

**SDX Linear Application Note
APP-006**

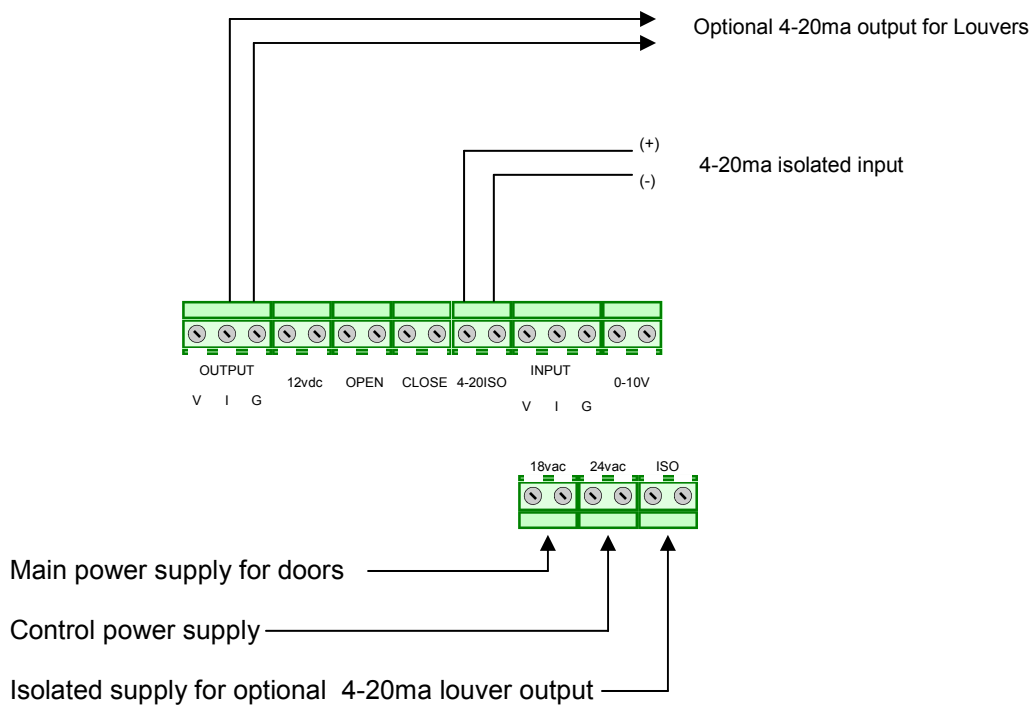
SDX Door Control (DR-420 replacement)

This application Note will describe how to use the SDX card to operate in the 4-20ma mode, using a potentiometer to provide feed back for door position. **Note - the SDX card has to be a rev A or greater to use this feature.**

