PRBS43A Software User Guide

1.0   Software

If software has already been installed go to **1.8**

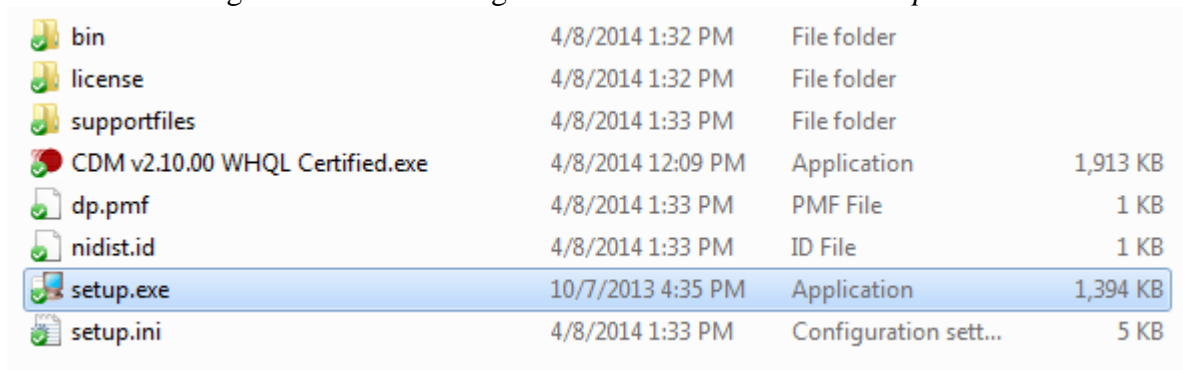**1.1** Locate installation files given as shown in Figure 1. Double left-click on *setup.exe*

bin	4/8/2014 1:32 PM	File folder	
license	4/8/2014 1:32 PM	File folder	
supportfiles	4/8/2014 1:33 PM	File folder	
CDM v2.10.00 WHQL Certified.exe	4/8/2014 12:09 PM	Application	1,913 KB
dp.pmf	4/8/2014 1:33 PM	PMF File	1 KB
nidist.id	4/8/2014 1:33 PM	ID File	1 KB
setup.exe	10/7/2013 4:35 PM	Application	1,394 KB
setup.ini	4/8/2014 1:33 PM	Configuration sett...	5 KB

Figure 1. Setup Files

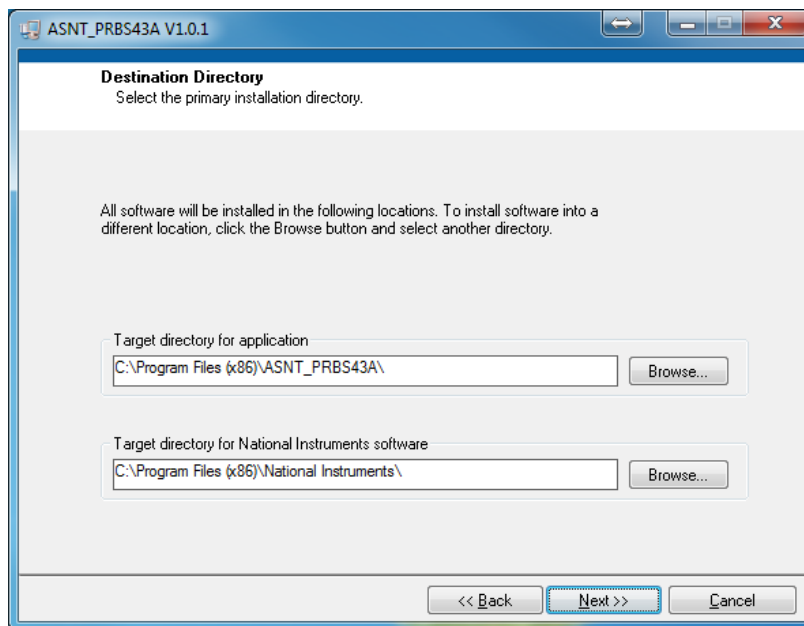**1.2** Select Target directory for location of installation files that will be installed. Then left-click on *Next*.

