USB-1208FS-Plus/LS/1408FS-Plus Series

12-bit and 14-Bit Multifunction DAQ Devices

All devices in this series offer eight singled-ended or four differential analog inputs, two analog outputs, 16 digital I/O, and one counter input. Eight of the digital I/O on the USB-1208FS-Plus/1408FS-Plus can be used for high-current (24 mA) connections.

Overview

The USB-1208FS-Plus/LS/1408FS-Plus Series consists of low-cost analog and digital I/O devices. All devices in this series offer four differential (DIFF) or eight single-ended (SE) analog inputs, two analog outputs, 16 digital I/O and one event counter.

The USB-1208LS offers sample rates up to 1.2 kS/s, while all USB-1208FS-Plus and USB-1408FS-Plus devices (standard and OEM) offer sample rates up to 50 kS/s.

All devices in this series also support multiple software-selectable voltage input ranges, making them ideally suited for a wide assortment of measurements.

USB-1208FS/LS/1408FS Series Selection Chart			
Specification	**USB-1208LS**	**USB-1208FS-Plus USB-1208FS-Plus-OEM**	**USB-1408FS-Plus USB-1408FS-Plus-OEM**
Analog Input	8 SE/4 DIFF	8 SE/4 DIFF	8 SE/4 DIFF
Maximum Sample Rate	1.2 kS/s	50 kS/s	48 kS/s max
Analog Output	2	2	2
Concurrent AI/AO Scanning Operations	–	✔	✔
Digital Output	±2.5 mA per Pin	±6.0 mA per Pin (Port A) ±24.0 mA per Pin (Port B)	±6.0 mA per Pin (Port A) ±24.0 mA per Pin (Port B)
Event Counters	1	1	1
DAQami Support	✔	✔	✔
UL for Android Support	–	✔	✔
Linux Support	✔	✔	✔
Matlab Support	✔	✔	✔

Features

- Low-cost USB DAQ devices with 4 differential or 8 single-ended analog inputs
- Maximum sample rates ranging from 1.2 kS/s to 50 kS/s
- 2 analog outputs
- 16 digital I/O
- One 32-bit counter input channel
- No external power required
- All devices available with enclosure and screw terminals
- Board-only OEM versions of -Plus devices also available

Supported Operating Systems

- Windows® 11/10/8/7/Vista®XP 32/64-bit
- Linux®
- Android™ (-Plus devices only)

Analog Input

The USB-1208LS and USB-1208FS-Plus provide eight, 11-bit SE analog inputs or four, 12-bit DIFF analog inputs.

The USB-1408FS-Plus These devices provide eight, 13-bit SE analog inputs or four, 14-bit DIFF analog inputs.

All devices support software-selectable ranges that provide inputs from ±1 V to ±20 V in a DIFF configuration, and ±10 V in a SE configuration.

Sample Rate

USB-1208LS: When scanning in hardware-paced mode, the USB-1208LS can sample at a maximum of 1.2 kS/s.

The device also supports BURSTIO mode into the 4 kS FIFO at rates up to 8 kS/s.

USB-1208FS-Plus/1408FS-Plus: In hardware-paced mode, the USB-1208FS-Plus can sample at a maximum of 50 kS/s, and the USB-1408FS-Plus can sample at a maximum of 48 kS/s.

Overview

Channel-Gain Queue

The channel-gain queue feature lets users configure a list of channels and gains for each scan. Each channel can have a different gain setting. The gain settings are stored in a channel-gain queue list that is written to local memory on the device.

- The USB-1208LS channel-gain queue list can contain up to eight channels in SE mode and up to four channels in DIFF mode. The channels can be listed in any order.
- The USB-1208FS-Plus/1408FS-Plus channel-gain queue can contain up to eight unique channels in SE mode and up to four unique channels in DIFF mode. The channels can be non-consecutive, but must be listed in increasing order.

Analog Output

The maximum analog output update rate for all devices depends on several factors, including USB port speed.

USB-1208LS

This device offers two 10-bit analog outputs with a range of 0 V to 5 V.

One analog output updates at a maximum rate of 100 S/s; two analog outputs update at a maximum rate 50 S/s each. The USB-1208LS updates in software-paced mode only.

USB-1208FS-Plus/1408FS-Plus

All devices offer two 12-bit analog outputs with a range of 0 V to 5 V.

When updating continuously from computer memory (hardware-paced mode), the analog outputs update at a maximum rate of 50 kS/s per channel.