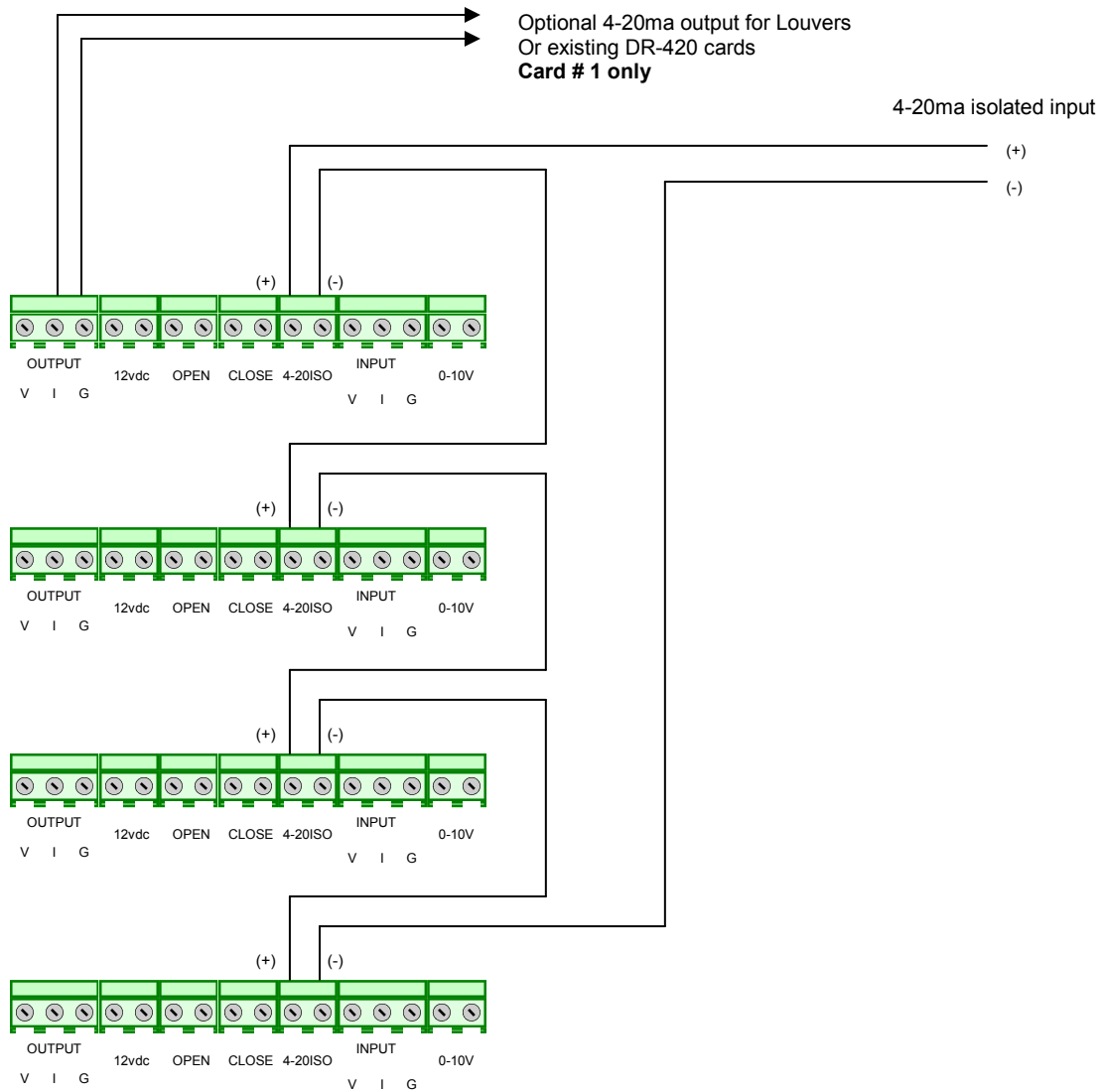
Theory

When operating in the 4-20ma linear mode, the SDX receives a 4-20ma signal from a control panel and will position the fresh air doors accordingly. In the 4-20ma mode, the SDX will convert the 4-20ma signal to a percentage output, and run the actuator to position the door accordingly. The SDX uses the position of the open and close limit switch to convert the potentiometer reading to a 0-100 % output. For this to happen you need to manually run the door full open to the limit switch and then full closed to the limit switch. The SDX will remember these reading and use them to calculate the percentage.

