

TECHNICAL NOTE **TNOI29**

Title: Allen Bradley Native Tag Support

Product(s): G3, MC, and DSP

ABSTRACT

Allen Bradley Logix series PLCs do not support the traditional Allen Bradley protocols, without the need for some extra work in the PLC. Using the native tag support, Red Lion Controls products are now able to access PLC tags directly with no programming required for the PLC. This document will present how a G3 HMI is set up to communicate with a CompactLogix PLC.

INTRODUCTION

The latest range of Allen Bradley PLC, ControlLogix and CompactLogix can communicate with other devices via serial or Ethernet. Both transports support native tag communication. This type of communication allows an external device, in our case a G3, to request PLC tags directly, i.e. communication addresses, such as the one used by DF1 or DH485, are not required anymore and the user will directly point the tag name required.

The G3, Modular Controller and Data Station Series all support this new driver on Ethernet or Serial.

In order to get both devices working together, it is advised to program the PLC first. Tags will be exported from the PLC software, RSLogix 5000, to then be imported in the HMI software, Crimson 2. If tags are created later in the PLC, please refer to the Accessing new PLC tags section of this document.

The following technical note describes how to set up a G310 HMI and a CompactLogix 1769-L32E PLC to communicate over Ethernet.

NOTE: Red Lion Native tag driver has only access to Controller Tags in RSLogix 5000, NOT to program tags that are local to the PLC.

PLC setup and tags export

In RSLogix 5000, the Ethernet port has to be configured with an IP address. For a CompactLogix PLC, it can be found under I/O configuration as shown in Fig. 1. Setup the IP address to match your network configuration. In this example the PLC is set up to 192.168.200.5.

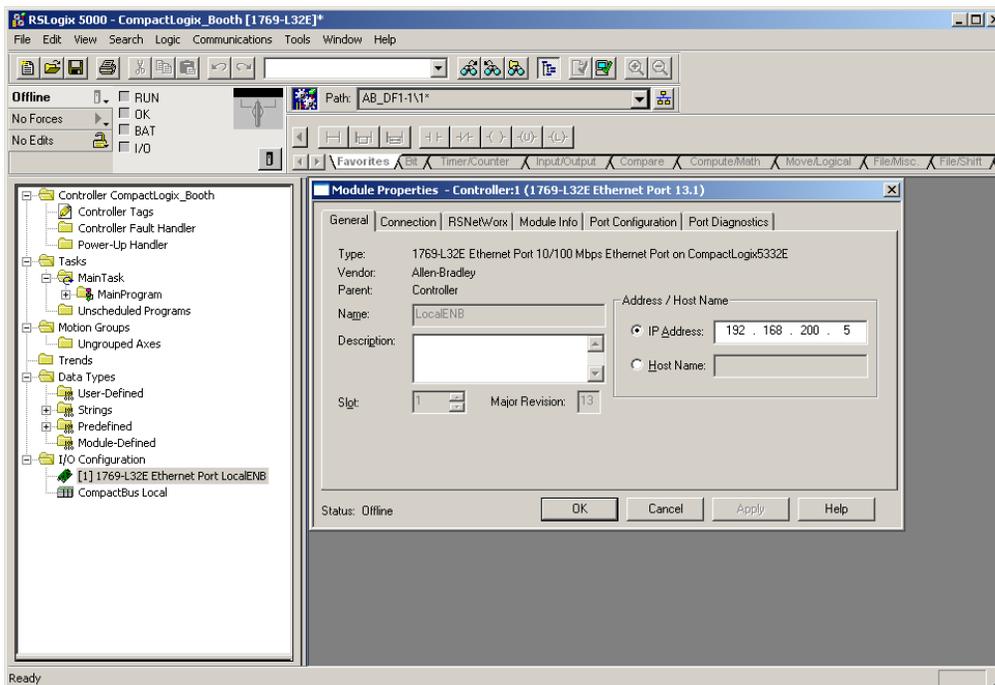


Fig. 1

Once the PLC is set up, tags can be exported. Double-click on Controller Tags in the navigation window and select Tools>Export... Fig. 2. Save the tag file in a known location.

