Technical Note

ProSoft TECHNOLOGY

Red Lion DSPLE to DH+ PLC5 using an AN-X2-AB-DHRIO

Work in Progress

Document Code: TN220723-001
Author: Daniel Roslan
Date: 7 2018

ASIA PACIFIC | AFRICA | EUROPE | MIDDLE EAST | LATIN AMERICA | NORTH AMERICA

Document Information

Author	Daniel Roslan
Description	**How to use Crimson 3.0 to set up an EtherNet/IP Red Lion DSPLE to talk to a DH+ PLC5 through an AN-X2-AB-DHRIO using the DH+ firmware**
Date	**7/2018**
Revision	**1.00**
Product Name	**AN-X2-AB-DHRIO**
Document Code	TN220723-001

ProSoft Technology

9201 Camino Media, Suite 200
Bakersfield, CA 93311
+1 (661) 716-5100
+1 (661) 716-5101 (Fax)
http://www.prosoft-technology.com

All ProSoft Technology® products are backed with unlimited technical support.

Purpose of Tech Note:

This Tech Note has been designed to assist customers who are attempting to connect a Red Lion Data Station Plus using EtherNet/IP to a PLC5 using Data Highway Plus via an AN-X2-AB-DHRIO gateway. For the purpose of this tech note we will be using a DSPLE specifically, and will be converting data to Modbus TCP/IP, but the same process on the EtherNet/IP side should work regardless of the protocol on the other end. This tech note assumes that your PLC5 has already been configured with data you wish to extract or write to, and that you have at least moderate knowledge of how to use Red Lion's Crimson 3.0 software. For the sake of an example, a value of 42 has been put into a PLC5s N7:0 data file to be extracted by a Red Lion DSPLE through our AN-X2-AB-DHRIO and transferred to a PC running a Modbus Server Simulator.

Required Components:

To complete this tech note you will need at least one of the following:
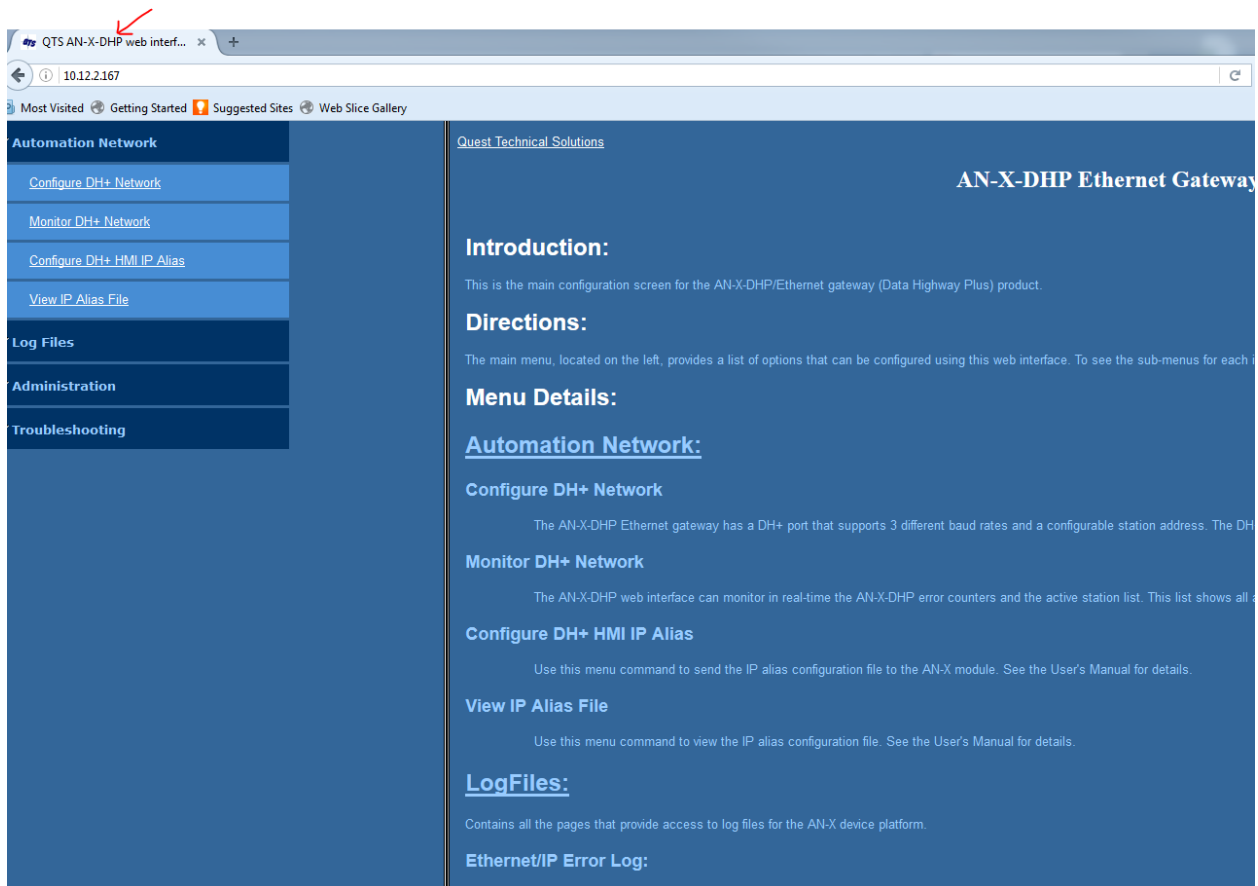-   An AN-X2-AB-DHRIO
-   A Red Lion Data Station Plus with EtherNet/IP capability
-   A PLC5
-   A cat 5 (or similar Ethernet) cable
-   A DH+ cable (Blue Hose)
-   Red Lion's Crimson 3.0 software
-   A configuration cable for the Red Lion DSPLE (a USB cable was used in screen shots)

Step 1: Setting up the AN-X2-AB-DHRIO

This tech note assumes that you have already configured the IP address for your AN-X2-AB-DHRIO to one you can reach from your PC. If you have not yet configured the IP address please refer to the user manual or watch one of the many AN-X2-AB-DHRIO tutorial videos which discusses how this can be done.

