NOVATECH
INSTRUMENTS

Matlab Application Note

The Matlab user defined function named NT_Serial shown here can be used to send commands to Novatech Instruments' Signal Generators and display the response returned by the signal generator. An explanation of this functions is as follows:

After comment %A we define a function named NT_Serial where the parameter "m" holds the return value of the function and COM command.

After comment %B we close any open COM ports.

After comment %C we create a Matlab Serial Port Object named "tep" and associate it with the serial port number stored in the 'com' variable.

After comment %D we configure the "tep" serial port object with the parameter values for BaudRate, Parity and StopBit and set the Timeout parameter to 1 second.

After comment %E we create an identifier variable named WarnID for serial port unsuccessful read warning messages.

After comment %F we we open the "tep" serial port.

After comment %G we send the contents of the "command" variable to the serial port defined by the "tep" object.

After comment %H we turn off the the Matlab warning function. We do this because we are creating a loop that continues until there is an unsuccessful read and we don't want to view the waring messages that we know in advance will happen.

After comment %I we read all the responses returned to the serial port. The variable "c" stores the delimiter characters that will separate each line of the response. Note that there will be multiple response lines whenever the signal generator "echo" is enabled and after sending a "que" command.

After comment %J we turn the unsuccessful read warnings back on.

After comment %K we put the characters returned by the serial port along with the delimiter characters into the NT_serial function returned value variable "m" and then close the "tep" serial port.

If we have a computer with a COM3 serial port that is connected to a Novatech Instruments signal generator we can now send commands to the signal generator using the NT_Serial function. We do this by entering the following into the MATLAB command Line:

```
com = "COM3"
command = "f0 20.5"
NT_Serial(com,command)
```

This will cause the signal generator to ouput 20.5MHz and, if the signal generator echo is enabled, Matlab will display the following:

"f0 20.5"

"OK"

NT_Serial(com,command)

```
%A
        function [m] = NT_Serial(com, command)
%B
          if ~isempty(instrfind)
          fclose(instrfind);
          delete(instrfind);
          end
%C
          tep = serial(com);
%D
          set(tep,'BaudRate', 19200);
          set(tep,'Parity', 'none');
          set(tep,'StopBit', 1);

          tep.Timeout = 1;
%E
          warnID = 'MATLAB:serial:fgetl:unsuccessfulRead';

%F
          fopen(tep);
%G
          fprintf(tep, command);
%H
          warning("off", warnID);
%I
          temp = fgetl(tep);
          c = "!$";
          recentVal = fgetl(tep);
            while recentVal ~= ""
            temp = strcat(temp, c, recentVal);
            recentVal = fgetl(tep);
            end
%J
          warning("on", warnID);
%K
          lines = split(temp, "!$");
          m = lines;
```

Matlab Application Note
Page 2

Running the NT_Serial Function

To run the NT_Serial function in Matlab, copy the text of the function as show opposite with no comments and paste it into the Matlab editor and then save it with a file name that is the same as the function name. In this case the file name should be NT_Serial. Matlab automatically puts saved files into the current folder.

Assuming you want to send a command to the signal generator to set the output frequency of channel zero to 5MHz and that your computer is using serial COM Port number three, you would type the following into the command window:

fx >> NT_Serial("COM3", "f0 5")

The Novatech signal generator should now be generating 5MHz on channel zero.

You could also create variables for the COM port number and the signal generator command as follows:

com = "COM3"
command = "f0 5"

Then you could run the function by typing:

Fx>> NT_Serial(com,command)

NT_Serial(com,command) Function With No Comments

```
function [m] = NT_Serial(com, command)

if ~isempty(instrfind)
 fclose(instrfind);
  delete(instrfind);
end

tep = serial(com);

set(tep,'BaudRate', 19200);
set(tep,'Parity', 'none');
set(tep,'StopBit', 1);
tep.Timeout = 1;
warnID = 'MATLAB:serial:fgetl:unsuccessfulRead';
fopen(tep);
fprintf(tep, command);

warning("off", warnID);
temp = fgetl(tep);
c = "!$";
recentVal = fgetl(tep);
while recentVal ~= ""
    temp = strcat(temp, c, recentVal);
    recentVal = fgetl(tep);
end
warning("on", warnID);
lines = split(temp, "!$");
m = lines;
fclose(tep);
end
```