Wiring - Single or Two door system



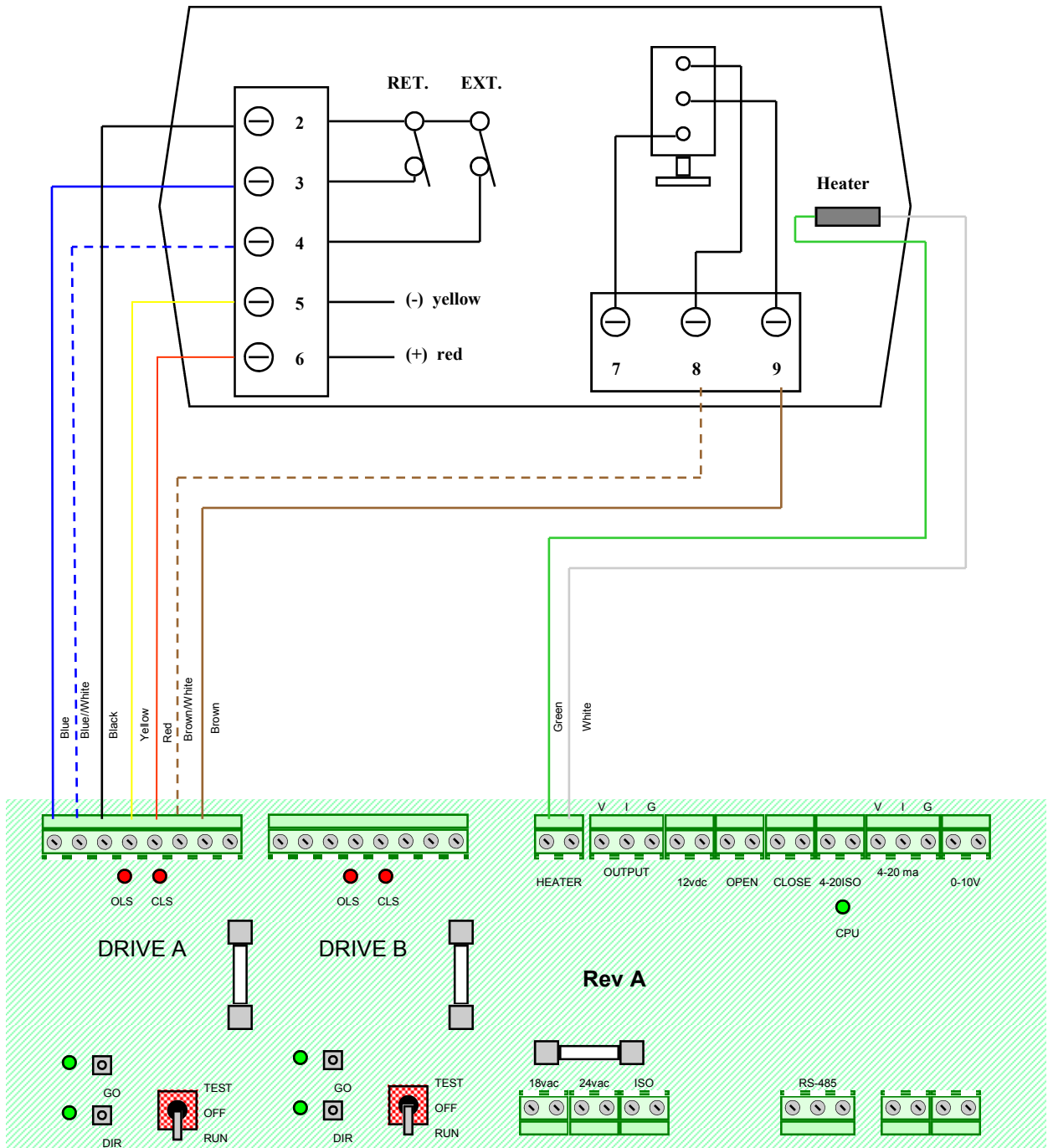
Wiring - multiple SDX cards

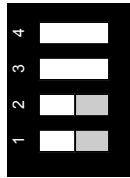


When using multiple cards the 4-20ma signal has to be daisy chained to each card. The SDX's can have up to 4 cards chained together. Each card has a max voltage drop of 6vdc. Thus if you have the max of 8 doors with 4 cards you would need to have a minimum of 24vdc supply for the 4-20ma signal. Most of the systems will be a max of 6 doors or 3 cards, and the require a max of 18vdc. Most of the Galaxy systems should be able to drive at least 3 cards.

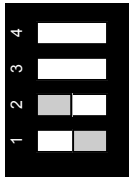
Wiring - Actuator head

Drive Head - Top View

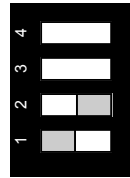


Dip Switch Settings

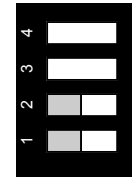
CARD 1



CARD 2



CARD 3



CARD 4

Each SDX card needs to have a unique number 1 to 4. Use dip switches 1 & 2 to define the card. In the 4-20ma mode switch 3 & 4 are not used.