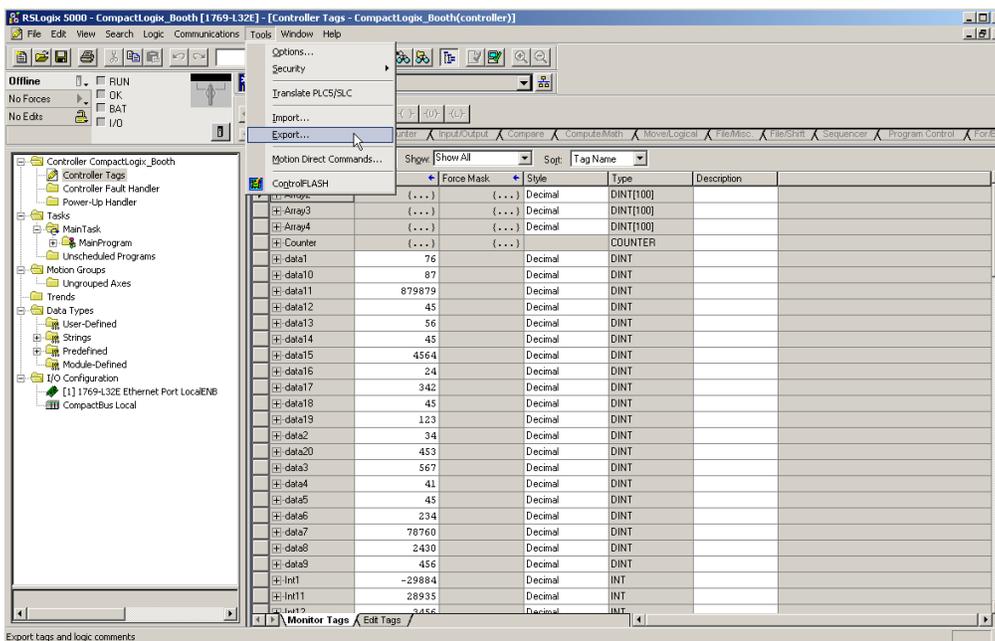


Fig. 2

CRIMSON 2.0 SETUP

In Crimson 2, first enter the Communications module and enable the G3's Ethernet port by clicking Ethernet and selecting DHCP, or Manual Configuration. In this example, Fig. 3, the G3 is set as manual configuration with the IP 192.168.200.10.

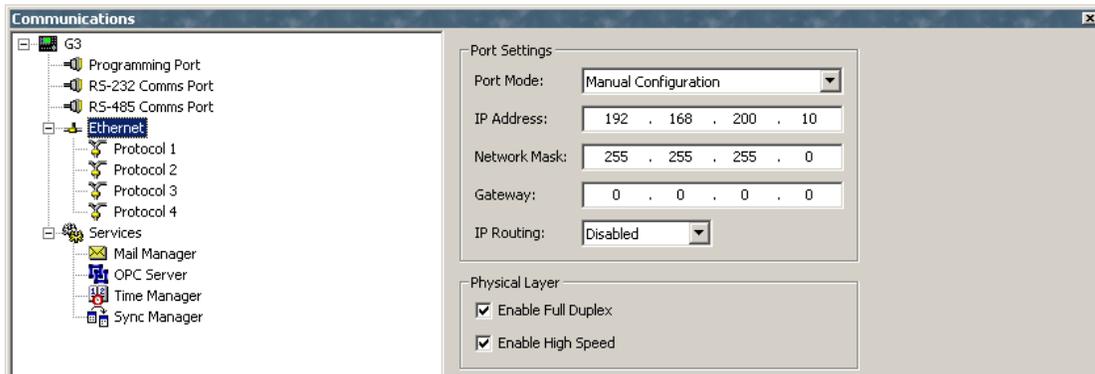


Fig. 3

Then, select one of the Ethernet protocols and click Edit to choose a driver. Select the Allen Bradley Native Tag Addressing driver and click OK. Fig. 4.

