isoLynx®

8B SLX300
Configuration Software Tool
User Manual

SLX300
Data Acquisition
System

DATAFORTH®

8B isoLynx® SLX300 Configuration Software Tool User Manual
MA1029 Rev. A – July 2010
© 2010 Dataforth Corporation. All Rights Reserved.

Table of Contents

About Dataforth Corporation

"Our passion at Dataforth Corporation is designing, manufacturing, and marketing the best possible signal conditioning, data acquisition, and data communication products. Our mission is to set new standards of product quality, performance, and customer service." Dataforth Corporation, with more than a quarter century of experience, is the worldwide leader in Instrument Class® Industrial Electronics – rugged, high performance signal conditioning, data acquisition, and data communication products that play a vital role in maintaining the integrity of industrial automation, data acquisition, and quality assurance systems. Our products directly connect to most industrial sensors and protect valuable measurement and control signals and equipment from the dangerous and degrading effects of noise, transient power surges, internal ground loops, and other hazards present in industrial environments.

Dataforth spans the globe with more than 50 International Distributors and US Representative Companies. Our customers benefit from a team of over 130 sales people highly trained in the application of precision products for industrial markets. In addition, we have a team of application engineers in our Tucson factory ready to solve any in-depth application questions. Upon receipt of a quote or order, our Customer Service Department provides fast one-day delivery information turnaround. We maintain an ample inventory that allows small quantity orders to be shipped from stock.

Contacting Dataforth Corporation

Contact Method	Contact Information
E-Mail: Technical Support	techinfo@dataforth.com
Website:	www.dataforth.com
Phone:	520-741-1404 and toll free 800-444-7644
Fax:	520-741-0762
Mail:	Dataforth Corporation 3331 E. Hemisphere Loop Tucson, AZ 85706

Errata Sheets

Refer to the Technical Support area of Dataforth's website (www.dataforth.com) for any errata information on this product.

1.0   8B isoLynx® SLX300 Communication Setup

1.1   Quick Startup

1. Start the 8B isoLynx® SLX300 Configuration Software Tool program.

2. Connect the appropriate communication cable and supply the 8B isoLynx® SLX300 with the appropriate power.

3. From the main menu select **Communication** and then click **Configure**.

4. Set up the appropriate communication settings and click the **Connect** button.

   The default settings are as follows:

   - Serial communication settings are 115.2kbps, even parity, Slave ID 16.
   - Ethernet communication default static IP Address is 192.168.128.100.

1.2   8B isoLynx® SLX300 Communication Setup & Connection

To start the 8B isoLynx® SLX300 Configuration Software Tool application, click on the **SLX300 shortcut** located on the desktop. (There is also an SLX300 shortcut under the Start menu, All Programs, 8B isoLynx SLX300.) Once started, the initial SLX300 Configuration Software Tool window displays with the View Pane disabled, indicating that the application is not yet connected to the attached 8B isoLynx® SLX300 system. Reference Figure 1.
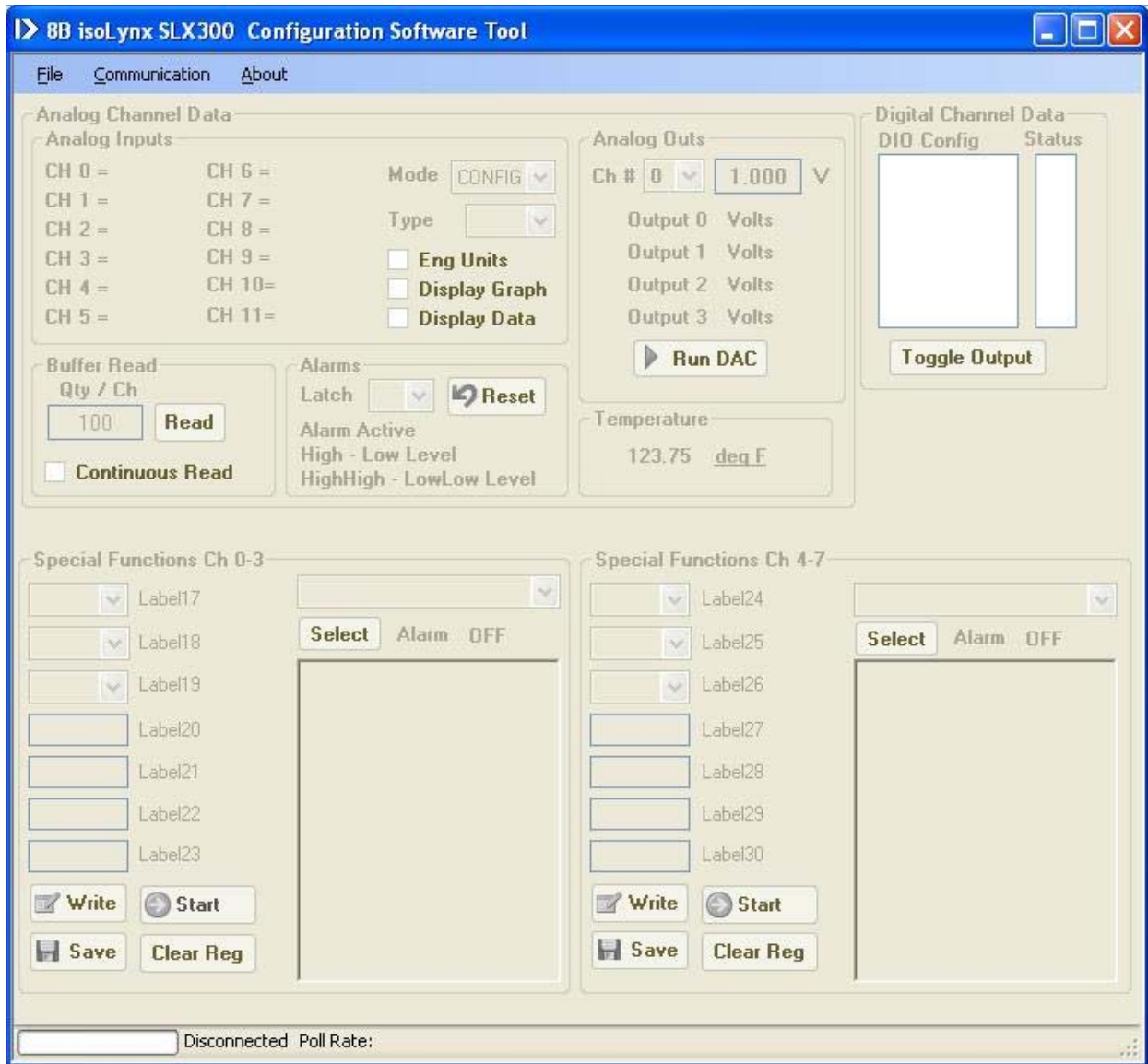
Figure 1: SLX300 Configuration Software Tool Window, View Pane Disabled