Concurrent AI/AO Scanning Operations (-Plus devices only)

All USB-1208FS-Plus/1408FS-Plus devices support executing an analog input scan and analog output scan at the same time.

Digital I/O

All devices provide 16 TTL-level digital I/O lines. Digital I/O can be programmed on each 8-bit port (Port A and Port B) for either input (default) or output.

On the USB-1208FS-Plus and USB-1408FS-Plus, port B0 through Port B7 are high-current drive (24 mA) digital I/O connections.

Event Counter Input

Each device supports one 32-bit TTL-level counter that accepts inputs up to 1 MHz.

External Clock I/O (-Plus devices only)

The USB-1208FS-Plus and USB-1408FS-Plus have a bidirectional external clock terminal. When configured for input, A/D conversions can be paced by an external source.

These devices support TTL-level input signals up to 50 kHz.

When configured for output, these devices can pace A/D conversions on a second device.

Trigger Input

The USB-1208FS-Plus and USB-1408FS-Plus each provide an external digital trigger input that is software-selectable for rising or falling edge, high or low level.

The USB-1208LS provides an external digital trigger input that is software-selectable for high or low level.

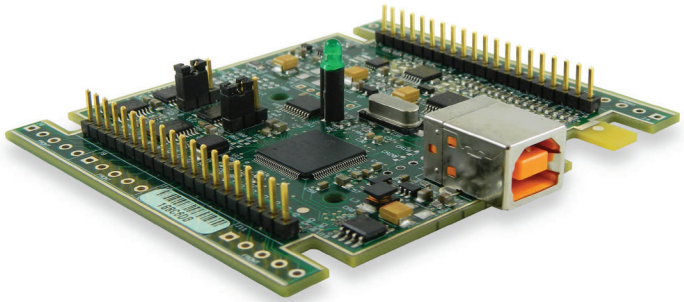
Calibration

All USB-1208FS-Plus/LS/1408FS-Plus Series devices are factory-calibrated. Specifications are guaranteed for one year. For calibration beyond one year, return the device to the factory for recalibration.

The USB-1208LS also supports field calibration with InstaCal. Perform calibration whenever the ambient temperature changes by more than ±10 °C from the last calibration.

OEM Versions (-Plus devices only)

The USB-1208FS-Plus-OEM and USB-1408FS-Plus-OEM have a board-only form factor with header connectors for OEM and embedded applications (no case, CD, or USB cable included). All devices can be further customized to meet customer needs.



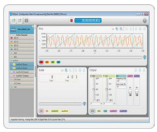
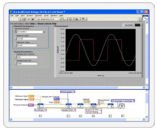
The USB-1208FS-Plus-OEM and USB-1408FS-Plus-OEM have the same specifications as the USB-1208FS-Plus/1408FS-Plus, but in a board-only form factor with header connectors instead of screw terminals.

USB-1208FS-Plus/LS/1408FS-Plus Series

Software

Software Support

The USB-1208FS-Plus/LS/1408FS-Plus Series 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 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 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 TracerDAQ is included with the free MCC DAQ Software bundle. 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. The UL for Windows is included with the free MCC DAQ Software bundle. The UL Python API for Windows is available on GitHub (https://github.com/mccdaq/mcculw).
UL for Linux®		Library for developing applications in C, C++, and Python on Linux. UL for Linux is available on GitHub (https://github.com/mccdaq/uldaq). UL for Linux is supported by -Plus devices only. Open-source, third-party Linux drivers are also available for supported MCC devices.
UL for Android™ (-Plus devices only)		Library of Java classes for programmers who develop apps for Android-based mobile devices. UL for Android communicates with select MCC DAQ devices. Supports Android project development on Windows, Linux, Mac OS X. UL for Android is included with the free MCC DAQ Software bundle.
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 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 DASYLab is available as a purchased software download. An evaluation version is available for 28 days.
MATLAB® driver		High-level language and interactive environment for numerical computation, visualization, and programming. The Mathworks Data Acquisition Toolbox™ allows users to acquire data from most MCC PCI and USB devices. Visit www.MathWorks.com for more information about the Data Acquisition Toolbox.

Specifications

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

USB-1208FS-Plus and USB-1408FS-Plus

These specifications apply to both standard and OEM versions unless noted otherwise.