Door Staging

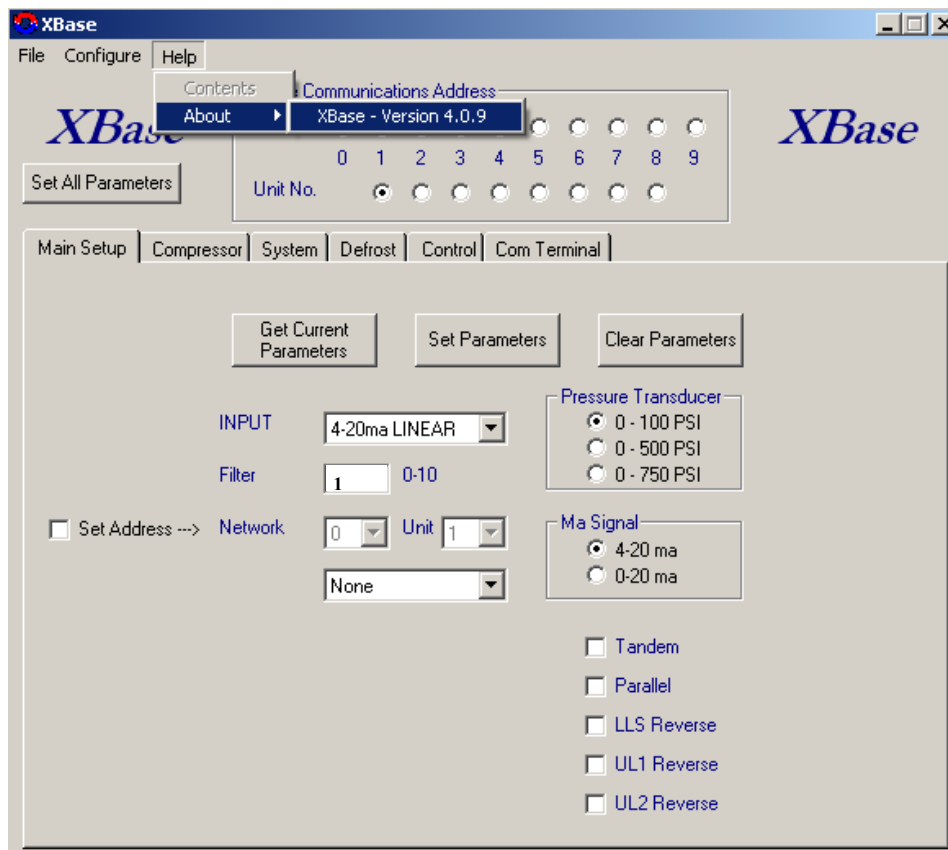
Door staging is done using Xbase programming software. Each door can be assigned a window any where between 0 to 100 %. Thus you can come up with any kind of staging imaginable. We will refer to the stage window as the percent the door is set to go from full closed to full open. In a three door system, door 1 would typically be set to for a stage window of 0 to 50%. Doors 2 & 3 would be set for a stage window of 50 to 100 %.

Note - the smaller the stage window is, you will need to increase the dead band zone. The dead band is the zone plus or minus where the door will not move. Example - with a dead band set to 2 %, the input signal would have to go 2 % above or below the door position for the door to move.

It is never recommended that you set the stage window below 25%. Low percentage stage window should be done for volume doors only. The larger the stage window, the finer the door adjustment and control will be.

In the previous example of a 3 door system, it might be far better to span door 1 from 0 to 75 % and keep door 2 & 3 at 50 to 100%. It even might work well to span door 1 from 0 to 100%.

SDX Programming



When programming the SDX card your Xbase should be Version 4.0.9 or newer. Use the sdx.inf file dated 8-28-06 or newer, with this version.

The hex file for the SDX card should be version 1.29 or later.

When setting a new card, you can use the default settings under the Configure drop down. This will load all the settings needed for the SDX card to operate correctly. You will need to customize the values depending on how you want to set it up.