From the **Communication** pull-down menu, select **Configure**. The **Communication Setup** window will appear giving the user the ability to configure the communication port. Reference Figure 2.
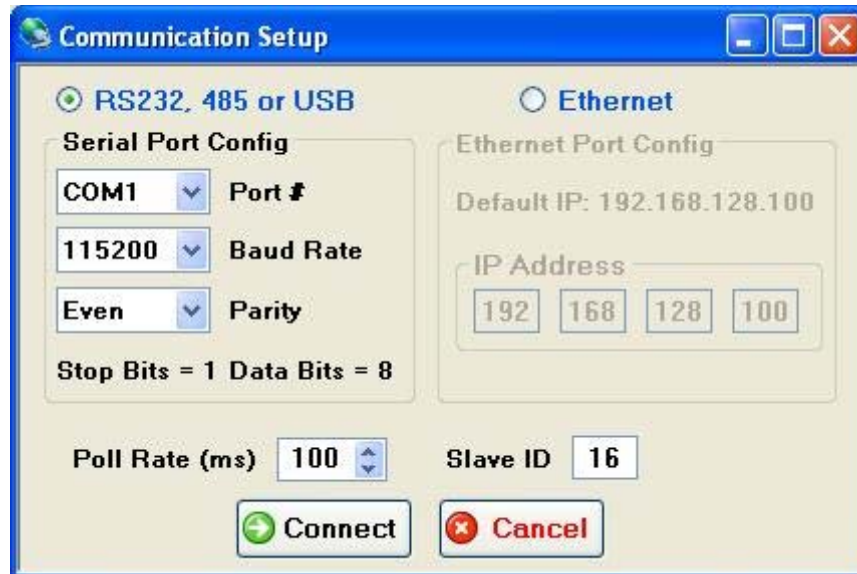
Figure 2: Communication Setup Window

- For SLX300-10, -10D, -20, -20D, -30 or -30D make sure the **RS232, 485 or USB** radio button is selected. Select the appropriate Communication Port number from the **Port #** drop-down menu. For the initial connection leave the **Baud Rate**, **Parity** and **Slave ID** unchanged.

- For SLX300-40 or -40D make sure the **Ethernet** radio button is selected. For initial connection leave the **IP Address** unchanged. The host computer Ethernet port must be configured with a fixed IP Address of 192.168.xxx.xxx, which does not match the static IP Address of the SLX300, and Subnet Mask of 255.255.0.0 when the 8B isoLynx® SLX300 Ethernet port is used.

Once the communication parameters have been set, click the **Connect** button. The 8B isoLynx® **Communication Setup** window will now disappear and the **8B isoLynx® SLX300 Configuration Software Tool** window will come to center screen. If the connection and setup are correct, the bar graph on the bottom left corner of the window will start moving, otherwise the connection failed. Review the communication cable connections and communication setup parameters and try connecting again.

2.0   8B isoLynx® SLX300 Configuration Software Tool Window
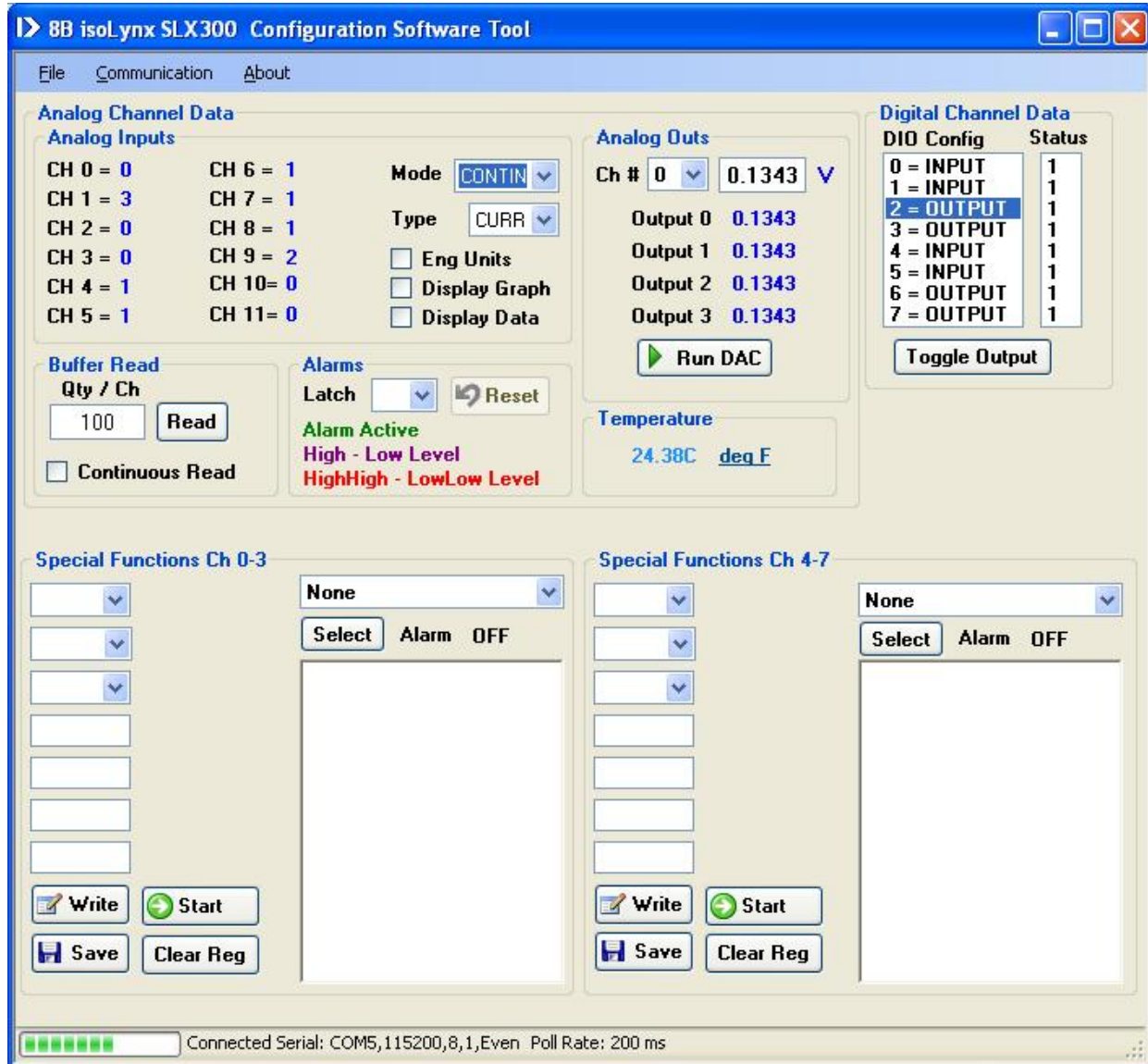
Figure 3: SLX300 Configuration Software Tool Window, View Pane Active

2.1   Analog Channel Data

1. **Analog Inputs**: Displays the value of each channel being read in counts or engineering units, depending on whether or not the **Eng Units** box is checked.

    a. In the **Mode** box the user has the option of selecting CONFIG (Configuration), CONTIN (Continuous), or BUFFER mode.

        i. CONFIG mode is used to make changes to the analog input channel configuration, channel weight, alarm configuration, etc.

        ii. CONTIN mode displays data at the update rate selected in the 8B isoLynx® SLX300 Communication Setup window. The background analog input channel scan rate in

4

CONTIN mode is fixed at 6ksps. In this mode the user can view four different types of data; these are selected from the **Type** box drop-down menu.

