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NB7NQ621M GUI Manual

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APPLICATION NOTE

SOFTWARE INSTALLATION

1. Open the “NB7NQ621M_GUI_Rev2 installer” folder and run the “setup” application file.
2. Choose a directory to install the GUI and follow subsequent prompts from the installation window.
3. Accept the National Instruments license agreement.
4. Confirm installation file “NB7NQ621M_GUI_Rev2” and click next to start install.
5. Do not interrupt installation, and click finish once the installation is complete.

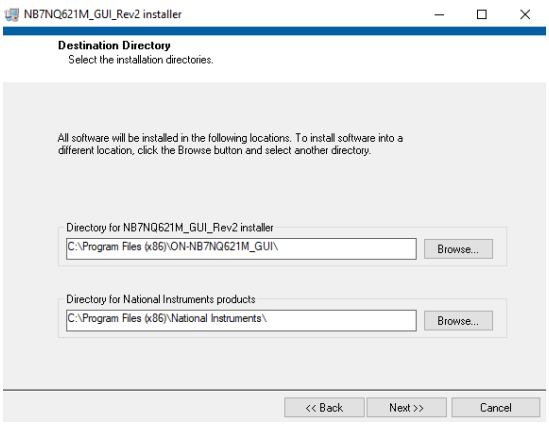

Figure 1. Destination Directory

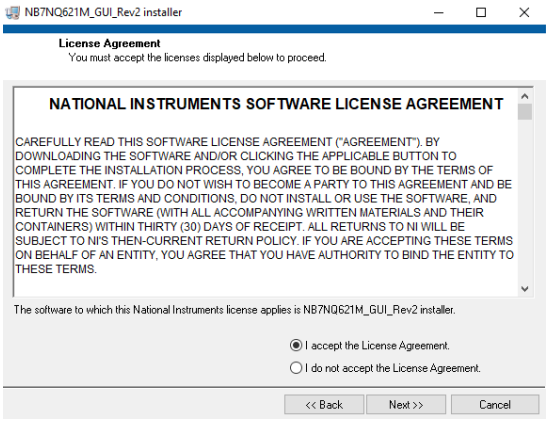

Figure 2. National Instruments License Agreement

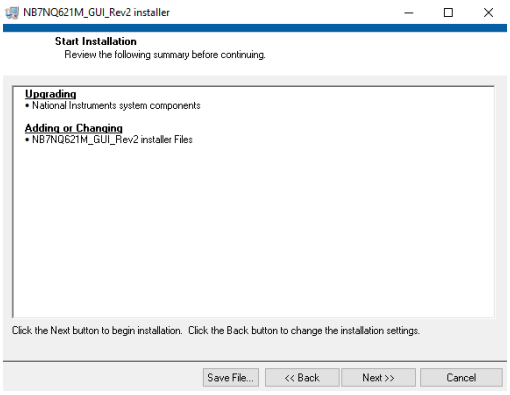

Figure 3. Start Installation

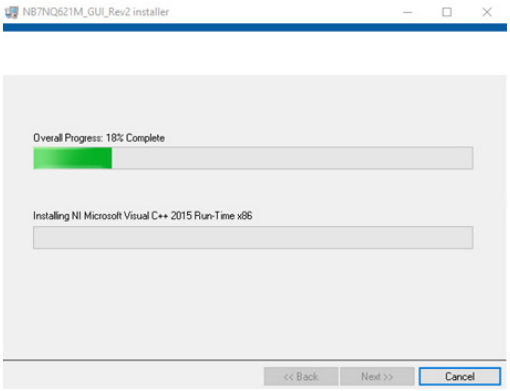

Figure 4. Installation in Progress

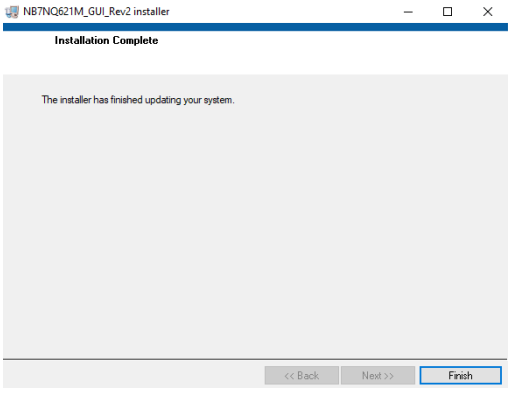

Figure 5. Installation Complete

HARDWARE INITIALIZATION

1. Connect the Teensy Evaluation Board to a USB port on PC with the supplied USB cable.
2. Connect the SDA, SCL, and GND pins from the Teensy module to the same pins on the NB7NQ621M demonstration board.

GUI INTERFACE

