Crimson 3.0 DSP/G3/Graphite/MC/PTV Custom Site

Abstract

Crimson 3.0 Web Server provides embedded tools for application remote viewing and control. No extra development is required to be able to remotely access, view and modify information on the process or machine using the embedded Virtual HMI. However, for custom purposes, the G3 series, Graphite Series, Modular Controller Master and Data Station Plus SX or GT, and the PTV provide the ability to develop custom web pages.

Introduction

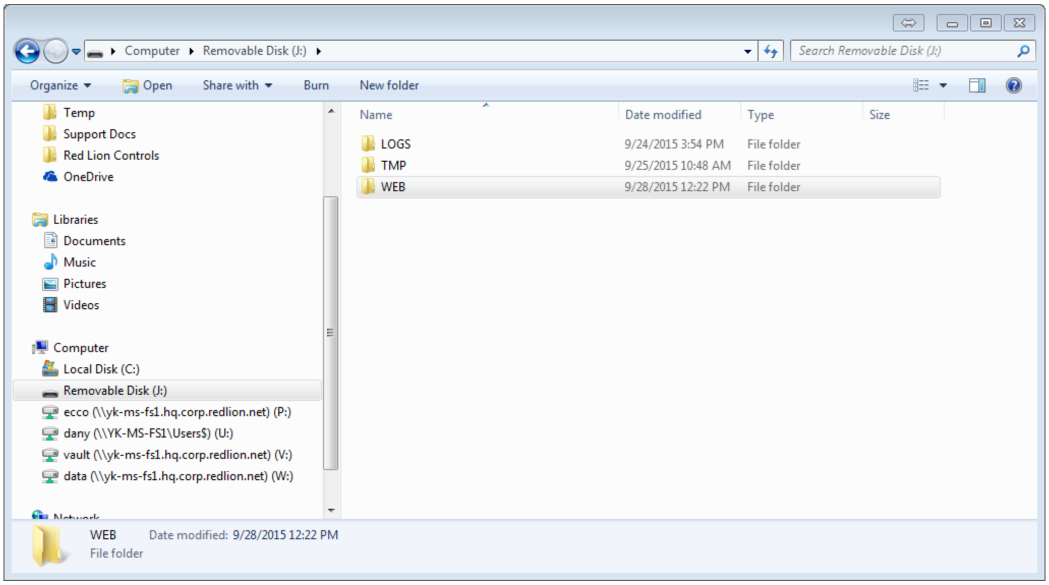
The following technical note presents how to create a custom web site on a G3 and the tools available to the developer to view and/or manipulate data. Development on a Modular Controller Master and Data Station Plus SX or GT is exactly the same. The following steps will be used to develop a custom web site:

- Installation of a Memory card on the unit
- Access to the Memory using the USB connection
- Creation of the WEB folder and default.htm page
- Review an example of how to view data on a custom web page
- Review an example of how to change data on a custom web page.

Although the HTML code will be explained or commented on throughout this document, a basic understanding is required to create a proper web site.

Preparing the Memory Card

A memory card is required to use the custom web site capability for all the units. Please insert the card in the available slot and double check that the orange LED is lit and in a steady on state. If the LED blinks slowly, please refer to the Crimson 2.0 manual for troubleshooting. Once the card is inserted, connect the USB cable between your unit and PC. Once the drivers are installed, the memory card can be accessed from Windows Explorer as shown below. Create a folder called “WEB” on the root of the memory card. The WEB folder will contain all the custom web site files, i.e. html pages and pictures. Subfolders can be created under the WEB folder if required.


Computer ▸ Removable Disk (J:) ▸
Search Removable Disk (J:)
Organize
Open
Share with
Burn
New folder
Temp
Support Docs
Red Lion Controls
OneDrive
Libraries
Documents
Music
Pictures
Videos
Computer
Local Disk (C:)
Removable Disk (J:)
ecco (\\yk-ms-fs1.hq.corp.redlion.net) (P:)
dany (\\YK-MS-FS1\Users$) (U:)
vault (\\yk-ms-fs1.hq.corp.redlion.net) (V:)
data (\\yk-ms-fs1.hq.corp.redlion.net) (W:)
Network

Name	Date modified	Type	Size
LOGS	9/24/2015 3:54 PM	File folder	
TMP	9/25/2015 10:48 AM	File folder	
WEB	9/28/2015 12:22 PM	File folder	

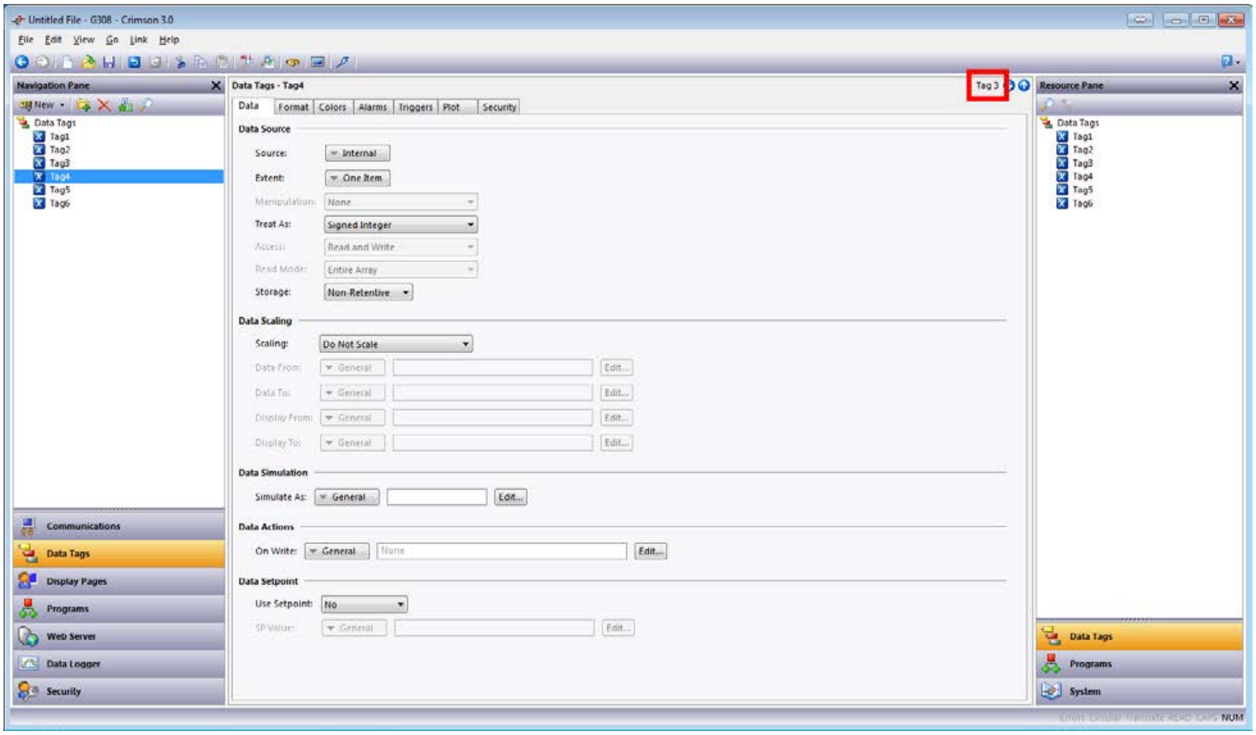
WEB Date modified: 9/28/2015 12:22 PM
File folder

Creating a Web Page and Accessing Data

When a web browser accesses the custom web site, the first page it will load will be “default.htm”. Therefore, the welcome page or main page of the custom web site must be named “default.htm” and created in the WEB folder. You can then generate or create pages under any HTML or web page editor such as Front Page, Mozilla or Notepad. In this tutorial, the html code will be displayed as shown in Notepad. The sample code below is a very basic “default.htm” that will display a sentence and the value of the tag with index 0. Code comments are displayed in green. As shown in the code, the index is entered in the form [[x]] where x is the tag’s index number. The Web Server will then replace this code with the value of the corresponding tag. Moreover, this value will be formatted as per the tag format in Crimson 3.0. A flag will therefore show the on or off text and decimal points will be displayed.

```
<html>
<!-- Head information for the page including page title -->
 <head>
  <title>My first page</title> <!-- Your page title -->
 </head>
 <body color=#FFFFFF> <!-- Start of your page body -->
 <!-- This code displays the current tag value for index 0
 [[0]] will be replaced by the tag value a the time the page is loaded -->
 The value of the tag with index 0 is [[0]].
 </body> <!-- End of your page body -->
</html>
```

The tag index number is defined by Crimson and is shown in the upper-right corner of the Editing Pane. The index displayed corresponds to the tag selected in the tree. In this sample Tag4 has index 3.



Data Tags - Tag4

Data | Format | Colors | Alarms | Triggers | Plot | Security

Data Source

Source: Internal
Extent: One Item
Manipulation: None
Treat As: Signed Integer
Access: Read and Write
Read Mode: Entire Array
Storage: Non-Retentive

Data Scaling

Scaling: Do Not Scale
Data From: General Edit...
Data To: General Edit...
Display From: General Edit...
Display To: General Edit...

Data Simulation

Simulate As: General Edit...

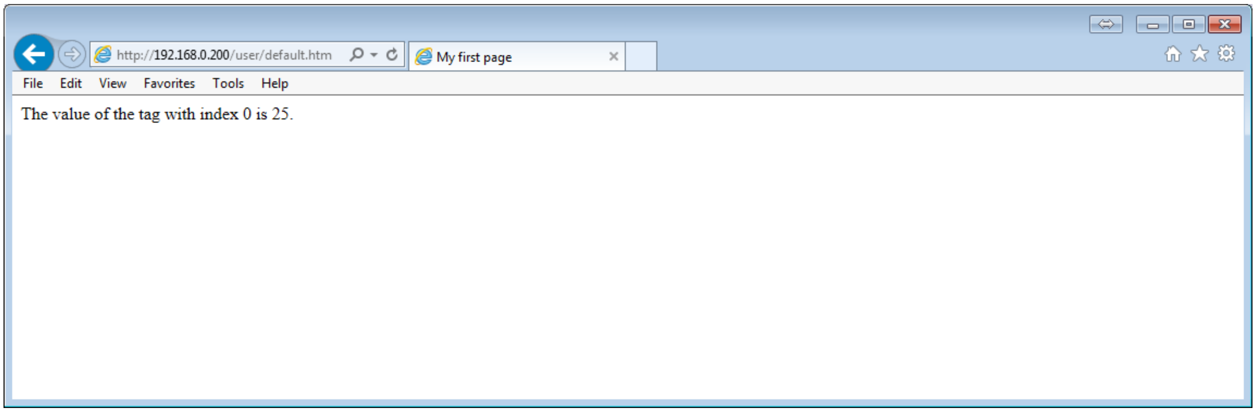
Data Actions

On Write: General None Edit...

Data Setpoint

Use Setpoint: No
SP Value: General Edit...

The resulting custom web page accessed from Windows Internet Explorer is displayed.

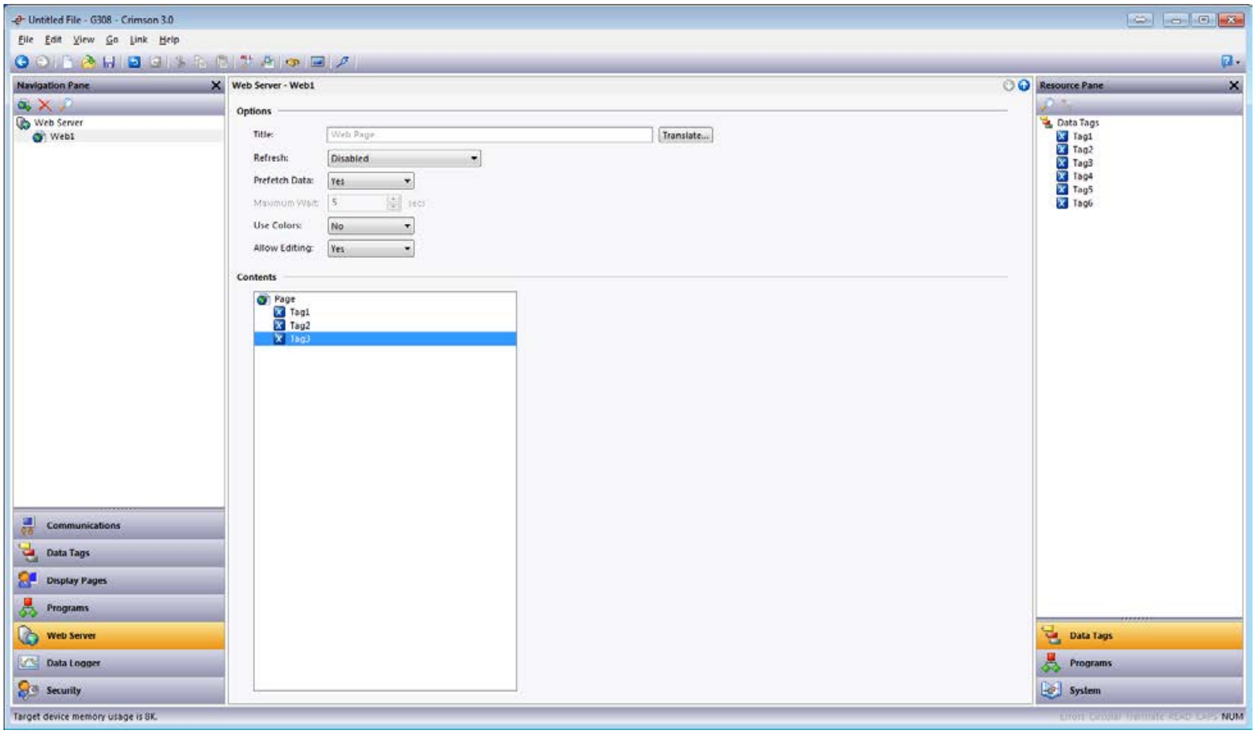


The value of the tag with index 0 is 25.

Note: In order to display array data, add a colon followed by the element within the double square brackets: [[3:45]]. This will display element 45 of an array whose tag index is 3.

Changing Data from a Custom Web Page

This section is a bit more complicated for those who do not know HTML and also implies some Crimson 3.0 set up for security reasons. Crimson also offers an easier way to give data access by using Web Pages created from the Web server module as shown. Each page can display a set of tags and edit them if Allow Editing is set to *Yes.*



Options

Title: Web Page

Refresh: Disabled

Prefetch Data: Yes

Maximum Wait: 5 secs

Use Colors: No

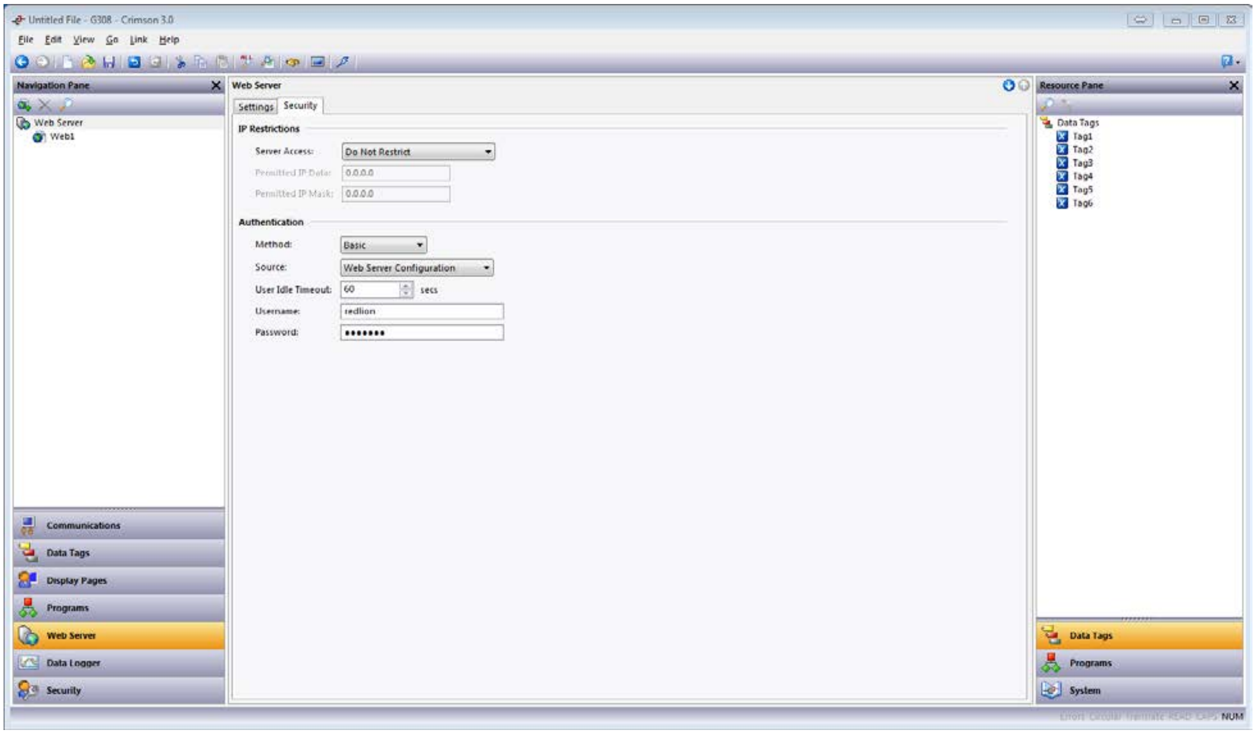
Allow Editing: Yes

Contents

Page
- Tag1
- Tag2
- Tag3

Setting up Crimson to accept data from custom web pages.

Crimson needs to be set up to accept data coming from the custom web site. It is advised that the security is activated on the web server as shown.



Web Server

Settings | Security

IP Restrictions

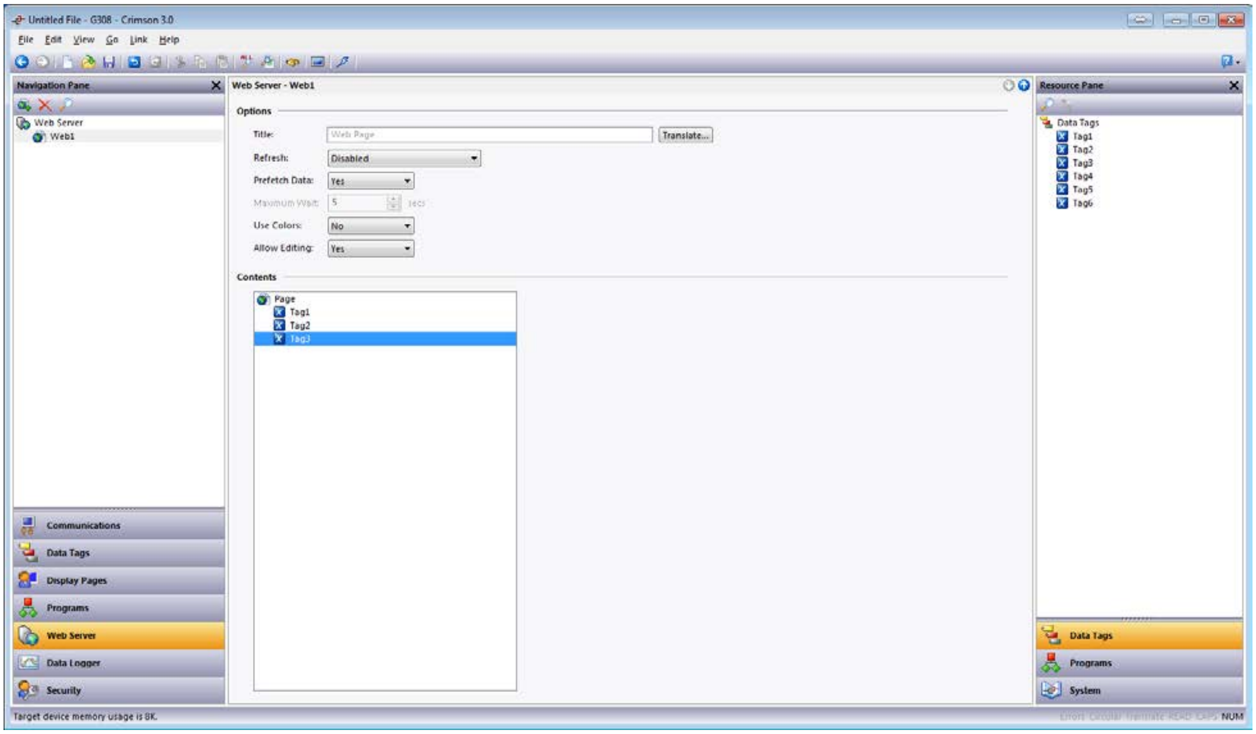
Server Access: Do Not Restrict
Permitted IP Data: 0.0.0.0
Permitted IP Mask: 0.0.0.0

Authentication

Method: Basic
Source: Web Server Configuration
User Idle Timeout: 60 secs
Username: redlion
Password: •••••••

Note: Security can be achieved from the Web Server configuration, as shown in the figure above, or from the Security Manager. If the Security Manager is used, one of the users has to possess the Web Server permissions.

Next, create a data web page from the Web Server Main tab and insert the variables that should be editable in the custom pages. Change Allow Editing to *Yes* as shown.



Web Server - Web1

Options

Title: Web Page [Translate...]
Refresh: Disabled
Prefetch Data: Yes
Maximum Wait: 5 secs
Use Colors: No
Allow Editing: Yes

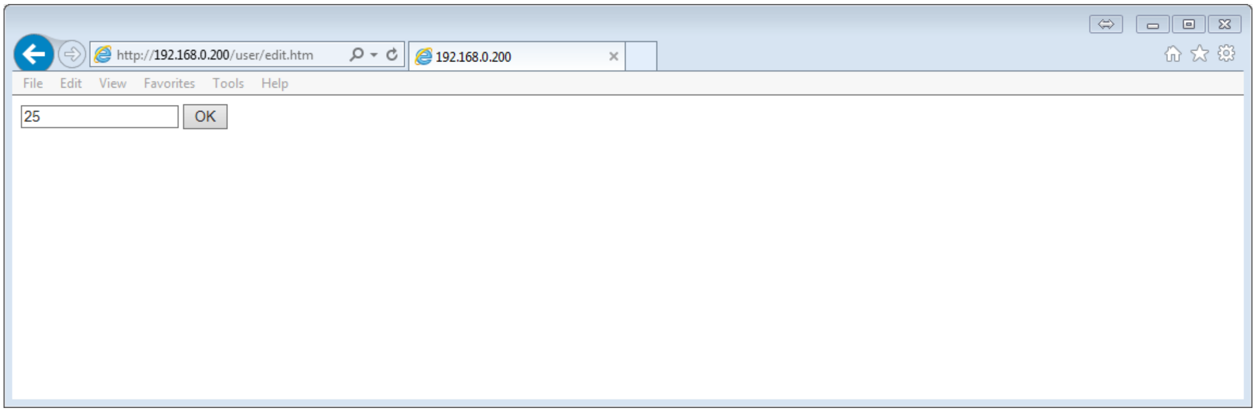
Contents

Page
Tag1
Tag2
Tag3

Target device memory usage is 8K.

Writing the HTML code.

Data entry is performed using an HTML form and a postscript to transfer the information to the G3. A form is a single or a group of data entry fields in an html page as shown. Upon entry, the web browser will send the data to the Red Lion unit using the POST function. The unit will reply with a confirmation page for success or failure. To disable this confirmation page, please see the section "Required information by the unit" below.



Single data entry

A data entry form as shown above uses the following HTML code.

Numeric Tags

```
<FORM name=form1 method=post action=script autocomplete=off>
  <INPUT type=text name=data value=0> <!-- Data Entry field -->
  <INPUT type=submit name=submit value=OK> <!-- Button OK -->
</FORM>
```

String Tags

```
<FORM name=form1 method=post action=script autocomplete=off>
  <INPUT type=text name=data maxlength=8 value=0> <!-- Data Entry field -->
  <INPUT type=submit name=submit value=OK> <!-- Button OK -->
</FORM>
```

Form Parameters

Values in red are the parameters changed to target the different information:

- **form1** – Form name, usually different for each form on a single html page
- **script** – The script to launch when the OK button is pressed
- **data** – the html tag the data entry is referencing
- **0** – The default value to display in the data entry field.

Values in blue are the extra parameters required for ASCII string data entry:

- **maxlength** – Maximum number of characters. It should be identical to the number defined in the targeted tag format in Crimson 3.

Information Required by the Unit

In the case of the Red Lion Unit, the script transferring data from the web page to the HMI is "write-tags" and is located in "**/scripts/write-tags**" in the unit server. In order to transfer the correct information, extra fields are required in the form but will be hidden to the user.

The following extra information has to be sent to the script using html INPUT tags:

- Parameter tagX – defines a tag name for the index given in value. Here Tag1 for index 0.
  <INPUT type=hidden name=tag1 value=0>

- Parameter posX – defines an element if the index given is an array, zero otherwise. This was added to Crimson 3.0 in build 515.002. It is required when dealing with arrays, when dealing with single element tags, it may be omitted (if using a build newer than 662.002) when dealing with an Extent of *One Item*.
  <INPUT type=hidden name=pos1 value=0>

- Parameter back – defines the page the script redirects you to after the data entry. Here default.htm.
  <INPUT type=hidden name=back value=/user/default.htm>

- Parameter page – to be left with default value 1
  <INPUT type=hidden name=page value=1>

- Optional parameter silent – removes confirmation page and replies HTTP 204 “No Content” for a non-zero value. Here no confirmation page will be sent. The parameter default is 0.
  <INPUT type=hidden name=silent value=1>

A complete form to send the value of one tag (not an ASCII string) will thus be as follows. Here changing the tag with index 0 and confirmation page active:

```
<FORM name=form1 method=post action=/scripts/write-tags autocomplete=off>
  <INPUT type=hidden name=tag1 value=0> <input type=hidden name=pos1 value=0> <!-- Define tag index 0, element 0 -->
  <INPUT type=hidden name=back value=/user/default.htm>
  <INPUT type=hidden name=page value=1>
  <INPUT type=text name=data1 value=[[0]]> <!-- Data Entry field -->
  <INPUT type=submit name=submit value=OK>
</FORM>
```

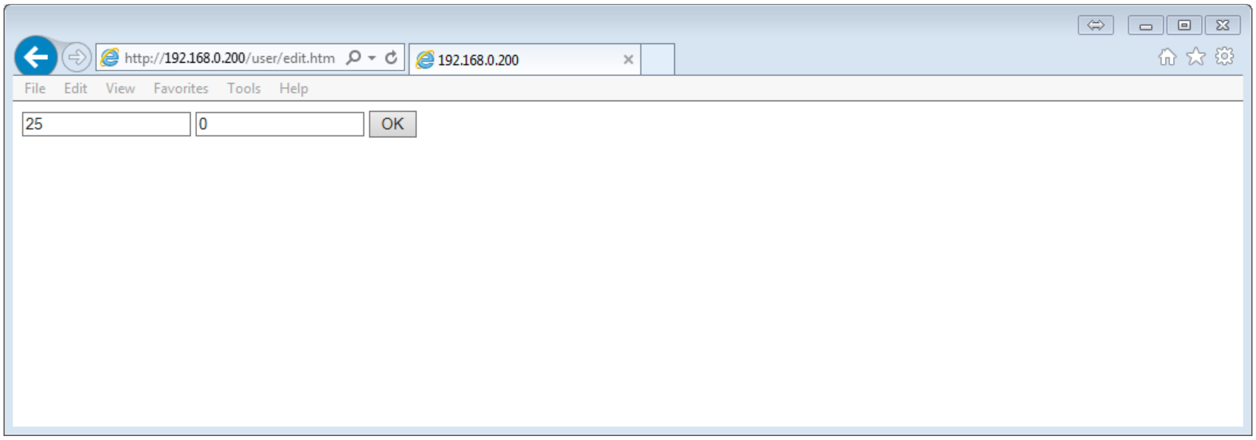
If the form is designed for only one data entry item, each form can use the couple tag1, data1 to reference the variable.

> **Note:** These tag names have no relation with Crimson tag names and are used by the postscript only. Their name cannot be changed, only the number at the end, for example tag2, data2.

See Appendix A for the complete formatted html code to send two individual tags to a G3.

Multiple Data Entry Simultaneously

In the case the user wishes to enter multiple tags at once, the form has to be modified to accept multiple data. A form including two tags is shown.



Note: Clicking on OK in this form will send both values simultaneously to the postscript. For this reason, it is advised to display the current value in the field so clicking OK does not change it.

To access multiple tags in a form, the following three html INPUT tags have to be inserted for each new tag included in the form, one hidden to define the tag index, one hidden to define the tag element, and one for the data entry field.

```
<INPUT type=hidden name=tag1 value=0>
<INPUT type=hidden name=pos1 value=0>
<INPUT type=text name=data1 value=[[0]]>
```

The names tag1 and data1 represent a couple. If multiple tags entries are required within a form, the second tag entry will use a hidden input tag2 and a data entry name data2. A third one would use tag3, data3 and so on…

The form code for two tags would look like this:

```
<FORM name=form1 method=post action=/scripts/write-tags autocomplete=off>
 <INPUT type=hidden name=tag1 value=0> <input type=hidden name=pos1 value=0>  <!-- Define tag index 0 -->
 <INPUT type=hidden name=tag2 value=1> <input type=hidden name=pos2 value=0>  <!-- Define tag index 1 -->
 <INPUT type=hidden name=back value=/user/default.htm>
 <INPUT type=hidden name=page value=1>
 <INPUT type=text name=data1 value=[[0]]> <!-- Data Entry field for 0 -->
 <INPUT type=text name=data2 value=[[1]]> <!-- Data Entry field for 1-->
 <INPUT type=submit name=submit value=OK>
</FORM>
```

Note: These tag names have no relation with Crimson tag names and are used by the postscript only. Their name cannot be changed, only the number at the end, for example tag2, data2.

See Appendix B for the complete formatted html code to send multiple tags to a G3.

