Programming Example: SDG waveform creation with Python and Sockets (no VISA)

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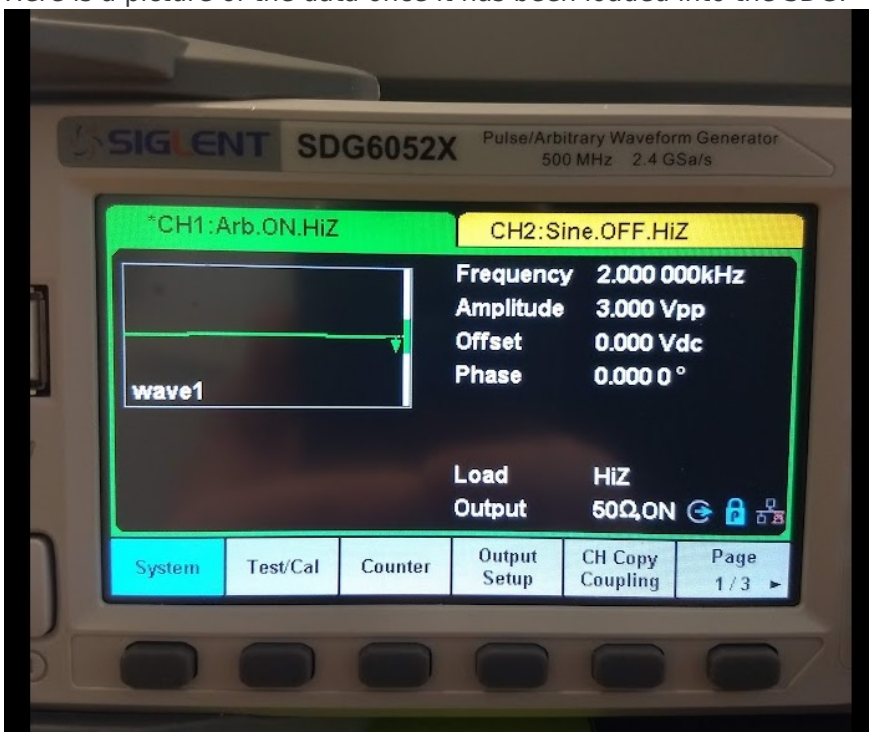
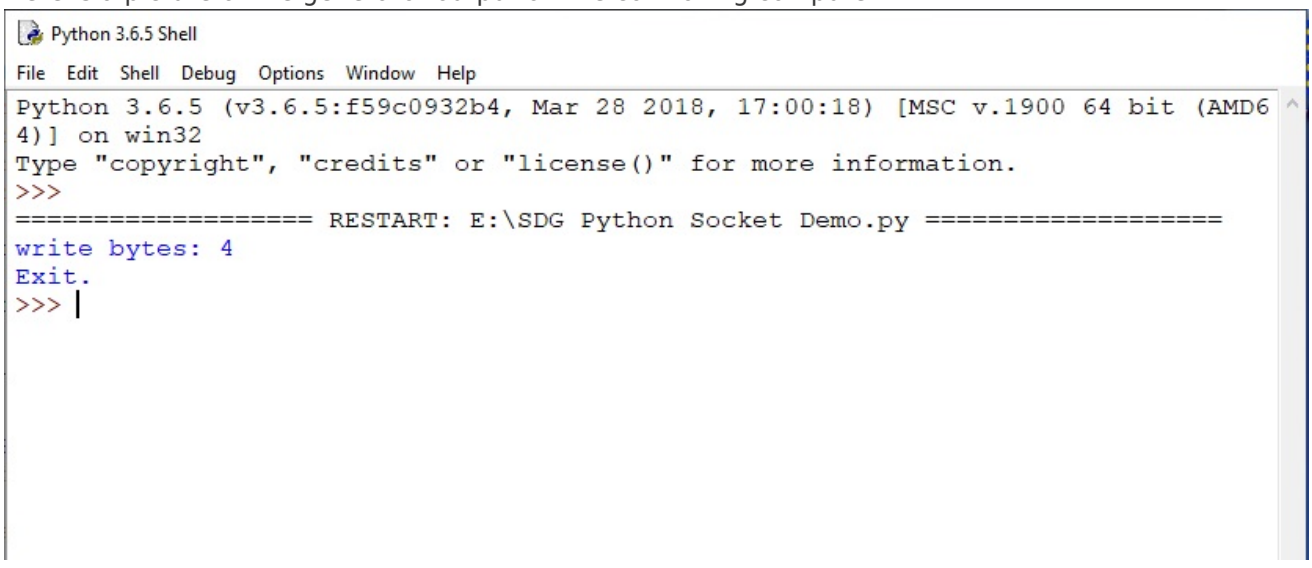
Here is a programming example using Python and Sockets over LAN to create a two-point waveform.

Sockets via LAN can be helpful if you wish or are unable to use the VISA library.