- CURR: Displays current data, i.e., the latest scan results prior to reading the address registers.
- MIN: Displays minimum read data since the CONTIN mode was selected.
- MAX: Displays maximum read data since the CONTIN mode was selected.
- AVG: Displays the average of the samples according to the specified weight of the channel.

iii. BUFFER mode is used to execute a burst scan. Scan List defines the channels that are scanned, Scan Size specifies the number of samples that are taken, and Scan Rate specifies the rate at which the channels are scanned. When the BUFFER mode is selected, all of the channels in the scan list are scanned in the order that they appear until the scan size is met; then the mode switches back to CONFIG. The average of the readings is displayed next to the channel number.

b. Under **Buffer Read** functions, the **Read** button is used to obtain samples from channels in the scan list from the previous burst scan, and the number of samples per scan list entry to be read is specified in the **Qty** box. This allows viewing of the data after a buffer scan has been completed. The data is displayed in a table in a separate window and will be replaced with the latest data the next time the **Read** button is pressed. Until the BUFFER mode is activated again, the data displayed will be from the last burst scan. The average of the sampled data is displayed at the bottom of each column and also next to the channel number in the main screen.

c. The **Continuous Read** checkbox loops the burst scan mode.

- It will execute a burst scan and then a subsequent read of the quantity specified in the **Qty** box for each channel in the scan list. The difference between using this checkbox and the Read button is that data is not displayed in another window; instead, the average of the values is posted next to the appropriate channel.

- This is useful for viewing a graph of the data. By checking the **Display Graph** checkbox, the Continuous Read function opens a new window in which the readings of the burst scan are graphed. It retrieves the number of samples per channel in the scan list specified by the Number of Samples to Display in the graph window. Each time the Continuous Read loops, it performs a new burst scan and displays the new data.

2. **Analog Outs**: Controls the analog outputs.

a. From the **Ch #** drop-down box menu the user can select any of the four analog output channels; the default channel is 0. The voltage value written to the output channel is displayed next to the Output Channel number. To change the value, type the new value in the text box and press Enter. The new value will be written to the selected output channel. Valid voltages are 0V to +5V.

b. **Run DAC** button: The 8B isoLynx® SLX300 has the ability to pre-program a series of desired output values and have them change at specific intervals. If values have been loaded into the system memory, this button will start and stop the routine that writes the values to the outputs. Values are loaded using the Configure I/O menu, Analog Output tab, Load File button.

3. **Alarm Status**: Displays the alarm status for each of the twelve analog input channels.

   a. If an alarm for any channel is active, the channel number will be displayed in **green**. If either the High or Low limit levels for the alarm are exceeded, the channel reading will change to **purple** and if either the High-High or Low-Low limits are exceeded the channel reading will change to **red** to indicate the alarm condition and type of alarm.

   b. The **Latch** drop-down box lists all of the channels which have been configured for a latching alarm as opposed to a tracking alarm. When a latched alarm has been triggered it will not reset until the user selects the alarm in the drop-down box and then presses the **Reset** button. Tracking alarms reset automatically when the alarm condition is no longer present.

4. **Temperature**: Displays the reading from the CJC temperature sensor.

   Temperature can be displayed in degrees F or degrees C using the **deg F** label. If the temperature is between 0 and 30 degrees C it will display in a **cyan** color, if it is greater than 30 degrees C, the display will change to **red**, and if the temperature is below 0 degrees C the display will change to **blue**.

2.2 Digital Channel Data

1. **DIO Config**: This list box contains all of the eight DIO channels and a brief description of their current configurations (INPUT, OUTPUT, ALARM or VACANT). To change the configuration of a channel, see Section 3.0 8B isoLynx® SLX300 Input / Output Channel Configuration Window .

2. **Status**: This list box contains the status of each of the eight DIO channels, 1 = High and 0 = Low.

3. **Digital Outs**: When a channel is configured as an output it is populated in this drop-down box. To change the value, select the output channel in the **DIO Config** and toggle its state with the **Toggle Output** button.

2.3 Special Functions

The DIO channels are grouped into two banks: Channels 0-3 are Bank 0 and Channels 4-7 are Bank 1. Each of the two banks can run any one of seven special functions at any given time. The functions are:

1. **Pulse / Frequency Counter Function**
   Uses the first channel of a bank (i.e., Ch0 or Ch4); this channel must be configured as an input.

   - Select rising or falling edge
   - Pulse Count = Number of pulses since last enable or last clearing of the counter
   - RPM
   - Specify ticks per revolution for use with RPM
   - Frequency

2. **Pulse / Frequency Counter with De-bounce Function**
   Uses the first channel of a bank (i.e., Ch0 or Ch4) as input and can also use the third channel of the bank (i.e., Ch2 or Ch6) to output the de-bounced signal. The first channel must be configured as an input and if the third channel is used it must be configured as an output.

   - Select rising or falling edge
   - Specify length of time that input must remain high; time is in increments of 100µs
   - Specify length of time that input must remain low; time is in increments of 100µs
   - Can output de-bounced signal to third channel of the bank

- Pulse Count = Number of pulses since last enable or last clearing of the counter
- Frequency

3. **Waveform Measurement Function**
   Uses first channel of a bank (i.e., Ch0 or Ch4); this channel must be configured as an input.

   - Select rising or falling edge
   - Specify number of events to measure before stopping
   - Events measured counter
   - Specify timebase, from 1 second to 1µs
   - Provides Current as well as Average, Maximum and Minimum high time readings as a function of the timebase
   - Provides Current as well as Average, Maximum and Minimum low time readings as a function of the timebase
   - Frequency
   - Duty cycle
   - Period

4. **Time Between Events Function**
   Uses the first and second channels of a bank (i.e., Ch0, Ch1 or Ch4, Ch5); these channels must be configured as inputs.

   - Select rising or falling edge
   - Specify number of events to measure before stopping
   - Specify average weight
   - Specify timebase, from 1 second to 1µs
   - Provides Current as well as Average, Maximum and Minimum time between events as a function of the timebase
   - Frequency

5. **Frequency Generator Function**
   Uses the third channel of a bank (i.e., Ch2 or Ch6); this channel must be configured as an output.

   - Can generate a frequency between 1 and 100kHz
   - Waveform will have a duty cycle of 50%

6. **PWM Generator Function**
   Uses the third and fourth channels of a bank (i.e., Ch2, Ch3 or Ch6, Ch7); these channels must be configured as outputs. This function allows the user to generate a waveform up to 20kHz with a user defined duty cycle. The frequency of both outputs is the same but the duty cycle of the waves can be different by changing the low time for each of the channels.

   - Specify timebase, from 1 second to 1µs
   - Specify PWM period as a function of the timebase
   - Specify third channel low time as a function of the timebase
   - Specify fourth channel low time as a function of the timebase
   - Enable/disable fourth channel as output

7. **One-Shot Pulse Generator Function**
   Uses the third channel of a bank (i.e., Ch2 or Ch6) and, depending on the trigger selection, may use the first channel of a bank as well (i.e., Ch0 or Ch4). The third channel must be configured as an output and, if used, the first channel must be configured as an input. This function allows the user to generate a single or multiple pulse wave with a specified pulse width. The pulse can be repeated either by a software command trigger or by a rising edge on the first channel. The

user can specify a Pre-Delay which will execute once the trigger has been received and/or a Post-Delay which will be used to ignore any triggers until the delay has expired.