Figure 2. Installation Directory

1.3 Left-click on *Next*.

1.4 Wait for files to be installed.

1.5 Left-click on *Finish*

1.6 Left-click on *Restart* if requested.

1.7 Double left-click on the "CDM v2.10.00 WHQL Certified.exe" to install USB drivers. This file can be found in the same directory as the setup file used earlier to install software.
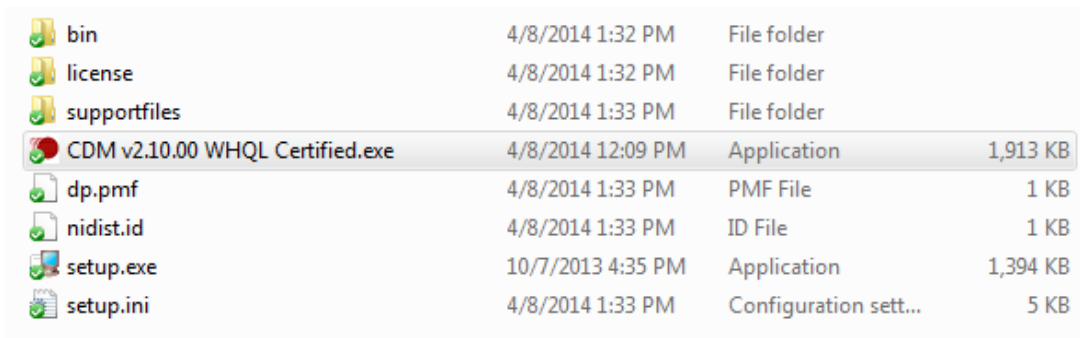

Figure 3. USB Driver

1.8 Double left-click on the icon *ASNT_PRBS43A Vx.x.x* on the desktop to open the control software.

1.9 Connect the USB cable to the device. Insert power cord and turn the switch on the back of the panel to the ON position. Referring to Figure 4, wait until the USB indicator has turned green. This indicates that the software is connected to the ASNT_PRBS43A. If green indicator does not appear, then USB drivers may not be installed correctly or USB cable may need to be re-inserted.
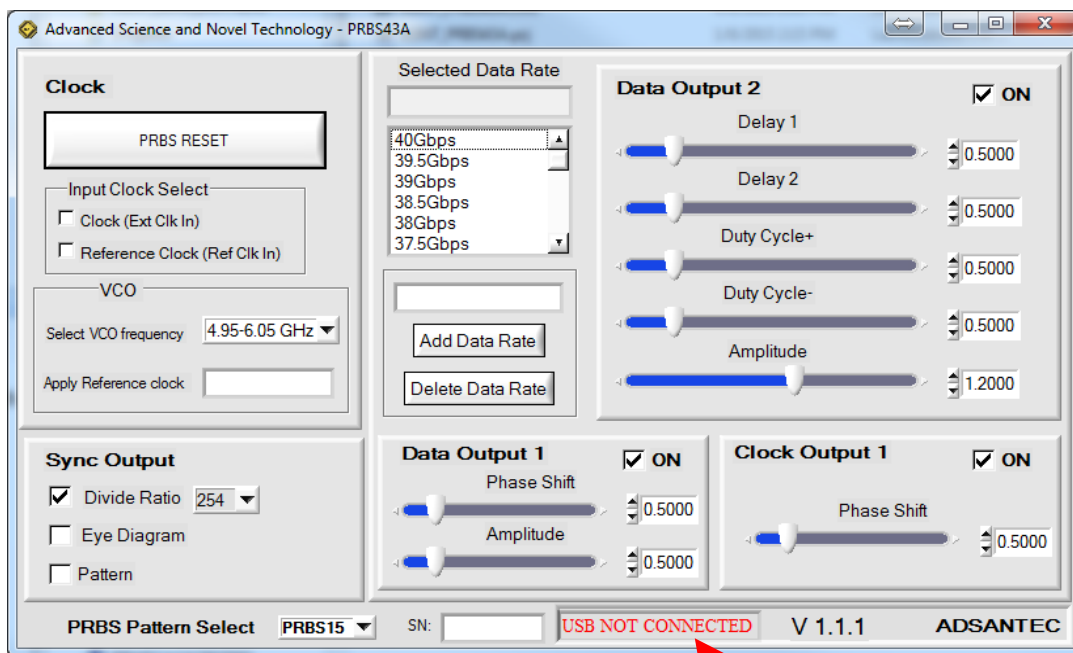

Figure 4. GUI

2.0 Software

2.1 Clock Input – Apply either a reference clock to Ref Clk In to use the internal VCO's or apply a half-rate clock into the Ext Clk In. Reference to Table 1 in the datasheet for appropriate clock frequencies when using Ref Clk In. These connections are shown in Figure 4. Note: Clock inputs are AC coupled inside unit. IMPORTANT: Only apply one clock at a time, do not apply both clocks simultaneously or else increased jitter will be observed on all Data/Clock outputs.