Analog Input

A/D converter type: Successive approximation
Channels: 8 SE or 4 DIFF, programmable as SE or DIFF
Input common-mode voltage range for linear operation
SE Mode: CH*x* to GND, ±10 V max
DIFF Mode: CHx to GND, –10 V min, 20 V max
Absolute maximum input voltage: CHx to GND, ±28 V max
Input impedance: 122 kΩ
Input current
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
Vin = 10 V, 70 µA typ
Vin = 0 V, –12 µA typ
Vin = –10 V, –94 µA typ
Ranges: Software or selectable on a per-channel basis
SE mode: ±10 V
DIFF mode: ±20 V, ±10 V, ±5 V, ±4 V, ±2.5 V, ±2.0 V, ±1.25 V, ±1.0 V
Throughput
Maximum throughput scanning to computer memory depends on the computer being used.
USB-1208FS-Plus
Software paced: 250 S/s typ, system-dependent
Hardware paced: 50 kS/s
USB-1408FS-Plus
Software paced: 250 S/s typ, system-dependent
Hardware paced: 48 kS/s
Channel gain queue: Up to 8 elements, software-selectable channel and range
Resolution
USB-1208FS-Plus
DIFF: 12 bits, no missing codes
SE: 11 bits (the AD7870 converter only returns 11-bits (0–2047 codes) in SE mode)
USB-1408FS-Plus
DIFF: 14 bits, no missing codes
SE: 13 bits (the AD7871 converter only returns 13-bits (0–8192 codes) in SE mode)
Integral linearity error
USB-1208FS-Plus: ±1 least significant bit (LSB) typ
USB-1408FS-Plus: ±2 LSB typ
Differential linearity error: ±0.5 LSB typ
Repeatability: ±1 LSB typ
Absolute accuracy long term drift (USB-1408FS-Plus only)
Extrapolating the long term drift accuracy specifications provides the approximate long term drift of the **USB-1408FS-Plus** intermediate input ranges.
±20 V range: ±3 LSB typ (Δt = 1000 hrs)
±4 V range: ±6 LSB typ (Δt = 1000 hrs)
±1 V range: ±8 LSB typ (Δt = 1000 hrs)
2.5VREF output current (USB-1408FS-Plus only)
Source: 5 mA max
Sink: 20 µA min, 100 µA typ
Trigger source (software-selectable)
External digital: TRIG_IN
Clock source (software-selectable)
Internal
External (SYNC), Rising Edge Triggered

Analog Input Accuracy USB-1208FS-Plus

Range	Accuracy (LSB)
Differential Mode	
±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 V	20.1
±1 V	24.1
Single-Ended Mode	
±10 V	4.0

Analog Input Accuracy USB-1408FS-Plus

Range	Absolute Accuracy 25°C	Absolute Accuracy 0 to 50°C
Differential Mode		
±20 V	±10.98 mV	±49.08 mV
±10 V	±7.32 mV	±33.42 mV
±5 V	±3.66 mV	±20.76 mV
±4 V	±2.92 mV	±19.02 mV
±2.5 V	±1.83 mV	±14.97 mV
±2 V	±1.70 mV	±14.29 mV
±1.25 V	±1.21 mV	±12.18 mV
±1 V	±1.09 mV	±11.63 mV
Single-Ended Mode		
±10 V	±10.98 mV	±49.08 mV

Specifications

Noise Performance USB-1208FS-Plus		
Range	**Typical Counts**	**Least Significant Bit Root Mean Square (LSBRMS)**
Differential Mode		
±20 V	2	0.30
±10 V	2	0.30
±5 V	3	0.45
±4 V	3	0.45
±2.5 V	4	0.61
±2 V	5	0.76
±1.25 V	7	1.06
±1 V	8	1.21
Single-Ended Mode		
±10 V	2	0.30

USB-1408FS-Plus		
Range	**Typical Counts**	**Least Significant Bit Root Mean Square (LSBRMS)**
Differential Mode		
±20 V	**8**	1.21
±10 V	**8**	1.21
±5 V	**9**	1.36
±4 V	**10**	1.51
±2.5 V	**12**	1.81
±2 V	**14**	2.12
±1.25 V	**18**	2.72
±1 V	**22**	3.33
Single-Ended Mode		
±10 V	**8.0**	1.21