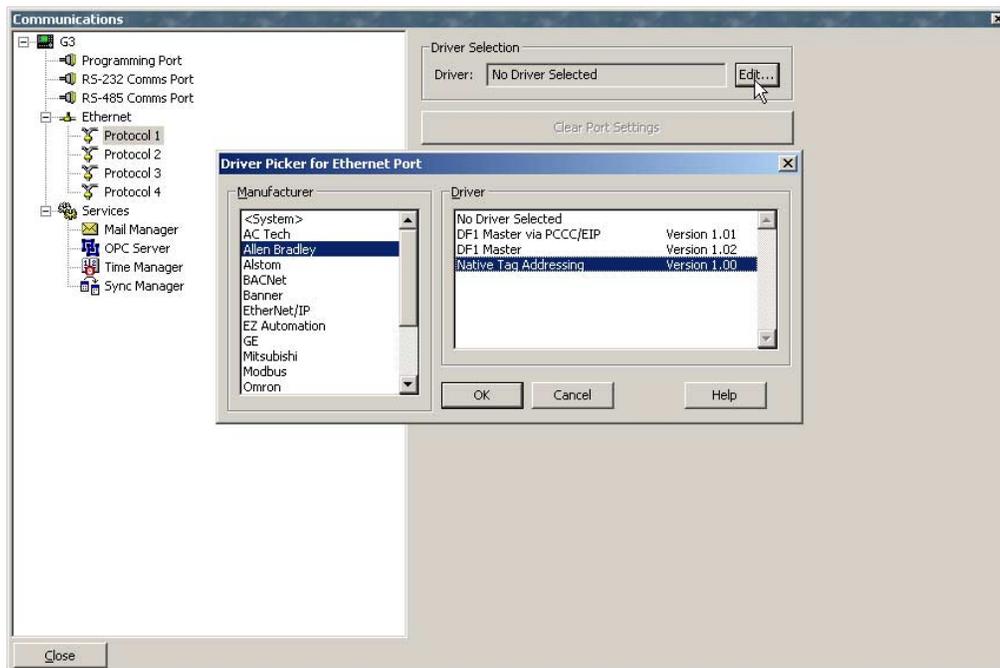


Fig. 4

A device named PLC1 appeared under the Ethernet Protocol. Select that device and eventually rename it to fit the application. For this example, we will keep the name PLC1. The right hand side pane now shows the PLC settings. Set the IP address and processor slot number. In the case of a CompactLogix, the slot number is 0. Fig. 5.

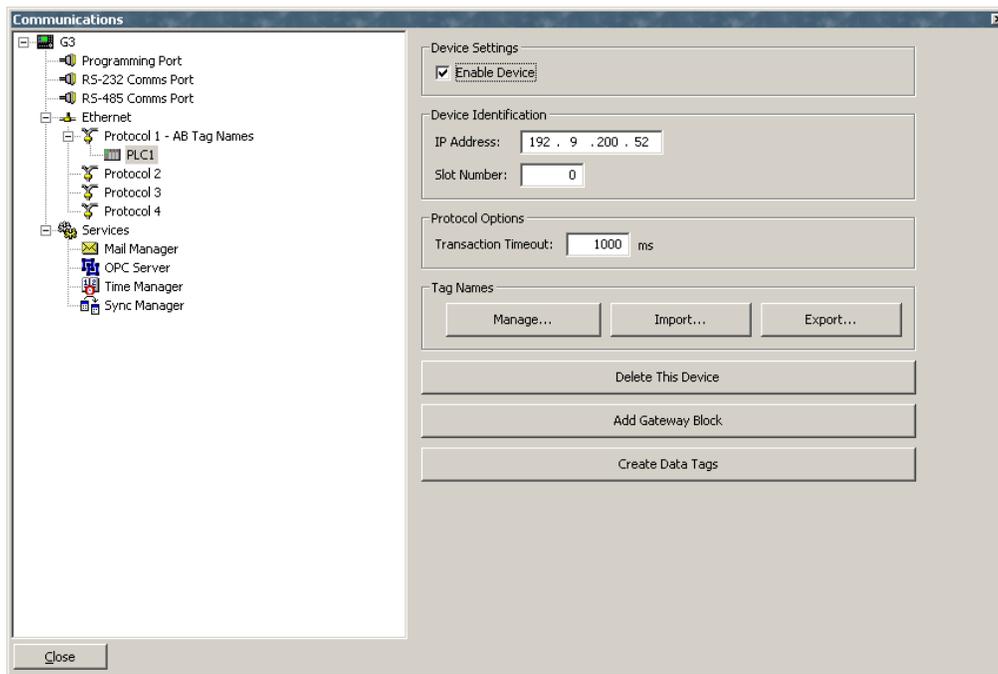


Fig. 5

The next step is to import the tags from the PLC CSV file. Click the Import button and select the CSV file. Crimson 2 will then import all the PLC tags and confirm if the import was successful or if any errors were found in the file.