- Specify timebase, from 1 second to 1µs
- Specify trigger for pulse generation: Software command, hardware rising edge or hardware falling edge
- Specify number of pulses to generate before stopping
- Specify output pulse polarity as positive or negative
- Count of number of pulses generated
- Specify length of pulse as a function of the timebase
- Specify length of pulse Pre-Delay as a function of the timebase
- Specify length of pulse Post-Delay as a function of the timebase

2.4 Special Function Selection

Special Functions Ch 0-3 and **Special Functions Ch 4-7**

- **Select** button: After selecting the desired function from the drop-down menu at the top of the Special Functions section of the screen, the Select button must be pressed. The appropriate boxes and labels will then be populated.

- **Write** button: If any changes are made to the current configuration, the Write button must be pressed for the changes to take effect.

- **Save** button: To store the current settings in the 8B isoLynx® SLX300 EEPROM, the Save button must be pressed; otherwise, the next time this function is selected it will populate with the settings that were last saved.

- **Clear Reg** button: Allows the user to clear the count registers of the function currently selected.

3.0   8B isoLynx® SLX300 Input / Output Channel Configuration Window

The Input / Output Channel Configuration window is selected from the File – Configure I/O pull-down menu.
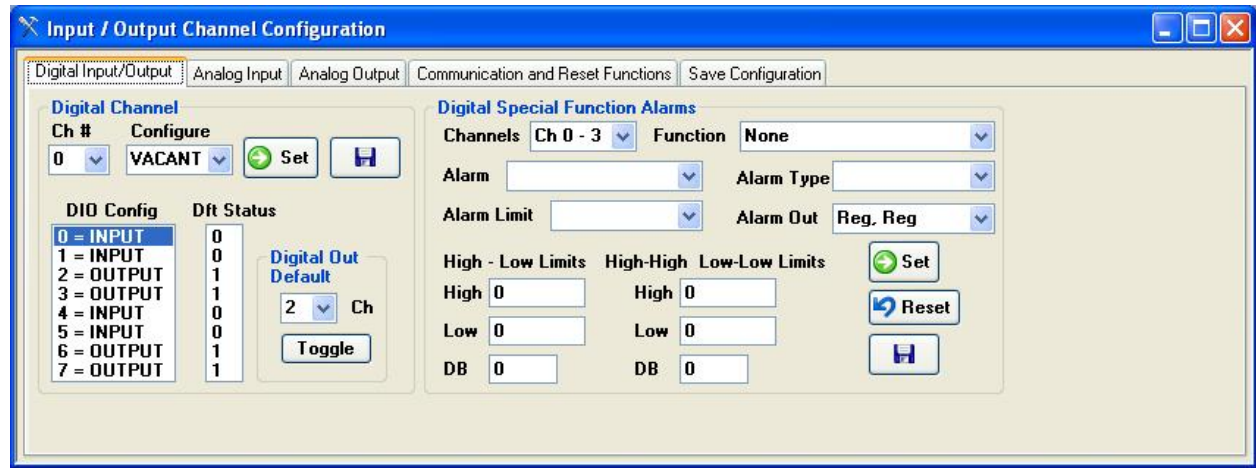
3.1   Digital Input/Output Tab

Figure 4: Input / Output Channel Configuration Window: Digital Input/Output Tab

1. **Digital Channel**: This is where the user selects the configuration for each digital I/O channel. First, select the channel from the **Ch #** drop-down box, then select the desired configuration from the **Configure** drop-down box, and then press the **Set** button. The **DIO Config** list box will refresh and show the latest configuration selected.

2. **Digital Out Default**: When a channel is selected as an output, the drop-down box in this section will be populated with that channel. The user is then able to change the default state for that output channel. The default state for each channel is displayed in the **Dft Status** list box.

3. **Save button**: To make changes permanent, the **Save** button must be pressed, otherwise the changes will only remain until the next power cycle or reset.

4. **Digital Special Function Alarms**: Sets the alarm conditions for digital channels 0-3 and 4-7.

    -   **Channels**: Use this drop-down box to select the channels for which alarms will be set: Ch 0-3 or Ch 4-7.

    -   **Function**: Select the function from the drop-down box. There are only four Special Functions that can have alarms: Pulse/Frequency Counter (Pulse/Freq Counter), Pulse/Frequency Counter with De-bounce (Pulse/Freq Ctr Debnc), Waveform Measurement, and Time Between Events. All four can be configured but only one can be configured at a time.

    -   **Alarm**: Each function has different items it monitors for alarms, which are one or more of the following: Pulse Count, Frequency, RPM, Events Measured, Positive Pulse Width and Time Between Events.

    -   **Alarm Type**: Tracking or Latching
        Tracking: This type of alarm will trigger once the conditions are met and will reset when the alarm conditions are no longer present.

9

> **Latching**: This type of alarm will trigger once the conditions are met and will not reset until the user resets it manually, even if the alarm condition is no longer present.

- **Alarm Limit**: Select the limit that will be monitored. Options are: Low, High, High & Low, Low & Low-Low, High & High-High, and All Limits.

- **Alarm Out**: Any alarm can have two outputs. An alarm condition can either be reported by only a flag or by a flag and mapped to a digital output channel. If a digital output channel is selected, the output can be selected to go High or Low on alarm trigger. Alarms must be mapped to specific output channels. High-Low alarms map to the third channel of a bank (i.e., Ch2 or Ch6), while High-High Low-Low alarms map to the fourth channel of a bank (i.e., Ch3 or Ch7). In the Alarm Out drop-down box there are two words separated by a comma; the first word is for High-Low alarms and the second is for High-High Low-Low alarms. For example, if **Reg, DH** is selected, this means that the High-Low alarm will only report as a flag and the High-High Low-Low alarm will report as a flag and also drive the fourth channel low since DH means default state high.

- **Limits**: The limits must be set according to the desired alarm. DB means deadband.

- After all of the settings are complete, press the **Set** button and then the **Save** button. To clear an alarm setting, the **Reset** button must be pressed and then the **Save** button; this will erase that particular alarm configuration.
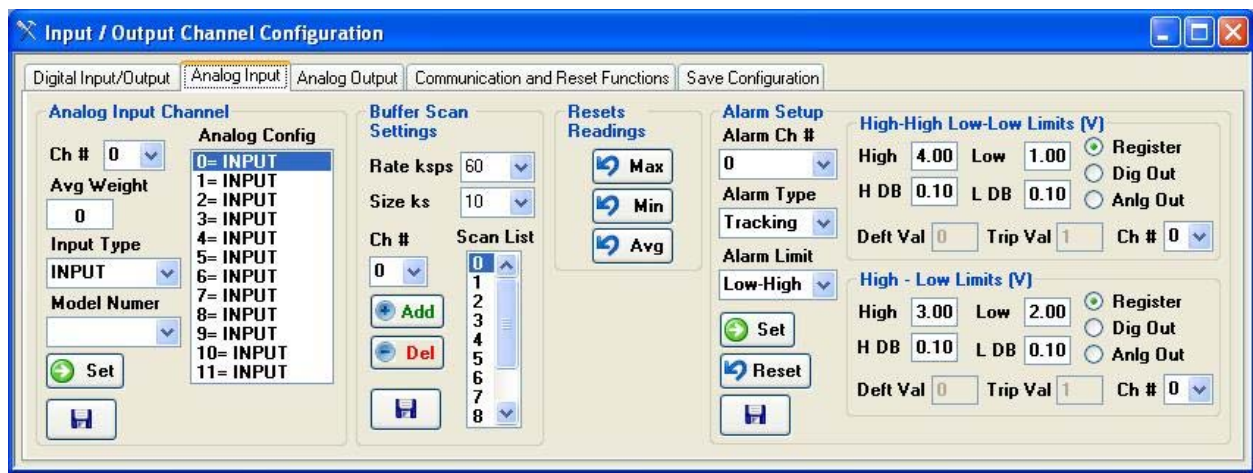
3.2   Analog Input Tab

Figure 5: Input / Output Channel Configuration Window: Analog Input Tab

1. **Analog Input Channel**: The configuration process is as follows: First select the channel number from the **Ch #** drop-down box, then enter the desired average weight in the **Avg Weight** box. Valid values for average weight are 1 to 32768. Using the **Input Type** drop-down box, the channel can be configured with one of three options: INPUT, NONLIN TC or LINEAR TC. INPUT applies when any 8Bxx module except 8B37x or 8B47x-xx is populated in a given channel. Select NONLIN TC when an 8B37x is populated or LINEAR TC when an 8B47x-xx is used and then select the 8B model number from the **Model Number** drop-down box. Once all selections are complete, press the **Set** button. If the changes are to be permanent, press the **Save** button. If the Save button is not pressed, the changes will only remain until the next power cycle or reset.