Analog Output

Resolution: 12 bits, 1 in 4096
Output range: 0 V to 5 V
Number of channels: 2
Throughput
Software paced: 250 S/s single channel typ, system-dependent
Hardware paced: 50 kS/s max per channel
Power on and reset voltage: 0 V, ±20 mV typ, initializes to 000h code
Output drive (each D/A out): 5 mA, sourcing
Slew Rate: 0.8 V/µs typ
Accuracy, all values are (±), 0 V to 5 V: 4.0 LSB typ, 45.0 LSB max (accuracy tested at no load)
Analog output accuracy components, all values are (±)
Range: 0 V to 5 V
% of FSR: 0.1 typ, 0.9 max
Gain error at full scale: 4.0 mV typ, 36.0 mV max
Offset: 1.0 mV typ, 9.0 mV max
Zero-scale offsets may result in a fixed zero-scale error producing a *dead-band* digital input code region. In this case, changes in digital input code of less than 0x040 may not produce a corresponding change in the output voltage. The offset error is tested and specified at code 0x040.
Accuracy at FS: 4.0 mV typ, 45.0 mV max

Digital I/O

Digital type: CMOS
Number of I/O: 16 (Port A0 through A7, Port B0 through B7)
Configuration: 2 banks of 8 (port B is the high-current drive)
Pull-up/down configuration: All pins pulled up to 5 V via 47 kΩ resistors (default). Change to pull-down using internal user-configurable jumpers.
Input high voltage: 2.0 V min, 5.5 V absolute max
Input low voltage: 0.8 V max, –0.5 V absolute min, 0 V recommended min
Output high voltage, port A: 4.4 V min (IOH = –20 µA), 3.84 V min (IOH = –6.0 mA)
Output low voltage, port A: 0.1 V max (IOL = 20 µA), 0.33 V max (IOL = 6.0 mA)
Output high voltage, port B: 4.4 V min (IOH = –50 µA), 3.76 V min (IOH = –24.0 mA)
Output low voltage, port B: 0.1 V max (IOH = 50 µA), 0.44 V max (IOH = 24.0 mA)
Power on and reset state: Input

External Trigger

Trigger source: External digital, TRIG_IN
Trigger mode: Edge or level sensitive; software-selectable for CMOS compatible rising or falling edge, high or low level.
Trigger latency: 10 µs max
Trigger pulse width: 1 µs min
Input type: Schmitt trigger, 47 kΩ pull-down to ground
Schmitt trigger hysteresis: 1.01 V typ, 0.6 V min, 1.5 V max
Input high voltage threshold: 2.43 V typ, 1.9 V min, 3.1 V max
Input high voltage limit: 5.5 V absolute max
Input low voltage threshold: 1.42 V typ, 1.0 V min, 2.0 V max
Input low voltage limit: –0.5 V absolute min, 0 V recommended min

External Clock Input/Output

Pin name: SYNC
Pin type: Bidirectional
Direction (software-selectable)
Input (default): Receives A/D clock from external source. Active on rising edge.
Output: Outputs internal A/D clock. Active on rising edge.
Input clock rate
USB-1208FS-Plus: 50 kHz, max
USB-1408FS-Plus: 48 kHz, max
Clock pulse width
Input mode: 1 µs min
Output mode: 5 µs min
Input type: Schmitt trigger, 47 kΩ pull-down to ground
Schmitt trigger hysteresis: 1.01 V typ, 0.6 V min, 1.5 V max
Input high voltage threshold: 2.43 V typ, 1.9 V min, 3.1 V max
Input high voltage limit: 5.5 V absolute max
Input low voltage threshold: 1.42 V typ, 1.0 V min, 2.0 V max
Input low voltage limit: –0.5 V absolute min, 0 V recommended min
Output high voltage: 4.4 V min (IOH = –50 µA), 3.80 V min (IOH = –8 mA)
Output low voltage: 0.1 V max (IOL = 50 µA), 0.44 V max (IOL = 8 mA)

Counter

Pin name: CTR
Counter type: Event counter
Number of channels: 1
Input type: Schmitt trigger, 47 kΩ pull-down to ground
Input Source: CTR screw terminal
Resolution: 32 bits
Maximum input frequency: 1 MHz
High pulse width: 500 ns min
Low pulse width: 500 ns min
Schmidt trigger hysteresis: 1.01 V typ, 0.6 V min, 1.5 V max
Input high voltage threshold: 2.43 V typ, 1.9 V min, 3.1 V max
Input high voltage limit: 5.5 V absolute max
Input Low voltage threshold: 1.42 V typ, 1.0 V min, 2.0 V max
Input low voltage limit: –0.5 V absolute min, 0 V recommended min