NOTE: The import tool only loads the tag from the CSV file for mapping purpose and will not create any tags in Crimson 2 Data Tags.

Two options are now available, automatically creating tags or manually creating tags.

- Automatically (recommended) will generate a new tag in Crimson 2 Data Tags for each PLC tag imported. The name of the tag will be identical to the PLC tag name. This will save development time by providing a ready to use tag database. However, if the number of tags exported by the PLC software is large, numerous tags will be created in Crimson 2. To avoid such a scenario, unnecessary tags can be removed from the CSV file exported by RSLogix 5000 prior to import.
- Manually consist in creating and mapping each tag in Crimson 2 Data Tags. Although this method involves longer development time, the user is able to map only the required tags for his application.

Automatically Creating Tags

After importing the tags, Crimson 2 can automatically create Data Tags for the G3 database. To do so, click on the Create Data Tags button.

NOTE: If a PLC tag name is similar to an already existing tag in Crimson 2 Data Tags, the mapping of the latest will be overwritten with the PLC mapping information.

Once tags are created, go to the Data Tags module. All the PLC tags are now in the tag list. If some of the tags are counters or timers, please verify that they are mapped correctly as they will be imported as “Counter.CTL”. Fig. 6. More than likely, the mapping required for the application will be “Counter.ACC” or “Counter.PRE”. This mapping can be changed by selecting the tag and clicking the Edit button. The mapping window will pop up and the portion of the Counter/Timer can be changed. Fig. 7. Also, copy/pasting the tag allows the creation

of a new one that can be assigned to another portion. For example, one can be assigned to the ACC and the other to the PRE. For more details on the mapping window, see the Manually Creating Tags section.