The NB7NQ621M GUI may be run. The NB7NQ621M graphical user interface is used in conjunction with ON Semiconductor NB7NQ621M demo boards in order to graphically program the devices I^2C registers. The GUI has complete control over the NB7NQ621M's modes of operation.

1. *GUI Overview: Figure 6* is the view of the GUI on start up. The GUI will open with all of the settings the same as the NB7NQ621M's default register settings.
2. In the I^2C Slave Address menu, the address should be set to "BC" as default. Please refer to datasheet for more information.
   NOTE: E0/ADDR0 and EQ1/ADDR1 are active I^2C slave address pins when I2C_EN is high.
3. In the Serial Port menu, select the appropriate COM port that the Teensy module is assigned to; i.e. COM4. Then press the RUN arrow in the upper left screen.

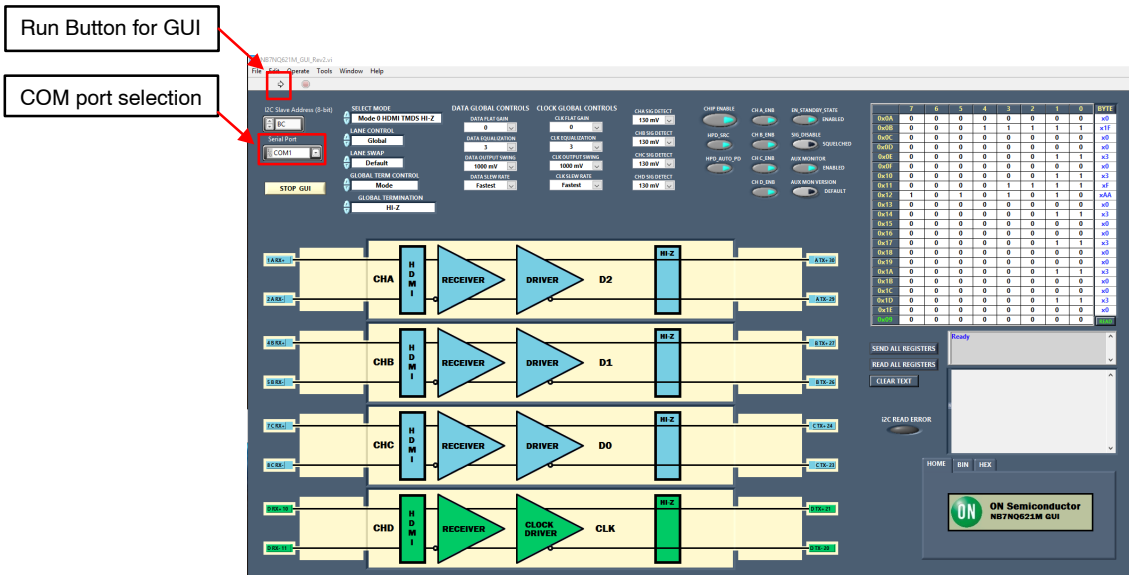

Figure 6. GUI Overview

Connecting to Teensy Module

After the RUN button has been pressed, the teensy module will proceed to connect. The connection status of the teensy module is shown in the display window on the right side of the GUI. Once the connection initialization is complete, "Ready" should be displayed in the display window indicating that the teensy module has been successfully connected and is ready for use.