2. **Buffer Scan Settings**

- **Rate ksps**: Select the sample rate that is desired for the burst scan mode, in kilo-samples per second.

- **Size ks**: Select the amount of memory to fill before stopping the scan mode, in kilo-samples**.**

- **Scan List**: Specifies the channels that will be sampled, the order in which channels are sampled, and the number of times each channel is sampled at each burst scan. Channels can be added or deleted by selecting the desired channel in the drop-down box and pressing the **Add** or **Del** buttons. There can be a maximum of 48 channels in the scan list. Pressing the **Save** button will save the current buffer scan settings to memory, otherwise the changes will only remain until the next power cycle or reset.

3. **Reset Readings**

- **Max**: Resets the maximum readings of the continuous sample mode.

- **Min**: Resets the minimum readings of the continuous sample mode.

- **Avg**: Resets the average readings of the continuous sample mode.

4. **Alarm Setup**: Sets the alarm conditions for analog input channels 0-11.

- **Alarm Ch #**: Select the analog input channel for which the alarm will be set.

- **Alarm Type**: Tracking or Latching
  Tracking: This type of alarm will trigger once the conditions are met and will reset when the alarm conditions are no longer present.
  Latching: This type of alarm will trigger once the conditions are met and will not reset until the user resets it manually, even if the alarm condition is no longer present.

- **Alarm Limit**: Select the limit that will be monitored. Options are: Low, High, High & Low, Low & Low-Low, High & High-High, and All Limits.

- **Alarm Out**: Designates how the system responds to an alarm condition. When an alarm condition is reached, a digital output channel can be toggled, an analog output channel can be set to a specified level, or a register can be set. In either the **High-High Low-Low Limits** box or **High-Low Limits** box, specify the output channel to be used. If the **Dig Out** radio button is selected, digital channel 0 through 7 can be selected and if **Anlg Out** is selected, analog output channel 0 through 3 can be selected. If **Dig Out** or **Anlg Out** is selected, **Deft Val** (default output value) and **Trip Val** (alarm tripped value) must also be entered. For digital output, valid values are 0 = Low and 1 = High, and for analog output, valid values are 0 = 0V and 5 = 5V. **Deft Val** is the value that the specified output channel will have when the monitored value has not exceeded alarm limits and **Trip Val** is the value that the specified output channel will have when the monitored value exceeds alarm limits.
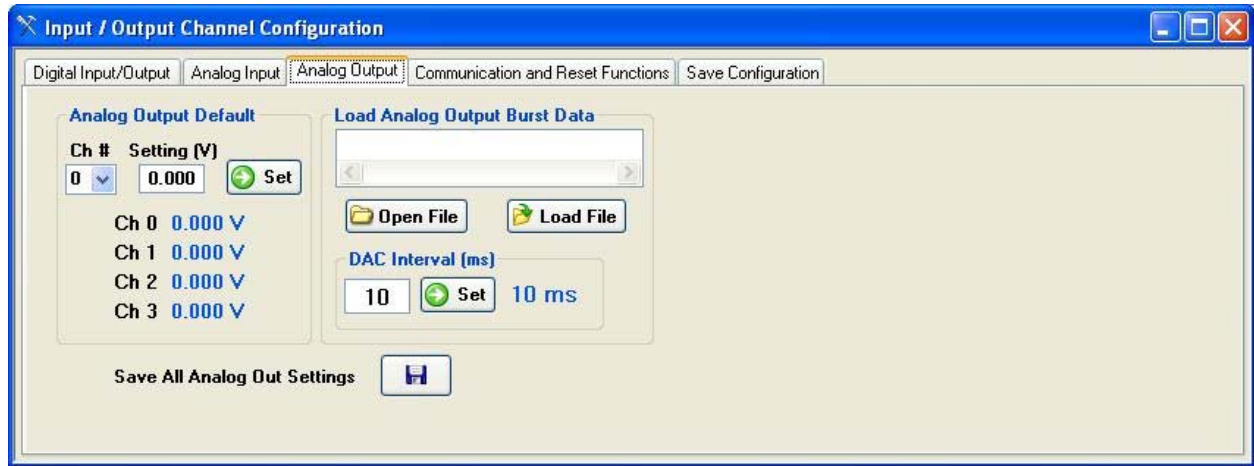
3.3 Analog Output Tab

Figure 6: Input / Output Channel Configuration Window: Analog Output Tab

1. **Analog Output Default**: The analog outputs can be programmed to default to a set voltage every time the board powers up or returns from reset. The current default values are displayed next to the channel labels. If a different value is desired, select the channel in the **Ch #** drop-down box, enter the desired value in the text box, and press the **Set** button.

2. **Load Analog Output Burst Data**: The 8B isoLynx® SLX300 can be loaded with up to 16k samples per analog output channel which can be written to the analog output channels in a single or repeated burst. Data can be entered by hand or the Configuration Software Tool can import the data from an Excel file. Press the **Open File** button, browse to the file location and select the file. Press the **Load File** button to send the file to the 8B isoLynx® SLX300. The file loaded will remain in system memory until the next power cycle or reset, after which it will have to be reloaded. Before any changes are made to the Analog Output Burst Data or DAC Interval, select **Stop DAC** in the Analog Out section of the main screen. If data is imported from an Excel file, the spreadsheet must have the same format as the sample file 'DAC Burst Data.xls' found in the directory C:\...\Dataforth\8B isoLynx SLX300 on the hard drive where the software was installed.

3. **DAC Interval**: Specifies the refresh rate for the analog output channels in milliseconds. This is the length of time that each sample will be written to a given output channel before the next sample value is written. To change the refresh rate, enter the desired value in the text box and press the **Set** button.