Here is a picture of the data once it has been loaded into the SDG:



Here is a picture of the generator output on the controlling computer:



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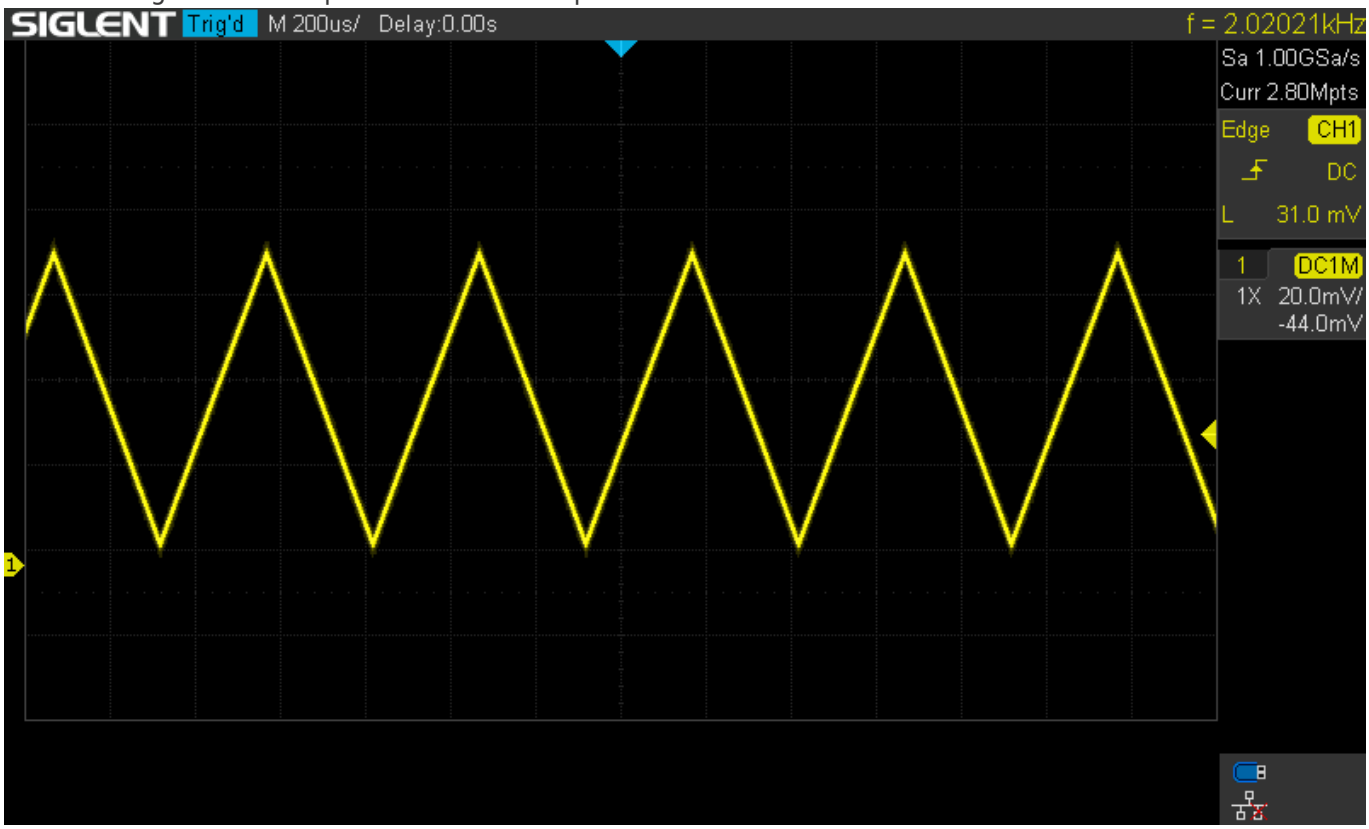
Here is the generator output on an oscilloscope:



You can download the Python .py script here:
SDG Python Socket Demo

```
import socket
import sys
import time
import binascii

remote_ip = "192.168.1.84"
port = 5025
count = 0

wave_points = [0x8000, 0x3f06]

for i in range (1000):
    wave_points = wave_points + [0x8000, 0x3f06]

def SocketConnect():
    try:
        s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    except socket.error:
        print('Fail to creat socket.')
        sys.exet();
```

```
    try:
        s.connect((remote_ip, port))
    except socket.error:
        print('failed to connect to ip' + remote_ip)
    return s

def SocketQuery(Sock, cmd):
    try:
        Sock.sendall(cmd)
        time.sleep(1)
    except socket.error:
        print('Send failed')
        sys.exit()
    reply = Sock.recv(4096)
    return reply

def SocketSend(Sock, cmd):
    try:
        cmd = cmd + '\n'
        Sock.sendall(cmd.encode('latin1'))
        time.sleep(1)
    except socket.error:
        print('Send failed.')
        sys.exit()

def SocketClose(Sock):
    Sock.close()
    time.sleep(.300)

def create_wave_file():
    f = open('wave1.bin','wb')
    for a in wave_points:
        b = hex(a)
        b = b[2:]
        len_b = len(b)
        if(0 == len_b):
            b = '0000'
        elif(1 == len_b):
            b = '000' + b
        elif(2 == len_b):
            b = '00' + b
        elif(3 == len_b):
            b = '0' + b
        c = binascii.a2b_hex(b)
        f.write(c)
    f.close()
```

```
def main():
    global remote_ip
    global port
    global count

    create_wave_file()
    s = SocketConnect()
    f = open('wave1.bin', 'rb')
    data = f.read().decode('latin1')
    data1 = data.encode('latin1')
    with open('wave2.bin', 'wb') as f1:
        f1.write(data1)
    print('write bytes:', len(data))
    data = str(data)
    SocketSend(s,"C1:WVDT
WVNM,wave1,FREQ,2000.0,AMPL,3.0,OFST,0.0,PHASE,0.0,WAVEDATA,%s"%(data))
    SocketSend(s,'C1:ARWV NAME,wave1')
    f.close()
    SocketClose(s)
    print('Exit.')

if __name__ == '__main__':
    proc = main()
```

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