Application Note #5468

Using the QSI G55 terminal with a Galil Ethernet controller

The QSI G55 series handheld is an ideal operator terminal interface for applications where both a graphical display and portability are desirable. The handheld terminal features a 320x240 pixel, lighted, trans-flective, grayscale LCD display measuring 96 mm (3.8") diagonally (a TFT color display will be available 3rd qtr 2004.) The G55 also features an Ethernet option (recommended) that easily interfaces with the Galil motion controller. For detailed information and documentation on the QSI terminals go to: http://www.qsicorp.com.

This application note will describe the basic setup of the G55 terminal, as well as how to easily create a custom interface with a Galil controller.

Figure 1 – QSI G55 Handheld Terminal

Initial Hardware and Software Setup

The G55 terminal with the Ethernet option can be connected to a Galil controller over an existing Galil network using the standard RJ45 connector supplied with the G55 unit. The G55 should be connected to an Ethernet hub (or switch) that is connected to the Galil controller, as well as a separate 12VDC, 1A supply. The G55 also features a POE (Power over Ethernet) option that is compatible with powered Ethernet hubs, which will eliminate the need for a separate power supply for the terminal.

Once the Terminal is connected and powered up, follow the menus on the "Power On Setup" screen to assign a compatible IP address to the terminal (hold any three buttons on the touchpad during power-up to access the setup menu…use function keys F1, F2, and F3 to navigate between menu items).

Install and run the QSI Qlarity foundry design environment (v2.50) to the host PC. Select a new "Galil Motion Controller" project from the introductory menu. One a Galil project is selected, Qlarity automatically adds the necessary objects to interface with the Galil controller.
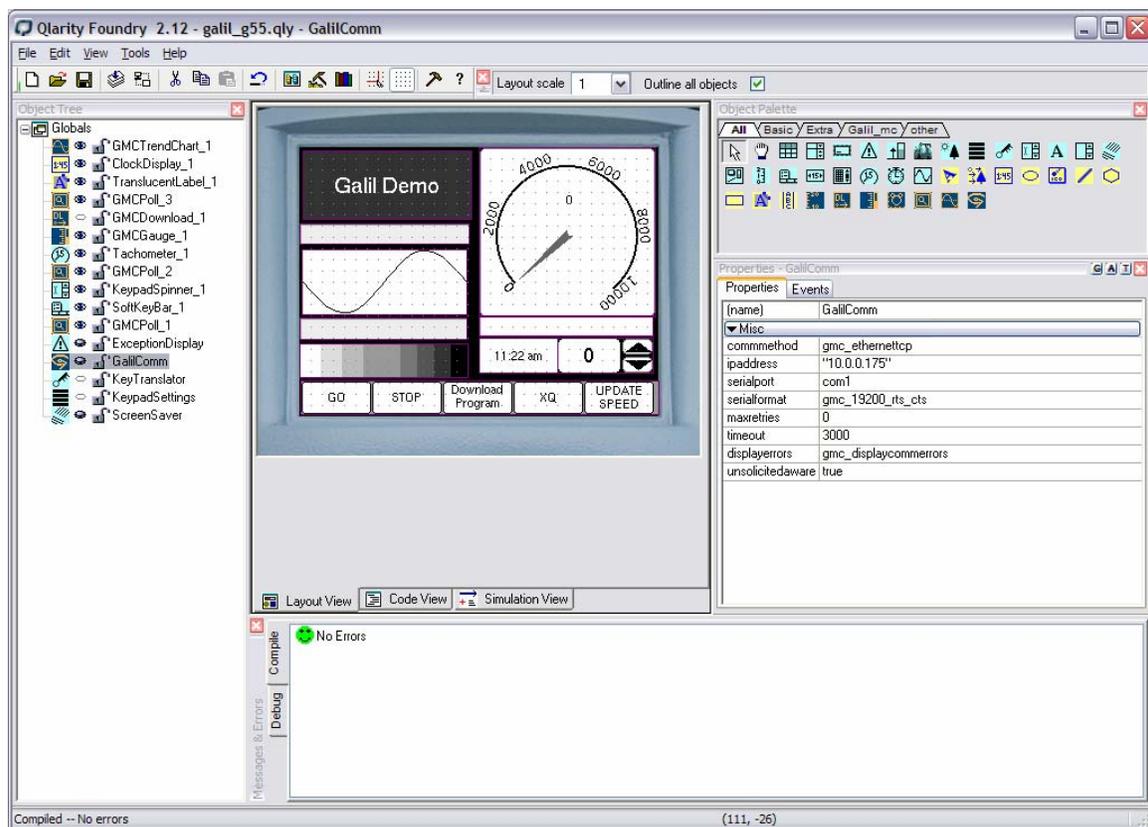

Figure 2 – Qlarity Foundry Design Environment

Creating the Galil / HMI Application

To link the application to the desired controller, click on GalilCommV2 in the object tree and set the controller's IP address in the "ipaddress" field in property page associated with the GalilCommV2 object which was automatically added to the project.