Figure 4. Back panel

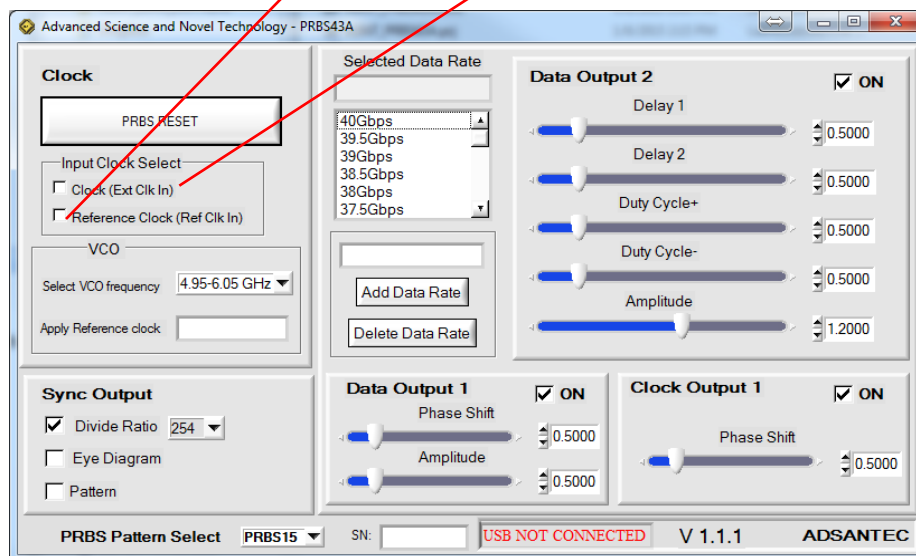**2.1** Select the desired Clock Mode on the GUI shown in Figure 5.

Figure 5. GUI

2.2 If using the Ref Clk In, select the desired frequency from the pull down menu labeled as "Select VCO frequency." Ref Clk In will now need to be in the range specified in the "Apply Reference clock" text box. The Clk Out will only have a clock output when 6.05GHz to 8.025 GHz or 12.1GHz to 16.05 GHz range is selected from the menu aforementioned.

2.3 Sync Output – The Sync Output is AC coupled inside the unit. The Sync Output is used to synchronize the data with an oscilloscope. The GUI has three options to select from to control the Sync Output: Divide Ratio, Eye Diagram, and Pattern. If Pattern box is selected, then the Sync Output will provide a divided by 254 clock to observe the PRBS7 pattern on an oscilloscope. "Eye diagram" box provides a divided by 252 to observe an eye diagram on an oscilloscope. "Divide Ratio" box allows a pop-up menu to appear when the number box is selected. Divide ratios from 2 to 512 can be selected in multiples of 2.
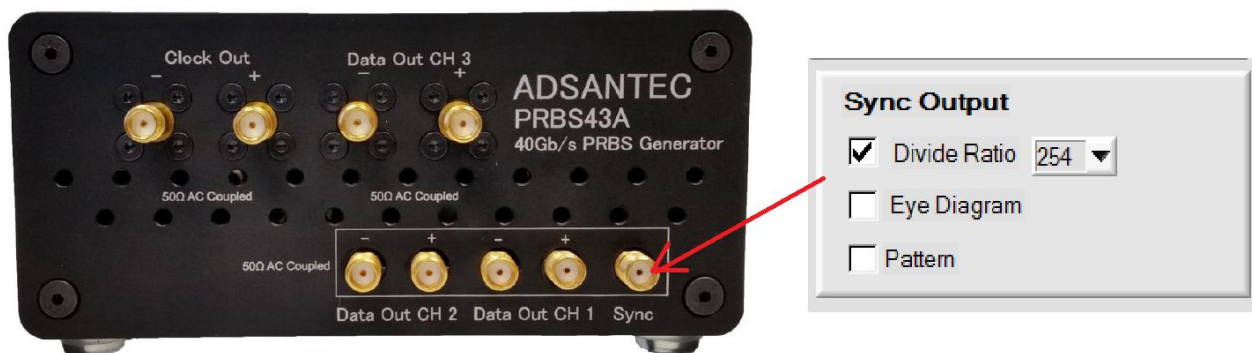

