

Application Note #5490

Interfacing a Galil Controller with a Cognex Barcode Scanner

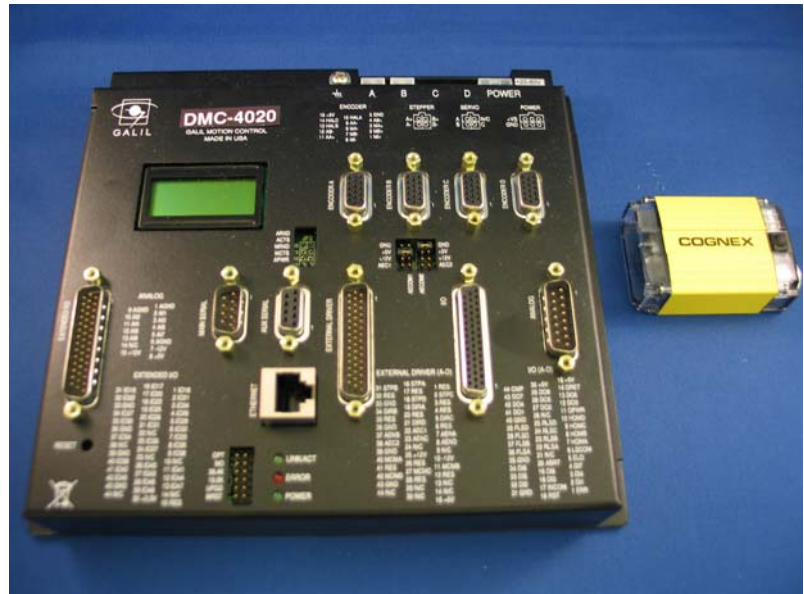
The ability to track product as it moves through an autonomous system is often critical to the overall success of the system. Generally the tracking of the product is performed with a simple bar code scanner. Many times the bar code data is sent back to a host PC for processing however in some systems (particularly systems without a PC) it can be faster and more efficient to have the motion controller receive the bar code information directly in order to make a decision on what type of motion is needed for the given product. The Ethernet enabled Cognex Dataman series of bar code scanners has the ability to send bar code results directly to a Galil Ethernet motion controller such as the DMC-40x0 or DMC-21x3. In addition, the RIO pocket PLC from Galil would work in the same manner. In this example we will use a DMC-4020 and a Cognex Dataman 200 series bar code scanner.

Hardware Required

1. Galil DMC-4020
2. Cognex Dataman 200 series (including POE supply)
3. 20-80VDC power supply (DMC-4020)
4. 2x Ethernet Cable
5. Ethernet Hub/Switch
6. PC (for setup only)

Software Required

1. GalilTools (Lite or Full)
2. Dataman 3.5 Setup Software



Setup

Connect the PC, scanner, and motion controller to a hub via Ethernet. Use the Dataman Setup software to set an IP address for the bar code scanner. In this example we set the scanner at 192.168.173.15. Using the GalilTools software, assign an IP address to the motion controller. Here we use IP address 192.168.173.10