The application interface can then be customized with several Galil specific objects which include: GalilCommV2, GMCTrendChartV2, GMCPollV2, GMCPathTraceV2, GMCGaugeV2, GMCDownloadV2, GMCSimpleTerminalV2, GMCCommandExecV2, GMCCommandDisplayV2, and GMCTachometerV2.

The application below (Figure 3) uses several of the Galil objects as well as standard QSI objects to create a custom user interface where a tachometer displays motor velocity and position error. Programmed function key inputs (F1-F5) allow the user to start, stop and, change speeds.
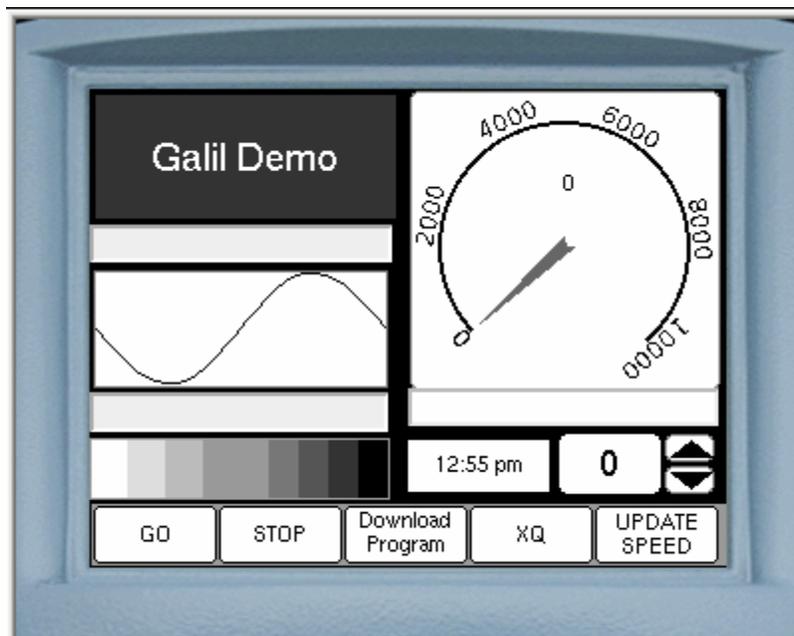

Figure 3 – Custom Galil Interface

Customizing the Galil Objects for Specific Galil Functions

Add a SoftKeyBarV2 object from the object palette. Programmed function key inputs (F1-F5) relating to the soft-key bar at the bottom of the screen allow the user to start, stop, change speeds, and download DMC programs stored on the terminal. The soft-keys can be easily created using the dialog (Figure 4) accessed by selecting the soft-key list property.
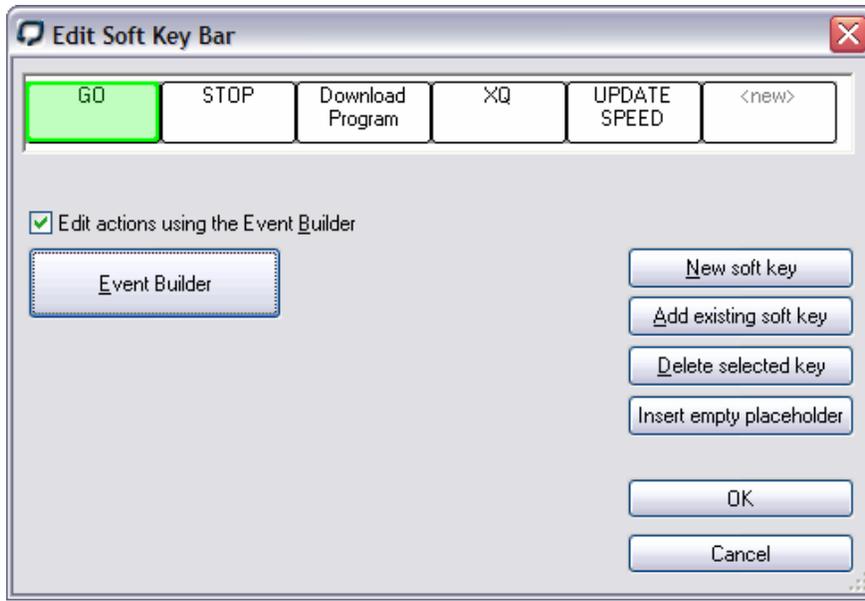
Figure 4 – Edit Soft Key Bar Dialog