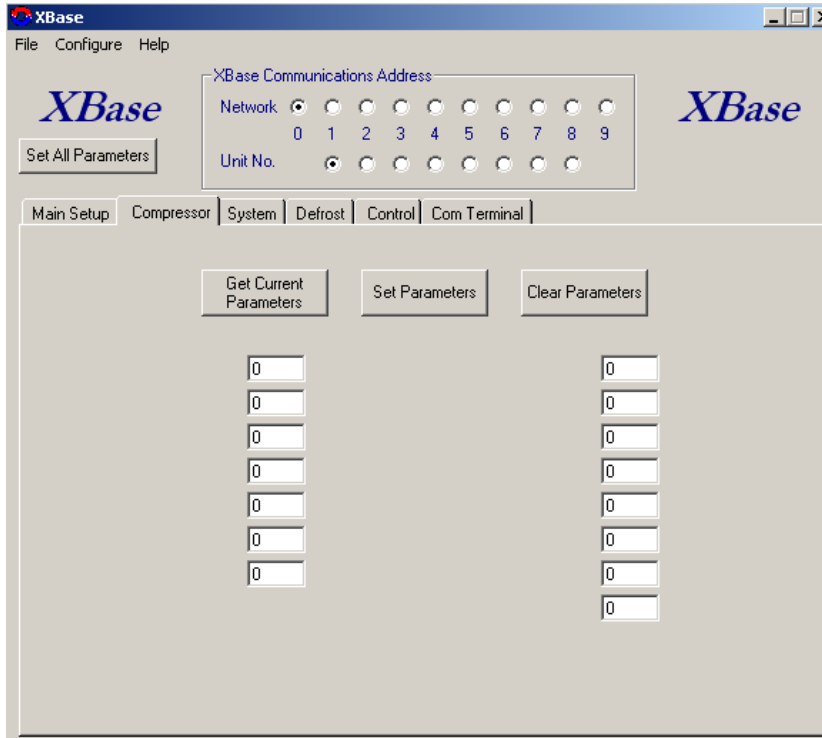
For this application you will need to set the **INPUT** to 4-20ma LINEAR.

You will not need to set the address, as it is set using the dip switches on the card.

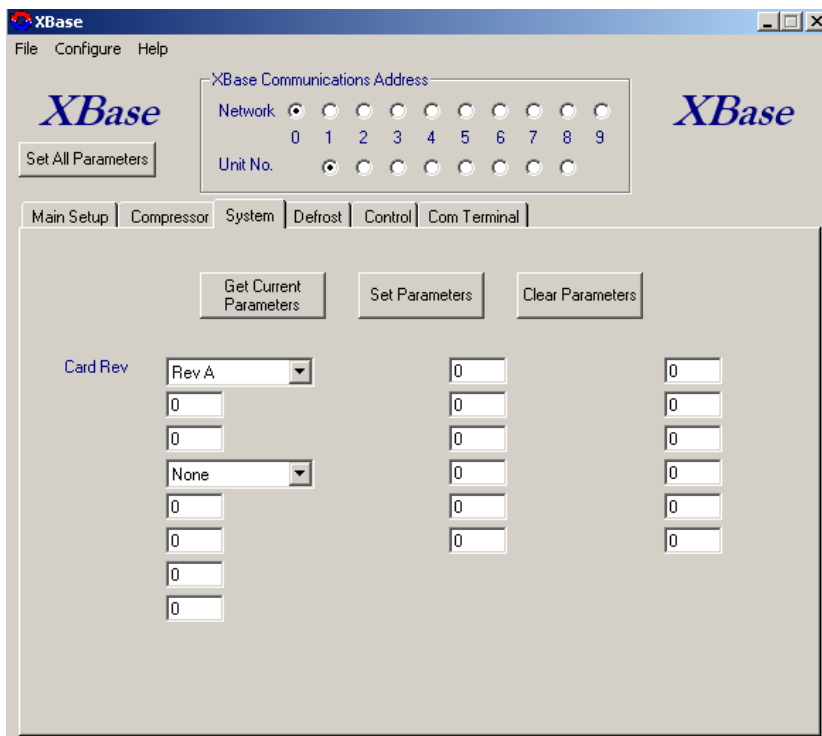
The **Filter** setting should be at 1. This applies a digital filter to the incoming 4-20ma signal from the control panel. The higher the number up to 10 will filter the signal heavier. A smaller signal will filter less. This could be useful in the 4-20ma signal is fluctuating greatly.