Figure 6. Controlling the Sync Output

2.3 Data Output -Data Output Ch1 has PRBS7/PRBS15 up to 24$Gbps$ with controllable 155ps of delay, amplitude control from 0V to 1.6V differentially and output duty cycle control from 40% to 60%. Data Output Ch2 has PRBS7/PRBS15 up to 48$Gbps$ with amplitude control from 0V to 1.7V differentially. Data Output Ch3 has PRBS7/PRBS15 up to 24$Gbps$ with output amplitude of 0.8V differentially. Clock Out is a differential output from 1MHz to 24GHz with an adjustable delay up to 105ps and an amplitude of 0.8V *peak to peak* differentially. Note: Data output Ch3 and Ch1 will always generate a true PRBS7/PRBS15 pattern. Data Out Ch2 must have its delays adjusted in order to achieve a correct PRBS7/PRBS15 pattern.

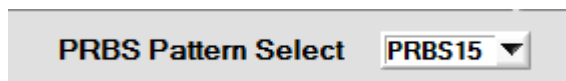On the bottom left of the GUI, the data pattern of PRBS is selected from the pull-down shown in Figure 7.

Figure 7. PRBS pattern Select

2.4 PRBS Reset – Left-click on the "PRBS RESET" button shown in Figure 8 to reset the internal PRBS generator. This must be done every time clock frequency is changed or upon powering up the unit.
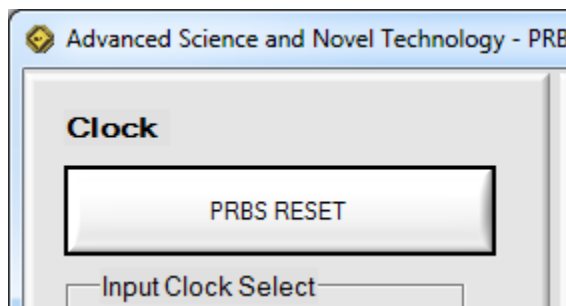
Figure 8. PRBS Reset button

2.5 Data out Ch 2 Calibration –

Most of the time, ch2's delays will have to be adjusted in order to get a TRUE PRBS pattern. The following instructions is one way of calibrating the delays for correct PRBS pattern.

Procedure for calibration:

1. Connect Data Out Ch 2 output to an oscilloscope. (Connect that data output with a "+" on the front panel of the unit to the oscilloscope)
2. $50 Ohm$ terminate the other data output.
3. Connect Sync output from the front panel to the oscilloscope's trigger.
4. Set Sync Output to "Pattern".
5. Select PRBS7 on the PRBS pattern Select box.
6. Set desired data rate by applying half-rate clock to the Clock In input with at least $100mV$.
7. Left-click on the PRBS RESET button.
8. Scroll/Delay the 127 bit PRBS7 pattern on the oscilloscope until you observe a sequence of data close to 7 one's followed by 6 zero's. You may find a pattern shown below in **Figure 9**, which is incorrect.
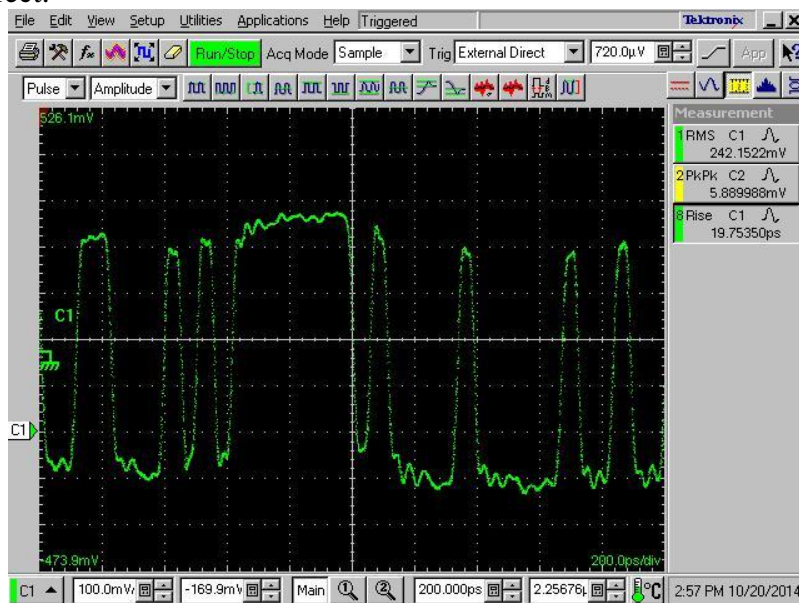