Use the event builder to insert specific instructions such as sending Galil commands to the controller. After creating a button with the desired caption, highlight the button and launch the Event Builder dialog as shown in figure 5.
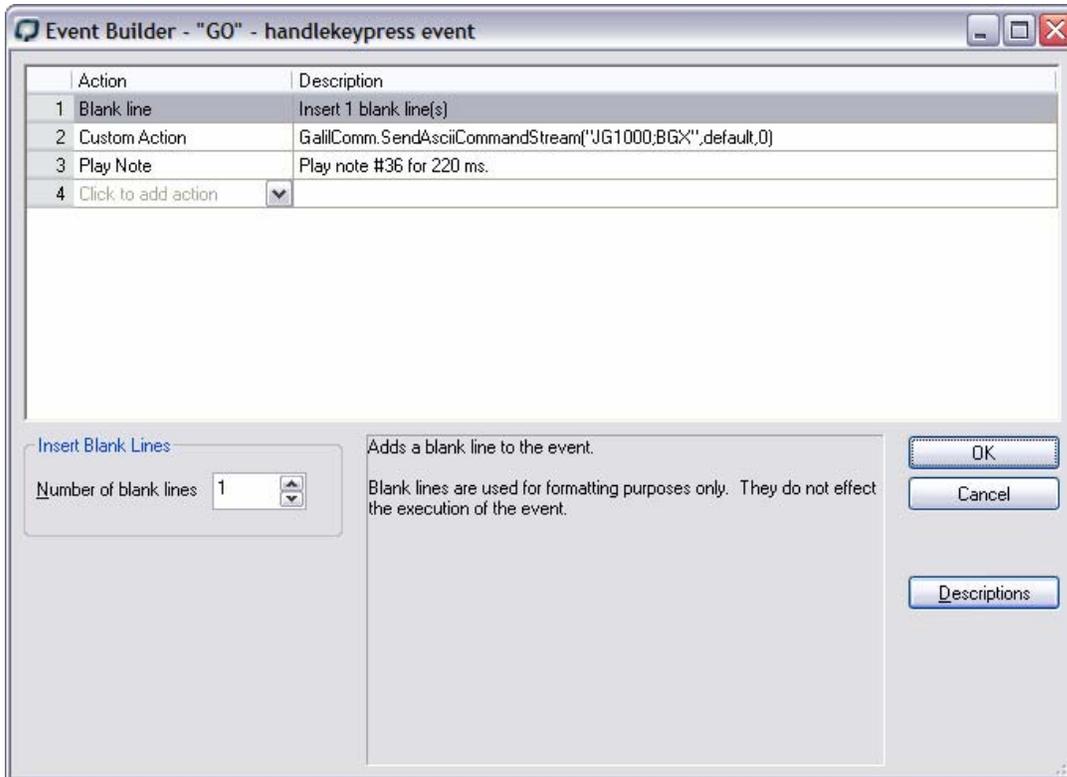

Figure 5 – Command Event Builder

In the example in Figure 5, the Galil is commanded to begin jogging the X-axis at 1000 cnts/sec, then play an audible sound to the user.

