NewTek DataLink™

INSTALLATION GUIDE AND REFERENCE MANUAL

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2 INTRODUCTION

DataLink™ provides users of NewTek's TriCaster™ and VT[5]™ live video production systems the ability to display dynamically updated external data from a variety of sources.

Supported data sources include several third-party sports scoreboard systems, plus two common file types – standard ASCII text files and SQL database files.

If you intend to use DataLink to connect to a supported external scoreboard controller, pay special attention to all portions of this manual featuring this large 'scoreboard icon'.

2.1 OVERVIEW

With DataLink installed, special 'key name' entries (typed into your Title Templates, in the same way you normally enter static text) are updated 'on the fly' when displayed. The text actually displayed is drawn from the external data source, but retains its original formatting.

You could think of "DataLink" this way: the "Data" portion refers to external information (data) expressed as a 'key-value pair'.

The data in thus formatted as follows:

(key name) = (value assigned)

Here's a typical key-value pair:

current temp = 75° F

The "Link" part of the "DataLink" reflects the fact that the plugin links data from the key-value pairs with matching key entries in your Text Templates. To provide dynamic updates in this manner, DataLink operates quietly in the background, patiently monitoring external sources for changes.

Three special DataLink components monitor specific external sources. These are the *Scoreboard Linker, TXT Linker*, and *Database Linker*.

2.1.1 SCOREBOARD LINKER

This Linker receives data from an external hardware scoreboard controller such as a Daktronics™ system. The external system provides information to DataLink by a physical COM port connection. (Section 3.2, Connecting External Devices, explains how to connect these devices so they can communicate with DataLink.)

DataLink supports popular external devices from several different manufacturers. The Scoreboard Linker monitors the incoming data stream, and assigns specific values to unique DataLink key names. These values are then substituted for those key name entries in your title templates. These special key names are listed by brand in Section 4.1.

> *Note: As the data supplied by various external systems differs, DataLink uses unique key names for each supported brand. As well, this arrangement permits devices from two (or more) manufacturers to be connected simultaneously without conflict.*

2.1.2 TXT AND DATABASE LINKERS

These two Linkers each keep an eye on their namesake file types, refreshing the display as required. Prepared in advance, data files can serve many handy and creative purposes.

> *Note: TXT Linker monitors files (.txt) you place in the folder C:\TriCaster\Stats Plugins\Text Input.*

For example, a simple ASCII text file (.txt) containing a list of names (prepared as key-value pairs) could be used to automatically update a credits slate, or perhaps to populate the name fields in a series of individual lower thirds used in a weekly production (Section 4.2 explains the details of this example).

The **TXT Linker** continuously watches for changes in the values assigned to keys. If a value changes in the file, the display is immediately updated. Thus, third-party programs may be designed for various applications that continuously update the onscreen text display by changing values assigned to keys in the file.

The **Database Linker** provides even more powerful possibilities. It allows the use of supported MySQL database functions to derive replacement values for DataLink keys on the title page – even accessing the data across a network! (More on this feature can be found in Chapter 4, Using DataLink.)

3 GETTING STARTED

This chapter lists system prerequisites, outlines DataLink™ installation and registration, and explains how to establish a connection between the DataLink host system and external devices.

3.1 SYSTEM REQUIREMENTS

DataLink requires (as a minimum):

- A NewTek TriCaster system running TriCaster 2.0 or higher software,

  Or …

- A NewTek VT[5] system (version 5.2 or higher)

3.2 CONNECTING EXTERNAL DEVICES

THE STEPS IN THIS SECTION ARE MANDATORY IF YOUR DATALINK INSTALLATION REQUIRES DATA FROM AN EXTERNAL DEVICE (SUCH AS A DAKTRONICS™ OR COMPARABLE SCOREBOARD SYSTEM).

Naturally, to communicate with an external data source, that equipment must be connected to the DataLink host system and powered up. As well, DataLink must be configured to find the connection.

3.2.1 USB-SERIAL ADAPTERS

The diversity of supported external systems, cable connectors, and available ports on the host system means this connection may require an adapter.

Newer external devices may use USB connections, but others use older RS-232 (25-pin) connectors, or occasionally (slightly more recent) 9-pin style connectors.