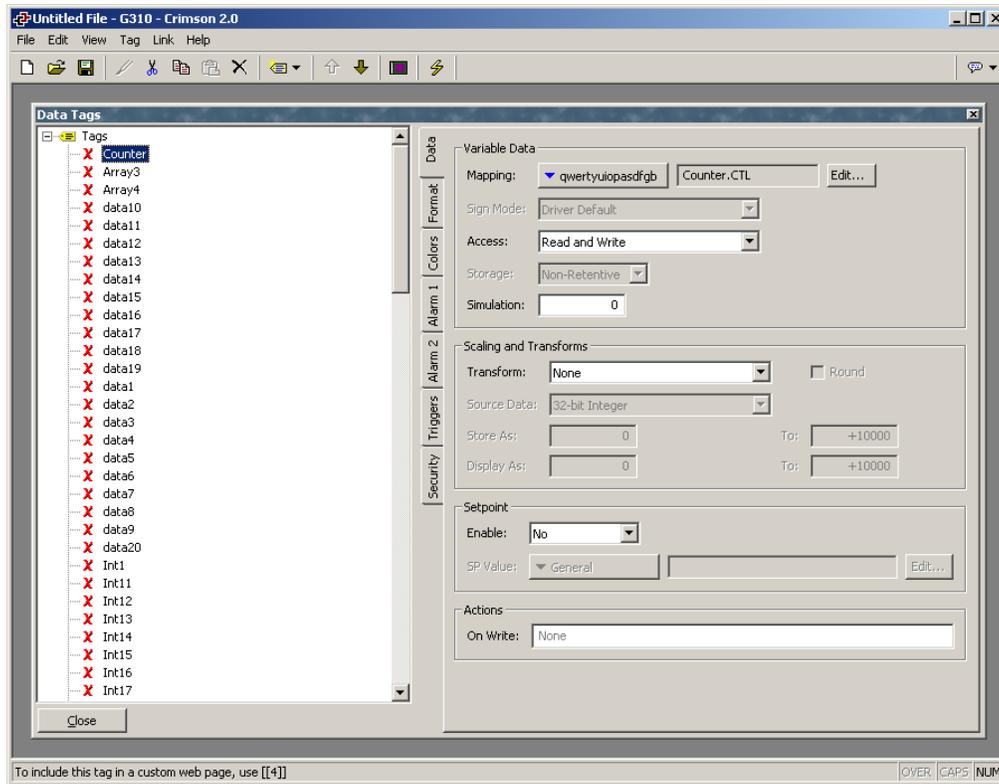


Fig. 6

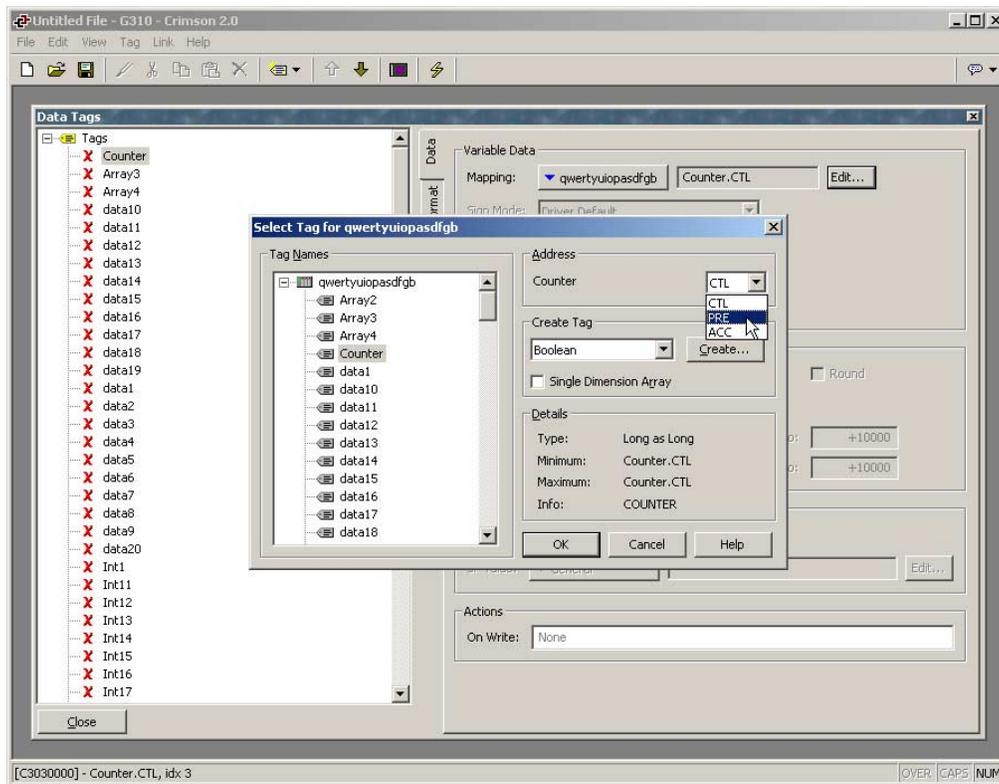


Fig. 7

Manually Creating Tags

After importing the tags, go to the Data Tags module. The tag window will be empty since no tags were created. To create a tag and map it, follow these steps:

- Click on the variable tag type you want to create. In this example, an integer variable,
- Select the variable and eventually rename it.
- On the right hand pane, click the Internal button next to mapping and select the device to map the tag to. Fig. 8.
- In the window that popped up, you can select the PLC tag you wish to map the G3 tag to in the Tag Names list. Fig. 9. This list represents the PLC tags and is loaded when the CSV file is imported.
- Select the address required if available (Arrays, Counters and Timers only),
- Click OK. This tag is now link to a PLC tag.