Other Galil objects, such as the GMCTrendChart, can easily link the value to a Galil specific data item by selecting the desired data item from a list (Figure 6).
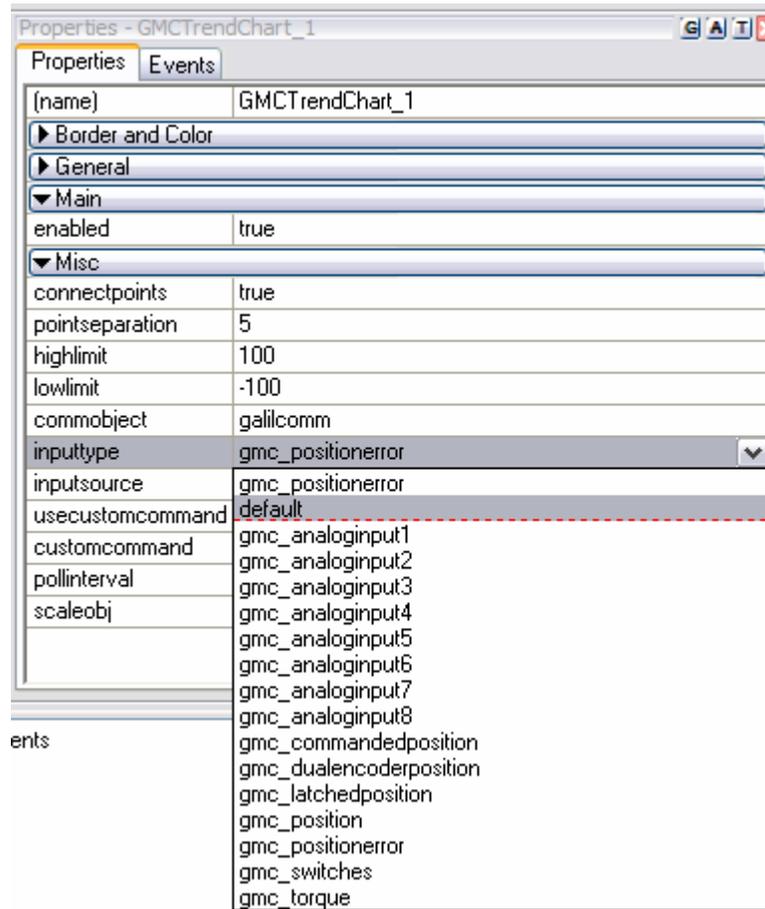

Figure 6 – Galil Data Input Property Selection

Using Standard Qlarity Objects for Galil Data Display

Standard Qlarity objects (non–Galil specific), such as the Tachometer display can be linked to Gail data by using a GMCPoll object to feed data to the desired object at some desired interval. The event procedure below associated with the GMCPoll object demonstrates how to transfer the Galil data to the Tachometer object. This editing is done in the Code View for the GMCPoll object.

```
func ResponseReceived (response as reference to string)
    dim Mspeed as float
    Val(Mspeed,Trim(response))
    Tachometer_1.value = Mspeed
endfunc
```

Storing DMC Application Programs in QSI Memory

Galil DMC application programs can be stored on QSI flash memory and then downloaded to the controller at runtime. DMC programs are stored on the QSI by adding a binary resource to the QSI terminal. The Edit Resource dialog (Figure 7) can be accessed from the Edit menu in the Qlarity design environment. This dialog allows the programmer to browse local directories for the desired .DMC file and "Add" it with a suitable resource name. After the DMC program has been added to the resource list, the Qlarity Foundry will automatically download the DMC file to the QSI unit when the whole application is sent.
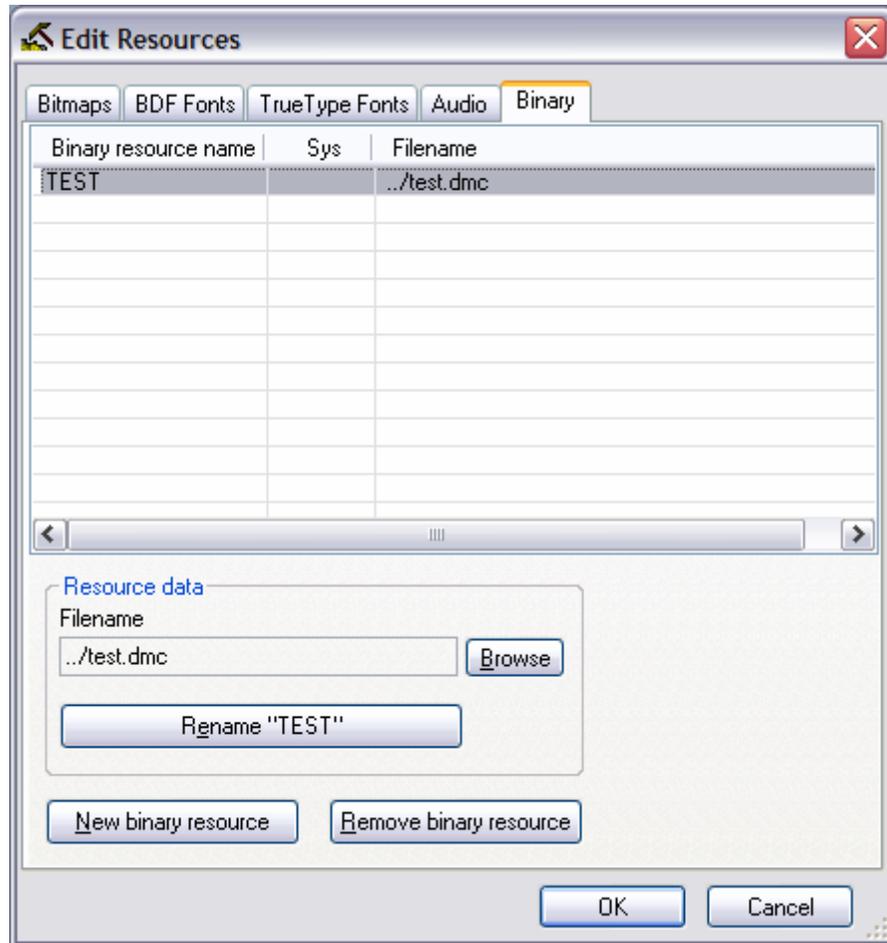

