit event counter accepts frequency inputs up to 1 MHz, and increments when the TTL level transitions from low to high.

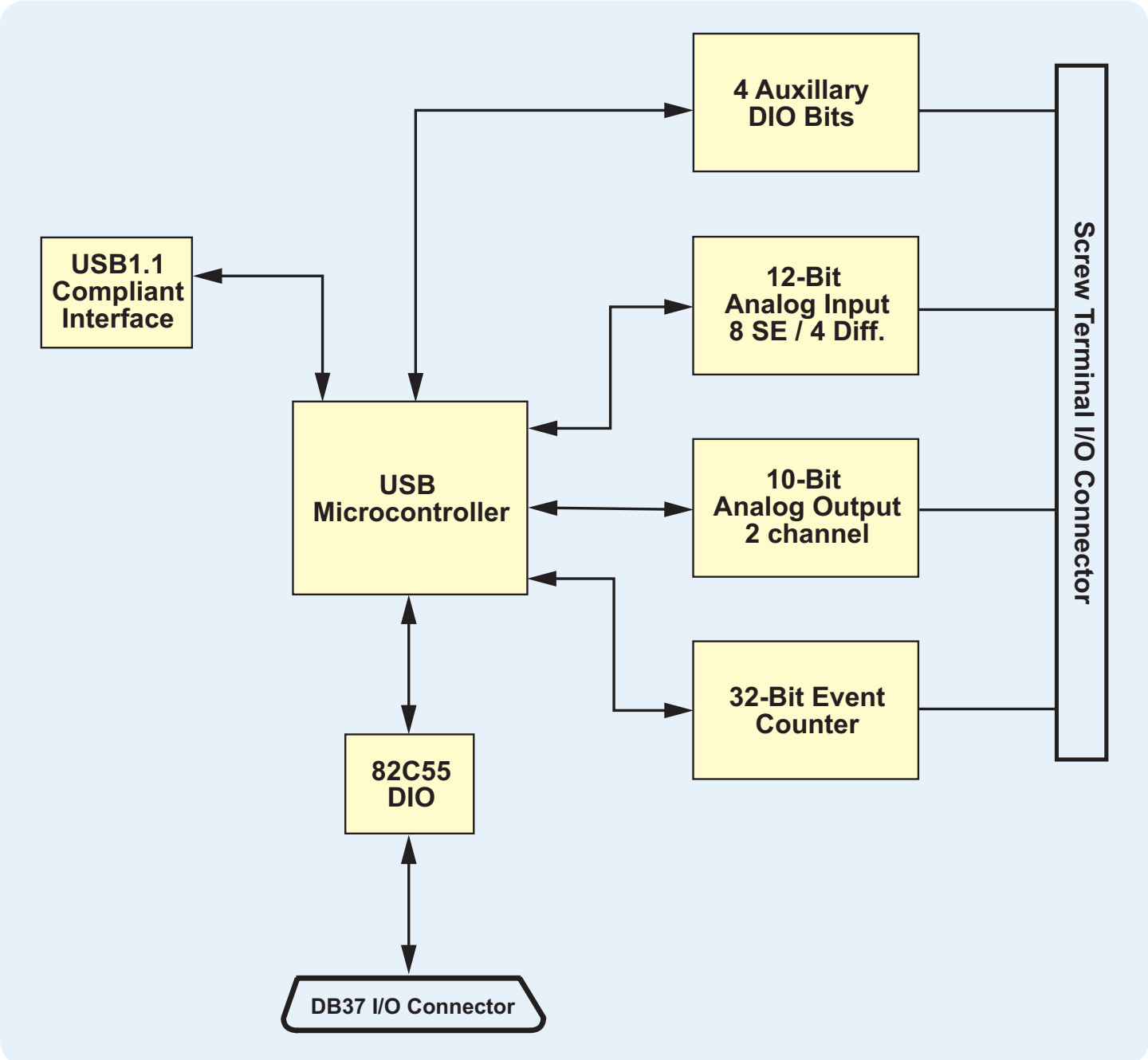
## Calibration

The miniLAB 1008 is factory-calibrated using a NIST-traceable calibration process. Specifications are guaranteed for one year.