Unless the external system is supplied with a USB connection, a USB-Serial adapter is required to connect it to a TriCaster (and some VT[5] systems with newer motherboards as well).

To connect using a USB-Serial adapter, follow these steps:

1. (TriCaster only) – power up your TriCaster

2. (TriCaster only) – if the Live Production desktop is showing, click the **Close** [x] button in its upper-right corner, then click **Admin** to access the Windows™ desktop

3. Connect the scoreboard controller's output cable connector to the USB-Serial adapter

    a. Plug the adapter into the Datalink host system

    b. Install drivers for your USB-Serial adapter on the Datalink host system. Drivers for the adapter are generally supplied on a Compact Disk (CD) packaged with the adapter by the manufacturer. Unless these drivers are correctly installed, DataLink cannot receive data from the external controller.

Several methods are available to transfer and install the drivers on a TriCaster system. You may either:

1. Connect an external CD disk drive to the TriCaster by USB cable, or …

2. Copy the driver installer from the driver CD to a USB thumb drive, plug that drive into the TriCaster, or …

3. Copy the driver installer program to the TriCaster across a network from another computer that sports a CD disk reader

Then install the drivers, carefully following the instructions provided by the manufacturer of the adapter you purchased.

3.2.2 FIND THE COM PORT

The next step involves determining which COM port Windows has assigned to the new connection. This information is required to configure Datalink.

4. Right-click the **My Computer** icon on the Windows™ desktop, and select **Manage** from the menu to open the **Computer Management** panel

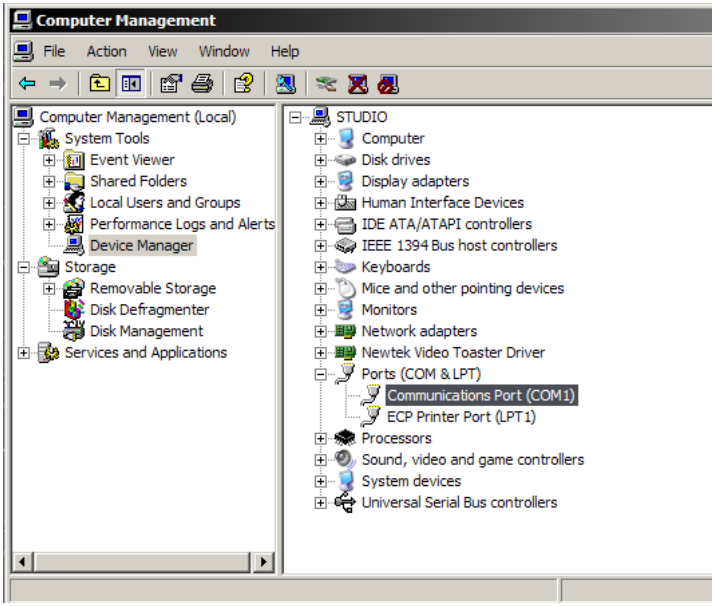

Figure 1 - Device Manager

5. Open the **Device Manager** (Figure 1) by clicking that entry in the left-hand pane of this window

6. Click the + sign next to **Ports (COM and LPT)** in the right-hand pane to disclose available communication ports

7. Locate the entry for your scoreboard controller - note which COM port number is assigned to it (such as COM 1 or COM2)

   Note - you should see your new connection listed, as in Figure 1. If it doesn't appear at first, try removing and re-inserting the USB cable connector – or you can use the "Scan for hardware changes" item in the Device Manager's Action menu.

*(If it does appear, but shows a **!** icon next to the entry, this may indicate a problem with the USB connection or your adapter driver installation – try re-installing the adapter driver, following the directions supplied with it.)*

8. Close the Device Manager.

Again, this port number is needed to configure DataLink to recognize the external device (and use the data it supplies). Let's continue to install and configure the DataLink plugin.)

3.3 INSTALL DATALINK™

THE STEPS IN THIS SECTION ARE MANDATORY FOR ALL DATALINK INSTALLATIONS.

DataLink is delivered on a special USB thumb drive. To install the software, insert the DataLink thumb drive into a free USB port (such as one of those found on the front panel of a TriCaster).