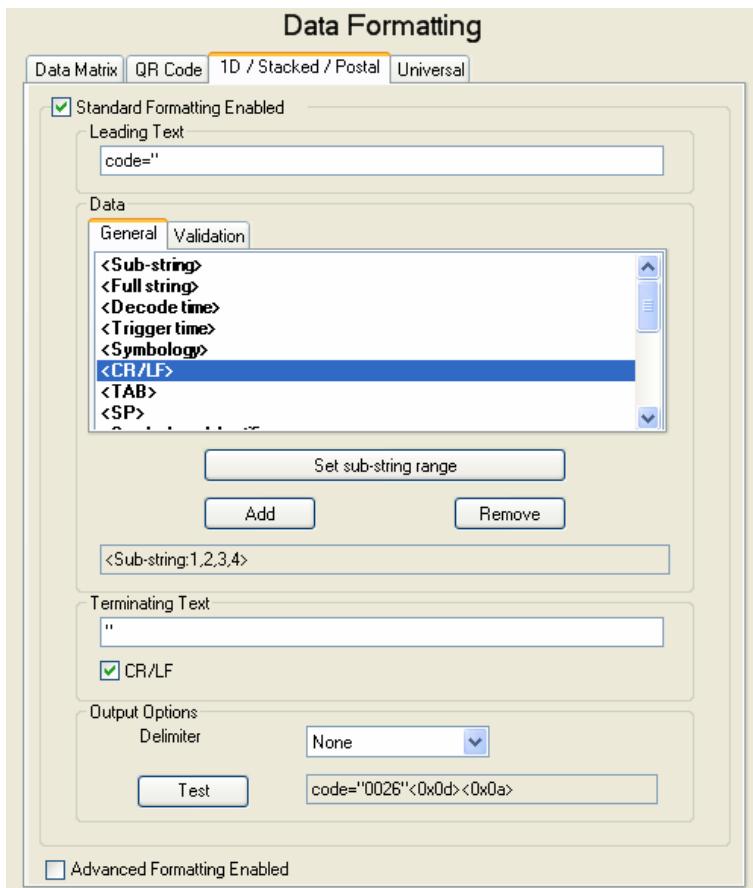
Configure Scanner Output String

Galil motion controllers use basic ASCII strings over a TCP/IP connection to communicate. This open protocol makes it very easy to have most Ethernet enabled devices communicate to the controller. In addition, the Cognex bar code scanner has the ability to form a string composed of user defined characters and also the feedback the scanner. Taking advantage of this ability, we will program the bar code scanner to output strings that the controller will interpret as valid commands. Specifically we will create strings to assign variables on the controller. Declaring a variable on the DMC-40x0 is as simple as sending the string `bob="test1"`. This will create a variable named bob and set it to the value test1.

Implementation #1

Dataman

Open the Dataman Setup software and connect to the bar code scanner. Move to the *Data Formatting* tab. Here we will need to set up the string that is output when a successful read occurs. You can program it to behave differently depending on the type of barcode. In this example we will be using "1D/Stacked/Postal" type barcodes so we will select that tab.



Here we will set the Leading Text to be `code="` and the Terminating Text to be a double quote. Under the data menu, click on `<Sub-string>` and then *Set sub-string range*. In this example we will use 1,2,3,4 to capture the first 4 elements of our barcode data. Be sure to check the *CR/LF* box to append a carriage return line feed to the end of the string. Now click on *System / Save Settings* to commit the changes to the barcode scanner. The scanner will now send a proper Galil command to set the variable code equal to value returned from the scan.

DMC-4020

On the controller side we will now need to establish a connection to the barcode scanner. In our example the

scanner is at IP address 192.168.173.15 It is important to open the connection to port 25 on the scanner in order for the communication to work properly. From the terminal we can send the command

```
IHD=192,168,173,15<25
```

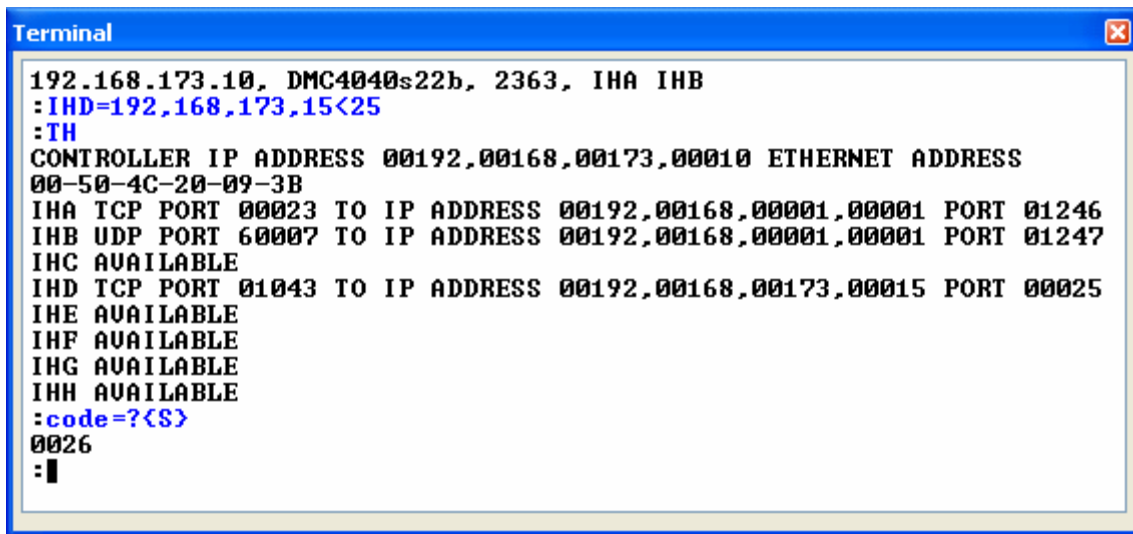
The scanner and the controller should now be communicating. You can send the TH command to confirm an open connection on handle D.