The miniLAB 1008 also supports field calibration for users to calibrate the device locally with the InstaCal utility.

# miniLAB 1008

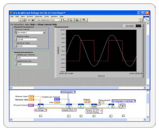
## Functional Block Diagram



# miniLAB 1008

## Software Support

The miniLAB 1008 is supported by the software in the table below.

| | | |
|---|---|---|
| **Ready-to-Run Applications** | | |
| DAQami™ |  | Data acquisition companion software with drag-and-drop interface that is used to acquire, view, and log data, and generate signals. DAQami can be configured to log analog, digital, and counter channels, and to view that data in real-time or post-acquisition on user-configurable displays. Logged data can be exported for use in Excel® or MATLAB®. Windows OS<br>DAQami is included with the free MCC DAQ Software bundle. Install DAQami and try the fully-functional software for 30 days. After 30 days, all features except for data logging and data export will continue to be available – data logging and data export features can be unlocked by purchasing the software. |
| InstaCal™ |  | An interactive installation, configuration, and test utility for MCC hardware. Windows OS<br>InstaCal is included with the free MCC DAQ Software bundle. |
| TracerDAQ™ and TracerDAQ Pro |  | Virtual strip chart, oscilloscope, function generator, and rate generator applications used to generate, acquire, analyze, display, and export data. Supported features may vary by hardware. The Pro version provides enhanced features. Windows OS<br>TracerDAQ is included with the free MCC DAQ Software bundle.<br>TracerDAQ Pro is available as a purchased software download. |
| **General-Purpose Programming Support** | | |
| Universal Library™ (UL) for Windows |  | Library for developing applications in C, C++, VB, C# .Net, VB .Net, and Python on Windows.<br>The UL for Windows is included with the free MCC DAQ Software bundle.<br>The UL Python API for Windows is available on GitHub (https://github.com/mccdaq/mcculw). |
| **Application-Specific Programming Support** | | |
| ULx for NI LabVIEW™ |  | A comprehensive library of VIs and example programs for NI LabVIEW that is used to develop custom applications that interact with most MCC devices. Windows OS<br>ULx for NI LabVIEW is included with the free MCC DAQ Software bundle. |
| DASYLab® |  | Icon-based data acquisition, graphics, control, and analysis software that allows users to create complex applications in minimal time without text-based programming. Windows OS<br>DASYLab is available as a purchased software download. An evaluation version is available for 28 days. |

# miniLAB 1008

## Specifications

All specifications are subject to change without notice.
Typical for 25 °C unless otherwise specified.

### Analog Input

**A/D converter type**: Successive approximation type
**Input voltage range for linear operation, single ended mode**
CHx to GND: ±10 V max
**Input voltage range for linear operation, differential mode**
CHx to GND: –10 V min, +20V max
**Absolute maximum input voltage**
CHx to GND: ±40 V max
**Input current**:
Vin = +10 V: 70 µA typ
Vin = 0 V: –12 µA typ
Vin = –10 V: –94 µA typ
Input current is a function of applied voltage on the analog input channels. For a given input voltage, Vin, the input leakage is approximately equal to (8.181*Vin–12) µA.
**Number of channels**: 8 single-ended / 4 differential, software selectable
**Input ranges,**
Single-ended mode: ±10 V, G=2
Differential mode, software selectable:
±20 V, G=1
±10 V, G=2
±5 V, G=4
±4 V, G=5
±2.5 V, G=8
±2.0 V, G=10
±1.25 V, G=16
±1.0 V, G=20
**Throughput**
Software paced: 50 S/s
Continuous scan: 1.2 kS/s
Burst scan to 4K sample FIFO: 8 kS/s
**Channel gain queue**: Up to 8 elements with software configurable channel, range, and gain.
**Resolution**
Differential: 12 bits, no missing codes
Single-ended: 11 bits, 0-2047 codes
**CAL accuracy**
CAL = 2.5 V: ±0.05% typ, ±0.25% max
**Integral linearity error**: ±1 LSB typ
**Differential linearity error**: ±0.5 LSB typ
**Repeatability**: ±1 LSB typ
**CAL current**
Source: 5 mA max
Sink: 20 µA min, 200 nA typ
**Trigger source**: Software selectable, eternal digital, DIO0-DIO3