None of the other parameters on the main Setup Screen are used.

SDX Programming

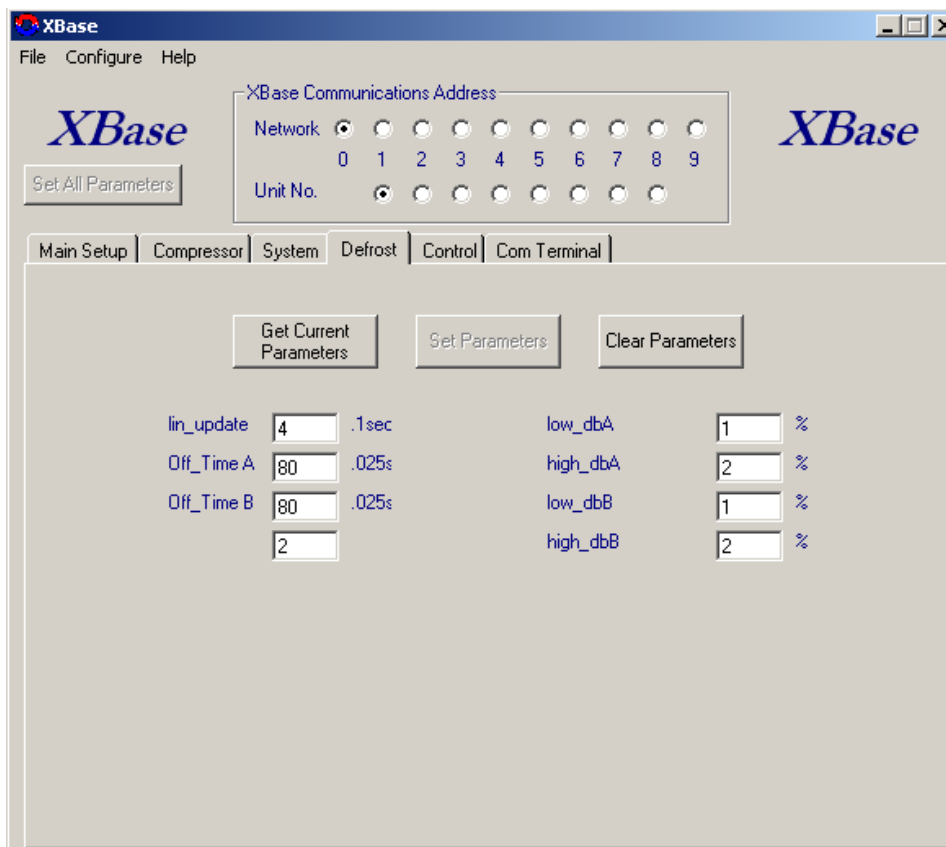


None of the parameters on the compressor tab are used.



The Card Rev drop down must be set correctly for the SDX to function. If you are using an older original card, select the Original under the drop down.

Note - for all 4-20ma linear applications, you must use a Rev A card.



Lin_update - this is the time in .1sec that an update will happen. This is just like the PID update timer. Shorting the time will make the door more responsive and lengthening the time will decrease the response. The default setting is 4.

Off_Time A - this is the amount of time that door A will be off after a match occurs. The time is in .025 sec, a default setting of 80 will give a off time of 2 sec's.