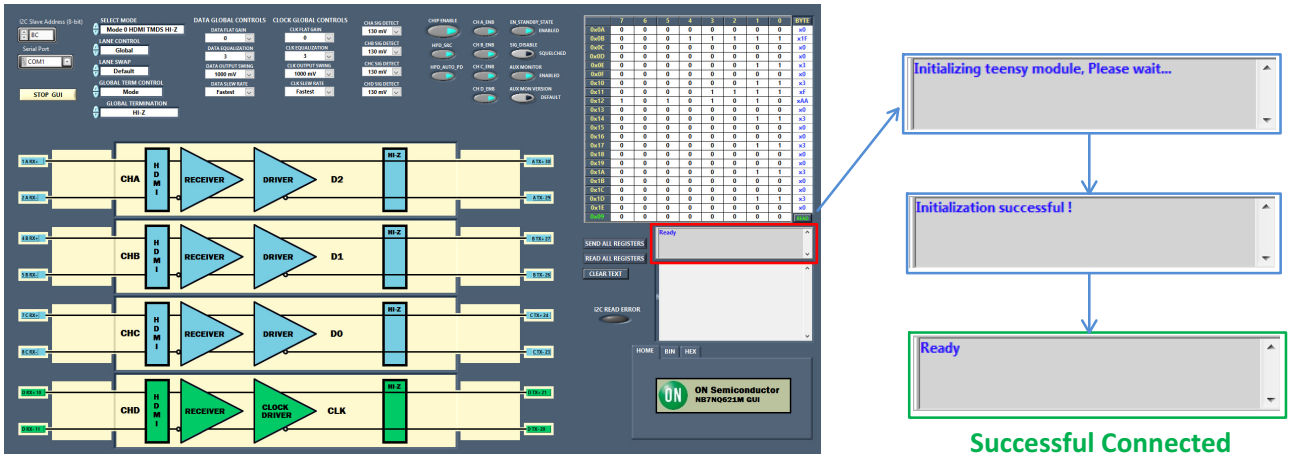

Figure 7. Successfully Connecting to the Teensy Module

Selectable & Default Settings

1. *Operation Modes:* The NB7NQ621M has seven operation modes to choose from. The default operation mode is “Mode 0, HDMI with HI−Z termination”.
2. *Lane Control:* The default setting is “Global” which allows for multiple device channel settings to be changed at the same time. These include channel slew rates, channel termination, output compression and AUX monitoring. If only individual channel settings need to be accessed the “Individual” option can be used instead.
3. *Global Term Control:* “Mode” is the default setting and the termination will match the datasheets specified termination based on mode of operation. It can be changed to be “Global Register”. If this is selected then the termination will not change with the mode and may not match the mode. All Termination types will be available regardless of the device mode.
4. *Global Termination:* There are a total of 7 selectable global termination settings. The default global termination setting is “HI−Z (no term)”.

Details of each setting can be found in the NB7NQ621M datasheet.

