

# DAQFlex

Open-Source, OS-Independent Software Framework



## Features

- Platform-compatible with Windows® 32/64, Linux®, Mac®, and Android™
- Single API for any OS
- Small driver footprint
- Supported by select USB DAQ devices

## Overview

DAQFlex is a software development framework that combines a small-footprint driver with a message-based command protocol, allowing for DAQ programming in virtually any operating system (OS) or on embedded systems with no OS.

The DAQFlex protocol greatly simplifies driver and application development. This protocol offers an efficient yet powerful interface to DAQ devices and a common command set that simplifies application development.

The DAQFlex framework consists of the software API, DAQFlex device driver, and DAQFlex device engine.

## Simple, Efficient Software API

The DAQFlex framework has a simple software API that is common to all DAQFlex-supported devices. Users can write application code that is OS-independent. By implementing a message-based protocol, DAQFlex developers need to use only a handful of methods, allowing for a short learning curve and rapid-application development.

## DAQFlex Device Driver

The DAQFlex device driver receives DAQFlex messages from the customer program through the software API. The driver then sends these messages through the physical layer to the DAQ device. Conversely, the DAQFlex driver receives data and messages from the data acquisition device and returns this information to the program through the API.



DAQFlex is ideal for developing applications for devices (such as the USB-7204 shown above) that are embedded as part of a larger OEM system.

Measurement Computing supplies device drivers for the following OS:

- Windows 8/7/Vista®/XP (32- and 64-bit)
- Linux (Fedora, OpenSUSE, and Ubuntu distributions)
- Mac OS X
- Android 3.1 or later<sup>1</sup>

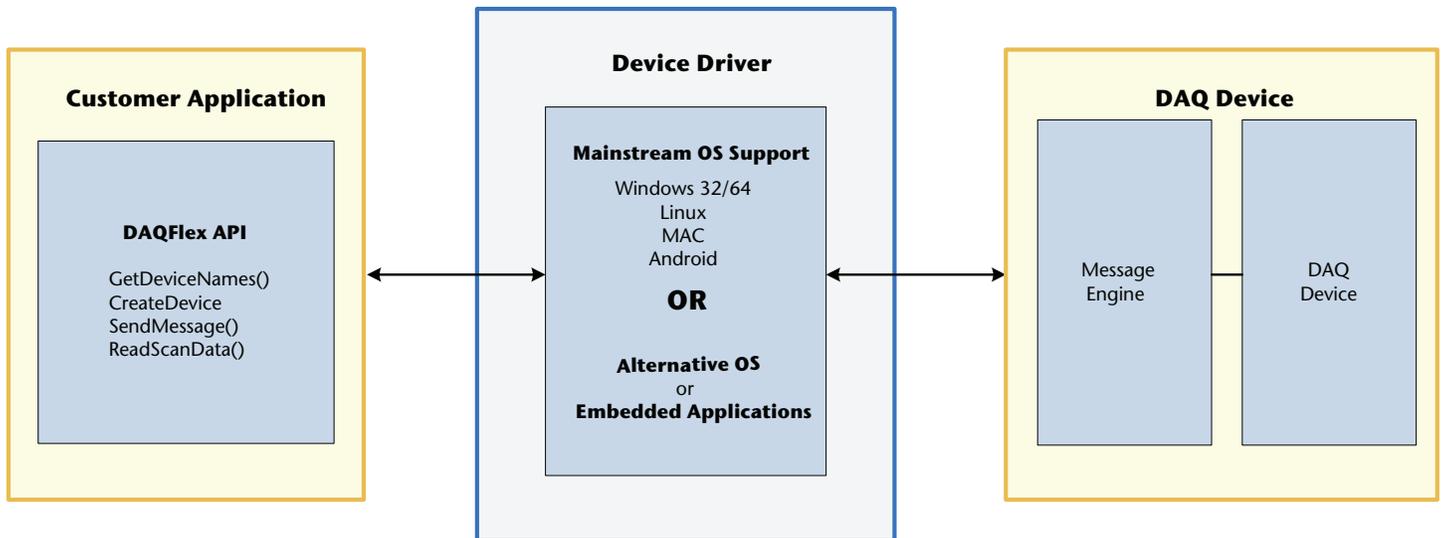
Developers can either use these supplied drivers or they can build their own drivers by modifying the open-source code. Custom DAQFlex drivers can be built with standard USB driver — such as WinUSB for Windows or libusb for Linux — or, for users who need more control, with kernel-mode USB drivers.

<sup>1</sup> Visit [www.mccdaq.com/support/android-apk.aspx](http://www.mccdaq.com/support/android-apk.aspx) for a list of MCC-tested tablets.

## DAQFlex Device Engine

DAQFlex-supported devices contain a DAQFlex device engine which consists of the *message engine* and the *DAQ engine*. Unlike most DAQ devices which interface to the computer through low-level commands, DAQFlex devices interface with simple messages. Once received, these messages are parsed and converted to instructions and sent to the DAQ engine.

The DAQ engine then configures the device, performs the DAQ operations, and returns the data to the message engine, which in turn sends the data to the DAQFlex device driver when requested. The message engine simplifies the transfer of the DAQFlex message-based command set that control the device and process data.

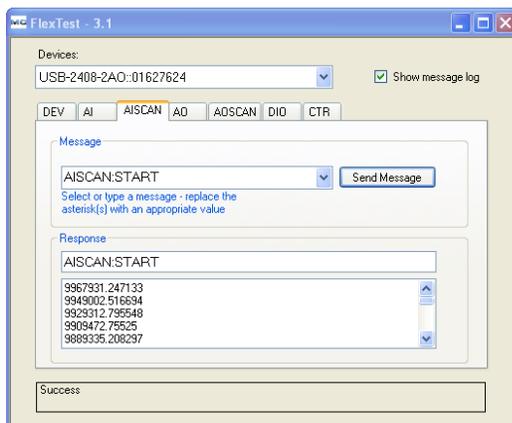


The main components of the DAQFlex software framework are the software API, DAQFlex device driver, and DAQFlex device engine.

## FlexTest Utility

FlexTest is an interactive GUI-based test utility that demonstrates how to communicate with a device using the DAQFlex communication protocol and software.

This utility automatically recognizes an available DAQFlex device, shows all commands available for this device, and allows users to interact with the device one command at a time. During this interaction, the commands are captured in a log, allowing the user to cut and paste them directly into a program. FlexTest is included as part of the DAQFlex installation.



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## DAQFlex for Android

DAQFlex for Android is a version of the DAQFlex framework that supports development of data acquisition apps that run on Android-based tablets.

DAQFlex for Android includes a core DAQFlex project along with example programs that developers can use as starting points to develop DAQ apps for Android tablets.

Visit [www.mccdaq.com/support/android-apk.aspx](http://www.mccdaq.com/support/android-apk.aspx) for a list of MCC-tested tablets.



DAQFlex for Android enables development of data acquisition apps that run on Android-based tablets.

## Ordering Information

Both DAQFlex and DAQFlex for Android are available as free downloads from [www.mccdaq.com/software.aspx](http://www.mccdaq.com/software.aspx).

DAQFlex support is available on the following MCC DAQ devices:

Part No.	Description	Part No.	Description
USB-201	USB-based DAQ device with eight 12-bit analog inputs, 100 kS/s, and 8 digital I/O lines (includes USB cable and MCC DAQ software CD)	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
USB-201-OEM	Board-only USB-based DAQ device with eight 12-bit analog inputs, 100 kS/s, and 8 digital I/O lines	USB-1608FS-Plus	USB-based DAQ device with 8 simultaneous 16-bit analog inputs and 8 digital I/O
USB-202	USB-based DAQ device with eight 12-bit analog inputs, 100 kS/s sampling, two 12-bit analog outputs, and 8 digital I/O lines (includes USB cable and MCC DAQ software CD)	USB-1608G	USB-based 16-channel, 250 kS/s device with eight DIO lines, two 32-bit counter inputs, and one timer output
USB-202-OEM	Board-only USB-based DAQ device with eight 12-bit analog inputs, 100 kS/s sampling, two 12-bit analog outputs, and 8 digital I/O lines	USB-1608GX	USB-based 16-channel, 500 kS/s device with eight DIO lines, two 32-bit counter inputs, and one timer output
USB-204	USB-based DAQ device with eight 12-bit analog inputs, 500 kS/s, and 8 digital I/O lines (includes USB cable and MCC DAQ software CD)	USB-1608GX-2AO	USB-based 16-channel, 500 kS/s device with two analog outputs, eight DIO lines, two 32-bit counter inputs, and one timer output
USB-204-OEM	Board-only USB-based DAQ device with eight 12-bit analog inputs, 500 kS/s, and 8 digital I/O lines	USB-2408	USB-based 24-bit, isolated, 16 SE/8 DIFF temperature and voltage measurement device with 8 digital I/O and 2 counter inputs
USB-205	USB-based DAQ device with eight 12-bit analog inputs, 500 kS/s sampling, two 12-bit analog outputs, and 8 digital I/O lines (includes USB cable and MCC DAQ software CD)	USB-2408-2AO	USB-based 24-bit, isolated, 16 SE/8 DIFF temperature and voltage measurement device with 8 digital I/O, 2 counter inputs, and 2 analog outputs
USB-205-OEM	Board-only USB-based DAQ device with eight 12-bit analog inputs, 500 kS/s sampling, two 12-bit analog outputs, and 8 digital I/O lines	USB-7202	USB-based 16-bit, 8-channel, 100 kS/s device with one A/D per channel, eight digital I/O, and one counter input
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	USB-7204	USB-based 12-bit, 8-channel, 50 kS/s per channel device with 16 digital I/O, and one counter input
		USB-2001-TC	USB-based single-channel thermocouple measurement device for DAQFlex - Designed for OEMs