Enter the IP Address of your AN-X2-AB-DHRIO into your preferred web browser. If your AN-X2-AB-DHRIO is already in DH+ mode, you will see AN-X-DHP on the browser tab, as well as an Automation Network which, when expanded, will appear as below.

If you are in AN-X-DHP mode but do not see *Configure DH+ HMI IP Alias* and *View IP Alias File*, you have an older revision of the DH+ firmware. Please contact ProSoft Technical Support for directions on upgrading your firmware.

If you are already in DH+ mode you can skip to page 6.

![ProSoft Technology logo]

In the event you are not in DHP mode you can activate this mode by expanding the administration tab, clicking on AN-X Configuration, selecting AN-X2-AB-DHP from the drop down, and then clicking submit.
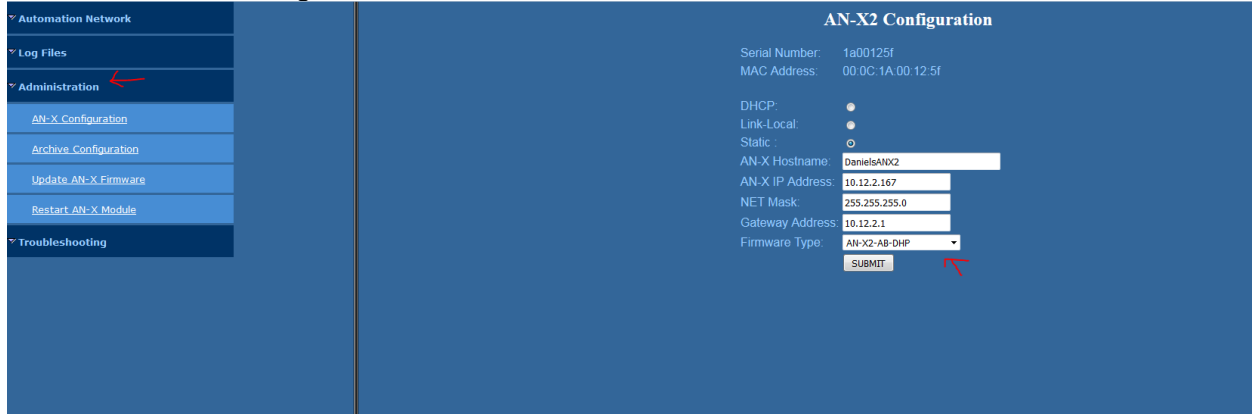
A module reboot will be required after performing this action which usually takes about a minute to complete.

After the module has finished rebooting be certain to flush your browser's cache. (Ctrl-F5 will reload pages in Firefox or Internet Explorer, Shift-F5 will reload pages in Google Chrome.)

Once you are in DH+ mode, expand the Automation Network section and click on Configure DH+ Network, then choose the baud rate settings for your network and a Station number which is not already in use on your network and click submit.


In this example the SLC5/04 was using 57k and Station 1, and there was nothing else on the network so we chose 57k and Station 2.

Next, wire the AN-X2-AB-DHRIO into your DH+ network (or directly to the PLC5 if that is the only device on the network, as was the case in this example). Your wiring should look similar to this.
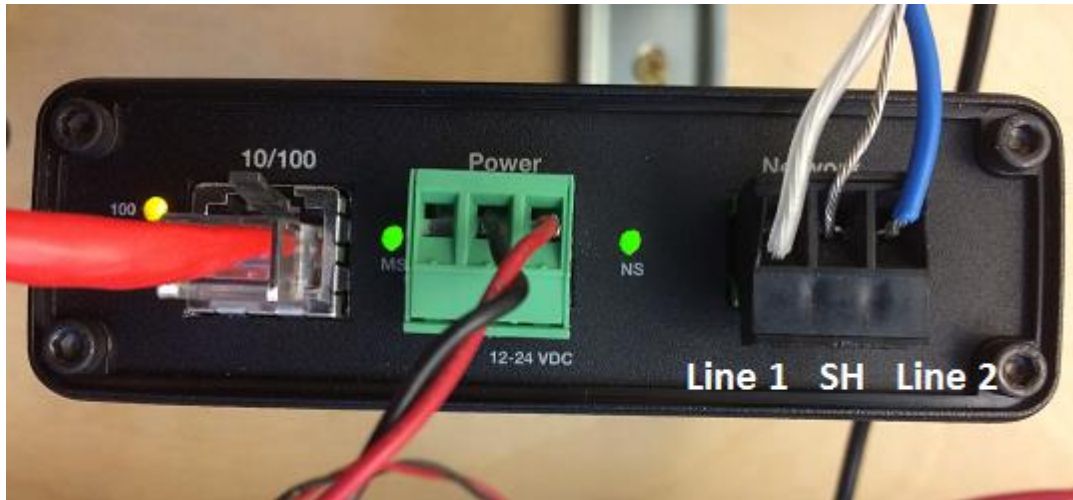

If we are the end of the network, make sure to add proper termination to the wiring (For networks running at 57k6 or 115k2 baud it is necessary to have 150 ohm resistors on each end of the network, for 230k4 use 82 ohm resistors).