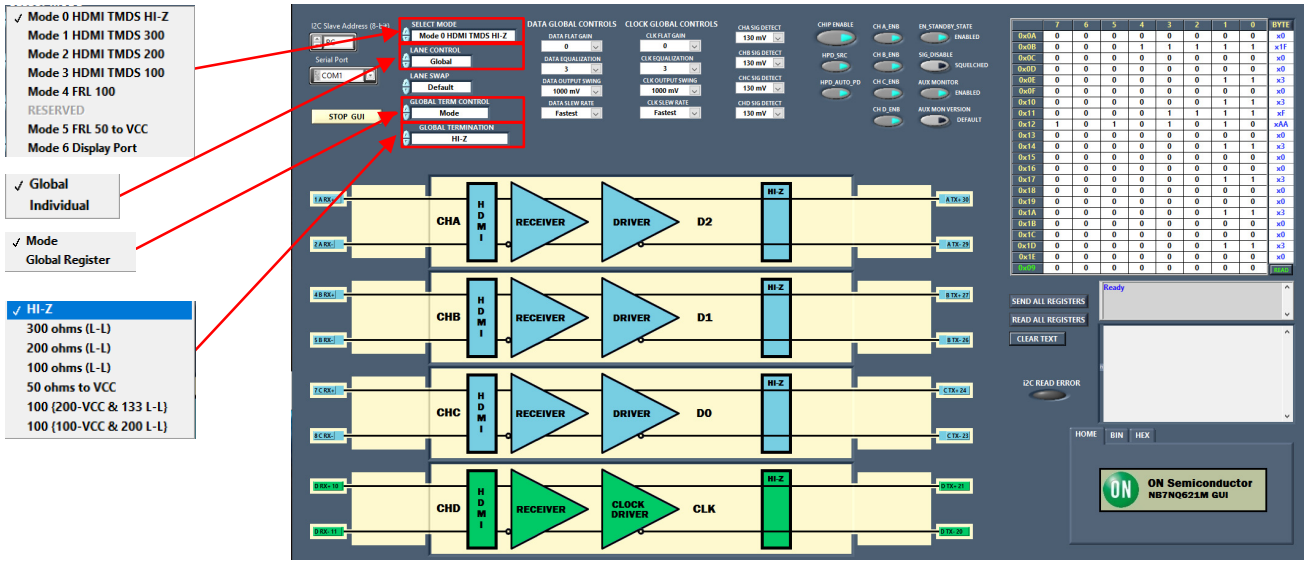

Figure 8. Selectable & Default Settings

Signal Detection & AUX Monitoring

SIG_Detect Button and Selection

The “SIG_Detect,” button will turn the receiver signal detection on or off. It is on by default and the amplitude of detection is set to 130 mV for each channel. The device will only recognize signals that have an amplitude above this voltage selection. If the “SIG_Detect”, button is clicked it will turn the signal detection off and the channels will stay active passing through all signal amplitudes.

NOTE: In HDMI mode Ch. D (CLK) must be active, or “SIG DETECT” must be disabled in order to use the data channels by themselves. The individual channels can have their signal detection threshold adjusted. For tests requiring very low input amplitudes like testing gain with a VNA, “SIG DETECT” should be disabled.