Figure 7 – Edit Resource Dialog

To programmatically download the application to the controller, the GMCDownload object is used to load the resource file and then download it to the controller as in the example code below.

```
GMCDownload_1.LoadFromResource(TEST)
GMCDownload_1.Download("")
```

The .Download argument defines to what label in Galil memory to download the application. An empty string ("") argument will cause download starting at line 0 in Galil memory.

Loading the QSI application to the G55

Once the desired application is complete, the application code can be downloaded to the QSI G55 terminal via the Ethernet connection. Setup the QSI to accept the application by placing the G55 in the "Download" App Mode using the "Power-On-Setup" screen.

Select the "Download Application…" from the File menu to display the Download application Dialog shown in Figure 8.

Enter the IP address set to the QSI terminal and push the "Download Application" button. The application program will download to the G55 in a few seconds and then immediately begin operation. The connection to the Galil will initiate automatically (and every time the G55 is powered on from then on). Enjoy.
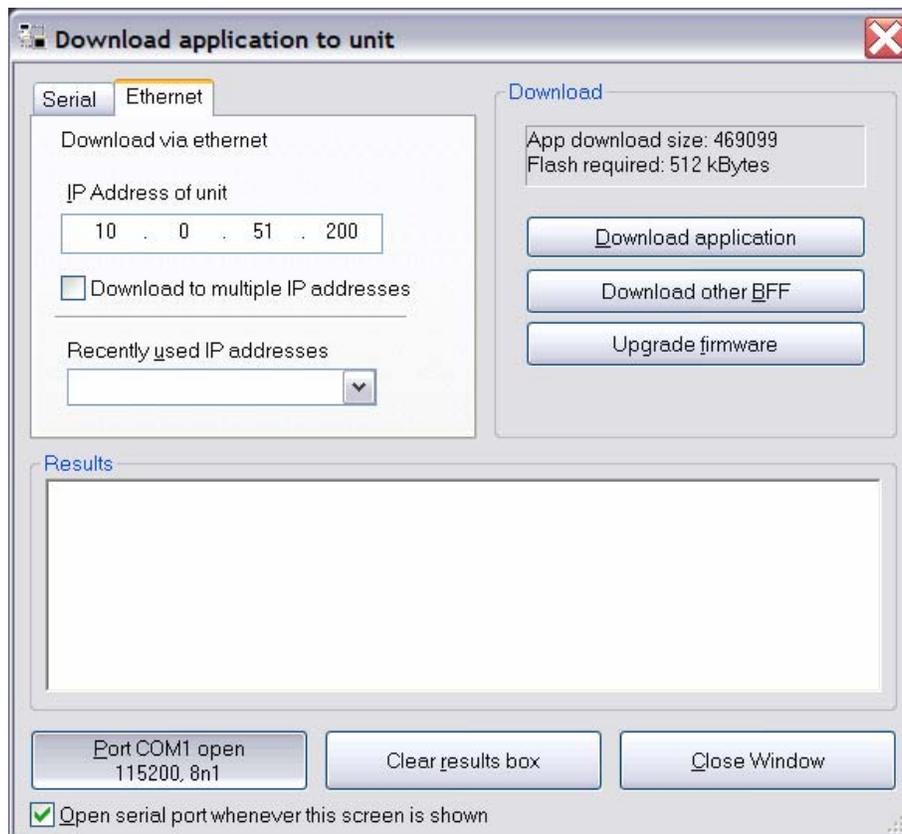
Figure 8 – Download Application Dialog