Non-Volatile Memory

EEPROM: 2,048 bytes (768 bytes calibration, 256 bytes user, 1,024 bytes system data)

Power*
Supply Current
During USB enumeration: < 100 mA
After USB enumeration, including DIO, AO, SYNC, and +VO output loading: < 500 mA
+VO power available after USB enumeration: 4.5 V min, 5.25 V max
+VO output current after USB enumeration: 100 mA max

General
Device type: USB 2.0 full-speed mode (12 Mbps)
Device compatibility: USB 1.1, 2.0

Environment
Operating temperature: 0 ˚C to 70 ˚C
Storage temperature: –40 ˚C to 70 ˚C
Relative humidity: 0% to 90% non-condensing
Signal I/O connector
USB-1208FS-Plus, USB-1408FS-Plus: 2 banks of screw-terminal blocks
USB-1208FS-Plus-OEM, USB-1408FS-Plus-OEM: Two 20-pin, 0.1 in. pitch headers

Mechanical
Dimensions (L × W × H)
USB-1208FS-Plus, USB-1408FS-Plus: 79 × 82 × 27 mm (3.20 × 3.10 × 1.05 in.)
USB-1208FS-Plus-OEM, USB-1408FS-Plus-OEM: 81.28 × 70.36 × 13.72 mm (3.20 × 2.77 × 0.54 in.)

USB-1208LS

Analog Input
A/D converter type: Successive approximation
Channels: 8 SE or 4 DIFF, programmable as SE or DIFF
Input voltage range for linear operation, SE mode
CHx to GND: ±10 V max
Input common-mode voltage range for linear operation, differential mode, DIFF mode
CHx to GND: –10 V min, 20 V max
Absolute maximum input voltage
CHx to GND: ±40 V max
Input current
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
Vin = 10 V, 70 µA typ
Vin = 0 V, –12 µA typ
Vin = –10 V, –94 µA typ
Input impedance: 122 kΩ
Ranges: Software or selectable on a per-channel basis
SE mode: ±10 V
DIFF mode: ±20 V, ±10 V, ±5 V, ±4 V, ±2.5 V, ±2.0 V, ±1.25 V, ±1.0 V
Throughput
Maximum throughput scanning to computer memory depends on the computer being used.
Software paced: 50 S/s typ, system-dependent
Hardware paced: 1.2 kS/s
BURSTIO to 4 kS FIFO: 8 kS/s
Channel gain queue: Up to 8 elements, software-selectable channel and range
Resolution
DIFF: 12 bits, no missing codes
SE: 11 bits (the AD7870 converter only returns 11-bits (0–2047 codes) in SE mode)
CAL accuracy: CAL = 2.5 V, ±0.05% typ, ±0.25% max
Integral linearity error: ±1 least significant bit (LSB) typ
Differential linearity error: ±0.5 LSB typ
Repeatability: ±1 LSB typ

* Self-powered USB hubs and hosts have their own power supply. The USB port(s) on your computer are root port hubs. All externally powered root port hubs (desktop computers) provide up to 500 mA of current for a USB device. Battery-powered root port hubs provide 100 mA or 500 mA, depending upon the manufacturer. A laptop PC that is not connected to an external power adapter is an example of a battery-powered root port hub.

Bus-powered USB hubs and hosts do not have their own power supply.

CAL current
Source: 5 mA max
Sink: 20 µA min, 200 nA typ
Trigger source (software-selectable): External digital (TRIG_IN)

Analog Input Accuracy	
Range	**Accuracy (LSB)**
Differential Mode	
±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 V	20.1
±1 V	24.1
Single-Ended Mode	
±10 V	4.0

Accuracy Components, All Values are (±)				
Range	**% of Reading**	**Gain Error at FS (mV)**	**Offset (mV)**	**Accuracy at FS (mV)**
Differential Mode				
±20 V	0.2	40	9.766	49.766
±10 V	0.2	20	9.766	29.766
±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
±2 V	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
Single-Ended Mode				
±10 V	0.2	20	19.531	39.531

Analog Output
D/A converter type: PWM
Resolution: 10 bits, 1 in 1024
Output range: 0 V to 5 V
Number of channels: 2
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
Vs is the USB +5 V power. The maximum analog output voltage is equal to Vs at no load. *V* is system-dependent and may be less than 5 V.
No load: Vs
1 mA load: 0.99 * Vs
5 mA load: 0.98 * Vs
Output drive (each D/A out): 30 mA
Slew rate: 0.14 V/ms typ