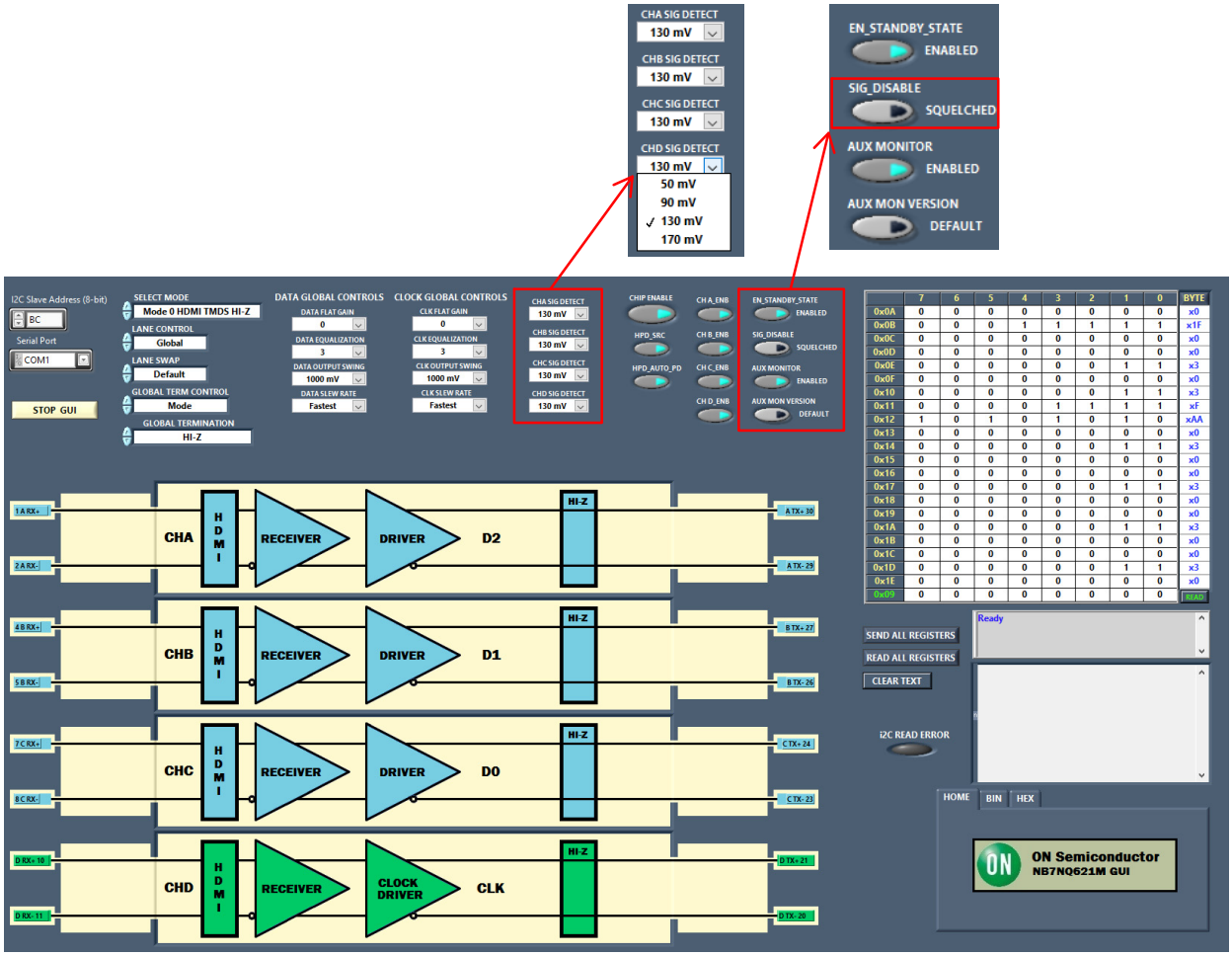

Figure 9. Signal Detection

AUX Monitoring and AUX Monitoring Version

While operating in DisplayPort modes the NB7NQ621M has the ability to monitor the AUX channels in order to turn main link lanes on or off and to change the devices power state. If operating the device in HDMI modes, these buttons may be ignored and do not functionally change the device. While in DisplayPort mode, these buttons toggle the AUX monitoring feature on and off, and can change the version of monitoring in accordance with the datasheet.

