



Noise Eater Driver Software Programming Guide

Overview:

The Noise Eater Driver allows remote control and monitoring via either USB or optional Ethernet connection. Once a connection is made to the driver using one of these interfaces, all command and control is the same regardless of which interface is used.

USB Interface:

In order for Windows to recognize the Noise Eater Driver USB port the USB driver must first be installed, after which the Noise Eater Driver appears as an additional COM port on the computer. Currently Windows XP, Vista, 7, and 8 are supported. Windows 7 requires the extra step listed below; Windows 8 requires additional steps which can be found in the following application note:

<http://www.spectronixinc.com/Downloads/Installing%20Under%20Windows%208.pdf>

1. Copy the file "cdc_NTXPV764.inf" from the supplied CD to the hard drive.
2. Plug the Noise Eater Driver into a free USB port. When the hardware installation wizard asks for the driver location, browse to the "cdc_NTXPVista.inf" file on the hard drive.
3. After the driver has been installed right click "my computer" and select "properties". In the properties window select the "hardware" tab. Click on "device manager" and expand the "Ports (COM & LPT)" item. Locate the "Spectronix, Inc." entry and note the assigned COM number, (ie "COM4"). This is the COM port that the software will use to communicate with the Noise Eater Driver.

Note, on some operating systems such as Window 7, manual USB driver installation may be necessary. If the hardware installation wizard fails, go to "My Computer" > "Properties" > "Hardware" > "Device Manager", and find the "Spectronix" or "SERIAL DEMO" entry under "Other Devices" and select "Update Driver". At this point you will be able to browse to the location of the driver.

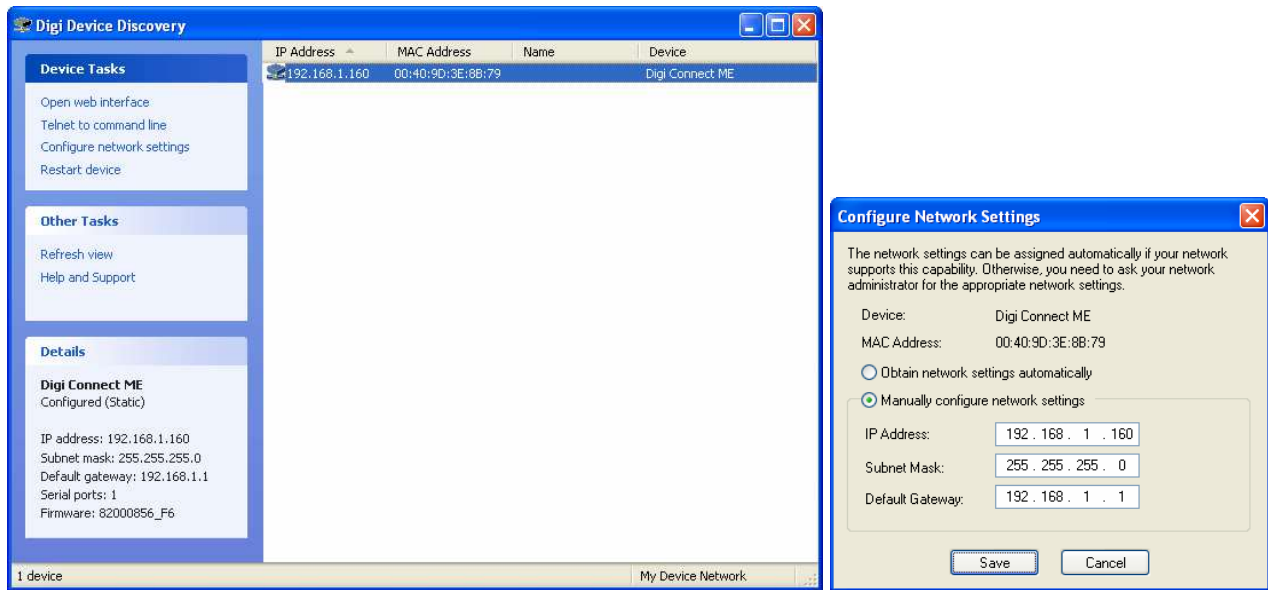
Optional Ethernet Interface:

The optional Ethernet connection communicates using TCP/IP on port number 2101 and is shipped with a default IP address of 192.168.1.161.

Changing the IP Address

The Digi Device Discovery utility allows the user to retrieve and change Noise Eater IP address. The installation program "40002265_G.exe" can be found on the Spectronix or Digi web sites.

After installing the utility, disable Windows Firewall and any other virus or firewall programs and start the program. The program will report the IP and MAC addresses of all compatible devices on the network. Right click on the device and select "Configure Network Settings" to change the network settings.



Updating the Firmware:

It is possible for the user to update the Noise Eater Driver firmware over USB or Ethernet (if supplied) using the Spectronix Bootloader application which can be found on the included CD or downloaded from the Spectronix web site. With the unit powered off press and hold the recessed programming button while turning on the main power switch, the LED will turn solid green. Release the button and follow the bootloader user's manual for instructions on loading the firmware.