Off_Time B - this is the amount of time that door B will be off after a match occurs. The time is

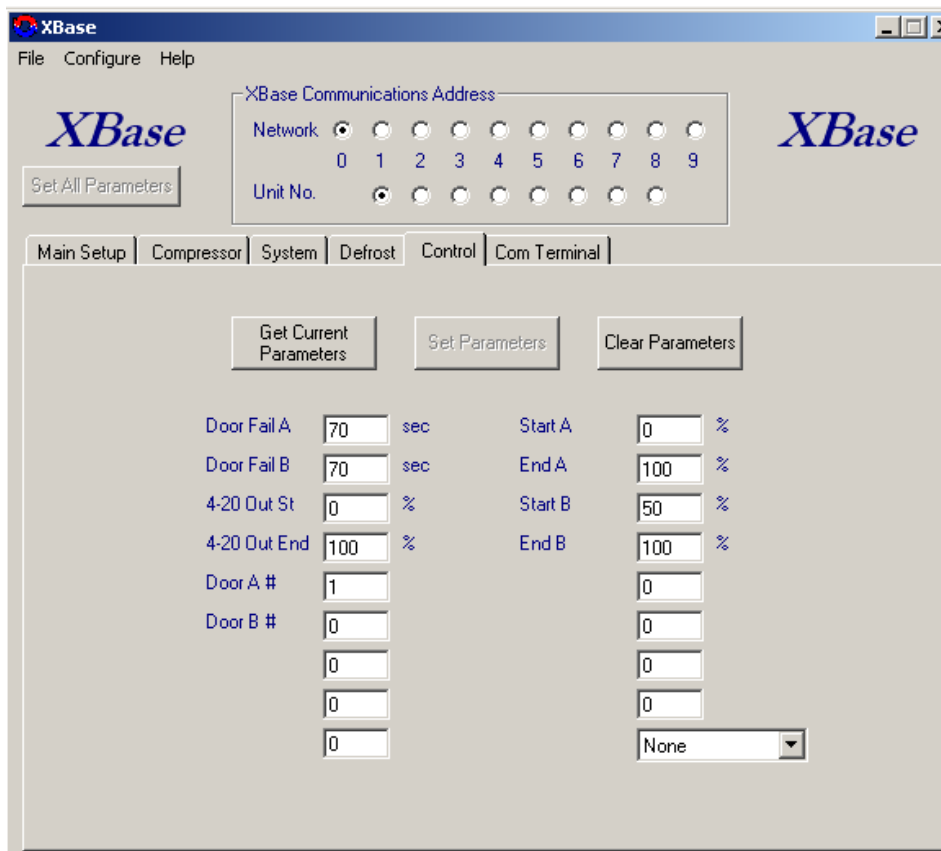
in .025 sec, a default setting of 80 will give a off time of 2 sec's.

Low_dbA - this is a dead band setting when the door is below 70% opening. The default setting is 1 percent. Thus the input signal would have to move a least 1 % to get the door to move. A setting of 0 can be used, but will cause the door to move at any change of input signal. This applies to door A.

High_dbA - this is a dead band setting when the door is above 70% opening. The default setting is 2 percent. Thus the input signal would have to move a least 2 % to get the door to move. This value could be set to 1 %, field test will be needed to verify the setting. This applies to door A.

Low_dbB - this is a dead band setting when the door is below 70% opening. The default setting is 1 percent. Thus the input signal would have to move a least 1 % to get the door to move. A setting of 0 can be used, but will cause the door to move at any change of input signal. This applies to door B.

High_dbB - this is a dead band setting when the door is above 70% opening. The default setting is 2 percent. Thus the input signal would have to move a least 2 % to get the door to move. This value could be set to 1 %, field test will be needed to verify the setting. This applies to door B.



Door Fail A - this value is not used in the 4-20ma linear mode.

Door Fail B - this value is not used in the 4-20ma linear mode.

4-20 Out St - this is the start percentage for the isolated 4-20ma output that is used to drive a set of louvers. A default setting of 0 is recommended.

4-20 Out End - this is the end percentage for the isolated 4-20ma output that is used to drive a set of louvers. A default setting of 100 is recommended.

Note - the 4-20ma louver signal is based on total door position. The SDX card number 1 will calculate the overall door position and the output a corresponding 4-20ma signal. Use the start and end values for the desired range.

Door A # - this is the door number that will tell the HMI which door it is. If you are not using position A, then a zero needs to be entered in.

Door B # - this is the door number that will tell the HMI which door it is. If you are not using position B, then a zero needs to be entered in.