1. (TriCaster only) - If necessary, click the **Close** button (the [x] gadget in the upper-right corner of the TriCaster window) and then click **Admin** in the **Shut Down** dialogue that pops up, to access the Windows™ desktop.

2. Double-click the **My Computer** icon to open a **File Explorer** window, and locate the **DataLink Install** disk icon. Double-click this icon (to show the files on the disk), and then double-click the ***DataLink*** icon shown to launch the installer.

3. The DataLink installer will now present a dialog (Figure 2) to ask you to accept the **End User License Agreement**. Please read the EULA

and, if you agree with its terms, click the switch indicating that you accept these and wish to proceed with the installation.

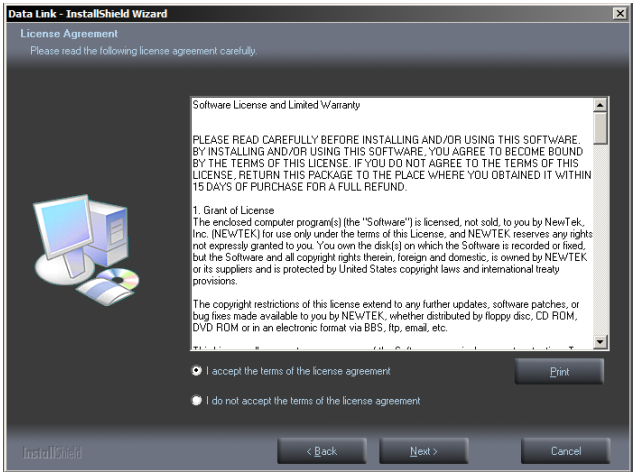

Figure 2 - EULA Dialog

4. After a few moments, the **Registration** panel pops up (Figure 3), showing the unique **Product ID** code for your installation.

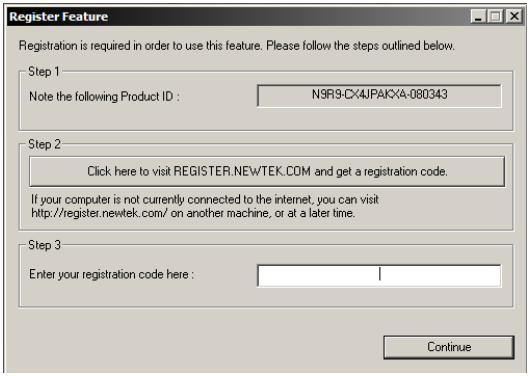

Figure 3 – Registration

5. If your DataLink host system is connected to the Internet, clicking the large button labeled “Step 2” will take you directly to NewTek’s website to complete the registration process.

   (Otherwise, mark down the characters comprising the Product ID, and use another computer that has an Internet connection to visit http://register.newtek.com. Follow the steps as presented on the site to obtain your DataLink registration code, and enter it in the text field provided for it in the Registration dialog.)

The Completion dialog will appear (Figure 4).

Note: If you do not obtain and enter the code, the installation will abort and you will need to re-install again at another time.

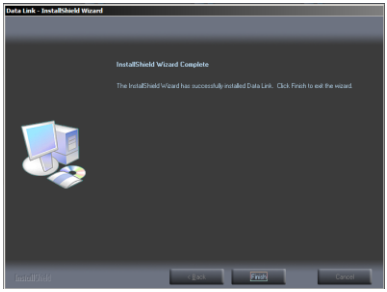

Figure 4

This completes the software portion of your DataLink installation. If you wish to use DataLink with an external hardware data source (such as a Daktronics™ game clock system) you should have already completed the steps in Section 3.2 – and you should now proceed to Section 3.4, Configure DataLink. Otherwise (for text or database file support *only*), you can jump right to Chapter 4, Using DataLink.

> *Hint: verify your DataLink installation by checking the About box in TriCaster or VT[5] for the notation "DataLink Installed". (If it's not there, please re-install).*

3.4 CONFIGURE DATALINK

THE STEPS IN THIS SECTION ARE MANDATORY IF YOUR DATALINK INSTALLATION REQUIRES DATA FROM AN EXTERNAL DEVICE (SUCH AS A DAKTRONICS™ OR COMPARABLE SCOREBOARD SYSTEM).