4. **Save button**: To store changes to the Analog Output Default and DAC Interval in the 8B isoLynx® SLX300 memory, press the **Save** button. Analog Output Burst Data cannot be stored in system memory.
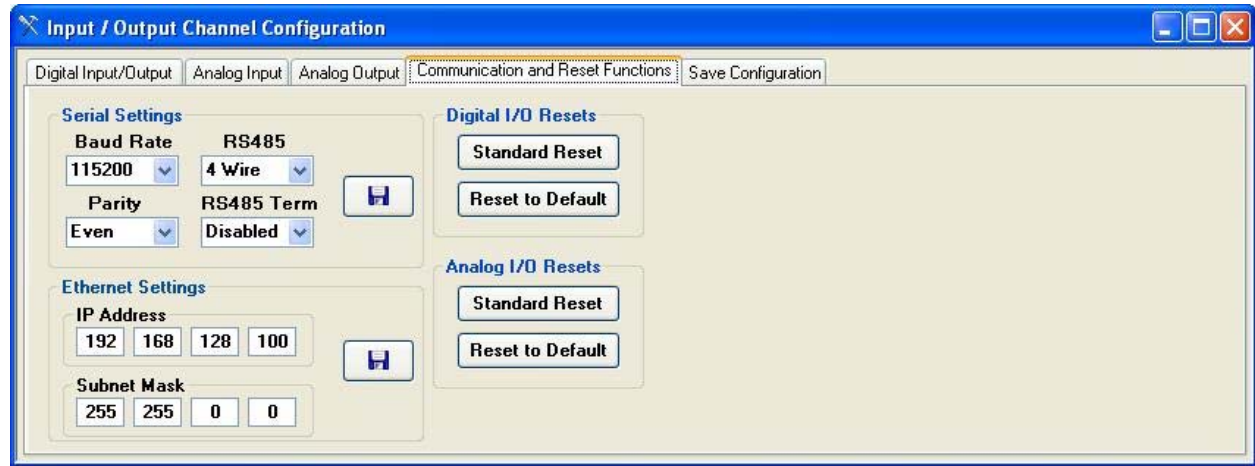
3.4　Communication and Reset Functions Tab

Figure 7: Input / Output Channel Configuration Window: Communication and Reset Functions Tab

1. **Serial Settings**: Select the **Baud Rate**, **Parity**, **RS485** 2- or 4-wire, and **RS485 Termination** enabled or disabled. After making the desired changes, press the **Save** button to configure the system and store the changes in 8B isoLynx® SLX300 memory.

2. **Ethernet Settings**: Allows the static Ethernet IP Address and Subnet Mask of the 8B isoLynx® SLX300 to be changed. Default IP Address is 192.168.128.100 and default Subnet Mask is 255.255.0.0. Press the **Save** button to save the change to system memory.

3. **Digital I/O Resets**

   - **Standard Reset**: Sets the digital output channels to the default state, i.e., High or Low, specified under the Digital Input/Output tab.

   - **Reset to Default**: Sets the digital input and output channels to the default configurations, i.e., Input, Output, Alarm, or Vacant, and sets those that are outputs to the default state, i.e., High or Low, specified under the Digital Input/Output tab.

4. **Analog I/O Resets**

Standard Reset				
ADC	Current Data Reg = 0	Min Reg = 4095	Max Reg = 0	Avg Reg = 0	Scan Mode Command Reg = CONFIGURE Mode
CJC	CJC Control Reg = 0 (disables the CJC registers)			
Alarm	Alarm Control Reg = 0	High-Low Status Reg = 0	High-High Low-Low Control Reg = 0	High-High Low-Low Status Reg = 0

Reset to Default Resets all registers listed under Standard Reset plus:				
ADC	Avg Weight Reg = 4	Scan List Reg = (default 0 to 12)	Scan Speed = Read from EEPROM	Scan Buffer Size Reg = Read from EEPROM
DAC	Default Output Reg = Read from EEPROM		Burst Interval Reg = 10ms	
CJC	Type Reg = 0			
Alarm	All limit registers High = 4095, Low = 0, High-High = 4095, Low-Low = 0, and Deadband = 0			

3.5   Save Configuration Tab

The digital input/output channel configuration default states and alarm configuration, analog I/O channel configuration, default output values and alarm configuration, scan rate, and scan size can all be saved to a file on the host computer hard drive and loaded into the 8B isoLynx® SLX300.

Figure 8: Input / Output Channel Configuration Window: Save Configuration Tab

1. **Current Config button**: Retrieves the current configuration to view but not edit.

2. **Save Config button**: Allows the user to enter a filename and path for the configuration file to be saved.

3. **Open Config button**: Allows the user to browse and open a configuration file. Once a file is selected, it will be loaded into the text box.

4. **Load Config button**: Loads the file in the text box into the 8B isoLynx® SLX300. This operation does not save the configuration in system memory. The configuration loaded can be saved to system memory by navigating the appropriate menus and saving the desired information.

4.0   Graphic Display of Channel Data Window

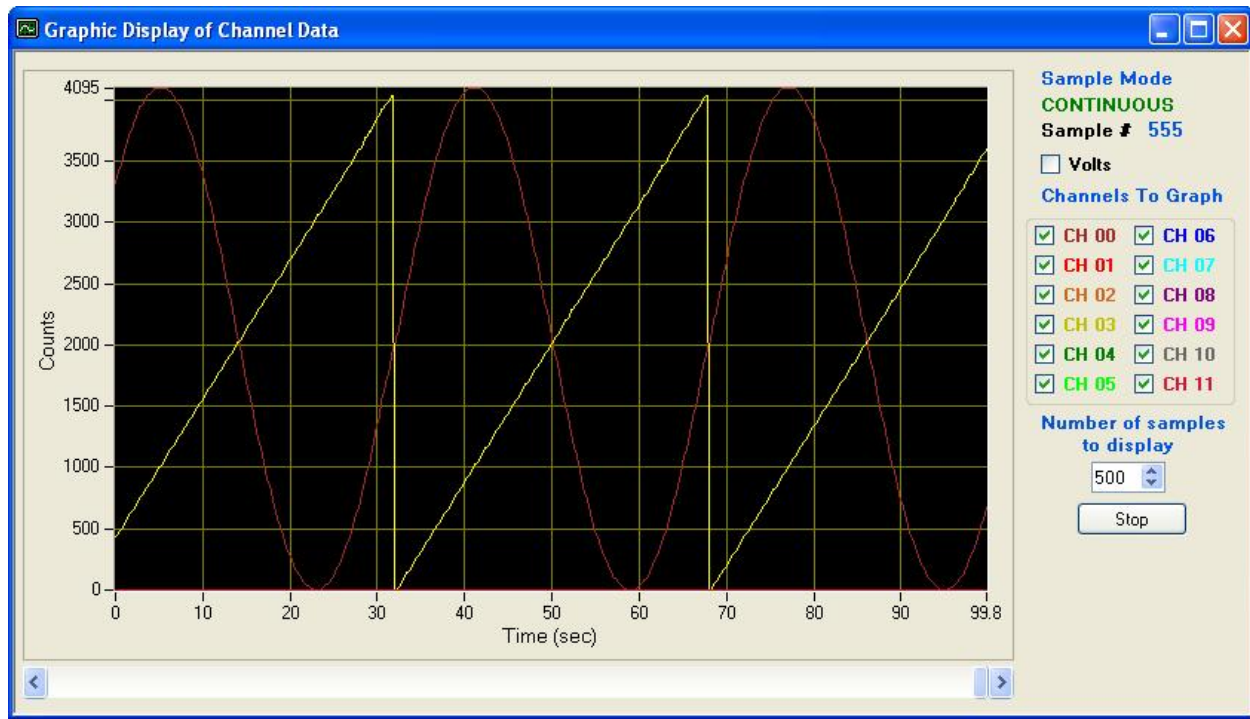The graph window is used to display the data from the Continuous and Buffer Sample modes.

Figure 9: Graphic Display of Channel Data Window
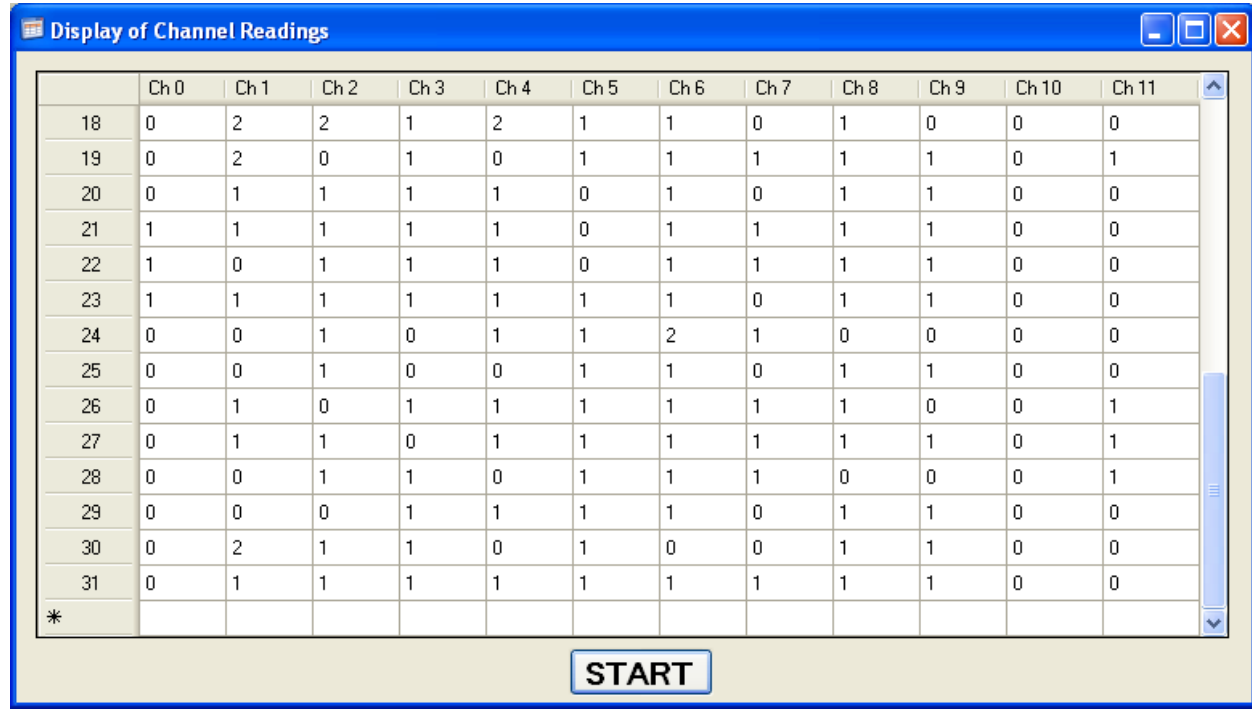
4.1   Continuous Sample Mode

When this mode is activated the software stores sampled data from the twelve analog input channels in an array. The array limit is 20,000 samples per channel, after which data will be overwritten starting at the first sample. When the **Display Graph** checkbox is selected in the Analog Inputs section of the main screen, a separate window will open and sampled data will be displayed.

1. **Sample Mode** label: Displays the active sample mode: Continuous or Buffer.

2. **Sample #**: Displays the current continuous sample that is graphed.

3. **Volts** checkbox: To change the Y axis from counts to volts, check this checkbox.

4. **Channels To Graph**: Selects the channels to be displayed in the graph. The color used for each channel listing is the color of the graph line for that channel.

5. **Number of samples to display**: Selects the number of data points that will be displayed on the screen. The minimum number of samples is 50 and the maximum is 1000.

6. **Horizontal Scroll bar**: This bar is used in Continuous mode to view data that has passed. The **Stop** button must be pressed to use this feature.

15

4.2   Buffer Sample Mode

The graph function is activated in this mode by selecting the **Continuous Sample** checkbox in the Analog Inputs section of the main screen. When the 8B isoLynx® SLX300 is operated in this mode a burst scan is performed on the channels specified in the Scan List in the Analog Input tab of the Input / Output Channel Configuration screen. The number of samples collected is also specified on this screen. A separate window is opened and the data is displayed in a graph. The graph automatically selects the checkboxes of the channels that are in the scan list. Once the burst scan has been completed and the data has been displayed, the system will perform a new burst scan then retrieve and display the new data.

5.0   Display of Channel Readings Window

Figure 10: Display of Channel Readings Window

5.1   Continuous Sample Mode

When this mode is activated and the **Display Data** checkbox is selected in the Analog Inputs section of the 8B isoLynx® SLX300 Configuration Software Tool window, a separate window opens with a table which displays sampled data from all twelve analog input channels. Data is collected at the rate specified in the **Poll Rate** box found in the Configure section of the Communications pull-down menu.

5.2   Buffer Sample Mode

In this mode, data is retrieved from a burst scan using the **Read** button on the 8B isoLynx® SLX300 Configuration Software Tool window and displayed in a table in a separate window. The **Display Data** checkbox does not need to be selected. The displayed data limit is 24,000 samples at a time and is specified in the **Qty** box of the Buffer Read section of the main window. For example, if the scan list contains one channel, then up to 24,000 samples can be read and displayed; if there are twelve channels in the scan list then only 2000 samples can be read and displayed. Each subsequent read will retrieve the next set number of samples specified from the buffer, up to the buffer size specified in the Analog Input tab of the Input / Output Channel Configuration screen. If the buffer scan size is 72,000 samples on a single channel, the user will read 24,000 samples three times to retrieve all the data.

DATAFORTH WARRANTY
Applying to Products Sold by Dataforth Corporation

a. **General**. Dataforth Corporation ("Dataforth") warrants that its products furnished under this Agreement will, at the time of delivery, be free from defects in material and workmanship and will conform to Dataforth's applicable specifications or, if appropriate, to buyer's specifications accepted in writing by Dataforth. DATAFORTH'S OBLIGATION OR LIABILITY TO BUYER FOR PRODUCTS WHICH DO NOT CONFORM TO THE ABOVE STATED WARRANTY SHALL BE LIMITED TO DATAFORTH, AT DATAFORTH'S SOLE DISCRETION, EITHER REPAIRING, REPLACING, OR REFUNDING THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT(S) PROVIDED THAT WRITTEN NOTICE OF SAID DEFECT IS RECEIVED BY DATAFORTH WITHIN THE TIME PERIODS SET FORTH BELOW:

i. for all software products including licensed programs, thirty (30) days from date of initial delivery;

ii. for all hardware products including complete systems, one (1) year from date of initial delivery;

iii. for all special products, sixty (60) days from date of initial delivery; and

further, all products warranted hereunder for which Dataforth has received timely notice of nonconformance must be returned FOB to Dataforth's plant in Tucson, Arizona USA within thirty (30) days after the expiration of the warranty periods set forth above.

The foregoing warranties shall not apply to any products which Dataforth determines have, by buyer or otherwise, been subjected to operating and/or environmental conditions in excess of the maximum value established therefor in the applicable specifications, or any products that have been the subject of mishandling, misuse, misapplication, neglect, improper testing, repair, alteration or damage. THE PROVISIONS OF THE FOREGOING WARRANTIES EXTEND TO BUYER ONLY AND NOT TO BUYER'S CUSTOMERS OR USERS OF BUYER'S PRODUCTS. THE DATAFORTH STANDARD WARRANTY IS IN LIEU OF ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE OR USE AND ALL OTHER WARRANTIES WHETHER EXPRESS, IMPLIED OR STATUTORY, EXCEPT AS TO TITLE. THE DATAFORTH STANDARD WARRANTY MAY BE CHANGED BY DATAFORTH WITHOUT NOTICE.

b. **Buyer Indemnity**. Buyer agrees to indemnify and hold Dataforth harmless from and against any and all claims, damages and liabilities whatsoever asserted by any person, entity, industry organization, government, or governmental agency of any country resulting directly or indirectly (i) from any acts not authorized by Dataforth in writing or any statements regarding the products inconsistent with Dataforth's product documentation or standard warranty, or (ii) from any breach or threatened breach by buyer, or by any of its employees or agents, of any term, condition or provision of this Warranty or (iii) from any warranty, representation, covenant or obligation given by buyer to any third party and not expressly provided for in this Warranty or (iv) for any non-compliance (in any form) of the products with any necessary or mandatory applicable laws, regulations, procedures, government or industry policies or requirements related to the use, sale or importation of the products. Such indemnification shall include the payment of all reasonable attorneys' fees and other costs incurred by Dataforth in defending such claim.

c. **Limitation on Damages**.

(1) IN NO EVENT SHALL DATAFORTH, ITS SUPPLIERS, LICENSORS, SERVICE PROVIDERS, EMPLOYEES, AGENTS, OFFICERS, AND DIRECTORS BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, COVER, ECONOMIC, PUNITIVE, ACTUAL, EXEMPLARY, CONSEQUENTIAL OR OTHER DAMAGES OF ANY NATURE INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR REVENUES, COSTS OF REPLACEMENT PRODUCTS, LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE ANY DATAFORTH PRODUCT.

(2) IN NO EVENT SHALL DATAFORTH BE LIABLE FOR DIRECT, SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE RESULTING FROM BUYER'S NONCOMPLIANCE (IN ANY FORM) WITH ALL NECESSARY OR MANDATORY APPLICABLE LAWS, REGULATIONS, PROCEDURES, GOVERNMENT POLICIES OR REQUIREMENTS RELATED TO THE USE, SALE OR IMPORTATION OF PRODUCTS.

(3) IN NO EVENT WILL THE COLLECTIVE LIABILITY OF DATAFORTH AND ITS SUPPLIERS, LICENSORS, SERVICE PROVIDERS, EMPLOYEES, AGENTS, OFFICERS, AND DIRECTORS TO ANY PARTY (REGARDLESS OF THE FORM OF ACTION, WHETHER BASED UPON WARRANTY, CONTRACT, TORT, OR OTHERWISE) EXCEED THE GREATER OF EITHER US$1000.00 (ONE THOUSAND DOLLARS U.S.A. CURRENCY) OR THE AMOUNT PAID TO DATAFORTH FOR THE APPLICABLE PRODUCT OR SERVICE OUT OF WHICH LIABILITY AROSE.

(4) DATAFORTH'S LIABILITY ARISING OUT OF THE PRODUCTION, SALE OR SUPPLY OF PRODUCTS OR THEIR USE OR DISPOSITION, WHETHER BASED UPON WARRANTY, CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED THE GREATER OF EITHER US$1000.00 (ONE THOUSAND DOLLARS U.S.A. CURRENCY) OR THE ACTUAL PURCHASE PRICE PAID BY BUYER FOR DATAFORTH'S PRODUCTS. DATAFORTH'S LIABILITY FOR ANY CLAIM OF ANY KIND SHALL IN NO CASE EXCEED THE OBLIGATION OR LIABILITY SPECIFIED IN THIS WARRANTY.

d. **Technical Assistance**. Dataforth 's Warranty as hereinabove set forth shall not be enlarged, diminished or affected by, and no obligation or liability shall arise or grow out of, Dataforth's rendering of technical advice, facilities or service in connection with buyer's order of the products furnished hereunder.

e. **Warranty Procedures**. Buyer shall notify Dataforth of any products which it believes to be defective during the applicable warranty period and which are covered by the Warranty set forth above. Buyer shall not return any products for any reason without the prior authorization of Dataforth and issuance of a Return Material Authorization ("RMA") number. After issuance of a RMA number, such products shall be promptly returned by buyer (and in no event later than thirty (30) days after the Warranty expiration date), transportation and insurance prepaid, to Dataforth's designated facility for examination and testing. Dataforth shall either repair or replace any such products found to be so defective and promptly return such products to buyer, transportation and insurance prepaid. Should Dataforth's examination and testing not disclose any defect covered by the foregoing Warranty, Dataforth

shall so advise buyer and dispose of or return the products in accordance with buyer's instructions and at buyer's sole expense, and buyer shall reimburse Dataforth for testing expenses incurred at Dataforth's then current repair rates.

f. **Repair Warranty**. Dataforth warrants its repair work and/or replacement parts for a period of ninety (90) days from receipt by buyer of the repaired or replaced products or for the remainder of the warranty period for the initial delivery of such order as set forth in paragraph a above, whichever is greater.

g. **Critical Applications**. Certain applications using Dataforth's products may involve potential risks of death, personal injury, or severe property or environmental damage ("Critical Applications"). DATAFORTH'S PRODUCTS ARE NOT DESIGNED, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR SYSTEMS, SAFETY EQUIPMENT, NUCLEAR FACILITY APPLICATIONS OR OTHER CRITICAL APPLICATIONS WHERE MALFUNCTION OF THE PRODUCT CAN BE EXPECTED TO RESULT IN PERSONAL INJURY, DEATH OR SEVERE PROPERTY DAMAGE. BUYER USES OR SELLS SUCH PRODUCTS FOR USE IN SUCH CRITICAL APPLICATIONS AT BUYER'S OWN RISK AND AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS DATAFORTH FROM ANY AND ALL DAMAGES, CLAIMS, PROCEEDINGS, SUITS OR EXPENSE RESULTING FROM SUCH USE.

h. **Static Sensitive**. Dataforth ships all product in anti-static packages. Dataforth's Warranty as hereinabove set forth shall not cover warranty repair, replacement, or refund on product or devices damaged by static due to buyer's failure to properly ground.

_____

Application Support

Dataforth provides timely, high-quality product support. Call 1**-800-444-7644 TOLL-FREE**.

Returns/Repair Policy

All warranty and repair requests should be directed to the Dataforth Customer Service Department at (520) 741-1404. If a product return is required, request a Return Material Authorization (RMA) number. You should be ready to provide the following information:

1. Complete product model number.
2. Product serial number.
3. Name, address, and telephone number of person returning product.
4. Special repair instructions.
5. Purchase order number for out-of-warranty repairs.

The product should be carefully packaged, making sure the RMA number appears on the outside of the package, and ship prepaid to:

Dataforth Corporation
3331 E. Hemisphere Loop
Tucson, AZ 85706 USA

The information provided herein is believed to be reliable; however, DATAFORTH assumes no responsibility for inaccuracies or omissions. DATAFORTH assumes no responsibility for the use of this information, and all use of such information shall be entirely at the user's own risk. Application information is intended as suggestions for possible use of the products and not as explicit performance in a specific application. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. DATAFORTH does not authorize or warrant any DATAFORTH product for use in life support devices and/or systems.