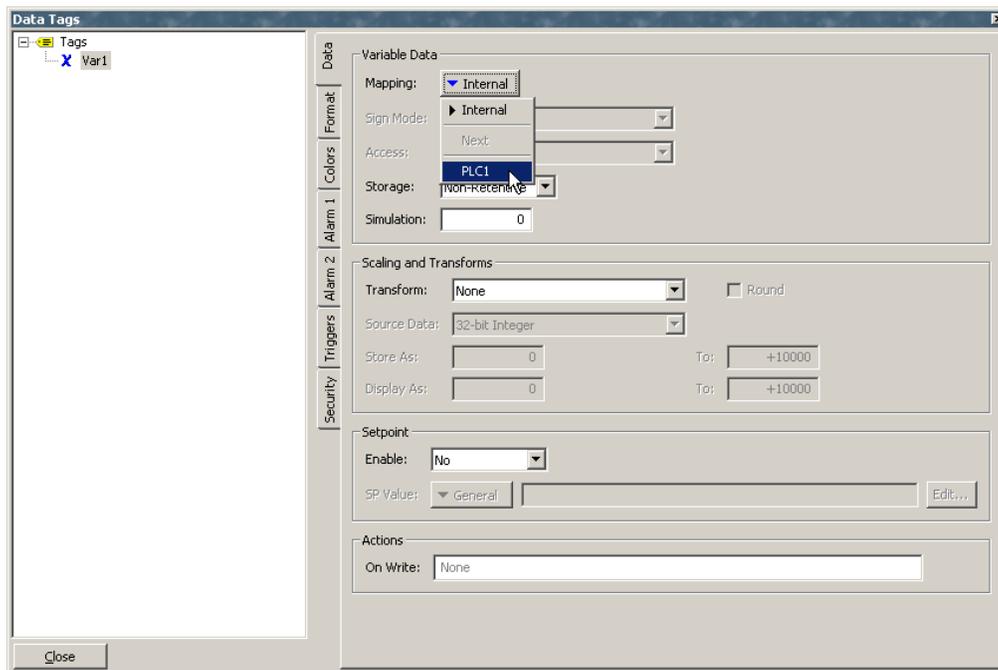


Fig. 8

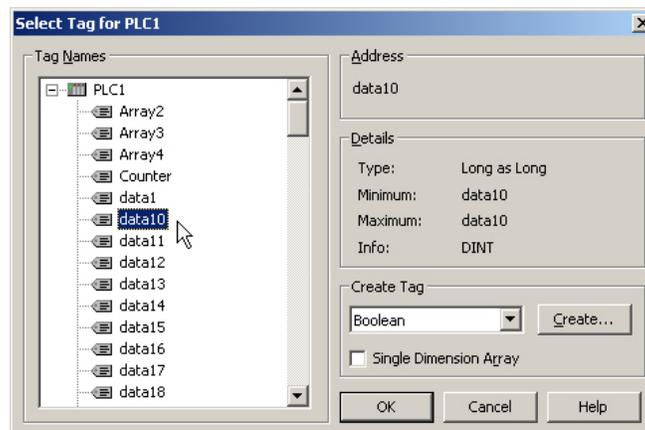


Fig. 9

Accessing New PLC Tags

The mapping window also includes a Create Tag area. This allows the creation of a tag in the PLC Tag names list. This newly created PLC tag can then be mapped to a Crimson 2 tag.

This tool is used when new tags are added to the PLC database in RSLogix 5000 and importing the PLC tags as described earlier is already done and too cumbersome for just one new tag. For example, if you create a new integer tag in the PLC database called “Var121”, to access it in Crimson 2 you need to create the same tag in the PLC Tag names list. This is done with the following step:

- Select the tag type to match the PLC tag in the drop down list. In this example, an integer or word,
- Click on the Create button,
- Enter the tag name as it is in the PLC. Fig. 10
- The new tag appears in the PLC Tag names list.

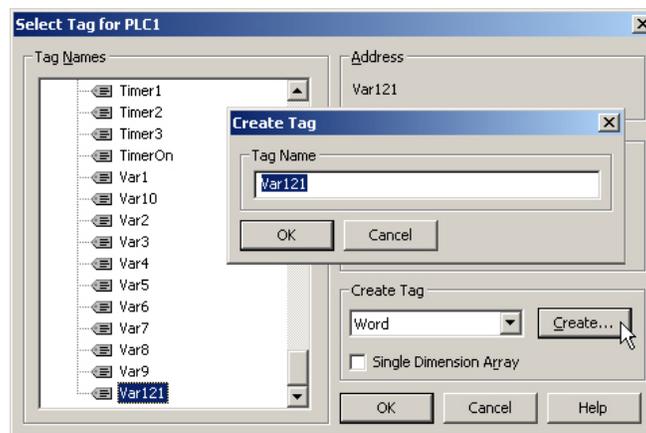


Fig. 10

IMPORTANT NOTE:

- The PLC tag name is case sensitive,
- To delete a tag in the PLC Tag Names list, use Shift+Delete,
- To rename a tag in the PLC Tag Names list, use F2.

This window is also available via the Manage button on PLC1 under the Communications module. Fig. 5.

Just link the G3 to the PLC using an Ethernet crossover cable or via a switch and communication will start. Of course, tags have to be inserted on the display to monitor or change their value.