Testing

To test we will need a barcode of the type 1D, Stacked, or Postal. Trigger a scan on the barcode scanner. Back in GalilTools, send the command

```
code=? {S}
```

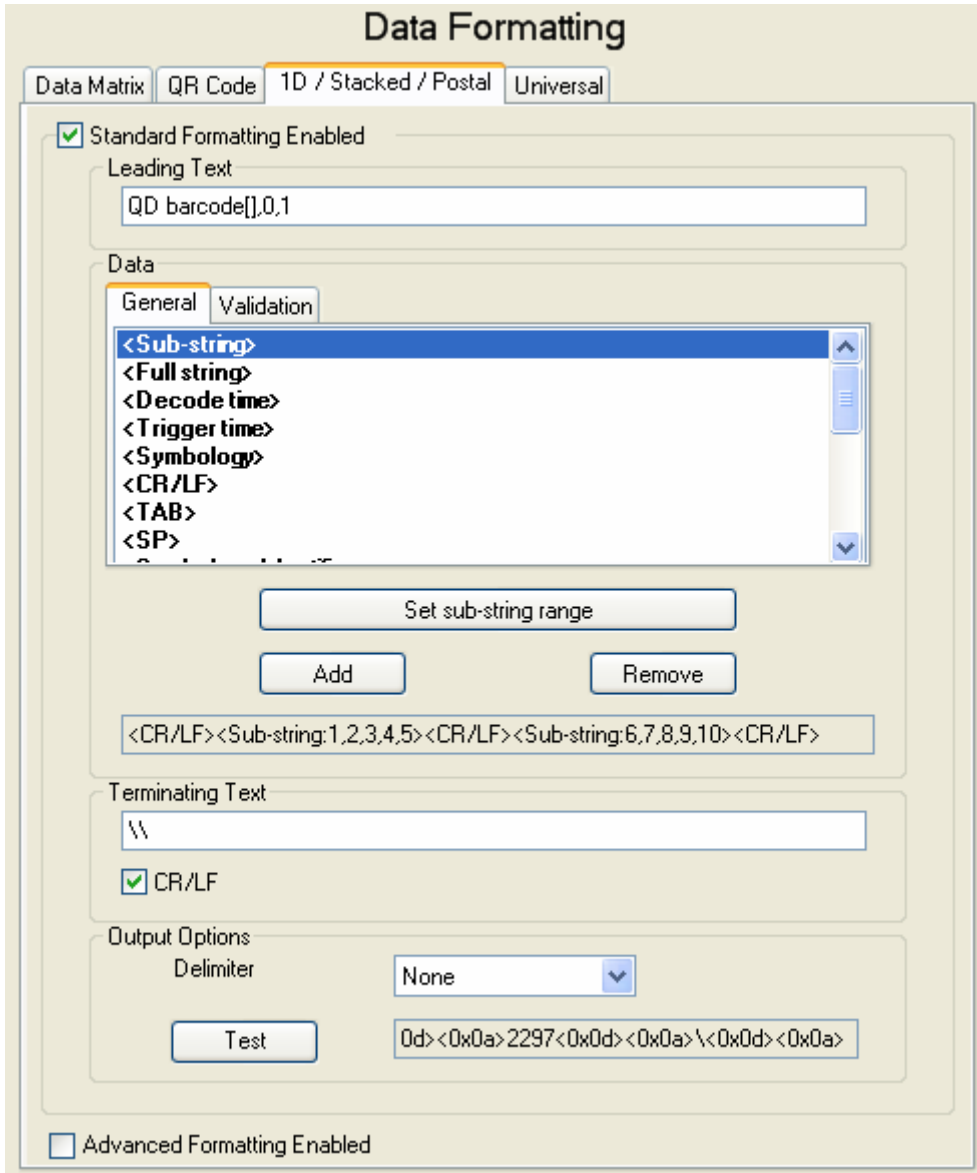
The {S} tells the controller to report back a string. In this example the first 4 numbers of our barcode are 0026



```
Terminal
192.168.173.10, DMC4040s22b, 2363, IHA IHB
:IHD=192,168,173,15<25
:TH
CONTROLLER IP ADDRESS 00192,00168,00173,00010 ETHERNET ADDRESS
00-50-4C-20-09-3B
IHA TCP PORT 00023 TO IP ADDRESS 00192,00168,00001,00001 PORT 01246
IHB UDP PORT 60007 TO IP ADDRESS 00192,00168,00001,00001 PORT 01247
IHC AVAILABLE
IHD TCP PORT 01043 TO IP ADDRESS 00192,00168,00173,00015 PORT 00025
IHE AVAILABLE
IHF AVAILABLE
IHG AVAILABLE
IHH AVAILABLE
:code=?{S}
0026
:█
```

Alternate Implementation

The maximum size string the standard DMC-4020 can handle is 6 characters. If instead of strings and variables you use integers and arrays you can capture longer barcodes. Start by dimensioning an array on the controller with the command DM barcode[2] Then in the Dataman software change the leading text to *QD barcode[,0,1* and the terminating text to two backslashes. The QD command is a Galil command to download arrays (see command reference for details). Keep the *CR/LF* box checked. We will fill two array elements with 5 characters each. Under the data menu start first by adding a *<CR/LF>* and then sub string 1,2,3,4,5. Add another *<CR/LF>* and then sub string 6,7,8,9,10 and one more *<CR/LF>*. Your complete string should look like this



Testing this alternative implementation would look like this (The barcode scanned is 0026229760)