Assuming you followed the steps listed in Section 3.2 (Connecting External Devices), there's one more thing to do before DataLink can communicate with an external device. You need to tell DataLink which COM Port(s) it should 'listen' to.

1. (TriCaster only) - Click the Windows Start menu, and go to Programs. Select **Programs>TriCaster>DataLink>Configure Scoreboard** (this will open the file *Scoreboard.ini* in a text editor, allowing you to modify it)

2. (VT[5] only) – Click the Windows Start menu, and go Programs. Select **Programs>NewTek>VT[5]>DataLink>Configure Scoreboard** (this will open the file *Scoreboard.ini* in a text editor, allowing you to modify it)

3. Locate the section (of the .ini file) appropriate for the brand of scoreboard controller connected

   Note: DataLink currently supports 4 different brands of external devices, namely Daktronics™, Whiteway™, DSI™, and OES™.

4. Change the value for **Port** in the connected device brand's section to correspond to the Port number you noted earlier in Section 3.2.2 (enter Port=1 if the device was found at COM1, and so on)

5. Change the value for **Enabled** in the appropriate brand's section to 1 (from 0)

   For any and all brands of controller that are not connected, Enabled should be set to 0 (so the relevant entry in their sections would be Enabled=0).

   Note that it is possible to connect more than one controller brand simultaneously. In this instance, enter Enabled=1 and the corresponding Port number for each connected controller's in the Scoreboard.ini file.

6. Save the Scorbeoard.ini file, and Exit the text editor.

***Important Note**: In some environments, Windows may arbitrarily reassign the external device to a different COM port following a reboot.*

If this happens, you could simply update COM port entry in the .ini file. However, you may prefer instead to lock the connected device to a specific COM port, using the Windows Device Manager.

> *To do this, please locate the current port entry for your scoreboard controller. Right-click the entry name, and select Properties in the drop-down menu.*
>
> *Next, click the Port Settings tab at the top of the Properties panel, and click the button labeled "Advanced". Use the Com Port Number drop-down menu to choose an unused port number, and click the OK button. OK the Properties panel too, then close the Device Manager. The Port Number you assigned should now be retained on subsequent reboots.*

At this point, TriCaster or VT is ready to utilize the scoreboard controller.

4 USING DATALINK

In this chapter we'll get into the finer details of using DataLink effectively and creatively in your live productions.

We'll consider the functionality provided by each of the three "Linkers" – the TXT Linker, Database Linker and Scoreboard Linker. We'll also explain how to add DataLink "keys" to your text page creations, and how these may be used in various ways.

The quickest way to become familiar with DataLink is to 'dive right in' and try it out.

4.1 SCOREBOARD LINKER

This DataLink component receives data from an external scoreboard hardware controller, such as a Daktronics™ unit.

We explained how to connect these external devices to the DataLink host system in Section 3.2, Connecting External Devices. If you have made that connection successfully and have a supported device connected, let's continue now to see how the information transmitted by the external device is accessed in your live production system.

Figure 5

4.1.1 A SIMPLE EXAMPLE

1. Launch your VT[5] or TriCaster, and add the Title Template named “Sports-Lower Thirds 1” to the Templates list – click its icon in the bin to activate it in the preview/edit pane.

   Title Templates contain text fields that you can edit to suit your needs. When you move your mouse over an editable field, a thin marquee is shown to indicate that you can modify that entry.

2. Move the mouse over the number “55” next to the “Burger Boys” team name – notice the marquee that appears.

3. Click inside this marquee, and a text entry popup will appear. (Initially, it will contain “55”, the default entry).
   You can type anything you like into this popup, but of course for DataLink provides special abilities for specific entries.

   As mentioned earlier, if you enter a “key” name here that is supported by your external device, when you subsequently display this title page in your live production the key entry will be updated with the actual value associated with it.

The value we want to appear for our example is the home team score.

4. Check the table of key names in Section 5, and make a note of the key name for “Home Team Score” for your scoreboard system.

For our example, we’ll assume you have a Daktronics™ unit – the key name we want is listed as %DakHomeScore%. You should use the correct value for your brand of device, of course.