#### Accuracy

| Differential mode | |
|---|---|
| **Range** | **Accuracy (LSB)** |
| ±20 V | 5.1 |
| ±10 V | 6.1 |
| ±5 V | 8.1 |
| ±4 V | 9.1 |
| ±2.5 V | 12.1 |
| ±2 V | 14.1 |
| ±1.25 | 20.1 |
| ±1 V | 24.1 |

| Single-ended mode | |
|---|---|
| **Range** | **Accuracy (LSB)** |
| ±10 V | 4.0 |

| Accuracy components, differential mode – all values ± | | | | |
|---|---|---|---|---|
| **Range** | **% of Reading** | **Gain Error at FS (mV)** | **Offset (mV)** | **Accuracy at FS (mV)** |
| ±20 V | 0.2 | 40 | 9.766 | 49.766 |
| ±10 V | 0.2 | 20 | 9.766 | 29.766 |
| ±5 V | 0.2 | 10 | 9.766 | 19.766 |
| ±4 V | 0.2 | 8 | 9.766 | 17.766 |
| ±2.5 V | 0.2 | 5 | 9.766 | 14.766 |
| ±2V | 0.2 | 4 | 9.766 | 13.766 |
| ±1.25 V | 0.2 | 2.5 | 9.766 | 12.266 |
| ±1 V | 0.2 | 2 | 9.766 | 11.766 |

| Accuracy components, single-ended mode – all values ± | | | | |
|---|---|---|---|---|
| **Range** | **% of Reading** | **Gain Error at FS (mV)** | **Offset (mV)** | **Accuracy at FS (mV)** |
| ±10 V | 0.2 | 20 | 19.531 | 39.531 |

### Analog Output

**D/A converter type**: PWM
**Resolution**: 10-bits, 1 in 1024
**Maximum output range**: 0 -5 Volts
**Number of channels**: 2 voltage output
**Throughput**
Software paced; 100 S/s single channel mode, 50 S/s dual channel mode
**Power on and reset voltage**: Initializes to 000h code
**Maximum voltage**
No load: Vs
1 mA load: 0.99 * Vs
5 mA load: 0.98 * Vs
Vs is the USB bus +5V power. The maximum analog output voltage is equal to Vs at no-load. V is system dependent and may be less than 5 volts.
**Output drive** (each D/A OUT): 30 mA
**Slew rate**: 0.14 V/mS typ

### Digital Input/Output (screw terminals)

**Digital type**: Discrete, 5V/TTL compatible
**Number of I/O**: 4, DIO[3:0], protected with 1.5 kΩ series resistors
**Configuration**: 4 bits, independently programmable for input or output.
**Input high voltage**: 3.0 V min, 15.0 V absolute max
**Input low voltage**: 0.8 V max
**Output voltage** (Note 4)
No load: Vs – 0.4 V min, Vs typ
1 mA load: Vs – 1.5 V
**Input leakage current**: ±1.0 µA
**Output short-circuit current**
Output high: 3.3 mA
**Power-up / reset state**: Input mode (high impedance)