Commands:

The Noise Eater Driver uses ASCII data to communicate with a host computer; the tables below list the individual commands, parameters, and responses from the Noise Eater.

Notes:

1. All communication is initiated by the host.
2. Commands are not case sensitive.
3. A space or equal sign should be inserted between the command and any parameters.
4. All commands should be terminated with a <CR> <LF>.
5. Responses from the Noise Eater Driver are initiated with >0x00> and terminated with <CR> <LF> <0xFF>.

Get Unit Information and driver status	
Command:	Example / Parameters:
"?"	(none)
Response:	Example / Parameters:
Start of message	<0x00>
Command echo	?,
Unit name	100436A,

Firmware Rev	000.000,
Termination	CR / LF <0xFF>
Notes:	

Get the chassis status and settings	
Command:	Example / Parameters:
"Status"	(none)
Response:	Example / Parameters:
Start of message	<0x00>
Command echo	Status,
Alarm	0, (0=normal, 1=fault)
Loop Control	c, (c=closed, o=open)
Beam Control	0, (0=zero order beam, 1= first order beam)
Proportional Gain	050, (0:100%)
Integral Gain	020, (0:100%)
Optical Setpoint	250, (Absolute power in V*100)
RF Power Setpoint	050, (0:100%)
RF Gain	020, (0:100%)
Phase Gain	250, (%*10 - see phase gain command)
Frequency	050000000, (MHz)
Phase offset	090, (0:360°)
Amplitude Scale	0512, (0:1023)
Termination	CR / LF <0xFF>
Notes:	

Read the current measurements	
Command:	Example / Parameters:
"Meas"	(none)
Response:	Example / Parameters:
Start of message	<0x00>
Command echo	Meas,
Alarm	0, (0=normal, 1=fault)
Optical Power	250, (Absolute power in V*100)
RF control value	050, (0:100% - current value of the RF amplitude control signal)

Phase Correction	030 , <i>(relative RF phase offset 0:180°)</i>
Termination	CR / LF < 0xFF >
Notes:	

Change the frequency of both channels	
Command:	Example / Parameters:
"SetFreq"	"50.5" <i>(MHz)</i>
Response:	Example / Parameters:
Termination	< 0xFF >
Notes:	

Change the phase offset of CHB	
Command:	Example / Parameters:
"SetPhase"	"90" <i>(degees)</i>
Response:	Example / Parameters:
Termination	< 0xFF >
Notes:	Advances the phase of CHB by the specified amount. When phase control is enabled, this value is changed automatically by the control loop.

Change the phase offset of CHB	
Command:	Example / Parameters:
"SetAmp"	"1023" <i>(amplitude 0-1023)</i>
Response:	Example / Parameters:
Termination	< 0xFF >
Notes:	Sets the DDS digital amplitude of both channels. This should be set for the desired optical throughput while the phase gain is zero and the phase offset is set to 60°.

Change the Optical Setpoint level	
Command:	Example / Parameters:
"OpticalSP"	"250" <i>(0:500 V*100)</i>
Response:	Example / Parameters:
Termination	< 0xFF >
Notes:	The Noise Eater adjusts the RF power in an attempt to

	stabilize the optical input signal to this level. The Noise Eater has an internal 50Ω termination on the detector input.
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Change the RF Setpoint level	
Command:	Example / Parameters:
"RFSP"	"50" (0:100%)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	In closed loop mode the Noise Eater adjusts the relative RF phase in an attempt to stabilize the RF drive to this level. This assumes a full scale input level of 5V. The Noise Eater has an internal 50Ω termination on the detector input. The SetAmp command adjusts the DDS full scale level.

Change the RF Setpoint level	
Command:	Example / Parameters:
"PhaseGain"	"100" (0:250 - % * 10)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	The Noise Eater adjusts the relative RF phase in an attempt to stabilize the RF drive level. This value determines the amount to adjust the phase on every 10mS sample - %Phase adjustment = [Value]*10 * %OpticalError. For a 50% RF error signal, a value of 100 (10%) will adjust the phase 5% of its full range (0-180°).

Set tuning mode	
Command:	Example / Parameters:
"tune"	"10" (0:100%)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	Modulates the current optical setpoint by the amount specified at a 320mS rate.

Set open or closed loop control (Rev 1.0 and above)	
Command:	Example / Parameters:
"setloop"	"c" (c=closed, o=open)
Response:	Example / Parameters:

Termination	<0xFF>
Notes:	

Set the beam order to control (Rev 1.0 and above)	
Command:	Example / Parameters:
"setbeam"	"0" (0=zero order, 1=first order)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	

Set the proportional gain (Rev 1.0 and above)	
Command:	Example / Parameters:
"setpropgain"	"0:100" (%)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	

Set the integral gain (Rev 1.0 and above)	
Command:	Example / Parameters:
"setintgain"	"0:100" (%)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	

Change the RF Setpoint level (Rev 1.0 and above)	
Command:	Example / Parameters:
"RFGain"	"50" (0:100%)
Response:	Example / Parameters:
Termination	<0xFF>
Notes:	In open loop mode this value sets the analog RF gain by adjusting the full scale DAC current.