The picture above matches the PLC5 wiring below, that is, if the clear wire is on the top pin for the PLC5, connect it to the pin closest to the power on the AN-X2-AB-DHRIO.
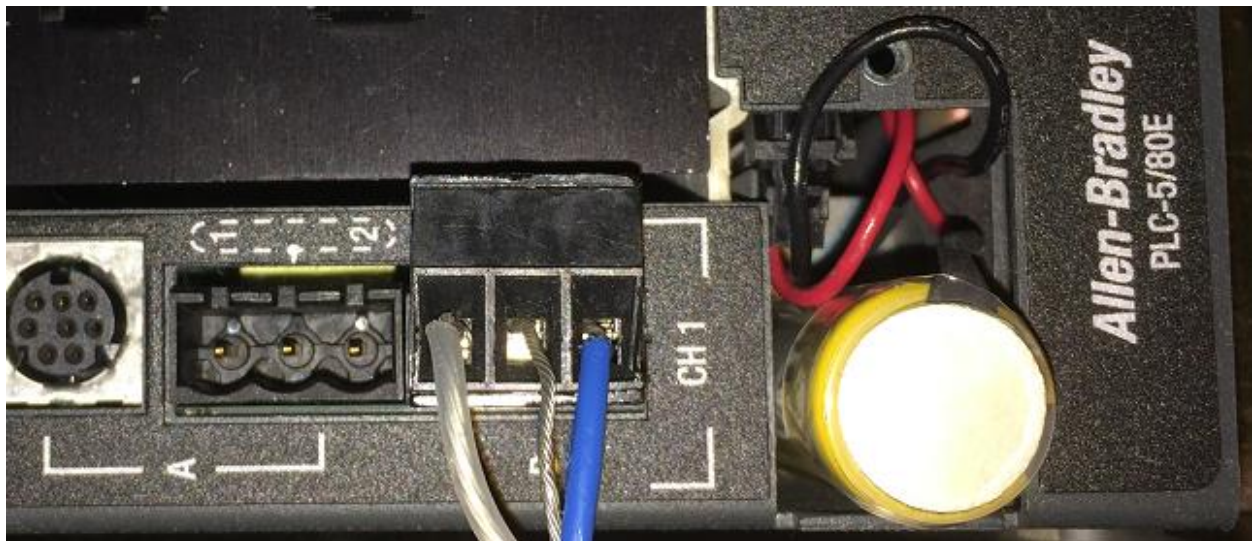
If everything has been configured and wired correctly your NS light between the power and the DH+ cable on the AN-X2-AB-DHRIO should turn green as seen on the previous page. If you go to go to Monitor DH+ Network under Automation Network you should also now see both station ID's in the station list:
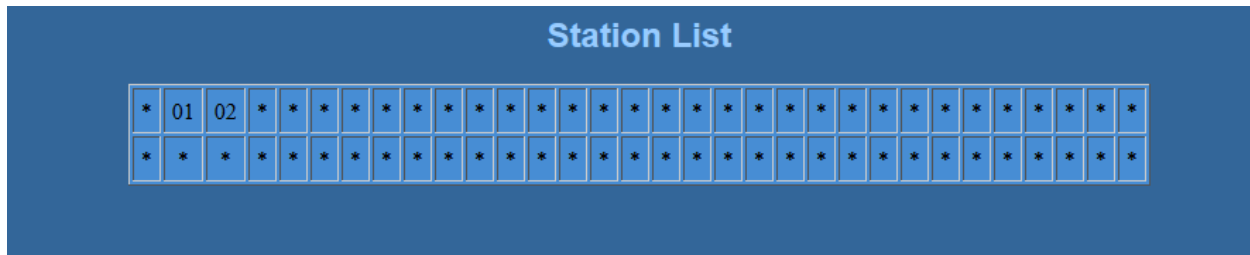
In RSLinx, you should see both stations in the AN-X2-ABDHP, CH A under the EtherNet/IP driver.
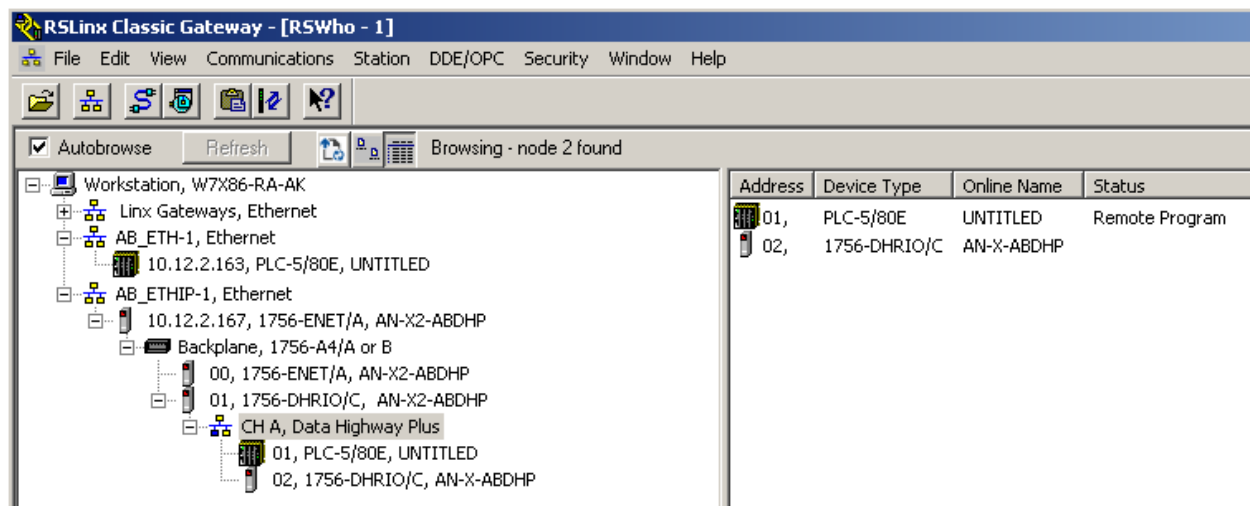
If the NS light does not turn green:
1) Double check that you have proper termination in place (even if the network seemed to work before).
2) If the light turns red, ensure that the outer braded shield has been grounded, and only grounded in one place, as this suggests there may be noise on the line.
3) If the light is amber, we are not seeing any communication on the network at all. Try swapping the polarity of the cable wiring on one end, and revalidate that we have the correct baud rate.