### Digital Input/Output (DB37 connector)

**Digital type**: 82C55
**Number of I/O**: 24 (Port A0 through Port C7)
**Configuration**: 2 banks of 8 and 2 banks of 4, or 3 banks of 8
**Pull up/pull-down configuration**: All pins pulled up to Vs via 47 kΩ resistors (default). Positions available for pull-down to ground. Selectable via 0 Ω resistor.
**Input high voltage**: 2.0 V min, 5.5 V absolute max
**Input low voltage**: 0.8 V max, –0.5 V absolute min
**Output high voltage (IOH = –2.5 mA)**: 3.0 V min
**Output low voltage (IOL = 2.5 mA)**: 0.4 V max

# miniLAB 1008

## Specifications (Cont'd) and Ordering

### External Trigger

**Trigger source**: External digital, DIO[3:0], only DIO may be selected as a trigger input
**Trigger mode**: Software selectable, level sensitive. User configurable for TTL level high or low input.
**Trigger latency**: Burst, 25 µs min, 50 µs max
**Trigger pulse width**: Burst, 40 µs min
**Input high voltage**: 3.0 V min, 15.0 V absolute max
**Input low voltage**: 0.8 V max
**Input leakage current**: ±1.0 µA

### Counters

**Counter type**: Event counter
**Number of channels**: 1
**Input source**: CTR screw terminal
**Input type**: TTL, rising edge triggered
**Resolution**: 32 bits
**Schmidt trigger hysteresis**: 20 mV to 100 mV
**Input leakage current**: ±1 µA
**Maximum input frequency**: 1 MHz
**High pulse width**: 500 ns min
**Low pulse width**: 500 ns min
**Input low voltage**: 0V min, 1.0 V max
**Input high voltage**: 4.0 V min, 15.0 V max

### Non-Volatile Memory

**Memory size**: 8192 bytes
**Memory configuration**
0x0000 – 0x17FF: Read/Write, A/D Data (4k samples)
0x1800 – 0x1EFF: Read/Write, user data area
0x1F00 – 0x1FEF: Read/Write, calibration data
0x1FF0 – 0x1FFF: Read/Write, system Data

### Power

**Supply Current**: 20 mA. This is the total current requirement and includes up to 5 mA for the status LED.
**+5V USB power available**
Connected to self-powered hub: 4.5 V min, 5.25 V max.
Connected to bus-powered hub: 4.1 V min, 5.25 V max
Self-powere hub refers to USB hubs and hosts with a power supply. Bus-powered refers to USB hubs and hosts without their own power supply
**Output Current**
Connected to self-powered hub: 450 mA min, 500 mA max. This is the total amount of current that can be sourced from the USB +5V, analog outputs and digital outputs.
Connected to bus-powered hub: 50 mA min, 100 mA max

### General

**USB controller clock error**
25 °C: ±30 ppm max
0 to 70 °C: ±50 ppm max
–40 to 85 °C: ±100 ppm max
**Device type**: USB 1.1 low-speed
**Device compatibility**: USB 1.1, USB 2.0

### Environmental

**Operating temperature range**: –40 to 85 °C
**Storage temperature range**: –40 to 85 °C
**Humidity**: 0 to 90% non-condensing

### Mechanical

**Case dimensions** (L × W × H): 157 × 102 × 40 mm (6.2 × 0.08 × 1.57 in.), including connectors
**USB cable length**: 3 m (9.84 ft) max
**User connection length**: 3 m (9.84 ft) max

## Order Information

### Hardware

| Part No. | Description |
|---|---|
| miniLAB 1008 | USB-based multifunction DAQ device with eight 11-bit SE/four 12-bit DIFF analog inputs, two 10-bit analog outputs, one counter input, and 28 digital I/O lines |

## Software also Available from MCC

| Part No. | Description |
|---|---|
| DAQami | Data acquisition companion software for acquiring data and generating signals |
| TracerDAQ Pro | Out-of-the-box virtual instrument suite with strip chart, oscilloscope, function generator, and rate generator – professional version |
| DASYLab | Icon-based data acquisition, graphics, control, and analysis software |


© Measurement Computing Corporation

**Artisan Technology Group** is an independent supplier of quality pre-owned equipment

## Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

## We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

## Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP