

# ThinkGear API MacOSX example

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# Contents

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/**
 * This program serves as a simple example of how one can use ThinkGear.bundle inside their Core
Foundation
 * (e.g. Cocoa and Carbon-based) apps. For more details on OS X bundles, read:
 * http://developer.apple.com/DOCUMENTATION/CoreFoundation/Conceptual/CFBundles/CFBundles.html
 *
 * Or check the "How to use the ThinkGear API in Xcode (Mac OS X)" document in the ThinkGear
documentation.
 *
 * Note: When executing the program, make sure ThinkGear.bundle is in the same current directory.
 */

#include <CoreFoundation/CoreFoundation.h>
#include <stdio.h>
#include <stdlib.h>
#include <signal.h>
#include <unistd.h>

/**
 * Baud rate for use with TG_Connect() and TG_SetBaudrate().
 */
#define TG_BAUD_1200      1200
#define TG_BAUD_2400      2400
#define TG_BAUD_4800      4800
#define TG_BAUD_9600      9600
#define TG_BAUD_57600     57600
#define TG_BAUD_115200    115200

/**
 * Data format for use with TG_Connect() and TG_SetDataFormat().
 */
#define TG_STREAM_PACKETS      0
#define TG_STREAM_5VRAW        1
#define TG_STREAM_FILE_PACKETS 2

/**
 * Data type that can be requested from TG_GetValue().
 */
#define TG_DATA_BATTERY        0
#define TG_DATA_POOR_SIGNAL    1
#define TG_DATA_ATTENTION      2
#define TG_DATA_MEDITATION     3
#define TG_DATA_RAW            4
#define TG_DATA_DELTA          5
#define TG_DATA_THETA          6
#define TG_DATA_ALPHA1         7
#define TG_DATA_ALPHA2         8
#define TG_DATA_BETA1          9
#define TG_DATA_BETA2          10
#define TG_DATA_GAMMA1         11
#define TG_DATA_GAMMA2         12

CFURLRef bundleURL;          // path reference to bundle
CFBundleRef thinkGearBundle; // bundle reference

int connectionID = -1;        // ThinkGear connection handle

/*

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* ThinkGear function pointers
*/

int (*TG_GetDriverVersion)() = NULL;
int (*TG_GetNewConnectionId)() = NULL;
int (*TG_Connect)(int, const char *, int, int) = NULL;
int (*TG_ReadPackets)(int, int) = NULL;
float (*TG_GetValue)(int, int) = NULL;
int (*TG_Disconnect)(int) = NULL;
void (*TG_FreeConnection)(int) = NULL;

/**
 * This function handles signal interrupts.
 *
 * Basically perform cleanup on the objects and then exit the program.
 */
void siginhandler(int sig){
    fprintf(stderr, "\nDisconnecting...\n");

    // close the connection
    if(connectionID != -1){
        TG_Disconnect(connectionID);
        TG_FreeConnection(connectionID);
    }

    // release the bundle references
    if(bundleURL)
        CFRelease(bundleURL);

    if(thinkGearBundle)
        CFRelease(thinkGearBundle);

    exit(1);
}

/**
 * The main driver for this program.
 *
 * Handle command-line arguments, initialize the ThinkGear connection,
 * and handle output.
 */
int main (int argc, const char * argv[]) {
    // register the signal interrupt handler
    signal(SIGINT, siginhandler);

    // cmd line argument checking
    if(argc < 2){
        fprintf(stderr, "Usage: %s portname\n", argv[0]);
        exit(1);
    }

    const char * portname = argv[1];           // port name
    int retVal = -1;                           // return values from TG functions

    int numPackets = 0;                        // number of packets returned from ReadPackets
    float signalQuality = 0.0;                 // poor signal status
    float attention = 0.0;                     // eSense attention
    float meditation = 0.0;                    // eSense meditation

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// create the path reference to the bundle
bundleURL = CFURLCreateWithFileSystemPath(kCFAllocatorDefault,
                                         CFSTR("ThinkGear.bundle"),
                                         kCFURLPOSIXPathStyle,
                                         true);

// create the bundle reference
thinkGearBundle = CFBundleCreate(kCFAllocatorDefault, bundleURL);

// make sure the bundle actually exists
if(!thinkGearBundle){
    fprintf(stderr, "Error: Could not find ThinkGear.bundle. Does it exist in the current
directory?\n");
    exit(1);
}

// now start setting the function pointers
TG_GetDriverVersion = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_GetDriverVersion"));
TG_GetNewConnectionId = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_GetNewConnectionId"));
TG_Connect = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_Connect"));
TG_ReadPackets = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_ReadPackets"));
TG_GetValue = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_GetValue"));
TG_Disconnect = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_Disconnect"));
TG_FreeConnection = (void *)CFBundleGetFunctionPointerForName(thinkGearBundle,
CFSTR("TG_FreeConnection"));

// check for any invalid function pointers
if(!TG_GetDriverVersion || !TG_GetNewConnectionId || !TG_Connect || !TG_ReadPackets ||
!TG_GetValue || !TG_Disconnect || !TG_FreeConnection){
    fprintf(stderr, "Error: Expected functions in ThinkGear.bundle were not found. Are you using
the right version?\n");
    exit(1);
}

// get the connection ID
connectionID = TG_GetNewConnectionId();

fprintf(stderr, "Connecting to %s ... ", portname);

// attempt to connect
retVal = TG_Connect(connectionID, portname, TG_BAUD_9600, TG_STREAM_PACKETS);

// check whether the connection attempt was successful
if(!retVal){
    fprintf(stderr, "connected.\n");

    // loop until we get the interrupt signal from the console. control
    // then gets passed onto the signal handler function
    while(1){
        // sleep for half a second
        usleep(500000);
    }
}

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        // read the packets from the output stream
        numPackets = TG_ReadPackets(connectionID, -1);

        // check whether we've received any new packets
        if(numPackets > 0){
            // if so, parse them
            signalQuality = TG_GetValue(connectionID, TG_DATA_POOR_SIGNAL);
            attention = TG_GetValue(connectionID, TG_DATA_ATTENTION);
            meditation = TG_GetValue(connectionID, TG_DATA_MEDITATION);

            // then output everything
            fprintf(stdout, "\rPoorSig: %3.0f, Att: %3.0f, Med: %3.0f", signalQuality, attention,
meditation);
            fflush(stdout);
        }
    }
    else {
        fprintf(stderr, "unable to connect. (%d)\n", retVal);
        exit(1);
    }

    return 0;
}

```