Ordering

Digital I/O

Digital type: 82C55
Number of I/O: 16 (Port A0 through A7, Port B0 through B7)
Configuration: 2 banks of 8.
Pull-up/down configuration: All pins pulled up to Vs through 47 kΩ resistors (default). Positions available for pull down to ground. Hardware-selectable through 0 Ω resistors as a factory option.
Input high voltage: 2.0 V min, 5.5 V absolute max
Input low voltage: 0.8 V max, –0.5 V absolute min, 0 V recommended min
Output high voltage (IOH = –2.5 mA): 3.0 V min
Output low voltage (IOL = 2.5 mA): 0.4 V max

External Trigger

Trigger source: External digital, TRIG_IN (protected with a 1.5 kΩ series resistor)
Trigger mode: Level sensitive; software-selectable 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

Counter

Pin name: CTR
Counter type: Event counter
Number of channels: 1
Input type: TTL, rising edge triggered
Resolution: 32 bits
Maximum input frequency: 1 MHz
High pulse width: 500 ns min
Low pulse width: 500 ns min
Schmidt trigger hysteresis 20 mV to 100 mV
Input leakage current: ±1 µA
Input high voltage: 4.0 V min, 5.5 V absolute max
Input low voltage: 1.0 V max, –0.5 V absolute min

Non-Volatile Memory

Memory size: 8192 bytes
Memory configuration
Address 0x0000 to 0x17FF: Read/write access, A/D data (4 kS)
Address 0x1800 to 0x1EFF: Read/write access, user data area
Address 0x1F00 to 0x1FEF: Read/write access, calibration data
Address 0x1FF0 to 0x1FFF: Read/write access, system data

Power*

Supply current: 20 mA (total current requirement; includes up to 5 mA for the status LED)
5 V 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
Output current (total amount of current that can be sourced from the USB 5 V, analog outputs and digital outputs)
Connected to self-powered hub: 450 ma min, 500 ma max
Connected to bus-powered hub: 50 mA min, 100 mA max

General

USB controller clock error
25 °C: ±30 ppm max
0 °C to 70 °C: ±50 ppm max
Device type: USB 1.1 low-speed mode (1.5 Mbps)
Device compatibility: USB 1.1, 2.0

Environment

Operating temperature: 0 ˚C to 70 ˚C
Storage temperature: –40 ˚C to 70 °C
Relative humidity: 0% to 90% non-condensing
Acquisition data buffer: 4 kS
Signal I/O connector: 2 banks of screw-terminal blocks
Dimensions (L × W × H)**:** 79 × 82 × 27 mm (3.20 × 3.10 × 1.05 in.)

* Self-powered USB hubs and hosts have their own power supply. The USB port(s) on your computer are root port hubs. All externally powered root port hubs (desktop computers) provide up to 500 mA of current for a USB device. Battery-powered root port hubs provide 100 mA or 500 mA, depending upon the manufacturer. A laptop PC that is not connected to an external power adapter is an example of a battery-powered root port hub.

Bus-powered USB hubs and hosts do not have their own power supply.

Order Information

Hardware

Part No.	Description
USB-1208LS	USB-based data acquisition device with eight 12-bit analog inputs, 1.2 kS/s, two analog outputs, and 16 digital I/O. Includes USB cable and MCC DAQ software.
USB-1208FS-Plus	USB-based multifunction DAQ device with 8 SE/4 DIFF analog inputs, up to 12-bit resolution, 50 kS/s, 2 analog outputs, and 16 digital I/O (includes eight high-current lines). Includes USB cable and MCC DAQ software.
USB-1208FS-Plus-OEM	Board-only USB-based DAQ device with eight analog inputs, 50 kS/s, up to 12-bit resolution, 50 kS/s, two analog outputs, 16 digital I/O lines (includes eight high-current lines).
USB-1408FS-Plus	USB-based multifunction DAQ device with 8 SE/4 DIFF analog inputs, up to 14-bit resolution, 48 kS/s, 2 analog outputs, and 16 digital I/O (includes eight high-current lines). Includes USB cable and MCC DAQ software.
USB-1408FS-Plus-OEM	Board-only USB-based multifunction DAQ board with 8 SE/4 DIFF analog inputs, up to 14-bit resolution, 48 kS/s, 2 analog outputs, and 16 digital I/O (includes eight high-current lines).

Software also Available from MCC

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

May 2018. Rev 3