Figure 9. Incorrect PRBS7 pattern

9. Adjust "Delay 1" and "Delay 2" sliders on the GUI in order to get the correct PRBS7 pattern which is shown in **Figure 10**.
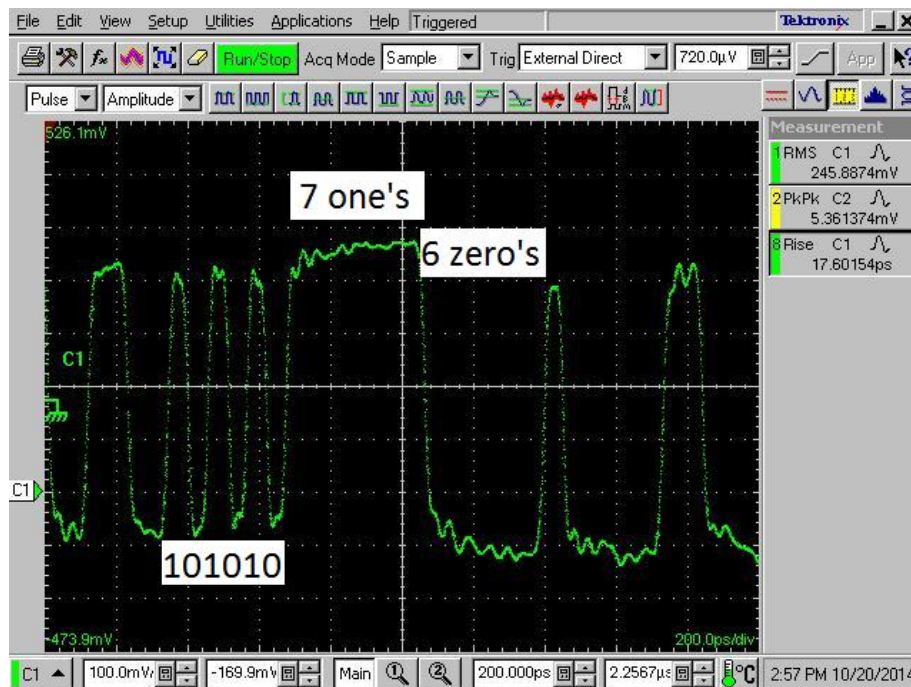

Figure 10. Correct PRBS7 pattern

Alternatively an error detector can be used instead of an oscilloscope to adjust Delay 1 and Delay 2 for correct PRBS7 pattern.

Note: After calibrating data output on Ch2 using PRBS7, PRBS15 may be selected and will give the correct PRBS15 pattern.

2.6 Data Rate - The Data Rate box provides a means of saving the settings of all sliders for a given data rate. The ASNT_PRBS43A internally multiplexes two PRBS data streams for ch2 and therefore the delay of each stream into the multiplexer must be changed when different frequencies are used. The Data Rate list box provides some present clock frequencies with some preset values for delay and duty cycle control. These values can be modified in the box by left clicking on them. The delay and duty cycle can then be modified and will be automatically saved when exiting the program.

To add an entry, clear the text box in the "Add Data Rate" box and type in a text string. For example, type "30Gbps" and left mouse click on the "Add Data Rate" button to add this to the list. Then modify the delay and duty cycle adjustment and the values will be saved to "30Gbps". Left

click on any of the text entries in the box to highlight the item and the values of that text will be updated to the unit.

To delete an entry inside the Data Rate list box, left click on the entry and left click on the "Delete Data Rate" button.

REVISION HISTORY

Revision	Date	Changes
1.1.2	07-2019	Updated Letterhead
1.1.1	01-2015	Updated calibration procedure Included information on selecting PRBS pattern
1.0.1	07-2014	Initial Release