If both the AN-X2-AB-DHRIO and the PLC5's Station do not appear in this list, please contact Technical support for trouble shooting assistance.

Now let's create/edit the IP Alias File for the AN-X2-AB-DHRIO. If you click on View IP Alias File under Automation Network you can view (but not edit) the current IP Alias file the AN-X2-AB-DHRIO is using. Every line that begins with a semi colon (;) is only a comment and is not being executed. Copy and paste whatever field you have here into a text editor (notepad will suffice in a pinch) and edit the IP and station to match an unused IP on your network and the station of the PLC5.   In this case 10.12.2.163 was available and my PLC5 was station 1. Note, you must keep the x.x.x at the beginning. (The ANX will automatically replace x.x.x with its first 3 IP octets.) You are only defining the fourth and final octet. This Alias IP is associated with the PLC5 DH+ station ID.

```
AliasIP x.x.x.163 -> Dhp 0o01
```
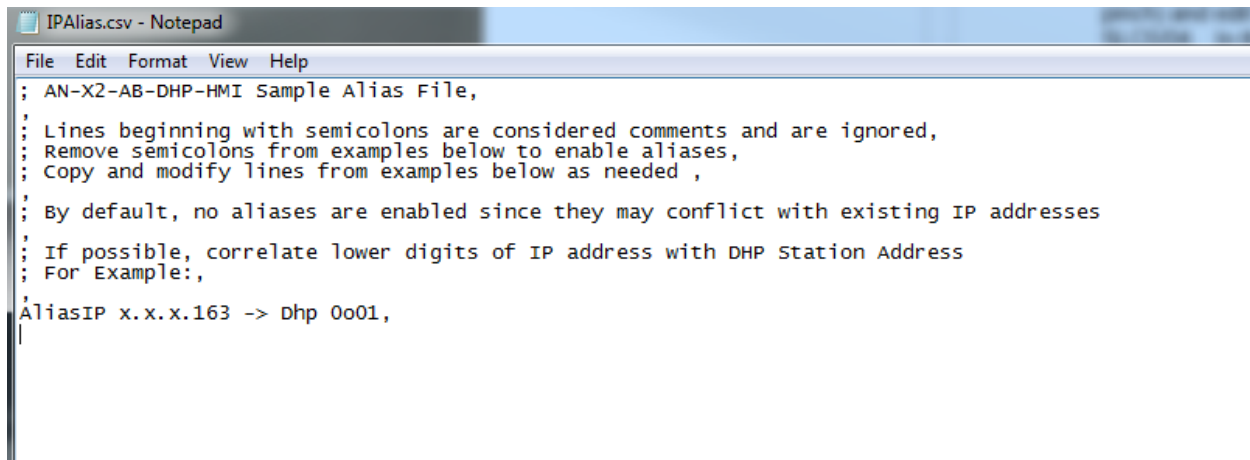

Save the file as IPAlias.csv, then use Configure DH+ HMI IP Alias to browse to the file and click Send File to AN-X.

Note that you will need to reboot the AN-X2-AB-DHRIO for the change to take effect:

IPAlias.csv (460 bytes, text/csv) saved.
Updating files....
File transfer done...

```
; AN-X2-AB-DHP-HMI Sample Alias File,
;
; Lines beginning with semicolons are considered comments and are ignored,
; Remove semicolons from examples below to enable aliases,
; Copy and modify lines from examples below as needed ,
;
; By default, no aliases are enabled since they may conflict with existing IP addresses
;
; If possible, correlate lower digits of IP address with DHP Station Address
; For Example:,
;
AliasIP x.x.x.163 -> Dhp 0o01,
```
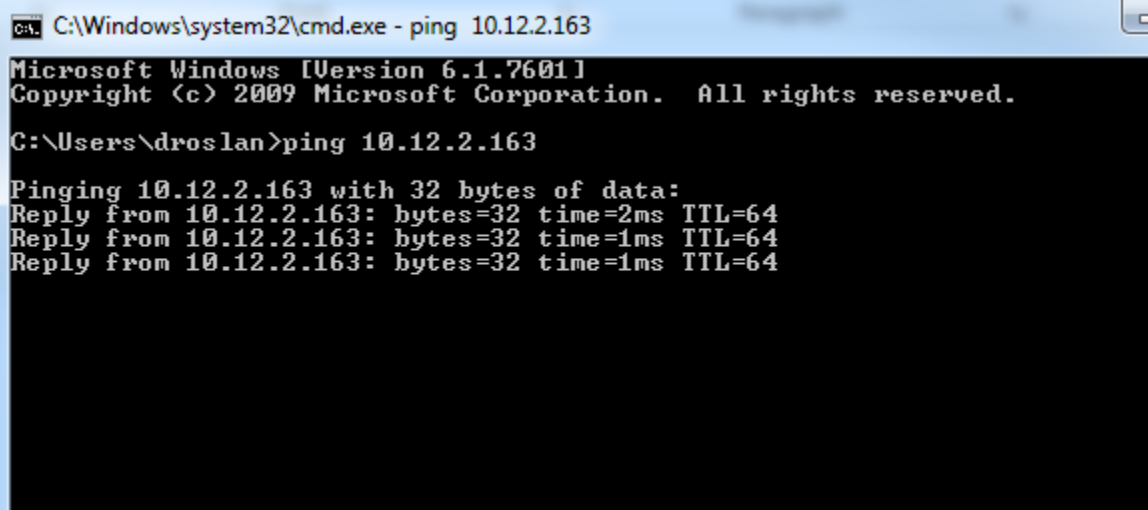
Changes to the IP Alias configuration will only take effect after a reset of the AN-X device.

Click this reboot link to reset or this link to go to main page.

If you click View IP Alias File you should now see your new file:

Automation Network

   Configure DH+ Network

   Monitor DH+ Network

   Configure DH+ HMI IP Alias

   View IP Alias File

Log Files

Administration

Troubleshooting

File: /mnt/mmc/IPAlias.csv Length: 460 bytes [Select new file]

```
; AN-X2-AB-DHP-HMI Sample Alias File,
;
; Lines beginning with semicolons are considered comments and are ignored,
; Remove semicolons from examples below to enable aliases,
; Copy and modify lines from examples below as needed ,
;
; By default, no aliases are enabled since they may conflict with existing IP addresses
;
; If possible, correlate lower digits of IP address with DHP Station Address
; For Example:,
;
AliasIP x.x.x.163 -> Dhp 0o01,
```

Although not required, you can validate that the alias file took by pinging the IP address from a command prompt:


Your AN-X2-AB-DHRIO should now be configured and ready for your Red Lion Data Station Plus.

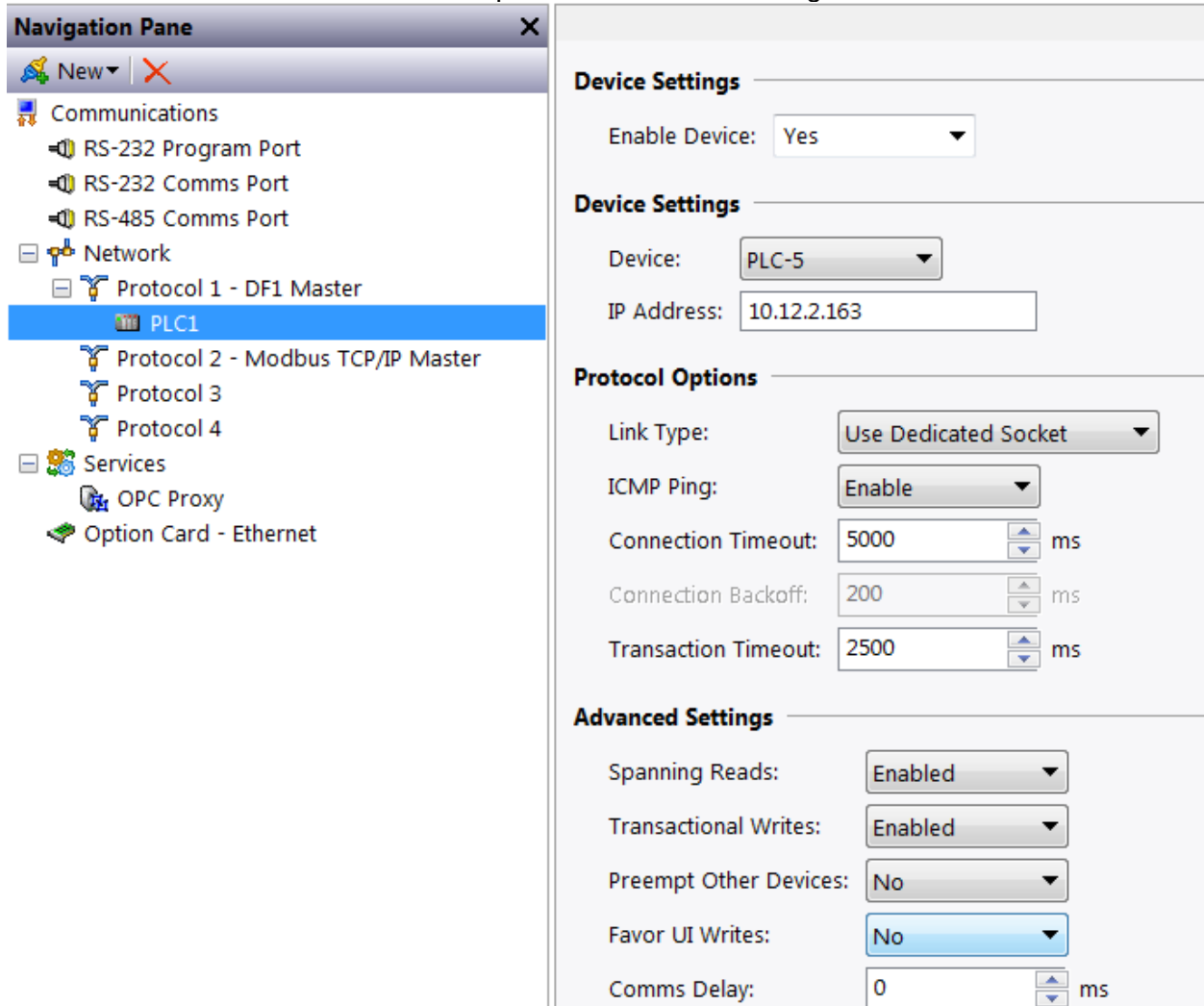## Step 2: Setting up the Red Lion Data Station Plus

Please make sure to correctly wire your Red Lion Data Station Plus for power and communication. Connect the appropriate configuration cable to both your DSP and PC, and select that configuration cable type for use in the Crimson 3.0 software. In this example we connected the Red Lion DSPLE to our PC with a USB configuration cable, then went to Link -> Options and selected the USB radio button and hit okay:
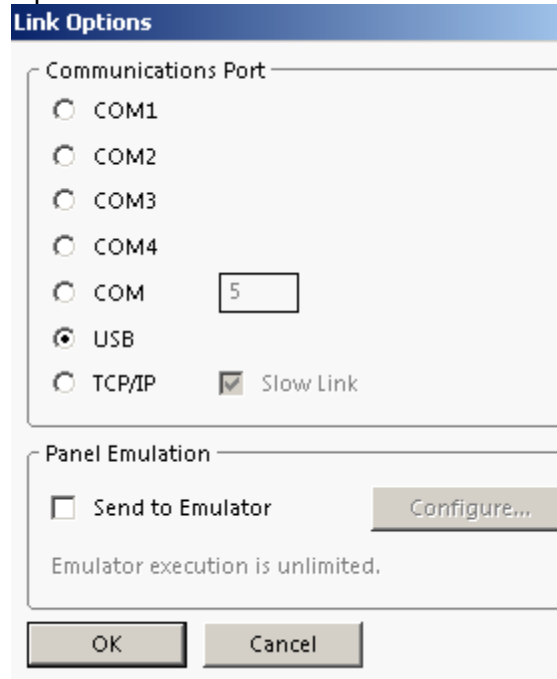
Choose the Communications tab on the navigation pane and select an unused Protocol under Network to configure the driver. When configuring the driver in Crimson 3.0 make certain that you choose the Allen-Bradley DF1 Master driver.
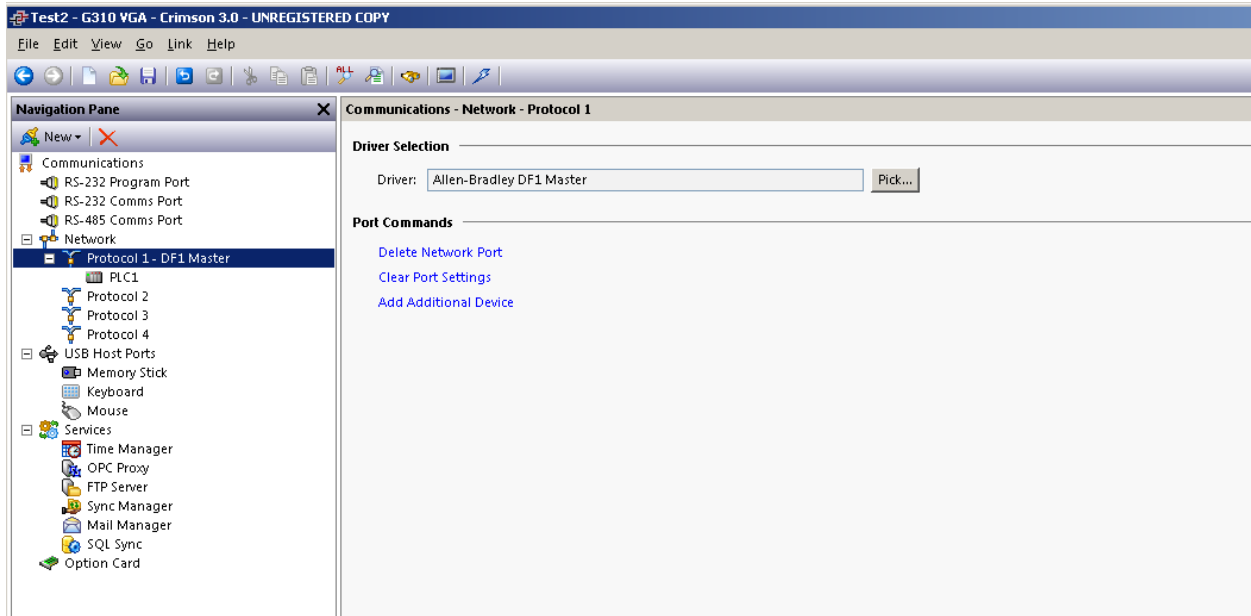
Next click on the PLC you have created under protocol in the navigation pane on the left (if you haven't renamed it, it will be PLC1). On the new screen that appears, make sure the device is both enabled and that the device is set to PLC-5, then set the IP Address to whichever *Alias IP* address you defined for the PLC5's station in the previous steps. In this case, we used 10.12.2.163. For the sake of this example we left all other settings on this screen default.
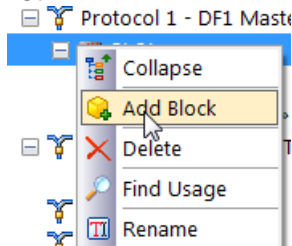
Next let's add a block to the protocol. To do so, in the Navigation Pane, right click on your PLC under Protocol 1 – DF1 Master (PLC1 by default) and choose Add Block from the drop down list.


Click on the Block (Block1 by default) and then click on Pick to the right of Start Address and select the data type of the data file you want to read or write from your PLC5. In this example we will be reading N7:0 so we will pick N for Integers and set the address to 007 : 0000.
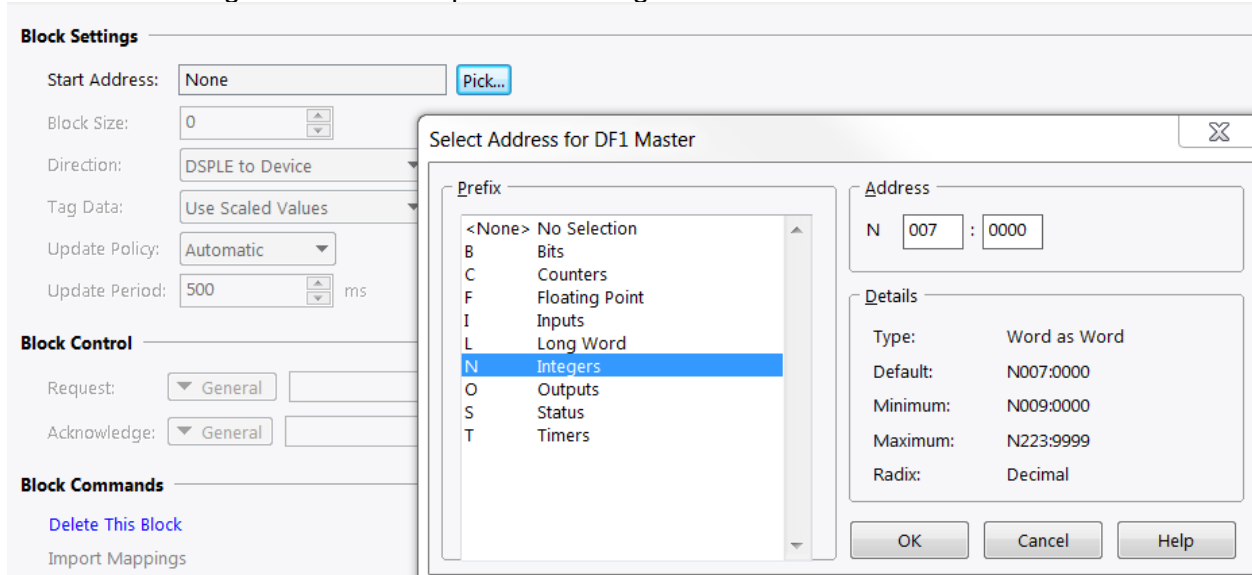
Finally make sure you have a Block Size of at least 1 and set the Direction to the direction you want data to flow. We want only a single point, so we'll set the block size to 1, and we want the data to move from the PlC5 to the RedLion (a read) so we'll set the direction to Device to DSPLE.
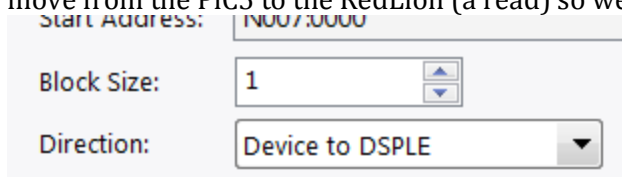
At this point you've already completed the process for the PLC5 side of the DSPLE (just add more blocks for other points), but for the sake of seeing it in action, lets link our point to another point on another protocol. Lets say we wanted to move this point to a Modbus TCP/IP Server/Slave device, we could define the second protocol as Modbus TCP/IP Master

```
☐ ϒ Protocol 2 - Modbus TCP/IP Master
        ▦ PLC2
    ϒ Protocol 3
```
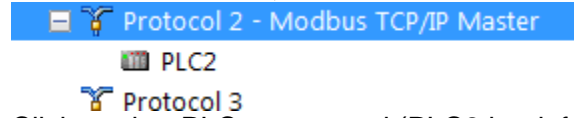
Click on that PLC we created (PLC2 by default) and enter the IP address of the Modbus TCP/IP server device.