Figure 6

5. Type %DakHomeScore% into the popup, replacing “55”. Don’t worry if the key name doesn’t seem to fit properly – the actual value should fit nicely in the space provided when displayed

6. Press Enter on the keyboard to end text entry, closing the popup

Figure 7

Notice that the name entry is replaced by [DL] in the preview (Figure 7). This indicates DataLink recognizes the name you entered as a valid DataLink key (if this doesn't happen, check your typing for errors).

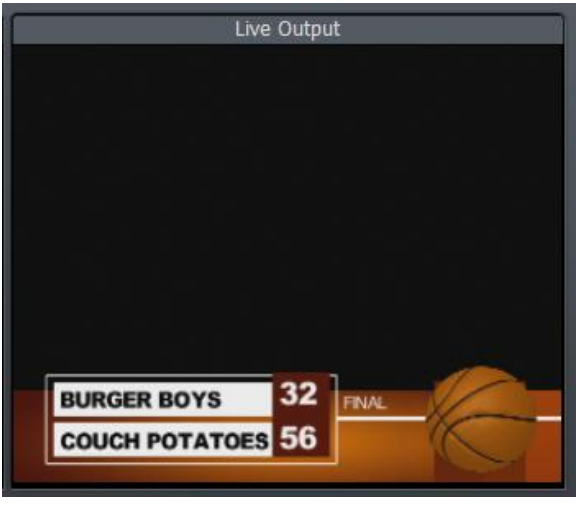

Figure 8

Now, whenever you have this template displayed in your live production system (and assuming the scoreboard is connected and running), the home team score will be automatically updated with the true value.

4.1.2 NEXT STEPS

Of course, you can use any combination of the available key names available for your external device in title pages of your own creation, too.

To do so, use TriCaster Edit Text or VT[5] CG Designer to create the graphics and key name entries. Then use the Export to Live feature provided in those modules to add your new template to the list available for live production use. See the manuals provided with your NewTek live production system for information on using their respective title creation tools.

4.2 TXT LINKER

As discussed back in Section 2.1, DataLink (installed on your TriCaster or VT) monitors suitable ASCII text files, pulling data from the (.txt) files you place in the folder *C:\TriCaster\Stats Plugins\Text Input* text file (note, for VT, use *C:\Program Files\NewTek\VT5\Stats Plugins\Text Input)*.

To supply usable values for DataLink, the text file should contain nothing other than *key-value pairs*, arranged in the following format:

[key] = [value]

The [key] entry should be a short string which will be entered into your TriCaster Title Templates. The [value] field supplies the actual title that will be displayed for that key.

Note: Both keys and values may contain punctuation and spaces.

Here's a little example:

1. Launch a text editor (such as Notepad®, Windows' default text program. You may exit the TriCaster to the **Admin** screen and run Notepad from the Windows Start menu to do this, or transfer a prepared .txt file from another system).

2. Enter the key-value pairs below on separate lines in the file, just as they appear here:

   city name = San Antonio
   temp = 89°F
   wind = W 20mph
   humidity = 63%
   pressure = 22

   Hint: to type the degrees sign (°) –> keep the ALT key pressed while using the keyboard number pad to type 017 6 … then release ALT (standard notation for this combination is ALT+0176).

3. Save the file (perhaps naming it *local conditions.txt*) to *C:\TriCaster\Stats Plugins\Text Input.*

4. Launch the TriCaster, and click the **Text** tab on the **Live Production** screen.

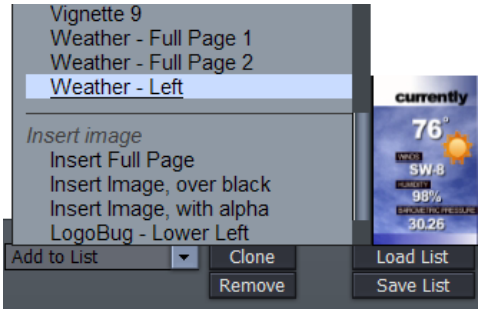

Figure 9- Add to List

5. Use the **Add to List** drop-down to add the template named **Weather – Left** to the Text playlist (Figure 9).

6. Click the thumbnail icon to display the template in the Text Preview pane at left.

7. Move your mouse over the word "**currently**" in the **Text Preview** pane, and click inside the bounding box that appears, activating this text field for modification (Figure 10).