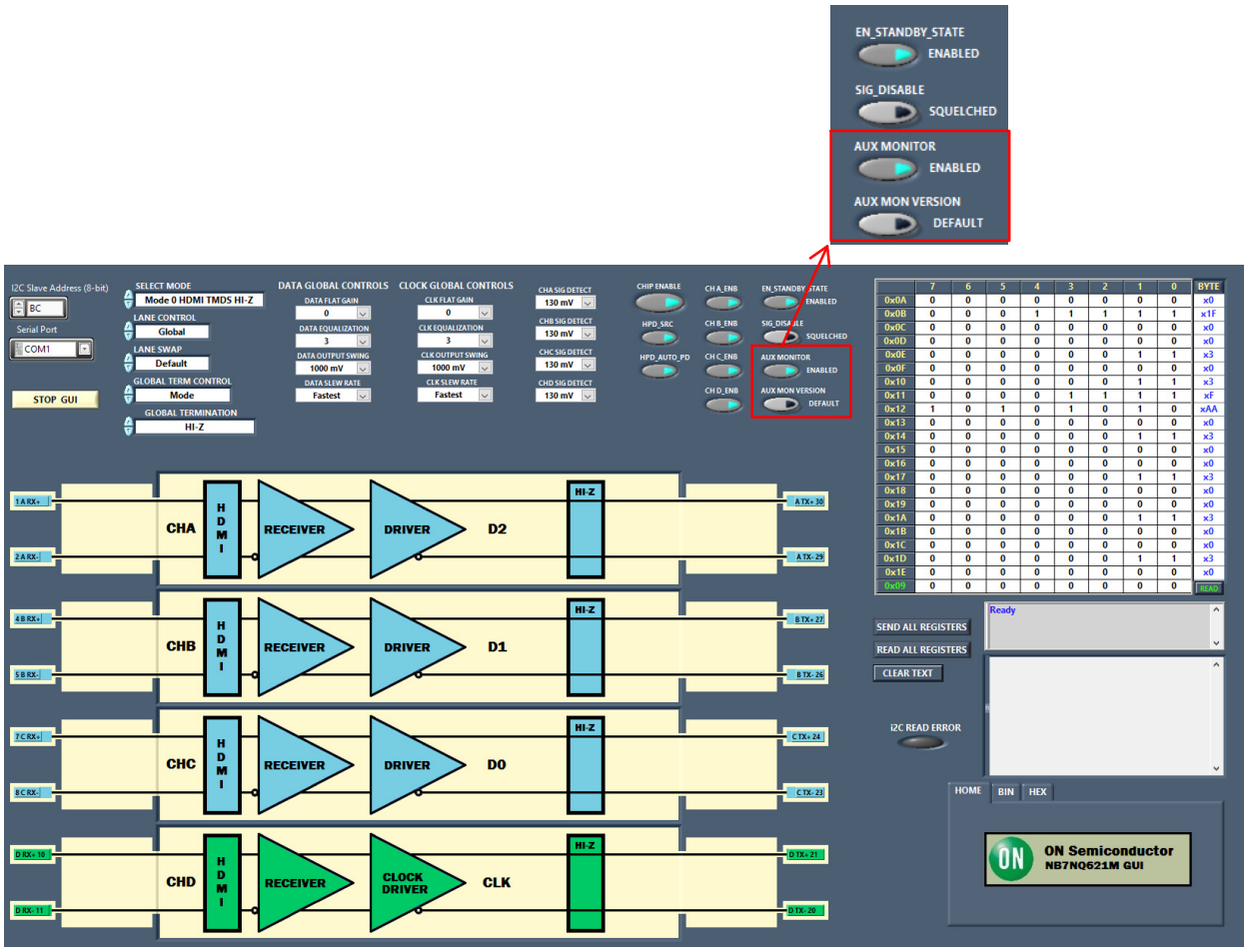

Figure 10. AUX Monitoring and AUX Monitoring Version

Flat Gain (FG) & Equalization (EQ)

When the FRL or DisplayPort modes are selected the CLK flat gain and equalization controls will disappear as they are not used.

1. *Flat Gain:* Depending on the mode selected CLK and/or Data channels can have flat gain (Low frequency gain) settings changed.
2. *Equalization:* Depending on the mode selected CLK and/or Data channels can have equalization (high frequency gain) settings changed.