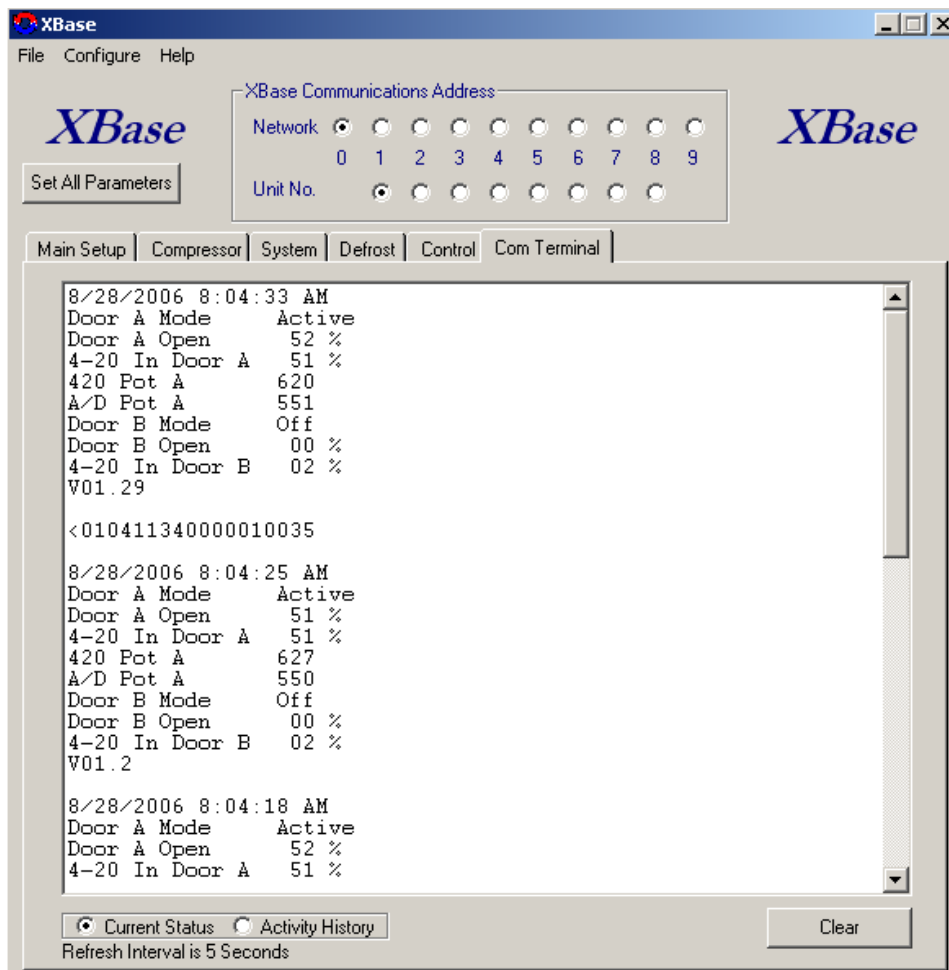
Start A - this is the start position for door A.

End A - this is the end position for door A.

Start B - this is the start position for door B.

End B - this is the end position for door B.

Note - it is not recommended to go below a 30 percent window between Start and End. The larger the window, the better control and smaller movements the door will have. The door windows can be overlapped for staging.



The Com Terminal can be used to monitor what is going on with the door. Click on the unit no. to select which card you want to view.

The Door Open position is the actual door position. 4-20 In Door A is a calculated value depending on the stage window. Example - stage window 0-50% for door A. With a 50% input signal from the control panel, the 4-20ma In Door A should read 100 %. When the 4-20ma In percentage changes, then the door will move to match up.

NOTE - WHEN EVER YOU UPDATE THE SDX SOFTWARE OR ARE INSTALLING A NEW CARD OR ACTUATOR, YOU MUST MANUALLY RUN THE DOOR FULL OPEN AND THEN FULL CLOSE. THIS IS CRITICAL FOR THE SDX TO CALIBRATE THE DOOR POSITION POT.

WITH THE DOOR FULLY CLOSED, AND THE PLUG REMOVED FROM THE SDX CARD, THE TWO WIRES FROM THE POTENTIOMETER SHOULD READ ABOUT 1000 OHMS.