Figure 10

8. Replace "currently" with **%city name%** (Figure 11), and press the **Enter** key to confirm the change.

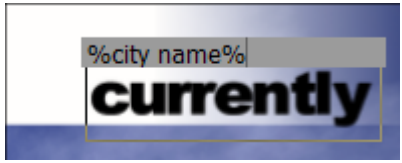

Figure 11

*Note that - after you press Enter - the **Text Preview** updates to show the letters **[DL]** where key names have been entered (Figure 12).*

Figure 12

9. Click on the temperature text ("76") and change it to **%temp%**

Note: don't be alarmed if the key name you enter seems too long. When DataLink replaces the key with an actual value, it will fit just fine.

Hint: For this reason, when creating custom templates for DataLink use, it's a good idea to initially place and format text lines using temporary 'stand-in' values. When everything looks just right, replace the stand-in values with key names surrounded by % signs (these % signs tell DataLink that the enclosed entry is a key name, and that it should be replaced with the true value on display).

10. Delete the little degree sign (°) from the page.

11. Continue replacing text with key names until your page looks like Figure 13.

12. Now, click the **TXT** button in the **Overlay** area to assign the custom weather template to it, and click the (Overlay section) **Take** button to view the result (Figure 14).

Figure 13

Figure 14 - DataLink values displayed

See how DataLink replaces the key names in the template with value data drawn from the file?

*Actually, if you still had Notepad® open with the text file open in it -- you could change the data displayed on the screen instantly by modifying a value next to a key, and then pressing **Ctrl+s** to save the modified file.*

Let's briefly consider a more elaborate example using the **TXT Linker:**

Suppose you regularly produce a half-time show featuring interviews with 8 to 10 different guests. You *could* create a CG project with 10 pages, and manually modify each page before every episode.

Or, you could prepare the pages *once*, and let DataLink update them all for you automatically every time! To do that, you could proceed as follows:

1. Go to the **Edit Text** (or **CG Designer** for VT users) and select a nice-looking lower third template using the **Add Page** menu ... or make your own if you prefer.

2. Where the guest's name should appear, enter a DataLink key: %guest1%

3. Clone the page as many times as necessary

4. Click the *second* thumbnail (no need to edit the first one) in the **Pages** column at right to select it for modification, and click the **T** button (to activate text entry).

5. Click in the DataLink key field on the **Work Area**, and replace %guest1% with %guest2%

6. Click the next page, and change the key name to %guest3%, and so-on until all done.

7. Select **Export Project for Live** in the **Project** area (above the Pages column) – note that export may take a few moments.

8. Leave **Edit Text** (or CG Designer), and go to TriCaster's **Live Production** panel (or VT[5]'s **Text Template** module).

9. Using **Add to List** (Add to Titles, VT[5]), locate the series of pages you just exported and add them (in order) to the list.

10. Use **Save List** to save a Template **playlist** containing this set of Text Templates as *guest-slates.vto* (so you can reload these pages en masse in seconds whenever you like).

11. Finally, prepare a simple text file similar to this one:

    guest1 = Bill E. Bob
    guest2 = Sam Houston
    guest3 = Dorothy Lamour
    … etc.

12. Save the file as *guests.txt*, and drop it into C:TriCaster\Stats Plugins\Text Input.

That's all you need to do. Before each episode, your production assistant can take a few moments to update the *guest.txt* file content, and the work is done!

Afterward, simply load *guest-slates.vto* into the **Title Templates** panel and each successive page automatically displays the correct name in sequence when displayed (whether as an Overlay/DSK or Switcher source).

4.3 DATABASE LINKER

This component also monitors an external file for keys (and changes to their corresponding values), but in this case it can access a more complex and powerful file structure -- the database.

The feature allows users to take advantage of supported MySQL database query functions to derive replacement values for the keys on the text page.