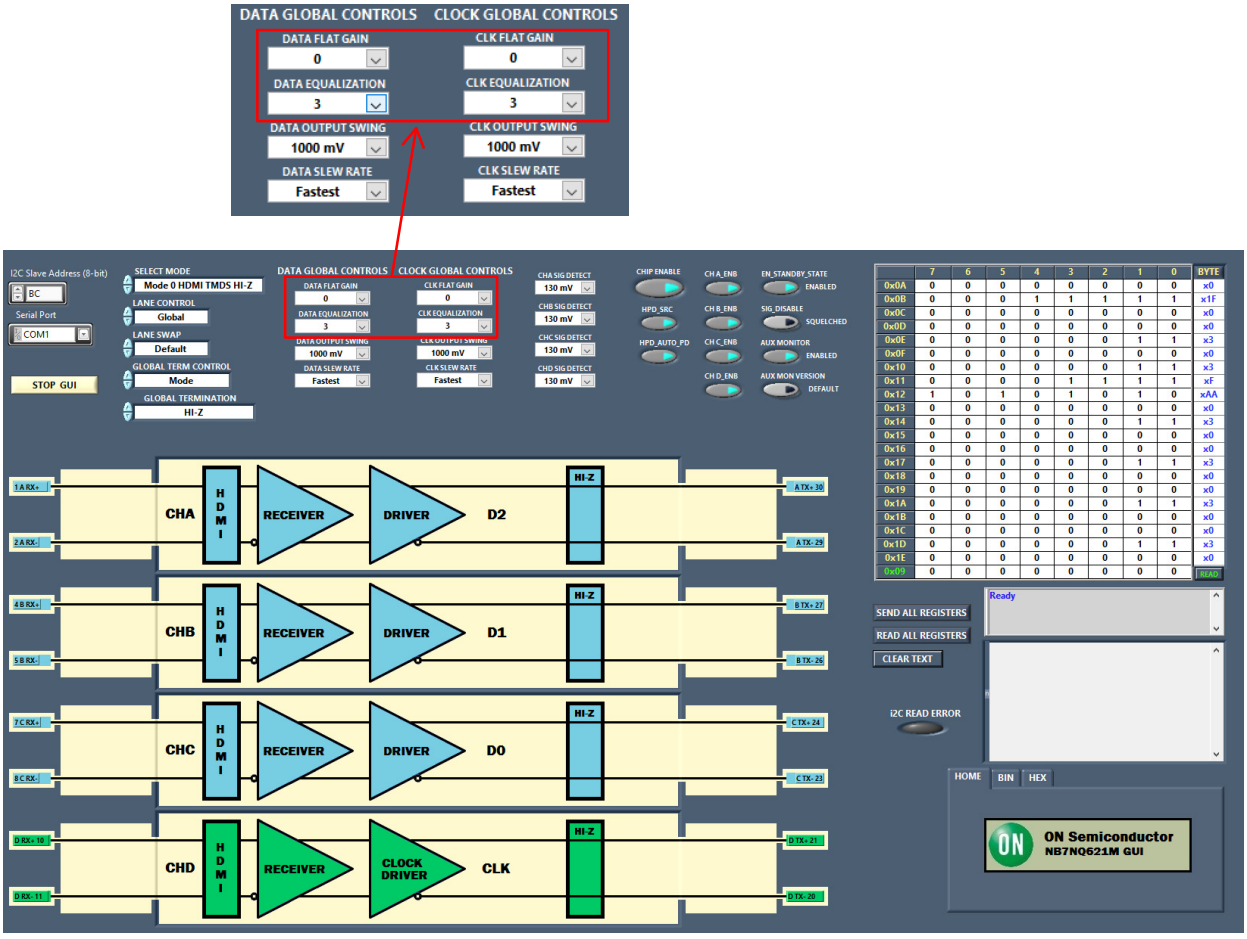

Figure 11. Flat Gain and Equalization

Send All Registers & Read All Registers

The registers can be read back from the device with the “READ ALL REGISTERS” button. The “SEND ALL REGISTERS” can be useful when the part is power cycled and previous GUI settings want to be written to the redriver. All GUI settings can be sent to the device as long as the GUI has not been stopped and power is again applied to the part.