APPENDIX A

The following code includes html format tags. Comments are in green. Copy/Pasting this code in an empty default.htm will work as long as Crimson's web server is set up correctly.

```
<html>
   <head>
   <title>Custom Edit</title>
   </head>
   <body color=#FFFFFF>
<!-- Text on top of the page -->
   <p><font face=tahoma size=4 color=#FF0000>
   <b>Custom Web Site: A page where data tags value can be changed   </b>
   </font></p>
<!—INDEX 0 -->
   <font face=tahoma size="2">
   <b>Tag with Index 0 in Crimson 2.0 Data Tags.</b><br><br>
<!-- Display the current value for index 0 -->
 Current Value:&nbsp; [[0]]
   </font>
<!-- Form to enter the value for index 0 and submit to the HMI -->
   <form name=form1 method=post action=/scripts/write-tags autocomplete=off>
   <font face=tahoma size="2">
   <input type=hidden name=tag1 value=0> <input type=hidden name=pos1 value=0>
   <input type=hidden name=back value=/user/default.htm>
   <input type=hidden name=page value=1>
 New Value:&nbsp;
   <input type=text name=data1 value="[[0]]" style="font-face: tahoma;
font-size: 12">
   <input type=submit name=submit value=&nbsp;OK&nbsp; style="font-face:
tahoma; font-size: 12">
   </font>
</form>
<br>
<!-- INDEX 1-->
<font face=tahoma size="2">
<b>Tag with Index 1 in Crimson 2.0 Data Tags.</b><br><br>
<!-- Display the current value for index 1 -->
Current Value:&nbsp; [[1]]
</font>
<!-- Form to enter the value for index 1 and submit to the HMI -->
<form name=form2 method=post action=/scripts/write-tags autocomplete=off>
   <font face=tahoma size="2">
   <input type=hidden name=tag1 value=1> <input type=hidden name=pos1 value=0>
   <input type=hidden name=back value=/user/default.htm>
   <input type=hidden name=page value=1>
 New Value:&nbsp;
   <input type=text name=data1 value="[[1]]" style="font-face: tahoma;
font-size: 12">
   <input type=submit name=submit value=&nbsp;OK&nbsp; style="font-face:
tahoma; font-size: 12">
   </font>
</form>
<br>
<!-- Link to go back to web server home page -->
<font face=tahoma size="2">
<a href="/">Web Server Home</a><br>
</font>
<p><font face=tahoma size=1>© 1993-2006   <a href=http://www.redlion.net>Red
Lion Controls</a></font></p>
</body>
</html>
```

APPENDIX B

The following code includes html format tags. Comments are in green.

Copy/Pasting this code in an empty default.htm will work as long as Crimson’s web server is set up correctly.

```
<html>
  <head>
  <title>Custom Edit</title>
  </head>
  <body color=#FFFFFF>
<!-- Text on top of the page -->
  <p><font face=tahoma size=4 color=#FF0000><b>
Custom Web Site: A page where data tags value can be changed in groups
  </b></font></p>
<!-- This code displays the current tags values for indexes 0 and 1 -->
  <font face=tahoma size="2">
  <b>Change a group of tags.</b>
  <br><br>
 Current Value:&nbsp; [[0]],&nbsp;[[1]]
  </font>
<!-- Form to enter the value for index 0 and 1 and submit to the HMI -->
  <form name=form1 method=post action=/scripts/write-tags autocomplete=off>
  <font face=tahoma size="2">
  <input type=hidden name=tag1 value=0> <input type=hidden name=pos1 value=0>
  <input type=hidden name=tag2 value=1> <input type=hidden name=pos2 value=0>
  <input type=hidden name=back value=/user/default.htm>
  <input type=hidden name=page value=1>
 Tag with index 0:   <input type=text name=data1 value="[[0]]" size=4
style="font-face: tahoma; font-size: 12"><br>
 Tag with index 1:   <input type=text name=data2 value="[[1]]" size=4
style="font-face: tahoma; font-size: 12"><br>
  <br>
  <input type=submit name=submit value=&nbsp;Valid&nbsp; style="fontface:
tahoma; font-size: 12">
  </font>
  </form>
  <br>
<!-- Link to go back to web server home page -->
  <font face=tahoma size="2">
  <a href="/">Web Server Home</a><br>
  </font>
  <p><font face=tahoma size=1>© 1993-2006   <a href=http://www.redlion.net>Red
Lion Controls</a></font></p>
  </body>
</html>
```

Red Lion Technical Support

If you have any questions or trouble contact Red Lion Technical Support by emailing support@redlion.net or calling 1-877-432-9908.