> *Hint: If you plan to use this feature, you (or someone in your employ) will need a measure of familiarity with database queries.*

In this case, DataLink monitors the folder *Database Input*, located inside the Stats Plugins folder mentioned earlier. However -- the database file itself doesn't need to be located in this folder. Rather, a special .xml type file goes here; in turn, the XML file content provides the information that DataLink needs in order to access the external database values. Here's a sample xml file:

```
<!—
        Example connection string and query for DataLink
using MySQL.
        This produces the keys %book.1%, %book.2%... etc
-->

<sql_databases>

    <database connection_string = "Driver={MySQL ODBC
3.51 Driver}; Server=localhost;
user=root;password=my_password; database=book_table">

        <query>
            command = "SELECT title FROM Books;"
            key = "book"
            timeout = "10000"
            multiple_keys = "true"
        </query>

    </database>

</sql_databases>
```

Replacing the Server, user, password, etc. values with the correct ones for your environment permits the Database Linker to supply values to

DataLink keys as described in the commented lines (an array in the format book.1, book.2, and so on).

With respect to the line that states timeout = “10000” in the xml file, this tells DataLink to how often (in milliseconds) to update its values from the database. Lower values result a faster refresh rate. Rates that are overly high are undesirable as the data may not seem to be updated in a timely manner.

The multiple_keys = “true” entry tells DataLink that more than one match to the SQL query is acceptable. In this case, DataLink will create a key/value pair for each qualified result. For example, a keyword “author” could produce an array of matches, which DataLink would arrange as follows:

%author% -> "Voltaire"

%author.1% -> "James Joyce"

%author.2% -> "Herman Melville"

5 KEY NAME LIST

In this chapter we'll list the actual key names that are available for use with DataLink and the different brands of external equipment it supports.

Mostly, the key names are self-explanatory, but we've added slightly more descriptive notes anyway. Here's the complete current list, grouped by manufacturer.

Note: the* key names *listed are shown inserted between percent (%) signs as a reminder, since this is how you will enter them onto your pages.

5.1.1 DAKTRONICS KEYS:

%DakClock%	-	Game Clock Time – "MM:SS.T"
%DakClockStatus%	-	Game Clock Status
%DakShotClock%	-	Shot Clock Time – "SS"
%DakHomeScore%	-	Home Team Score
%DakAwayScore%	-	Guest Team Score
%DakHomeFouls%	-	Home Team Fouls
%DakAwayFouls%	-	Guest Team Fouls
%DakHomeTOFull%	-	Home Time Outs Left – Full

%DakHomeTOPart%	-	Home Time Outs Left – Partial
%DakHomeTOTotal%	-	Home Time Outs Left – Total
%DakAwayTOFull%	-	Guest Time Outs Left – Full
%DakAwayTOPart%	-	Guest Time Outs Left – Partial
%DakAwayTOTotal%	-	Guest Time Outs Left – Total
%DakPeriod%	-	Current period
%DakHhr%	-	Hour (from Clock Time)
%DakMin%	-	Minutes (from Clock Time)
%DakSec%	-	Seconds (from Clock Time)
%DakTen%	-	Tenths (secs/10 from Clock Time)

5.1.2 WHITEWAY KEYS:

%WWPeriod%	-	Current period
%WWMin%	-	Minutes (from Clock Time)
%WWSec%	-	Seconds (from Clock Time)
%WWTen%	-	Tenths (secs/10 from Clock Time)
%WWAwayScore%	-	Guest Team Score
%WWHomeScore%	-	Home Team Score
%WWShotClock%	-	Shot Clock Time

%WWClock%	-	Game Clock Time – “MM:SS.T”

5.1.3 DSI KEYS:

%DSIClock%	-	Game Clock Time – “MM:SS.T”
%DSIShotClock%	-	Shot Clock Time

5.1.4 OES KEYS:

%OESClock%	-	Game Clock Time – “MM:SS.T”
%OESShotClock%	-	Shot Clock Time
%OESAwayScore%	-	Guest Team Score
%OESHomeScore%	-	Home Team Score
%OESHomeFouls%	-	Home Team Fouls
%OESAwayFouls%	-	Guest Team Fouls
%OESHomeTO%	-	Home Team Time Out
%OESAwayTO%	-	Guest Team Time Out
%OESPeriod%	-	Current period

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