Device Settings

Enable Device: Yes ▼

Device Identification

Primary IP Address: 10.12.2.11

Fallback IP Address: 0.0.0.0

TCP Port: 502

Unit Number: 1

Protocol Options

Ping Holding Register: 1

Ignore Read Exceptions: No ▼

![ProSoft Technology logo]

Now on the Resource Pane on the right we should see points for both devices. Let's say I want to move N7:0 into Modbus Register 40,001 on this other device, I can drag and drop the Holding Registers under the PLC2 in the Resource …
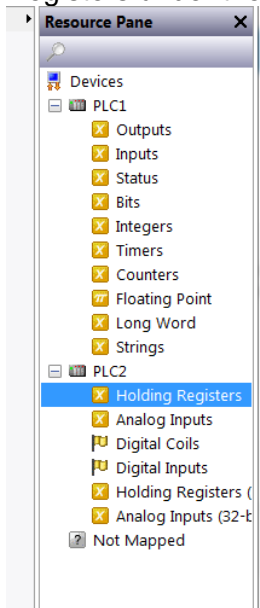
… to the N007:0000 data point under my block in the Navigation Pane:
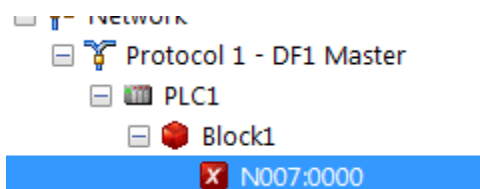
Doing so will open a window which will allow me to decide which specific holding register to map the point to and if I'll be mapping word or word, or some other conversion. I just want it in 40,001 in this example and word to word, so I'll choose that:
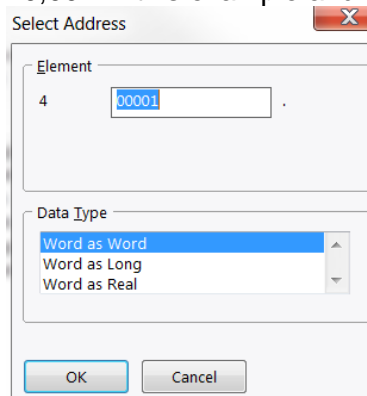
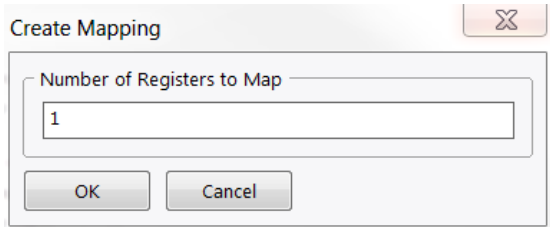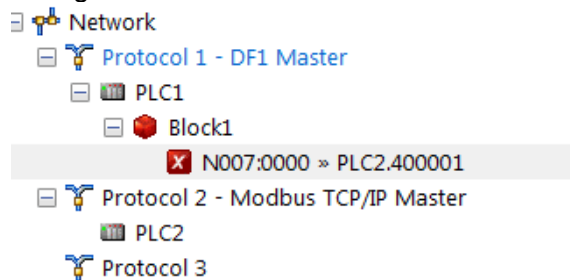Next I'll enter the number of consecutive Registers to Map. Again, in this example I just want one so I'll select that:
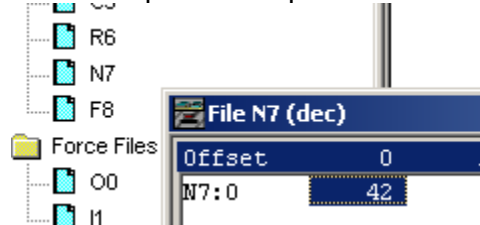
Create Mapping

Number of Registers to Map

1

OK   Cancel

And we're done, the points have been mapped. All that remains is to download the configuration to the Red Lion.

- Network
  - Protocol 1 - DF1 Master
    - PLC1
      - Block1
        - N007:0000 » PLC2.400001
  - Protocol 2 - Modbus TCP/IP Master
    - PLC2
  - Protocol 3

To do so go to Link along the top and choose Send.

Go   Link   Help
Update...   F9
Send...   Shift+F9
Verify...
Extract...

Once complete I can put a value into N7:0 in my PLC5

R6
N7
F8
Force Files
O0
I1

File N7 (dec)
Offset   0
N7:0   42

And sure enough, there it is in my Modbus Server

Device Id: 1

Address: 0001   MODBUS Point Type
Length: 100   03: HOLDING REGISTER

40001: <00042>   40022: <00000>   40043: <0
40002: <00000>   40023: <00000>   40044: <0
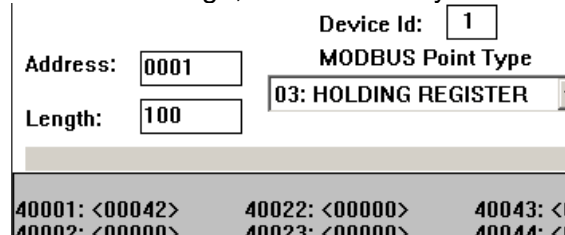
If you have any other questions about this, or any other use of the AN-X2-AB-DHRIO, please contact your local Prosoft Technical Support Office!

Asia Pacific

Malaysia Office

Phone: +603.7724.2080

asiapc@prosoft-technology.com

Languages spoken: Chinese, English

China Office

Phone: +86.21.5187.7337

asiapc@prosoft-technology.com
Languages spoken: Chinese, English

Europe

France Office

Phone: +33 (0)5.34.36.87.20

support.emea@prosoft-technology.com
Languages spoken: French, English

Middle East and Africa

Phone: +971.(0)4.214.6911

mea@prosoft-technology.com

Languages spoken: English, Hindi

North America

California and Wisconsin Offices

Phone: +1 661.716.5100

support@prosoft-technology.com
Languages spoken: English, Spanish

Latin America

Brazil Office

Phone: +55.11.5083.3776

brasil@prosoft-technology.com

Languages spoken: Portuguese, English

Mexico and Central America Office

Phone: +52.222.3.99.6565
soporte@prosoft-technology.com

Languages spoken: Spanish, English

Regional Office

Phone: +1.281.298.9109

latinam@prosoft-technology.com

Languages spoken: Spanish, English