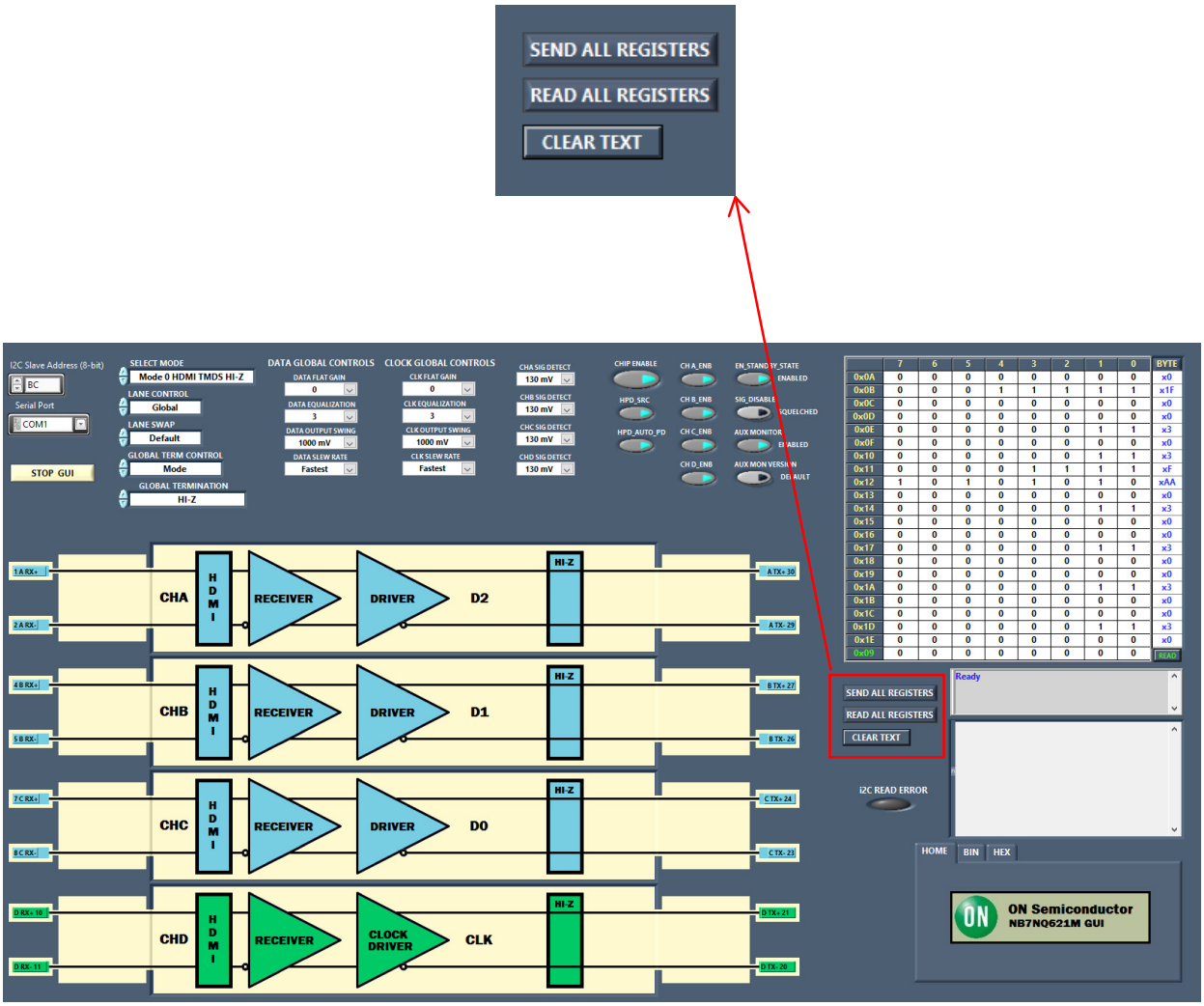

Figure 12. Send All Registers & Read All Registers

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